

## A REVIEW ON OLEOGEL AS BIOACTIVE DELIVERY IN FOOD

**Divya Singh Chauhan\***

Assistant Professor, Department of Food & Biotechnology, Jayoti Vidyapeeth Women's University (JVWU), Jaipur, India, \*Corresponding author

Email: [divyaachauhaan@gmail.com](mailto:divyaachauhaan@gmail.com)

### Abstract

Oleogels are gaining popularity due to their appealing benefits such as ease of manufacture, superior fatty acid composition, and safe application in food products to meet consumers' desires for healthy products. Edible oleogels can be used to substitute unhealthy trans and saturated fats. They are porous materials having a three-dimensional gel network that self-assembles. This gel structure may physically entrap and hold a large volume of a continuous edible liquid-oil phase. This review contains the most recent information on the various oleogel systems and discuss oleogels properties characteristics that might be useful for delivery. It is demonstrated that oleogel and oleogel-based systems can be used as bioactive delivery in food. Oleogels are introduced as a delivery method, and emphasis is placed on the utilisation of lipid-based delivery systems to improve the bio-accessibility of molecules that are weakly water-soluble.

Keywords: Oleogel, Hydrogels, Bigel

### Introduction

Oleogels can be used in the food sector to manage phase separation, limit oil phase mobility and migration, provide solid-like qualities without utilising large quantities of saturated fatty acids, and function as a carrier of bioactive substances. The world's current concerns include improving the nutritional characteristics of meals and reducing components that may be linked to health concerns. More and more nations are enacting legislation to limit the content of trans fats and saturated fats in food goods.

Due to the high intake of trans and saturated fats, these have emerged as the main health concerns, including cardiovascular disease, colon cancer, diabetes, obesity, stroke, breast cancer, shortened pregnancy periods, preeclampsia risks, disorders of the infant nervous system and vision, and allergies. Trans-fatty acids (TFAs) have been associated with adverse metabolic consequences, and there is significant evidence linking higher consumption of TFAs and saturated fat with coronary heart disease (Mozaffarian et al. 2006, 2009; Nishida and Uauy 2009, Nettleton et al. 2017). The FDA removed trans fats off the GRAS (generally recognised as safe) list in 2015 and banned the use of partly hydrogenated oils in food beginning in January 2020 (Adili et al. 2020). The World Health Organization (WHO) recommends limiting saturated fat consumption to less than 10% of total caloric intake. The WHO also suggests substituting liquid oils rich in polyunsaturated fatty acids for solid fats such as butter. The availability, cost, and ability to modify the physical properties while maintaining desirable functional characteristics like appearance and

texture of the final food products are the major challenges for the food industry to find desirable oil structuring methods and decrease the trans and saturated fats in the food product.

## 2. Hydrogels, Oleogels, Bigels, and Emulgels

Gels represent a type of colloid that consists of a solid-like three-dimensional network, in which a liquid phase is entrapped. A gel can be defined as a coherent system of at least two components, which exhibits mechanical properties of a solid, where both the dispersed component and the dispersion medium extend themselves continuously throughout the whole system (Contreras-Ramírez et al. 2022). The first attempts for convenient applications of organogels in drug delivery started in the last years of the 20th century (Bhushette et al. 2022). There is current interest in their application in pharmaceutical, cosmetic, food and petrochemical industries. To distinguish the gels including vegetable oils from the traditional “organogels”, applied in chemical engineering, these edible oil gels have been named oleogels (O’Sullivan, Barbut, and Marangoni 2016). Several food grade materials can be used as oleogelators such as proteins, polysaccharide, fatty acids, phytosterols etc., depending upon desired physical characteristics and applications in particular food systems. Gelation mechanisms entrapping oil help in retaining chemical characteristics of oil unlike inter-esterification and hydrogenation (A. R. Patel et al., 2014). Most important oleogelators used in food sector include waxes, ethylcellulose, alcohols or esters of fatty acids, phospholipids and phytosterols etc. (J. Lim, Hwang & Lee, 2017).

Gel formulations can be divided into two major classes according to the solvent used for their production; hydrogels refer to the case where the liquid phase is water, and organogels (or oleogels) when the dispersed liquid is an organic solvent and is structured by an organogelator.

The type of oleogelator used and type of method followed for oleogelation (direct or indirect) has a direct impact on the properties of oleogels formed. Some important criteria which make the oleogel suitable for use in food industry include: (i) possession of lipophilic and interactive entities, (ii) surface activity, (iii) thermoreversible characteristics, (iv) natural origin, and (v) GRAS status (Pérez-Monterroza, Márquez-Cardozo & Ciro Velásquez, 2014).

One of the main advantages of oleogels is the possibility of carrying lipophilic bioactive compounds, which is of great utility in both pharmaceutical and food applications [11]. The combined action between structure and health benefits supports the important role that oleogels can have in novel food products, as they can be tailored to meet the ideal properties for a food product, acting as a healthy substitute for solid fats. Great attention from the scientific and industrial communities towards oleogels has risen since they were first suggested as a possible substitute for fats.

Oleogelator plays an important role to produce oleogel. To create an oleogel, small quantities of certain structuring agent are added to edible oils. These structuring agent are known as organogelators (Botega et al., 2013), impart specific qualities to the oil and they generally form a network that provides structure to the gel. Some organogelators have already been approved for

use in foods in specific applications or concentrations, while others await GRAS status. For the organogelators that currently have GRAS status, the small concentrations should be within the guidelines that would be allowed for those products. Research into the actual health effects of oleogels is in progress. Waxes have been the most effective of the crystalline oleogelators out of the studied crystalline oleogelators so far, because they may develop a well-formed network with significant oil-binding characteristics even at low concentrations (as low as 0.5 percent ) (Doan et al., 2017; Patel et al., 2013). Many researches have been done on wax based oleogel systems such as “candelilla wax in safflower oil (Toro-Vazquez et al., 2007), sunflower wax in milk fat (Kanya et al., 2007), rice bran wax in olive oil (Dassanayake et al., 2009), beeswax and sunflower wax in olive oil (Yilmaz & Ögütçü, 2014), plant and animal based waxes in soybean oil (Mukti et al., 2013), and beeswax in hazelnut oil (Yilmaz & Ögütçü, 2014)”.

According to (Dassanayake et al., 2011), “oleogelators are categorized into self-assembly system and crystal particles system”. Examples of oleogelators for self-assembly, network forming and wax based are shown in Table 2. Self-assembly system happens when oleogelators produced by molecular-self organization in liquid phase whereas crystal particles system happen when crystal particles formed by nucleation and continuous increase in size of crystals in the liquid phase.

### **Oleogel as delivery vehicle**

To overcome the challenges of delivery of lipid soluble molecules, various structured systems have been designed. These have been reviewed extensively in other publications. These systems can be classified as lipid-based, surfactant-based, or biopolymer-based, where all three address the effective delivery of hydrophobic molecules using differing strategies (O’Sullivan, Barbut, and Marangoni 2016). Since they function as fat replacements and have a considerably richer composition than standard solid fats, the structuring of liquid oils rich in PUFAs can have a substantial positive impact on human health. Moreover, the design of oleogels makes them effective delivery vehicles for bioactive molecules since it allows for both release control and preservation of bioactive compounds' functioning against oxidation (Pinto et al. 2021). However, this field is currently understudied, with most studies relying on the incorporation of liposoluble molecules rather than hydrosoluble compounds in the oleogel structure. Because of the lipophilic nature of oleogels, this appears to be the easiest way (Okuro et al. 2020).

(Yu et al. 2012) oleogel-based nanoemulsion is an excellent choice for encapsulating lipophilic bioactive chemicals and is relatively new in the realm of oral nutraceuticals delivery. In a related study, oleogel-based nanoemulsion was created to improve BC's solubility, loading capacity, and bioavailability. The findings supported earlier work by (Lu et al. 2016) and showed that the bioaccessibility of nutrient (BC) increased when loaded in oleogels and further enhanced following manufacture of oleogel-based nanoemulsion.

These formulations all significantly increase the loading content, bioavailability, and biological activity of wrapped nutraceuticals, proving the effectiveness of oleogel-based emulsions for delivering hydrophobic and indigestible bioactives (Zhao, Wei, and Xue 2022).

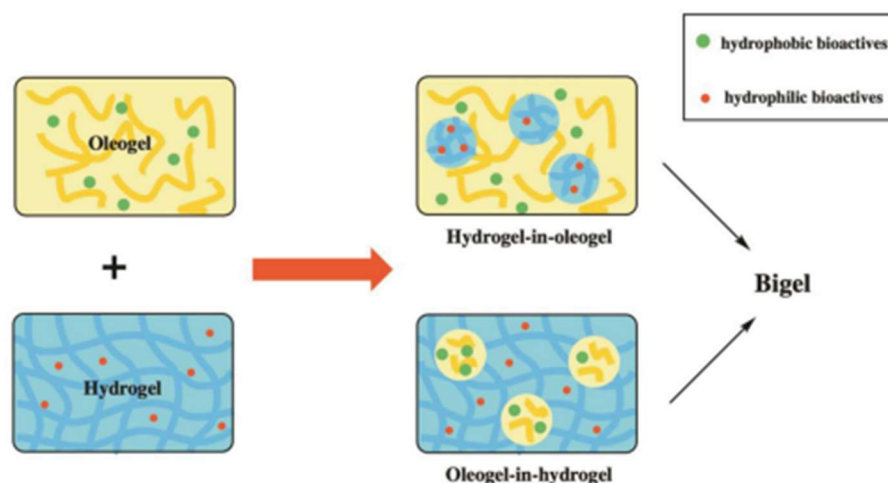


Fig.1. Schematic representation of bigel

The combination of oleogels with hydrogels produces hybridgels (or bigels), which have both hydrophilic and lipophilic properties (Figure 1). The properties of hybridgel are closely connected to the hydrogel and oleogel structures, as well as the hydrogel/oleogel ratios. Hybridgels have long been regarded as good drug transporters, whether hydrophilic or lipophilic (Zhao, Wei, and Xue 2022).

Further evidence that oleogel-based methods may be utilised to deliver poorly water-soluble nutraceuticals comes from the utilisation of these oleogels to create rapid-digestion emulsions (Yu et al. 2012). Since then, new formulations for the administration of curcuminoids have been created, with writers taking use of the variety of edible gelators suited for oil structuring. Li et al. 2019 created a new curcumin-loaded oleogel formulation by using sitosterol and lecithin's capacity to form self-assembled fibres, and they investigated its oxidative stability and release behaviour. In a recent study, the efficacy of an oleogel emulsion based on soy lecithin to improve probiotic viability was examined. The results showed that in an oleogel emulsion based on soy lecithin, oxidation was obviously delayed. Instead of the oleogel emulsion's physical barrier, soy lecithin's presence boosted probiotic vitality (Zhuang et al. 2021). There have been no studies that directly demonstrate the beneficial effects of oleogels on probiotic protection and delivery. Although it appears promising in theory, additional study into probiotic delivery via oleogels is needed to confirm its practicality and benefits. Probiotic distribution via oleogels is theoretically promising, but further study is needed to confirm its viability and benefits (Zhao, Wei, and Xue 2022).

## CONCLUSIONS

Oleogels for the delivery of bioactive compounds have been developed often throughout the past five years. The usage of oil-soluble chemicals was the main focus of the majority of the studies. However, there are examples of emulgels and bigels being used to transport water-soluble substances as well as to deliver oil- and water-soluble substances simultaneously in the same

system. A few research assess their digestion-related degradation mechanisms in addition to the large number of studies on their creation, manufacture, and characterisation. This method enables the use of oleogel-based devices for the release of bioactive chemicals in the human stomach. The future will be to create tailor-made oleogel systems that allow us to manage oleogel structure breakdown, lipolysis rate control, and bioaccessibility of bioactive substances all at the same time. Co-delivery systems require more research, which should be done to show how effective they are in delivering both lipophilic and hydrophilic chemicals. More in vivo research is also required. It is crucial to fully comprehend how these bioactive molecules are absorbed, and this issue has to be dealt with in the next years.

## REFERENCES

- Adili, L., L. Roufegarinejad, M. Tabibiazar, H. Hamishehkar, and A. Alizadeh. 2020. Development and characterization of reinforced ethyl cellulose based oleogel with adipic acid: Its application in cake and beef burger. *LWT - Food Science and Technology* 126:109277
- Botega, D. C. Z., Marangoni, A. G., Smith, A. K., & Goff, H. D. (2013). The Potential Application of Rice Bran Wax Oleogel to Replace Solid Fat and Enhance Unsaturated Fat Content in Ice Cream. *Journal of Food Science*, 78(9), 1334–1339.
- Bhushette, Pravin R, Sachin K Sonawne, Siddhesh Mishal, Shraddha Kanchan, ; Pravin, R Bhushette, and Sachin K Sonawane. 2022. "Food Science and Applied Biotechnology." *Food Science and Applied Biotechnology* 2022 (1): 2022. [www.ijfsab.comhttps://doi.org/10.30721/fsab2022.v5.i1](http://www.ijfsab.comhttps://doi.org/10.30721/fsab2022.v5.i1).
- Contreras-Ramírez, Javier Isaac, Ashok R. Patel, José Alberto Gallegos-Infante, Jorge Fernando Toro-Vázquez, Jaime David Pérez-Martínez, Walfred Rosas-Flores, and Rubén Francisco González-Laredo. 2022. "Organogel-Based Emulsified Systems, Food Applications, Microstructural and Rheological Features-a Review." *Biointerface Research in Applied Chemistry* 12 (2): 1601–27. <https://doi.org/10.33263/BRIAC122.16011627>.
- Dassanayake, L. S. K., Kodali, D. R., & Ueno, S. (2011). Formation of oleogels based on edible lipid materials. *Current Opinion in Colloid and Interface Science*, 16(5), 432–439.
- Dassanayake, L. S. K., Kodali, D. R., Ueno, S., & Sato, K. (2009). Physical properties of rice bran wax in bulk and organogels. *JAOCs, Journal of the American Oil Chemists' Society*, 86(12), 1163–1173.
- Doan, C. D., Tavernier, I., Okuro, P. K., & Dewettinck, K. (2017). Internal and external factors affecting the crystallization, gelation and applicability of wax-based oleogels in food industry. *Innovative Food Science and Emerging Technologies*, 45, 42–52.
- Kanya, T. C. S., Rao, L. J., & Sastry, M. C. S. (2007). Characterization of wax esters, free fatty alcohols and free fatty acids of crude wax from sunflower seed oil refineries. *Food Chemistry*, 101(4), 1552–1557.

- Lim, Jeongtaek, Hong-Sik Hwang, and Suyong Lee. "Oil-structuring characterization of natural waxes in canola oil oleogels: rheological, thermal, and oxidative properties." *Applied Biological Chemistry* 60, no. 1 (2017): 17-22.
- Li, Linlin, Wenbo Wan, Weiwei Cheng, Guoqin Liu, and Lipeng Han. 2019. "Oxidatively Stable Curcumin-Loaded Oleogels Structured by  $\beta$ -Sitosterol and Lecithin: Physical Characteristics and Release Behaviour in Vitro." *International Journal of Food Science and Technology* 54 (7): 2502–10. <https://doi.org/10.1111/ijfs.14208>.
- Lu, Muwen, Yong Cao, Chi Tang Ho, and Qingrong Huang. 2016. *Development of Organogel-Derived Capsaicin Nanoemulsion with Improved Bioaccessibility and Reduced Gastric Mucosa Irritation. Journal of Agricultural and Food Chemistry*. Vol. 64. <https://doi.org/10.1021/acs.jafc.6b01095>.
- Mukti, H. H., Erica, S., & Liu, S. X. (2013). Margarine from Organogels of Plant Wax and Soybean Oil. 1705–1712.
- Mozaffarian D., Katan, M.B., Ascherio, A., Stampfer, M.J., Willett, W.C. Trans-fatty acids and cardiovascular disease. *The New England Journal of Medicine*, 2006, 354(4): 1601-1613.
- Nettleton J.A., Brouwer I.A., Geleijnse J.M., Hornstra G. Saturated fat consumption and risk of coronary heart disease and ischemic stroke: a science updated. *Annals of Nutrition and Metabolism*, 2017, 70(1): 26-33.
- Nishida C., Uauy R. WHO Scientific update on health consequences of trans fatty acids: Introduction. *European Journal of Clinical Nutrition*, 2009, 63(2): S1- 4.
- O'Sullivan, Chloe M., Shai Barbut, and Alejandro G. Marangoni. 2016. "Edible Oleogels for the Oral Delivery of Lipid Soluble Molecules: Composition and Structural Design Considerations." *Trends in Food Science and Technology* 57: 59–73. <https://doi.org/10.1016/j.tifs.2016.08.018>.
- Okuro, Paula K., Artur J. Martins, António A. Vicente, and Rosiane L. Cunha. 2020. "Perspective on Oleogelator Mixtures, Structure Design and Behaviour towards Digestibility of Oleogels." *Current Opinion in Food Science* 35: 27–35. <https://doi.org/10.1016/j.cofs.2020.01.001>.
- Patel, Ashok R., Nick Cludts, Mohd Dona Bin Sintang, Benny Lewille, Ans Lesaffer, and Koen Dewettinck. "Polysaccharide-based oleogels prepared with an emulsion-templated approach." *ChemPhysChem* 15, no. 16 (2014): 3435-3439.
- Patel, A. R., Schatteman, D., De Vos, W. H., Lesaffer, A., & Dewettinck, K. (2013). Preparation and rheological characterization of shellac oleogels and oleogel-based emulsions. *Journal of Colloid and Interface Science*, 411(2013), 114–121.
- Pinto, Tiago C., Artur J. Martins, Lorenzo Pastrana, Maria C. Pereira, and Miguel A. Cerqueira. 2021. "Oleogel-Based Systems for the Delivery of Bioactive Compounds in Foods." *Gels* 7 (3): 1–24. <https://doi.org/10.3390/gels7030086>.
- Toro-Vazquez, J. F., Morales-Rueda, J. A., Dibildox-Alvarado, E., Charó-Alonso, M., Alonzo-Macias, M., & González-Chávez, M. M. (2007). Thermal and textural properties of organogels

developed by candelilla wax in safflower oil. *JAOCS, Journal of the American Oil Chemists' Society*, 84(11), 989–1000.

Yilmaz, E., & Ögütçü, M. (2014). Comparative Analysis of Olive Oil Organogels Containing Beeswax and Sunflower Wax with Breakfast Margarine. *Journal of Food Science*, 79(9), E1732–E1738.

Yilmaz, E., & Ögütçü, M. (2014). Properties and Stability of Hazelnut Oil Organogels with Beeswax and Monoglyceride.

Yu, Hailong, Ke Shi, Dong Liu, and Qingrong Huang. 2012. “Development of a Food-Grade Organogel with High Bioaccessibility and Loading of Curcuminoids.” *Food Chemistry* 131 (1): 48–54. <https://doi.org/10.1016/j.foodchem.2011.08.027>.

Zhao, Wanjun, Zihao Wei, and Changhu Xue. 2022. “Recent Advances on Food-Grade Oleogels: Fabrication, Application and Research Trends.” *Critical Reviews in Food Science and Nutrition* 62 (27): 7659–76. <https://doi.org/10.1080/10408398.2021.1922354>.

Zhuang, Xiaoqing, Nicole Gaudino, Stephanie Clark, and Nuria C. Acevedo. 2021. “Novel Lecithin-Based Oleogels and Oleogel Emulsions Delay Lipid Oxidation and Extend Probiotic Bacteria Survival.” *Lwt* 136 (P2): 110353. <https://doi.org/10.1016/j.lwt.2020.110353>.

SEVERAL FIXED POINT THEOREMS IN COMPLEX INVOLUTION BANACH SPACES

**Dr Brajraj Singh Chauhan**

Asst Professor, Jayoti Vidyapeeth Womens University Jaipur

Email-brajrajchauhan@gmail.com

**INTRODUCTION :**

This paper is committed to the find out of several fixed point theorems in Banach spaces. In section 1.1, we have proved various fixed point theorems on concurrence points of certain complex involutions in Banach spaces employing Lipschitzian involution [16], S. Sessa [17] and Khan & Imdad [13] contractive conditions which seem to be a contribution to the existing results and which in turn generalize and unify several other results.

**Preliminaries :**

Let  $R_+$  be the set of all non-negative reals and  $H_i$  be the family of all functions from  $R_+^i$  to  $R_+$  for each positive integer  $i$ , which are upper semi continuous and non decreasing in each coordinate variable.

Now, the subsequent definitions are borrowed by numerous authors the weak-commutativity condition introduced by Sessa [17] in metric space, which can be described in normed linear space stated as

**Key words:- complex involution, concurrence points, weak commutativity**

**Fixed point theorems of composite involutions in banach spaces :**

In this Section, we have obtained some fixed point theorems on coincidence points of certain composite involutions with some new contractive type conditions, which are extension and generalizations of Goebal and Zlotkiewicz [4], Khan-Imdad [13], Iseki [11].

Motivated from the contractive conditions given by Pachpatte [15]. We prove the following result by using this lemma.

Let  $x$  be an arbitrary point in  $K$  and  $A = \frac{1}{2}(T + I)$ , Define  $y = Ax$ ,  $z = Ty$  and  $\tilde{z} = 2y - z$ , we shall make repeated use of the following equivalent values. Where  $K$  stands for closed and convex subset of a Banach space  $X$  and  $T : K \rightarrow K$ . Therefore we state the lemma.

**Lemma :**

$$\|y - Tx\| = \|x - y\| = 1/2\|x - Tx\|$$

and  $\|x - Tx\| = 2\|Ax - x\|, \|y - Ty\| = 2\|A^2x - Ax\|$



Now we prove the following result.

**Theorem :**

Let  $F, G, S$  and  $T$  be self mappings of a Banach space  $X$  satisfying

- (i) The pair  $(ST, FG)$  commute
- (ii) The pair  $(S, T)$  and  $(F, G)$  are composite involution
- (iii)  $\|STx - STy\|^3 \leq h(\|FGx - FGy\| \cdot \|FGx - STx\| \cdot \|FGy - STy\|)$

....(1.1)

for every  $x, y \in X$ , where  $0 \leq h < 2$ , then  $FG$  and  $ST$  have a coincidence point  $x_0$ , i.e.,  $FGx_0 = STx_0$ . Moreover, if  $h < 1$  and the pairs  $(S, T)$ ,  $(ST, F)$ ,  $(ST, G)$ ,  $(F, G)$ ,  $(FG, S)$  and  $(FG, T)$  commute at the foregoing fixed point  $x_0$ , then  $x_0$  also remains the unique common fixed point of  $S, T, F$  and  $G$ .

**Proof :** From (i) and (ii) it follows that  $(STFG)^2 = I$ . Now using (1.1), we have,

$$\|STFG Fx - STFG Fy\| \leq h^{1/3} \left( \|(FG)^2 Fx - (FG)^2 Fy\| \cdot \|(FG)^2 Fx - (STFG)Fx\| \cdot \|(FG)^2 Fy - (STFG)Fy\| \right)^{1/3}$$

if we set  $Fx = z$  and  $Fy = w$ , then we get

$$\|STFG z - STFG w\| \leq h^{1/3} \left( \|z - w\| \cdot \|z - (STFG)z\| \cdot \|w - (STFG)w\| \right)^{1/3}$$

Since the map  $STFG$  is an involution, therefore, we define  $w = Az$ ,  $u = (STFG)w$  and  $\mu = 2w - u$  and note the values given in Lemma 1.1.1.

Now consider

$$\begin{aligned} \|u - z\| &= \|(STFG)w - (STFG)^2 z\| \\ &\leq h^{1/3} \left( \|w - (STFG)z\| \cdot \|w - (STFG)w\| \cdot \|(STFG)z - (STFG)^2 z\| \right)^{1/3} \\ &\leq h^{1/3} \left( \|w - (STFG)z\| \cdot \|w - (STFG)w\| \cdot \|z - (STFG)z\| \right)^{1/3} \\ &\leq h^{1/3} \left( \frac{1}{2} \|z - (STFG)z\| \cdot \|w - (STFG)w\| \cdot \|z - (STFG)z\| \right)^{1/3} \end{aligned}$$

....(1.2)

Similarly, by Lemma 1.1.1,

$$\begin{aligned} \|w - z\| &= \|2w - u - z\| = \|(STFG)z - (STFG)w\| \\ &\leq h^{1/3} \left( \|z - w\| \cdot \|z - (STFG)z\| \cdot \|w - (STFG)w\| \right)^{1/3} \\ &\leq h^{1/3} \left( 1/2 \|z - (STFG)z\| \cdot \|z - (STFG)z\| \cdot \|w - (STFG)w\| \right)^{1/3} \end{aligned}$$

....(1.3)

Thus, by using inequality (1.9) and (1.10), we get

$$\begin{aligned} \|u - v\| &= \|u - z\| + \|z - v\| \\ &\leq 2h^{1/3} \left( \frac{1}{2} \|z - (STFG)z\| \cdot \|z - (STFG)z\| \cdot \|w - (STFG)w\| \right)^{1/3} \end{aligned}$$

But

$$\|u - v\| = 2\|w - (STFG)w\|,$$

so that above inequality yields

$$\|w - (STFG)w\| \leq h^{1/3} \left( \frac{1}{2} \|z - (STFG)z\| \cdot \|z - (STFG)z\| \cdot \|w - (STFG)w\| \right)^{1/3}$$

This implies that

$$\|w - (STFG)w\| \leq (h/2)^{1/2} \|z - (STFG)z\|$$

Making use of Lemma 1.4.1, gives

$$\|A^2 z - Az\| \leq (h/2)^{1/2} \|Az - z\|$$

Consequently, proceeding inductively, we obtain

$$\|A^{n+1} z - A^n z\| \leq (h/2)^{n/2} \|Az - z\|$$

Since  $h < 2$ , it follows that  $\|A^{n+1} z - A^n z\| \rightarrow 0$  as  $n \rightarrow \infty$ . Thus  $\{A^n z\}$  is a Cauchy sequence and converges, to some point  $x_0$  in  $X$ . We obtain, therefore  $Ax_0 = x_0$  and so  $(STFG)x_0 = x_0$ .

So  $(STFG)$  has at least one fixed point say  $x_0$  in  $X$  i.e.,  $(STFG)x_0 = x_0$ . Now using  $(ST)^2 = I$ , we get  $FGx_0 = STx_0$  i.e. is a coincidence point of  $ST$  and  $FG$ .

Now

$$\begin{aligned} \|STx_0 - x_0\| &= \|STx_0 - ST(FGx_0)\| \\ &\leq h^{1/3} \left( \|FGx_0 - FG(STx_0)\| \cdot \|FGx_0 - STx_0\| \cdot \|FG(STx_0) - ST(STx_0)\| \right)^{1/3} \\ &\leq h^{1/3} \left( \|STx_0 - x_0\| \cdot 0 \cdot 0 \right)^{1/3} \\ &= 0 \end{aligned}$$

yielding thereby  $STx_0 - x_0 = 0$ , or  $STx_0 = x_0$  i.e.,  $x_0$  is a fixed point of  $ST$  and hence of  $FG$ .

To prove the uniqueness of common fixed point  $x_0$ , let  $y_0$  be another fixed point of  $ST$  and  $FG$ , then

$$\begin{aligned} \|x_0 - y_0\| &= \|STx_0 - STy_0\| \\ &\leq h^{1/3} \left( \|FGx_0 - FGy_0\|, \|FGx_0 - STx_0\|, \|FGy_0 - STy_0\| \right)^{1/3} \\ &\leq h^{1/3} \left( \|x_0 - y_0\|, 0, 0 \right)^{1/3} \\ &= 0 \end{aligned}$$

which implies that  $x_0 = y_0$ . i.e.,  $x_0$  is a unique common fixed point  $ST$  and  $FG$ .

Now using the commutativity of the pairs  $(F,G)$ ,  $(S,T)$ ,  $(FG,S)$ ,  $(FG,T)$ ,  $(ST,F)$ ,  $(ST,F)$  and  $(ST,G)$  at  $x_0$  one can write.

$$\begin{aligned} Sx_0 &= S(TSx_0) = ST(Sx_0), Fx_0 = F(GFx_0) = FG(Fx_0), \\ Tx_0 &= T(TSx_0) = ST^2x_0 = ST(Tx_0), Gx_0 = G(GFx_0) = FG(Gx_0), \\ Sx_0 &= S(FGx_0) = FG(Sx_0), Fx_0 = F(STx_0) = ST(Fx_0), \\ Tx_0 &= T(FGx_0) = FG(Tx_0), Gx_0 = G(STx_0) = ST(Gx_0), \end{aligned}$$

which show that  $Fx_0$ ,  $Gx_0$ ,  $Sx_0$  and  $Tx_0$  is a common fixed point of the pair  $(ST,FG)$  which due to uniqueness of the common fixed point of the pair  $(ST,FG)$  get us.

$$x_0 = Sx_0 = Tx_0 = Fx_0 = Gx_0$$

This completes the proof.

As the consequences of our Theorem 1.1.2, we get the following result by putting  $FG=I$  and  $S=I$ .

**Corollary :**

Let  $T$  be self mappings of a Banach space  $X$  satisfying

- (i)  $T^2 = I$
- (ii)  $\|Tx - Ty\|^3 \leq h(\|x - y\| \cdot \|x - Tx\| \cdot \|y - Ty\|)$

for every  $x, y \in X$ , where  $0 \leq h < 2$ , then  $T$  has at least one fixed point.

By unifying several well known contractive conditions in fixed point theory, Delbosco [2] defined a **g – contraction** as follows

$$d(Tx, Ty) \leq g(d(x, y), d(x, Tx), d(y, Ty))$$

where  $g: R_+^3 \rightarrow R_+$  is a continuous function having the properties.

- (i)  $g(1,1,1) = h < 1$  and
- (ii) for  $u, v \geq 0$  such that  $u \leq g(u, v, v)$  or  $u \leq g(v, u, v)$  or  $u \leq g(v, v, u)$  then  $u \leq hv$ .

However, we shall assume function  $g$  to have somewhat different properties from that defined by Delbosco [2]

Let  $U$  be the set all real valued contributions function of

$g : R_+^3 \rightarrow R_+$  satisfies the condition

(i)  $g(1,1,1) = h < 2$

(ii) if  $u, v \geq 0$  are such that either  $u \leq g(v, 2v, u)$  or  $u \leq g(v, u, 2v)$  or  $u \leq g(u, 2v, v)$ , then  $u \leq hv$

Now, we prove the following theorem,

**Theorem:**

Let  $F, G, S$  and  $T$  be self mappings of a Banach space  $X$  satisfying.

(i) The pair  $(ST, FG)$  commute,

(ii) The pairs  $(S, T)$  and  $(F, G)$  are composite involutions,

(iii)  $\|STx - STy\| \leq g(\|FGx - FGy\|, \|FGx - STx\|, \|FGy - STy\|)$

....(1.4)

for all  $x, y \in X, g \in U$ , then  $FG$  and  $ST$  have a coincidence point  $x_0$ , i.e.  $FGx_0 = STx_0$ , Moreover if the pairs  $(S, T), (ST, F), (ST, G), (F, G), (FG, S)$  and  $(FG, T)$  commute at the foregoing fixed point  $x_0$ , then  $x_0$  also remains the unique common fixed point of  $S, T, F$  and  $G$ .

**Proof :** From (i) and (ii) it follows that  $(STFG)^2 = I$ . Now using (1.11), we have

$$\|STFG Fx - STFG Fy\| \leq g(\|(FG)^2 Fx - (FG)^2 Fy\|, \|(FG)^2 Fx - (STFG)Fx\|, \|(FG)^2 Fy - (STFG)Fy\|)$$

If we set  $Fx = z$  and  $Fy = w$ , then we get

$$\|STFG z - STFG w\| \leq g(\|z - w\|, \|(z - STFG z)\|, \|(w - STFG w)\|) \dots(1.5)$$

Since the map  $STFG$  is an involution, therefore, we define  $w = Az, U = (STFG)w$  and  $\sim = 2w - U$  and note the values given in Lemma 1.4.1.

Now consider

$$\begin{aligned} \|u - z\| &= \|(STFG)w - (STFG)^2 z\| \\ &\leq g(\|w - (STFG)z\|, \|w - (STFG)w\|, \|(STFG)z - (STFG)^2 z\|) \\ &\leq g(\|w - (STFG)z\|, \|w - (STFG)w\|, \|(STFG)z - z\|) \\ &\leq g\left(\frac{1}{2}\|z - (STFG)z\|, \|w - (STFG)w\|, \|z - (STFG)z\|\right) \dots(1.6) \end{aligned}$$

by Lemma 1.4.1

Again

$$\begin{aligned} \|u - z\| &= \|2w - u - z\| = \|(STFG)z - (STFG)w\| \\ &\leq g(\|z - w\|, \|z - (STFG)z\|, \|w - (STFG)w\|) \\ &\leq g\left(\frac{1}{2}\|z - (STFG)z\| \|z - (STFG)z\|, \|w - (STFG)w\|\right) \quad \dots(1.7) \end{aligned}$$

But

$$\|u - v\| \leq \|u - z\| + \|z - v\|$$

And so, using inequalities (1.6) and (1.7) we get

$$\|u - v\| \leq 2g\left(\frac{1}{2}\|z - (STFG)z\|, \|z - (STFG)z\|, \|w - (STFG)w\|\right)$$

Since  $\|u - v\| = 2\|w - (STFG)w\|$ , so that above inequality gives

$$\|w - (STFG)w\| \leq g\left(\frac{1}{2}\|z - (STFG)z\|, \|z - (STFG)z\|, \|w - (STFG)w\|\right)$$

so that

$$\|w - (STFG)w\| \leq h/2 \|z - (STFG)z\|$$

Thus from Lemma (1.4.1), we obtain

$$\|A^2z - Az\| \leq h/2 \|Az - z\|$$

Thus, Inductively we obtain

$$\|A^{n+1}z - A^n z\| \leq (h/2)^n \|Az - z\|$$

Since  $h < 2$ , it follows that  $\|A^{n+1}z - A^n z\| \rightarrow 0$  as  $n \rightarrow \infty$ . Thus  $\{A^n x\}$  is a Cauchy sequence and converges, to some point  $x_0$  in  $X$ . We obtain, therefore  $Ax_0 = x_0$  and so  $(STFG)x_0 = x_0$ .

So  $(STFG)$  has at least one fixed point say  $x_0$  in  $X$  i.e.,  $(STFG)x_0 = x_0$ . Now using  $(ST)^2 = I$ , we get  $FGx_0 = STx_0$  i.e. is a coincidence point of  $ST$  and  $FG$ . Now

$$\begin{aligned} \|STx_0 - x_0\| &= \|STx_0 - ST(FGx_0)\| \\ &\leq g(\|FGx_0 - FG(STx_0)\|, \|FGx_0 - STx_0\|, \|FG(STx_0) - ST(STx_0)\|) \\ &< g(\|STx_0 - x_0\|, 0, 0) \\ &< h(\|STx_0 - x_0\|) \end{aligned}$$

yielding thereby  $STx_0 - x_0 = 0$ , or  $STx_0 = x_0$  i.e.,  $x_0$  is a fixed point of  $ST$  and hence of  $FG$ .

To prove the uniqueness of common fixed point  $x_0$ , let  $y_0$  be another fixed point of  $ST$  and  $FG$ , then

$$\begin{aligned} \|x_0 - y_0\| &= \|STx_0 - STy_0\| \\ &\leq g(\|FGx_0 - FGy_0\|, \|FGx_0 - STx_0\|, \|FGy_0 - STy_0\|) \\ &< g(\|x_0 - y_0\|, 0, 0) \\ &< h(\|x_0 - y_0\|) \end{aligned}$$

giving thereby  $x_0 - y_0 = 0$  i.e.  $x_0$  is a unique common fixed point of  $ST$  and  $FG$ .

Now using the commutativity of the pairs  $(F,G)$ ,  $(S,T)$ ,  $(FG,S)$ ,  $(FG,T)$ ,  $(ST,F)$ ,  $(ST,G)$  and  $(ST,G)$  at  $x_0$  one can write.

$$\begin{aligned} Sx_0 &= S(TSx_0) = ST(Sx_0), Fx_0 = F(GFx_0) = FG(Fx_0), \\ Tx_0 &= T(TSx_0) = ST^2x_0 = ST(Tx_0), Gx_0 = G(GFx_0) = FG(Gx_0), \\ Sx_0 &= S(FGx_0) = FG(Sx_0), Fx_0 = F(STx_0) = ST(Fx_0), \\ Tx_0 &= T(FGx_0) = FG(Tx_0), Gx_0 = G(STx_0) = ST(Gx_0), \end{aligned}$$

which show that  $Fx_0$ ,  $Gx_0$ ,  $Sx_0$  and  $Tx_0$  is a common fixed point of the pair  $(ST,FG)$  which due to uniqueness of the common fixed point of the pair  $(ST,FG)$  get us.

$$x_0 = Sx_0 = Tx_0 = Fx_0 = Gx_0$$

This completes the proof.

After putting  $FG = I$  and  $S = I$ , in Theorem 1.1.4, we get the following result.

### Corollary :

Let  $T$  be self mappings of a Banach space  $X$  satisfying

- (i)  $T^2 = I$ ,
- (ii)  $\|Tx - Ty\| \leq g(\|x - y\|, \|x - Tx\|, \|y - Ty\|)$

for every  $x, y \in X$  where  $g \in \mathcal{U}$ , then  $T$  has at least one fixed point

### Remark :

The foregoing Theorem 1.1.4 can be conveniently used to corollarize the theorem of Iseki (see[\*]) if we choose  $g(a, b, c) = (r/2 + s) \max\{2a, b, c\}$  for all  $a, b, c \geq 0$ .

Now, in our next theorem we generalized the contractive condition given by Imdad and Khan [13].

### Theorem :

Let  $F, G, S$  and  $T$  be self mappings of a Banach space  $X$  satisfying

- (i) The pair  $(ST, FG)$  commute,
- (ii) The pairs  $(S, T)$  and  $(F, G)$  are composite involutions,

$$(iii) \|STx - STy\| \leq \frac{h}{2} \max \left( \|FGx - FGy\|, \frac{1}{2} \|FGx - STx\|, \frac{1}{2} \|FGy - STy\|, \right. \\ \left. \frac{1}{2} \|FGx - STy\|, \frac{1}{2} \|FGy - STx\| \right) \quad \dots(1.8)$$

for every  $x, y \in X$  where  $0 \leq h < 4$ , then  $FG$  and  $ST$  have a coincidence point  $x_0$  i.e.,  $FGx_0 = STx_0$ . Moreover if the pairs  $(S, T)$ ,  $(ST, G)$ ,  $(ST, F)$ ,  $(F, G)$ ,  $(FG, S)$  and  $(FG, T)$  commute at the foregoing fixed point  $x_0$ , then  $x_0$  also remains the unique common fixed point of  $S, T, F$  and  $G$ .

**Proof :** From (i) and (ii) it follows that  $(STFG)^2 = I$ . Now using (1.8), we have

$$\|STFGFx - STFGFy\| \leq \frac{h}{2} \max \left( \|(FG)^2 Fx - (FG)^2 Fy\|, \frac{1}{2} \|(FG)^2 Fx - (STFG)Fx\|, \right. \\ \frac{1}{2} \|(FG)^2 Fy - (STFG)Fy\|, \frac{1}{2} \|(FG)^2 Fx - (STFG)y\|, \\ \left. \frac{1}{2} \|(FG)^2 Fy - (STFG)Fy\| \right)$$

If we set  $Fx = z$  and  $Fy = w$ , then we get

$$\|STFGz - STFGw\| \leq \frac{h}{2} \max \left( \|z - w\|, \frac{1}{2} \|z - (STFG)z\|, \frac{1}{2} \|w - (STFG)w\|, \right. \\ \left. \frac{1}{2} \|z - (STFG)w\|, \frac{1}{2} \|w - (STFG)z\| \right).$$

Since the map  $STFG$  is an involution and  $0 \leq h < 4$ , therefore by Theorem 2.1 (due to Khand and Imdad [13]),  $STFG$  has at least one fixed point say  $x_0$  in  $X$  i.e.,  $STFG x_0 = x_0$ . Now using  $(ST)^2 = I$ , we get  $FGx_0 = STx_0$  i.e.  $x_0$  is a coincidence point of  $ST$  and  $FG$ . Now

$$\|STx_0 - x_0\| = \|STx_0 - ST(FGx_0)\| \\ \leq \frac{h}{2} \max \left( \|FGx_0 - FG(STx_0)\|, \frac{1}{2} \|FGx_0 - STx_0\|, \frac{1}{2} \|FG(STx_0) - ST(STx_0)\|, \right. \\ \left. \frac{1}{2} \|FGx_0 - ST(STx_0)\|, \frac{1}{2} \|FG(STx_0) - STx_0\| \right) \\ \leq \frac{h}{2} \|STx_0 - x_0\|$$

yielding thereby  $STx_0 - x_0 = 0$ , or  $STx_0 = x_0$  i.e.  $x_0$  is a fixed point of  $ST$  and hence of  $FG$ .

To prove the uniqueness of common fixed point  $x_0$ . Let  $y_0$  be another fixed point of  $ST$  and  $FG$ , Then

$$\begin{aligned} \|x_0 - y_0\| &= \|STx_0 - STy_0\| \\ &\leq \frac{h}{2} \max \left( \|FGx_0 - FGy_0\|, \frac{1}{2} \|FGx_0 - STx_0\|, \frac{1}{2} \|FGy_0 - STy_0\|, \right. \\ &\quad \left. \frac{1}{2} \|FGx_0 - STy_0\|, \frac{1}{2} \|FGy_0 - STx_0\| \right) \\ &\leq \frac{h}{2} \|x_0 - y_0\| \end{aligned}$$

giving thereby  $x_0 - y_0 = 0$  or  $x_0 = y_0$  i.e,  $x_0$  is a unique common fixed point of  $ST$  and  $FG$ .

Now using the commutativity of the pairs  $(F,G)$ ,  $(S,T)$ ,  $(FG,S)$ ,  $(FG,T)$ ,  $(ST,F)$  and  $(ST,G)$  at  $x_0$  one can write.

$$\begin{aligned} Sx_0 &= S(TSx_0) = ST(Sx_0), Fx_0 = F(GFx_0) = FG(Fx_0), \\ Tx_0 &= T(TSx_0) = ST^2x_0 = ST(Tx_0), Gx_0 = G(GFx_0) = FG(Gx_0), \\ Sx_0 &= S(FGx_0) = FG(Sx_0), Fx_0 = F(STx_0) = ST(Fx_0), \\ Tx_0 &= T(FGx_0) = FG(Tx_0), Gx_0 = G(STx_0) = ST(Gx_0), \end{aligned}$$

which show that  $Fx_0$ ,  $Gx_0$ ,  $Sx_0$  and  $Tx_0$  is a common fixed point of the pair  $(ST,FG)$  which due to uniqueness of the common fixed point of the pair  $(ST,FG)$  get us.

$$x_0 = Sx_0 = Tx_0 = Fx_0 = Gx_0$$

This completes the proof.

If we take  $FG = I$  and  $S = I$  in Theorem 1.1.7, we get the following result of Khan and Imdad [13].

**Corollary :**

Let  $T$  be self mappings of a Banach space  $X$  satisfying

(i)  $T^2 = I$

(ii)  $\|Tx - Ty\| \leq \frac{h}{2} \max \left( \|x - y\|, \frac{1}{2} \|x - Tx\|, \frac{1}{2} \|y - Ty\|, \frac{1}{2} \|x - Ty\|, \frac{1}{2} \|y - Tx\| \right)$

for every  $x, y \in X$  where  $0 \leq h < 4$ , then  $T$  has at least one fixed point.

**Remark :**

Theorem 1.1.7, remains true if we replace condition 1.8) as follows

$$\|STx - STy\| \leq h \|FGx - FGy\| \text{ for every } x, y \in X, \text{ where } 0 \leq h < 2$$

We furnish an example to demonstrate the validity of the Remark 1.1.9



**Example :**

Let  $R$  be the set of reals equipped with usual norm. Define  $S, T, F, G: R \rightarrow R$  as

$$Sx = \begin{cases} -x & \text{if } x \geq 0 \\ -x/3 & \text{if } x < 0 \end{cases}, \quad Tx = \begin{cases} 3x & \text{if } x \geq 0 \\ x & \text{if } x < 0 \end{cases}$$

$$Fx = \begin{cases} -x & \text{if } x \geq 0 \\ -x/4 & \text{if } x < 0 \end{cases}, \quad Gx = \begin{cases} 4x & \text{if } x \geq 0 \\ x & \text{if } x < 0 \end{cases}$$

So that

$$STx = \begin{cases} -3x & \text{if } x \geq 0 \\ -x/3 & \text{if } x < 0 \end{cases} \quad \text{and} \quad FGx = \begin{cases} -4x & \text{if } x \geq 0 \\ -x/4 & \text{if } x < 0 \end{cases}$$

Note that  $(ST)^2 = (FG)^2 = I$

Now we distinguish following cases:

(a) For  $x \geq 0, y \geq 0$  we have

$$\|STx - STy\| = 3|x - y| \leq \frac{7}{8}(8|x - y|) = \frac{14}{8}(4|x - y|) = \frac{14}{8}\|FGx - FGy\|$$

(b) For  $x < 0, y < 0$  we can write

$$\|STx - STy\| = \frac{1}{3}|x - y| \leq \frac{7}{16}|x - y| = \frac{14}{8}\|FGx - FGy\|$$

(c) Next, for  $x \geq 0$  and  $y < 0$  we write a sequence of implications in the following way:

$$y < 0 \leq x \Rightarrow y < \left(\frac{192}{5}\right)x \Rightarrow y < \left(\frac{48}{5}\right)4x \Rightarrow \left(\frac{5}{48}\right)y < 4x$$

$$\Rightarrow \frac{7}{6}y - \frac{1}{3}y < 7x - 3x \Rightarrow 3x - \frac{1}{3}y < 7x - \frac{7}{16}y = \frac{14}{8}\left|4x - \frac{y}{4}\right|$$

Which implies that

$$\|STx - STy\| = \left|3x - \frac{y}{3}\right| \leq \frac{14}{8}\left|4x - \frac{y}{4}\right| = \frac{14}{8}\|FGx - FGy\|$$

Thus all the conditions of Remark 1.1.9 are

satisfied if we choose  $h = \frac{14}{8}$ . Here  $x = 0$  is the only coincidence point of  $ST$  and  $FG$ .

However 0 also remains the unique common fixed point of  $F, G, S$  and  $T$ .

**REFERENCES**

1. D-Delbosco., "A unified approach for all contractive mappings", Inst. Mat. Univ. Torino. Report n., **19 (1981)** Italy.

2. M. Imdad, Aqeel Ahamad and A. Rauf Khan., “On common fixed point of asymptotically commuting mappings”, Bull Cal. Math. Soc., **86(1994)**, 307-312.
3. M. Imdad and Q.H. Khan., “Remarks on fixed and coincidence points of certain composite involutions in Banach spaces, Mathematics student., Vol. **72**, Nos, 1-4 (**2003**), 165-169.
4. M.S. Khan and M. Imdad., “Fixed points of certain involution in Banach spaces”, J. Austral. Math. Soc. **37**, (**1984**), 169-177.
5. B.G. Pachpatte., “Fixed point theorems satisfying a new contractive type condition”, Soochow J. Math., **16 (2) (1990)**, 173-183.
6. S. Park and S. Yie., “On certain Lipschitzian involution in Banach spaces”, J. Korean. Math.; Soc, **23 (1986)**, 217-222.
7. S. Sessa., “On a weak commutativity condition in fixed point considerations”, Publ. Inst. Math. (Beogard)., **32 (46) (1982)**, 149-153.

---

**THE IMPACT OF LANGUAGE ON GENDER AND POWER**

**Dr. Kalyani Pradhan**

Assistant Professor Jayoti Vidyapeeth Women's University  
Rajasthan, India

**ABSTRACT**

The social roles of men and women who speak a language are closely related to the language's structures, vocabulary, and usage patterns. the reason why there are different types for men and women. Does language use differ between men and women? Why do these variations exist? Is it as a result of the language's structures? Or it could be because of social conventions that dictate how language should be used by both men and women.

Is it possible to label a certain language as "sexist"? is the first query that leads to the second. The second query raises a further query: "Is it feasible to describe the users of that language and the norms governing language use as "sexist"?" These questions are actually the ones that are discussed when it comes to gender and language. Another topic of discussion is how to prevent sexism in language. In light of the biological and social construction theories of gender, we look at how language is used differently by men and women.

**Keywords:** Gender, Power, Language, Linguistic Disparities, Social Status

**INTRODUCTION**

Women and men use language differently due to styles, registers, and ways of speaking as well as differences in interaction, thought, culture, and linguistic attitudes related to gender, politeness, and stereotypes. Women's speech is undoubtedly different from men's speech. In actuality, gender and language have a number of interrelated interactions. To put it another way, men and women use language in very different ways. It is due to the way the language is structured, societal norms, or the people who use the language in that society. Gender (male and female) is also socially constructed. We observe variations or differences between men and women as a result of the social institution or taboo. In addition, there are significant differences between how men and women speak that are founded in the hierarchy of power. I will provide some justifications for my remarks in the passages that follow.

**Studies of language and gender:**

The 1975 book *Language and Woman's Place* by Robin Lakoff, as well as other of Lakoff's earlier research, are frequently cited as the foundation for the sociolinguistic study of gender and language. Since the 1970s, the study of language and gender has advanced significantly. Leading academics include Penelope Eckert, Janet Holmes, Deborah Tannen, Deborah Cameron, and others.

## **Pronunciation**

In terms of pronunciation and morphology, social dialect research mostly examines the differences between men's and women's speech, with some concentration on syntactic structures (such as multiple negations). Men and women have different intonation patterns, according to Brend (1975). Syntax, semantics, and style are now the primary areas of study for gender differences, according to Robin Lakoff. She contends that language spoken about women in American society reflects their inferior socioeconomic rank. She lists certain linguistic elements that, in her opinion, are more frequently utilised by women than by males and that convey hesitation and lack of confidence. Robin Lakoff contends that women's use of hedging and boosting techniques reveals a lack of confidence.

## **Interruptions**

Women and men converse differently for a variety of reasons in terms of interpersonal dynamics. Women are more likely than men to listen attentively during conversations, interrupt less frequently, and be concerned that others have an opportunity to contribute (Holmes 1995). Despite the popular belief that women are the talkative sex and the proverbs that depict women as chatty. The majority of the scientific evidence indicates out the opposite; women's tongues are like lambs' tails; they never stay still. Men predominate when speaking in a variety of settings, especially public ones like conference talks, staff meetings, and television interviews where talking can boost your prestige. Interruptions between speakers of the same gender tend to be spread rather evenly. Male to male conflict is more common among same-sex couples, while female to female drama is more prevalent.

According to a number of studies, males interrupt women during cross-sex interactions far more frequently than women interrupt men. In cross-sex discussion, women use more you and we and less resistance than males when someone interrupts them. They also ask more questions, encourage others to talk, and use more signs like "mm hmm" to encourage people to continue speaking. Men tend to try to dominate the conversation by interrupting more, challenging more, disputing more, ignoring more, and making generalisations. In other words, men and women appear to reflect the power dynamic that prevails through society, where males are dominant and women are subservient, in cross-sex interactional patterns in discussion. Without a question, men continue to interrupt most frequently.

Men interrupt others more frequently than women do in other situations; it has been discovered. The pattern is present, for example, in contacts between doctors and patients and departmental meetings. Whether they are doctors or patients, women are more likely than males to be interrupted. The majority of interruptions in conversations between patients and children are made by fathers, and females are most frequently interrupted by both their moms and fathers. However, compared to most women, most men speak more frequently and for a longer period of time. More often than not, men interrupt than women. Although both men and women are guilty of interrupting, there are a few key distinctions:

- )] In general, men interrupt more frequently than women.
- )] Women are more likely than males to interrupt one another.
- )] When it comes to taking and keeping the floor, men are more successful.
- )] Women typically interrupt by asking questions or making encouraging remarks (yeah, right, I see, is

that so, etc.).

On the other hand, Holmes (1992) discovered that female doctors were interrupted more frequently than male doctors during patient-doctor talks. Men tended to dominate interactions in professional settings, but not women. In her investigation on the interactions between doctors and patients, West (1998) reached comparable conclusions.

### **Competitive vs. Cooperative**

It has been discovered that men are more competitive conventionalists and women are more supportive and cooperative conversationalists. According to a study of the Malagasy society, women speak more bluntly than males do. Women are the ones that handle the essential haggling in the marketplace as well as handling conflicts and debates within the home. Men in this society speak in a circumlocutory and oblique manner. Women are often cooperative conversationalists, according to research on conversational interaction, whereas men are more likely to be competitive and less tolerant of others.

### **Discussion topics between men and women**

Men speak more than women when both sexes are present in a conversation. The dialogues also cover a range of subjects. Men-men: rivalry and teasing, athleticism, aggression, commerce, politics, legal issues, and taxes. Women are concerned with their sense of self, relationships with others, families and friends, reading, eating and drinking, problems in life, and lifestyle. More often than males, women use adjectives like adorable, charming, magnificent, lovely, and sweet. They frequently add tag inquiries as a result of the same feelings of uncertainty and uneasiness.

Many people think that women talk more than males. Men have been found to talk more than women in a variety of contexts, including staff meetings, television panel discussions, and husband-and-wife pairs engaging in casual chat (Eakins and Eakins 1978; Bernard 1972). (Soskin and John 1963). According to evidence, men and women typically discuss different topics (Aries and Johnson 1983; Seidler 1989). Men, for instance, frequently discuss sports, politics, and cars, whereas women typically discuss parenting and interpersonal connections.

### **Questions in Conversations**

In interactions, inquiries are used differently by men and women. For men, a question is usually a genuine request for information whereas with women it can often be a rhetorical means of engaging the other's conversational contribution or of acquiring attention from others conversationally involved, techniques associated with a collaborative approach to language use. Therefore, women use questions more frequently. In writing, however, both genders use rhetorical questions as literary devices. For example, Mark Twain used them in "A War Prayer" to provoke the reader to question his actions and beliefs. Tag questions are frequently used to verify or confirm information; though in women's language they may also be used to avoid making strong statements.

### **Changing the topic of conversation**

In his research on the interactions of same-sex friends, Bruce Dorval found that men tend to switch topics more frequently than women. The idea that women chatter and talk excessively may have its roots in this distinction. Goodwin (1990) notes that rather than offering fresh subjects, girls and women relate their statements to those of earlier speakers and develop one another's topics. However, a study of young American couples and their interactions reveals that while women raise twice as many topics as men, it is the men's topics that are usually taken up and subsequently elaborated in the conversation.

### **Listening and Attentiveness**

Given the value that hearing in conversation carries for the listener as the speaker's confidant, it appears that women place more weight on listening than do males. Women typically interrupt conversations less frequently than men do, which suggests that listening is important to them. They also utilise minimal responses more frequently than men do, which suggests that women place greater importance on listening. However, as Victoria DeFrancisco's work reveals, men interrupt significantly more frequently with unrelated issues, especially in mixed-sex settings, and are more likely to respond silently to a female speaker's conversational focus than they are to minimise their own comments.

Women listen and concur when guys speak. However, despite the fact that this agreement was meant to be a sign of connection, males frequently interpret it as a sign of status and authority. A woman's listening and attempts at recognition may lead a man to believe that she is unsure or insecure. When in fact, a woman's motivations for acting in this way are a direct outcome of her views toward her relationships rather than her attitudes toward her knowledge. Giving information elevates the speaker in the listener's eyes while lowering them in the speaker's eyes. But when women listen to men, they often consider connection and support rather than necessarily position.

### **Reasons of Gender Differences in Language Use**

Language use by men and women differs for a variety of reasons. On this, three claims can be made: First, that there are significant biological differences between men and women that have an impact on how they speak. Psychologically, women are more likely to be romantically attached, supportive of one another, and non-competitive. Men have an intrinsic tendency toward independence and power over solidarity.

Second, social structures are constructed via a series of hierarchical power relations. In such a system, men typically hold the power while women typically do not. Language usage is a reflection of men's social dominance. They make an effort to take charge, introduce ideas, interrupt, and so forth. They act in this way toward women as well as toward one another. Women who feel helpless should be allowed to get away with it. Third, both men and women are social creatures who have mastered certain behaviours. The majority of language behaviour is taught activity.

Women learn how to be women, while men learn how to be men. The majority of studies suggest that distinct gender-specific activities and various socialisation and acculturation patterns may be to blame for the disparities between men and women's modes of interaction. To categorise men's and women's styles as "competitive" and "cooperative," respectively, would be stereotyped. The majority of

the data points to a difference between men and women's language use as a result of their various social roles. The discrepancies will be bigger the more distinct the roles. The reflection can also be seen in language in countries where gender roles are less clearly delineated and social stratification is less rigid. Alterations in society also reflect alterations in language.

### **Dominance versus subjection, Status and Power**

Most studies show that men are typically more domineering than women in mixed-gender conversations. Variability based on power serves as the main argument in favour of the dominance strategy. On the other hand, social, economic, and sociohistorical status are the sources of power. Using the example of male experts speaking more verbosely than their female counterparts, Helena Leet-Pellegrini proposes a dichotomy between a male desire for conversational dominance and a female aspiration for group conversational participation. Males are given more attention in the classroom, and this can result in them receiving more attention in the scientific and technical fields. This can then result in their success in those fields, which can then result in their having greater power in a technocratic society, claims Jennifer Coates.

Power plays a significant role in the male/female interaction in a variety of contexts, not just conversation. From the topic of the communication to the methods used to convey it, power is evident in every facet of communication. Men are more focused on their position than women are, who are often more concerned with building and keeping relationships. The goal of a woman's communication is often to establish and preserve connections. On the other hand, men will prioritise power more, and their communication patterns will reflect their desire to uphold their position in the partnership.

Tannen's research indicates that men frequently use storytelling as a means of upholding their social status. Men tend to make jokes or tell stories that are primarily about themselves. Women, on the other hand, are less preoccupied with their own power, and as a result, the focus of their storytelling is on others rather than on themselves. Women strive to minimise their role in their own tales by equating themselves with those around them, which deepens their bonds with those people.

### **Construction of Gender**

Sex is biologically determined. Sex differences are the differences based on biological/physical organs. Gender is a social construct that encompasses all of the psychological, social, and cultural distinctions that exist between men and women. There are well-known differences between the sexes: Compared to men, women have more fat, less muscle, are weaker, and weigh less. They are mature more rapidly and live longer. They have different voice quality and different vocal skill. But the majority of the variations, such as longevity and voice quality, can be the product of various socialisation processes. Phonological differences between men and women in almost all languages of the world, for example, Hindi language-differences in word choice in various languages. Japanese women show they are women when they speak, with the use of the morphological inflections *ne* or *wa*. According to Sapir (1929), the Yana language of California contains special forms for use in speech either by or to women.

Some other sex-based distinctions such as actor-actress, waiter-waitress, and master-mistress are found in language. Some of these distinctions are reinforced by entrenched patterns of usage and semantic

development. Master-mistress have quite different ranges of use and meaning Another pair of differentiation: boy-girl, man- woman, gentleman- lady, bachelor-spinster, widower-widow. Widower-widow has different use and meaning from the others. Lakoff cites that there are 'equivalent' words referring to men and women do have quite different associations in English language. "He's a professional" and "She's a professional".

### **Gender as a Social Construct**

A variety of social institutions contributed to the development of the gender construct. Some of these include family, educational institutions, judiciary, religion, etc In recent years, gender-related thoughts and notions have been increasingly prevalent in the media. Gender, unlike sex, which is based on biological division and is specific in character, is more amorphous in nature and is subject to change with reference to context and time.

### **Sexist Language**

Who is 'sexist'? Which comes first, the speakers or the language itself? According to Lakoff, the English language is sexist. Because of this, women seem to employ language more submissively toward men. For example, women are also often named, titled, and addressed differently from men. Women are more likely than men to be addressed by their first names when everything else is equal, or, if not by first names, by such terms as lady, miss, or dear and even baby, or babe. Males are considered to be more accustomed to using different address phrases to refer to women than to other men, and vice versa. Languages vary in terms of whether or not they assign gender to words referring to things without biological sex (Vigliocco 2005).

Any sexist statement or speech can be turned sex-neutral in language by making the appropriate changes, such as changing chairman to chairperson, salesperson to salary clerk, actor to actress, etc. The extreme power structure of dominance in the structure and use of language can also be avoided by initiating some changes in language. So language itself is not sexist. It is the people who use languages may be sexist or not. Feminist movement demands the elimination of all kinds of discriminations – social, economic, linguistic, and so on done against women. There are many suggestions for avoiding sexist language.

### **Gender and Sex**

Sex is a biological phrase that describes the anatomical differences between a male and female, whereas gender is a social construct. The binary split of male and female forms the basis of the political perspective on sex known as gender. This binary division seems to be a natural process. However, the issue with this separation arises when one object is ranked below another that is thought to be superior. According to Chanter (2006), "that is, biologically or chronologically, biology, anatomy, physiology, nature, DNA structure, genetics, materiality, or "the body," comes first. Social structures, gendered roles, historically held stereotypes and expectations about gender, cultural mores, sexual norms and taboos, etc. Chanter (2006), p. Therefore, we can say that a biologically given sex—namely, boy, girl, man, and woman—serves as the foundation for creating a social category known as gender (attributes of masculinity and femininity).



The language of conversation between women is first and foremost a language of rapport, claims Tannen (1991). (Tannen 1991). Its objective is to forge connections and negotiate alliances. Women often exhibit commonalities and shared experiences, and when they disagree in meetings, they frequently use examples from their own lives as support.

On the other hand, language serves as a means of negotiating and maintaining rank in the hierarchy for the majority of men. Men accomplish this, in Tannen's opinion (1991), by demonstrating their knowledge and expertise. Men also accomplish this by "holding centre stage," as in the case of delivering jokes, telling stories, or providing information. Men, for instance, often dispute in meetings by stating categorically what is right and wrong.

### **Women, power and taboo language**

Gender identity is a set of attitudes, habits, and standards that pervade all aspects of daily life. Each culture aims to make new borns into adult males and females. Gender identity is a set of cultural norms and expectations that outline how gay men and lesbian women, as well as transgender people, should behave. Another term for gender identity is a person's individual perception of and subjective experience with their own gender. This is typically referred to as one's internal sense of who they are in terms of being a man or a woman, primarily consisting of their acceptance of falling into one of two gender categories. Every society has a set of gender categories that can be used to form social identities in relation to other society members.

Male and female gender features are assigned differently in the majority of societies. However, not everyone identifies with all (or even some) of the aspects of gender that are in every nation assigned to a person's biological sex. Historically, the traits most closely associated with masculinity have been aggressive behaviour and obscenity. The language we use to discuss sexuality is limited by our cultural contexts. Words that suggest sexual activity are avoided in the United States because discussing sexuality is frowned upon. Sexual activity is forbidden, not because it isn't, but because it is. In America, women have long been encouraged to suppress their sexual desires while men have enjoyed greater sexual freedom.

Research on gender and cursing reveals three recurrent findings, men curse more than women; men use a larger vocabulary of curse words than women; and men use more offensive curse words than women (Jay, 1992, 2000, cited in Jule 2005).

### **Gender-Culture-Power**

An array of institutional and cultural activities preserve gender power relations. It has historically been the case that men dominate women. Whilst in recent decades, the feminist movement has sought to equalise the gender bias, there are still factors, both institutional and cultural, that serve to maintain this long-standing imbalance. Cultural practises breed institutional barriers and vice-versa. Sex and gender must be distinguished from one another.

Feminism, according to Dahlerup (1986), is a set of philosophies, practises, and laws that aim to end gender inequality and the dominance of men in society. It has issues since those who fall within this description of feminism, both women and men, actively reject the title. This might be the case since

feminism has been successfully satirised in the media as an extreme type of men-hatred practised by unlovable, unattractive, and humourless women. It's vital to note this media-related topic. As stated in the title, it raises concerns about cultural traditions.

To preserve female power relations, cultural practises are crucial. These habits frequently start when kids are still very small. This can be found in a variety of contexts, including language, toys, and general preconceptions. Before they can express it verbally, children acquire preverbal cues about their gender identification. Children learn to distinguish between things from an early age thanks to differences in hair, clothing, and aroma. These variations prepare kids to mature into their particular gender.

## CONCLUSION

Language and gender are closely related in a number of ways. To put it another way, men and women use language in very different ways. It is due to the way the language is structured, societal norms, or the people who use the language in that society. Gender (male and female) is also socially constructed. We observe variations or differences between men and women as a result of the social institution or taboo. In addition, there are significant differences between how men and women speak that are founded in the hierarchy of power.

The individual's personality and the vitality of the group are also factors in the explanation of language use variability. The social roles of men and women who speak a language are therefore closely related to the language's structures, vocabularies, and ways of use.

## REFERENCE

- ] Aries, E. (1996). *Men and women in interaction: Reconsidering the differences*. New York: Oxford University Press.
- ] Chambers, J.K. (1992). Linguistic correlates of gender and sex. *English Worldwide* 13, p-201.
- ] Coates, Jennifer / Cameron, Deborah (1988). *Women in their speech communities: a new perspective on language and sex*. Longman Group UK Ltd.: Harlow, Essex (England).
- ] Holmes, Janet (1992). *An introduction to sociolinguistics*. Longman Group UK Ltd.: Harlow, Essex (England). Holmes, Janet (1995). *Women, Men and Language*. London: Longman. P-67.
- ] Tannen, Deborah (1996). *Gender & Discourse: Featuring a new essay on talk at work*. OUP: Oxford University Press.
- ] Wagner, D. G., & Berger, J. (1997). Gender and interpersonal task behaviors: Status expectation accounts. *Sociological Perspectives*, 40, 1–32.
- ] Zimmerman, D., & West, C. (1975). Sex roles, interruptions and silences in conversation. In Barrie Thorne & Nancy Henly (Eds.), *Language and Sex: Difference and Dominance*. Rowley, Massachusetts: Newbury House. p- 89-101.

---

NATURE'S SILENT HEALER: *MOMORDICA CHARANTIA* L.

**Prof. KK Chaudhary**

Deptt. Of Science & Technology  
Faculty of Education & Methodology  
Jayoti Vidyapeeth Women's University, Jaipur

**ABSTRACT**

*Momordica charantia*, a member of the Cucurbitaceae family, is a plant that is frequently cultivated in tropical and subtropical climates. *M. charantia*, which has been used for a long time to treat several diseases. Asian herbal treatments employ curcumin to treat a variety of diseases and conditions. *Momordica charantia* is a plant that is used to cure diabetes, tumours, parasites, viruses, and stomach ulcers. It includes a number of physiologically and pharmacologically active components, including triterpene, collagen, antibiotics, alkaloids, inorganic, lipid, and phenolic compounds. As a result of the addition of Ayurvedic goods like Gunna, Rasa, and Virya, GunnaRasa becomes GunnaRasa, which is, in turn, drier, more pungent, less bitter, and hotter. The current study looks to examine if *M. Charantia* has antioxidant and antibacterial characteristics to emphasise more about its biology.

**Keyword:** *Momordica charantia* L, traditional medicinal plant

**INTRODUCTION**

*Momordica charantia* L. (MC), often known as bitter melon or bitter gourd, is a tropical and subtropical plant that is a member of the Cucurbitaceae family. It is thought that the numerous phytochemicals found in *Momordica* species offer a variety of positive health effects. The plant has been used for both traditional and alternative medicine for a very long time; it has also been the subject of extensive research [1], and studies have shown that it is effective for a wide range of illnesses, including AIDS, diabetes, obesity, asthma, tuberculosis, and viral and bacterial infections.

Karela, commonly known as bitter melon, has long been utilised in Ayurvedic treatment. The seeds, roots, leaves, and, in especially, the unripe fruits of the plant, each have unique pharmacological properties [2]. Juices of all kinds are used in medicine for a variety of health advantages, including the relief of joint pain, the treatment of jaundice, liver and digestive tract illnesses, and the treatment of persons who have a persistent fever. Juice also has diuretic, laxative, and anti-helminthic properties.

It works well when used locally to treat chronic skin conditions and to cure open wounds, boils, and rashes. To cure type 2 diabetes, it is advised to ingest the entire plant [2]. In order to heal and relieve stomach ulcers, an oil infusion made from bitter melon and warm olive oil from the sun is given topically to the digestive system [3]. Among other things, bitter melon is used in African folk medicine to treat rheumatism, skin conditions, dysentery, fever, and parasitic infections (roots).

T2DM practitioners treat liver illness, ulcers, boils, and burns with a decoction of leaves, fruits, and herbs. On top of that, gonorrhoea, scabies, measles, chicken pox, and malaria are all treated using

momordica remedies. In the Caribbean, it's usual practise to treat diabetes with fruit juice or leaf decoction.

The leaf decoction is occasionally used to prevent excessive blood pressure, diarrhoea, malaria, and other illnesses. Rheumatoid arthritis is treated with it [1].



**Figure 1** Momordica plant with fruits and flowers

## **Botanical features**

**Hindi name:** Karela, kareli

**English name:** Bitter gourd

**Sanskrit:** Karavelli

**Growth habit:** This tropical, subtropical, tendril-bearing climber (*Momordica charantia* Linn.) is a family of plant native to tropical and subtropical regions.

**Root:** Tap root.

**Stem:** Stem is slender, pubescent

**Distribution:** Along with other regions, it can be found in Asia, some nations in Europe, Africa, and the Caribbean. Since Momordica is a warm-season crop, it is grown there all year long. Every year, between April and July, this crop is grown.

**Leaf:** Simple palmately 5-7 lobed, typically glabrous or with little pubescence, and tendrils solitary or forked into two branches with alternate leaves having 3-7 deeply separated lobes The lobes have a few small peripheral tips, but the majority of them are blunt. The fashion has no rules.

**Flower:** Actinomorphic flowers with staminate plants often have a single, calyx-toothed flower with five lobes, five petals, three stamens, and several ovules that develop horizontally with a stigmatic stigma with three lobes. On short peduncles (female) or long peduncles (male), the perianth bears a brief to lengthy epigynous zone that transforms from yellow to yellowish green (male).

**Fruit:** Pepo, a fruit approximately 5-25 cm long with a pendant, fusiform, beaked, scaly body; has several tubercles, a rosette-like exterior, and an oblong shape. The young fruit is a vivid emerald green as it is but can change to a brilliant orange as it is mature. It is noticeably bitter across all foods.

**Seed:** Common and widely distributed, with diameters of 13-16 mm, ellipsoid, compressed, embedded in red pulp, wrinkled around the margins, and sculptured on both sides.

## **Taxonomic Classification [4]**

**Kingdom:** Plantae

**Division:** Magnoliophyta

**Class:** Magnoliopsida

**Order:** Cucurbitales

**Family:** Cucurbitaceae

**Genus:** Momordica

**Species:** charantia Linn.

## **Phytoconstituents of the Momordica charantia Linn.**

Ten metres long, *M. Charantia* is a medicinal plant. The plant has 4-5 cm wide leaves that have 3-7 evenly spaced lobes. The plant bears fruit that is oblong and has a waxy coating. The fruit's hollow interior contains seeds and a white centre [5]. Monoecious climbing weed *M. Charantia* develops from an annual to a perennial stage. It might not have any hair or have some. The stems extend from the cardinal taproot's tip to climb over every support that is present [6].

The nutritional value is decreased due to low levels of carbohydrates and proteins compared to other Cucurbitaceae members, which have great nutritional value attributed to contents of iron, phosphorus, and ascorbic acid [7]. Many *M. Charantia* species found in Thailand can be divided into two groups: Satunthottam, or Thai bitter melon, which has smaller, spindle-shaped fruit, and Mara-chin, or Chinese bitter melon, which has bigger, cylindrical fruit.

Thai bitter melon, also known as Mara-Khee-Nok, is a smaller, pear-shaped variety of bitter melon [8]. The *M. Charantia* species, a member of the Cucurbitaceae family, features vivid red blooms. The most popular fruit varieties are ellipsoid or spherical in shape, warty, pockmarked, or ridged. Some frequently possess fleshy, seed-containing capsules that split irregularly into three valves [9]. The 14th-century discovery of *M. Charantia* in India was transported to China. Both subtropical and tropical nations are familiar with acetyl [10].

The ingredient list for the product includes carantine, cycloartenols, cucurbitanes, cryptoxanthin, elaeostearic acids, diosgenin, ergythrodol, galacturonic acids, goyaglycosides, hydroxytryptamines, momordenol, gypsogenin, gentisic acid, linosterol and guanylatecyclasi.

## **Traditional uses**

Karela has been used for a long time in numerous conventional forms of Asian medicine for the prevention and treatment of diverse diseases.

**Fruits** used in *Momordica charantia*, burning sensation, hypertension, colic, constipation, cough, diarrhoea, measles, gout, helminthiasis, inflammation, leprosy, skin conditions, ulcer, and bite. It has also been demonstrated that there are hypoglycaemic (antidiabetic) properties in both animal and human

research. Karela juice leaves used for fully treating stacks. Because of its bitter tonic qualities, karela is used as a blood purifier. It may cure boils and other blood disorders that appear on the skin. Karela juice is also useful to cure and avoid liver injury [11-12].

**Leaves** are used for menstrual diseases, sense of burning, constipation, fever (malaria), colic, infection, larvae, and parasites as emmenogogue, measles, hepatitis, and helminthiasis [13]. Leaf tea is used in traditional medicine in Guyana for asthma, for the expulsion of intestinal gas, to facilitate menstruation and antiviral treatments for measles, hepatitis, and feverish disease. Topically, it is used in worms, wounds, pathogens and internally and externally for worms and parasites [14]. Seeds are used for ulcers, liver and spleen complications, diabetes, intestinal infections, elevated cholesterol, intestinal gas, healing, gastrointestinal damage etc.

**Roots** for the prevention of syphilis, rheumatism, boils, ulcer, septic swelling, ophthalmia and for Prolapsus vagenae are included [15]. Karela juice helps alleviate the Pyorrhoea issue (bleeding from the gums). The United States commonly offers karela capsules and tinctures for prevention of asthma, viruses, cold influenza, disease, tumours, elevated cholesterol and psoriasis [16].

**Ethnopathic** use of tribals for abortions, birth control, increased milk flow, vaginal disorders, constipation, hyperglycemia, foodstuffs, diabetes, stones, kidney, fat loss, liver, fever (malaria), jaundice, gout, eczema, haemorrhoids, hydrophobia, parasitic bowels, skin, lily leprosy, pneumonia, psoriasis and rheumatism, scabies, bacterium, etc [17].

### **Medicinal Uses of *Momordica charantia***

⌋ Momordica is rich in minerals including potassium, calcium, manganese, magnesium, zinc oxide, phosphorus, and dietary fibre as well as nutrients like beta-carotene, foliate, thiamine, riboflavin, and vitamin A. Momordica's potent antioxidant capabilities are all related to the phenols, anthroquinones, flavonoids, terpenes, isoflavones, and glucosinolates that give it its bitter flavour [18]. Bitter gourd juice reduces eye problems and improves eyesight when regularly drank, and it increases physical endurance to prevent chronic weariness.

⌋ Bitter melon stimulates acid secretion and treats dyspepsia by the stimulation of the digestive tract.

⌋ Bitter melon juice helps to keep insulin levels under control and reduces blood sugar levels. The phytochemical charantine, alkaloids, and insulin-like peptides all reduce glucose resistance without raising blood sugar levels and share the hypoglycaemic function of bitter guardians. These bioactive substances aid in the absorption of glucose and every other diabetic action, activate the AMPK protein, and regulate fuel metabolism. The amount of Beta cells in the pancreas that makes insulin increases as a result of bitter melon. The bitter gourd's anti-cancer, anti-inflammatory, and anti-diabetic properties have been noted in numerous studies, and many pharmaceutical companies have utilised them in their formulations [19]. Bitter gourd juice to enhance the liver and avoid yolk. Bitter melon juice can detox and nourish the liver and be effective in the treatment of hips.

⌋ An immune modulator, hypothetically bitter melon, will improve the immune cell role of patients with cancer. It is frequently used for malaria, cold and flu, fever, tumours, elevated cholesterol, psoriasis, and cancer treatments.

JA hypothetical bitter melon immune modulator would enhance the immune cell function of cancer patients. It is also used for malaria, cold and influenza, fever, tumours, high cholesterol, psoriasis, and cancer therapies[20].

### **Antidiabetic Activity**

Phytochemicals found in *Momordica charantia* include vicine, charantine, polypeptides-p, insulin plants, and caravilosides and glycosides. This increases the amount of glucose consumed and the amount of glycogen produced in the liver, muscles, and fat cells, which helps to lower blood sugar levels. Fruits and nuts include the polypeptide TP-insulin, which lowers blood sugar levels in treated rats and returns them to normal. Bitter melon contains a bioactive substance called insulin-like lectin. It serves as insulin and connects the two insulin receptors. Lectin has similar effects to cortisol in that it lowers blood glucose levels and damages peripheral tissues.

The hypoglycaemic action of bitter gil is greatly influenced by lectin. Alcoholic extract from charantin, which contains a combination of steroids, is a potent hypoglycaemic medication used to lower blood and diabetic patient sugar levels. By encouraging the release of insulin to promote insulin action, the bitter melon fruit improves cell glucose absorption. Fresh and dried fruit extracts also lowered blood sugar levels in diabetic mice. In rats with alloxane-induced diabetes, bitter gourd extracts have hypoglycaemic, antidiabetic, hypolipidemic, and hepatocrinal antioxidant properties. Bitter melon reduces arterial and capillary permeability to regulate microvascular dysfunction, a common diabetic consequence.

One of the hypoglycaemic medications is charantine, which combines steroidal saponins, stigmasteryl glucoside, and sitosteryl glucoside in a 1:1 ratio. When given intravenously or orally, charantin causes hypoglycemic symptoms in rabbits[21]. A polypeptide of 166 molecularly weighted amino acids makes up p-insulin. Da is yet another hypoglycemic with a cruel guard. Clinical studies have demonstrated that polypeptide-pZnCl<sub>2</sub> lowers blood sugar levels. In rats, the pyrimidine nucleoside found in seeds and fruits can cause intraperitonic hypoglycemia. Charantine-rich *momordica* extracts enhance insulin sensitivity in type-2 diabetics [22].

### **Anti-Microbial Activity**

Biologically, fresh leaf extracts are made of numerous secondary metabolites in *M. Charantia* with various therapeutic applications. Secondary metabolites include flavonoids, tannins, which have antiviral, antibacterial, tumor- and moluscicidal properties (anticarcinogenic, antioxidant antiviral, and antihemorrhagic). *Salmonella*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Streptococcus*, and *Bacillus* are left with antibacterial effect by BM. Different fresh leaf extractions proved effective against strains of *Escherichia coli*, *S. aureus*, and *B. cereus*. The fresh and dried fever extracts contain a variety of secondary metabolites, such as tannins, alkaloids, and flavonoids, with a variety of pharmacological effects, including antimicrobials. *Shigella*, *Staphylococcus*, *Pseudomonas*, *Salmonella*, *H. pylori*, *Escherichia coli*, *Streptococcus*, *Streptobacillus*, parasitic species *Plasmodium falciparum* & *Entamoeba histolitica*, as well as gram-positive and gram-negative bacteria, can all be controlled in growth and infection by bitter melon seed extracts. Potential options for leishmaniasis chemotherapeutics include the bioactive compounds found in bitter melon[23].

### **Anti-Malarial Activity**

A naturally occurring medicinal herb called momordica charantia is used to prevent and treat malaria. In general, the Bitter Guard is regarded as anti-malarial by Asians, Colombians, and Panamanians. To combat malaria, tea is created by boiling leaves in the bath. Additionally, scientific tests have confirmed the anti-malarial effectiveness of certain Momordica species.

### **Antioxidant Activity**

Antioxidants are molecules that may mitigate or eliminate free radicals harm to cells. The bitter melon ethanol extracts possess strong antioxidant activity like phenolic substances [24]. Bitter protection improves catalase production and reduces glutathione, which prevents the stress-induced peroxidation of lipids. Bitter melon phenolic compounds have antioxidant function. The compromised antioxidant status of Momordica charantia seeds in diabetic rats induced with streptozotocin is effectively normalised[25].

### **Anti-Tumor Properties**

Bitter gourds prevent the growth of tumour cells and have anti-carcinogenic properties. Anti-carcinogenic or protective chemical substances are present in BM. In the rat model sample, a bitter watch water extract will prevent the development of prostate cancer. In mice, a hot water extract of the entire plant inhibited the development of tumour cells in the mammary glands. Human leukemia, liver or hepatic carcinoma, strong sarcomas, and melanoma have all been found in various in vitro testing of anti-leucemic and anti-cancer active blood plasma in several cell lines [26–27]. In cancer patients, bitter gourd is a key immunomodulator that increases the activation of immune cells. The fruit and seed extracts of bitter melon MDAMB 23140-41 tested in vitro inhibit the growth of numerous cancer cell lines, including human colon cancer, prostate adenocarcinoma, and metastatic cell lines.

### **Hypo-cholesterolemic activity**

Momordica charantia's hypocholesterolemic effects were investigated in both normal and diabetic mice. Rats fed sunflower for four weeks were given seeds from Momordica charantia isolated as octadecatrienoic fatty acids. After 4 weeks, there was a reduction in nonenzymatic liver tissue peroxidation, erythrocytal membrane lipid peroxidation, and plasma lipid peroxidation. After receiving bitter gourd fruit and/or seeds for about 21 days, diabetic rats' triglyceride and cholesterol levels were stabilised. Blood and liver lipids are impacted by bitter gourd oil (BGO)[28].

### **Anti-Viral Properties**

In-vitro Bitter Gourd anti-viral behaviour tests have identified various viruses, including Epstein-Barr, herpes, and HIV [29]. Bitter melon leaf extract has an immunostimulant impact in livestock, improves interferon synthesis of natural killer cells and increases tolerance to viral infection. The bitter gourd's anti-viral components are protein or glycoprotein of nature. Due to slow absorption through oral administration, bitter gourd does not decrease virus replication in people infected with HIV. However,



oral treatment of *Momordica* compensates for the harmful consequences of anti-HIV medicines. Different Bitter Guards leaf extracts have antibacterial activities against *Pseudomonas*, *Escherichia coli*, *Staphylococcus*, *Streptobacillus*, *Streptococcus* and *Salmonella*. *Entamoeba histolytica* can be used in the whole plant extract in antiprotozoal operation [30]. The berries and fruit juice have antibacterial effects and contact with the stomach ulcer-causing infection *Helicobacter pylori*.

### **Larvicidal Activity**

The phytochemicals in bitter custody have larvicidal capacity. Many experiments have been carried out against two mosquito vectors including *C. quinquefasciatus* and *Anopheles stephensi* [31].

### **Anti-genotoxic activity**

The antigenotoxic effects of *Momordica charantia* reduce the breakage of chromosomes by reducing the genotoxic effects of tetracycline methane sulphonate and methyl nitrosamine [32].

### **Anti-helminthic activity**

Leaf, fruit, and seed extracts found to be pharmacologically active against helminths. Extracts from *M. Ascaridia galli* is more successful than piperazine with aqueous extracts from *Momordica*. Saponins are anthelmintic substances that block the enzyme action of acetylcholinesterase, hence the paralysis of the worm and contribute to death.

### **Wound healing activity**

More successful than the control group, *Momordica charantia* fruit powder on goldenness has wound closing time, epithelial period, tensile strength of the wound, and tissue regeneration comparable to rat's povidone reference medicine iodine ointment [33].

Bitter melon has a strong ability to heal wounds. The bitter melon's charantin and other phytochemicals stimulate growth factors, causing fibroblast proliferation and speeding capillary and wound oxygenation. The antioxidant and antibacterial properties of phytochemicals like flavonoids and glycosides enhance the healing process. *Momordica* has beneficial effects on wound healing rates, wound contraction, time to closure, speed of epithelization phase, and pain of the wound.

### **CONCLUSION**

All civilizations have historically used medicinal plants known as herbal remedies to treat sickness. It implied that *M. Charantia* was a potential herbal plant that was used all over the world to produce vegetables and medicines. The fact that nearly every part of the plant is used medicinally and ethnobotanically suggests that the plant has a long history of being associated with Indians. Thirpenes, proteins, steroids, alkaloids, and phenolics, which are responsible for their biological and pharmacological activity as antidiabetic, antioxidant, anti-carcinogenic, anti-tumor, anti-fertility, anti-virus, anti-malarial, anti-ulcerative, and immunomodulatory agents, are abundant in *M. charantia*. It will take more research to pinpoint a number of additional actions.

### REFERENCE

1. Polito L, Djemil A, Bortolotti M. Plant toxin-based immunotoxins for cancer therapy: A short overview. *Biomedicines* (2016b) 4:E12. doi: 10.3390/biomedicines4020012
2. Scartezzini P, Speroni E. Review on some plants of Indian traditional medicine with antioxidant activity. *J Ethnopharmacol* (2000) 71:23-43. doi: 10.1016/S0378-8741(00)00213-0
3. Güdr A. (2016) Influence of anthocyanins from bitter melon (*Momordica charantia* Linn.) as antidiabetic and radical scavenging agents. *Iran J Pharm Res* 15:301-309
4. Verma, P., Suyal, M., Joyshi, H., 2007. A new record of leaf spot of safed musli caused by *Alternaria alternata* in Kumaun Himalaya Uttarakhand. *Indian Phyto pathology* 37, 381-382.
5. Hamissou m., simth a. C., j. R rec., triplett j. K. Antioxidative properties of bitter melon (*M. charantia*) and zucchini (*cucurbitapepo*). *Emir J Food Agric*. 25 (9), 641, 2013
6. Anilakumar k. R., kumar g. P., ilaiyaraja n (2015). Nutritional, pharmacological and medicinal properties of *M. charantia*. *Int. J. Food Sci. Nutr.* 4 (1), 75, 2015.
7. Giuliani c., tani c., bini l. M. Micromorphology and anatomy of fruits and seeds of bitter melon (*M. charantia*, Cucurbitaceae). Published by Polish Botanical Society *Acta Soc Bot Pol.* 85 (1), 1, 2015.
8. Pornsuriya., Pramote., Pornsuriya., Pornthip., Numuen., C. Phenotypic diversity and classification of Thai bitter melon (*M. charantia*.) landraces from three provinces in central region of Thailand. *Int J Environ.* 7 (3), 849, 2011.
9. Kumar d. S., sharathnath k. V., yogeswaran p., harani a., sudhakar k., sudha p., banji d. A Medicinal Potency of *M. charantia*. *Int. J Pharm Sci Rev Res.* 1 (2), 95, 2010.
10. Panday dr., rauniarb g. P., panday k. R. M. *Charantia* (Karela); An Antidiabetic. *World. J. Pharm. Pharm. Sci.* 4 (1), 84, 2014.
11. Agharkar SP: Medicinal plants of Bombay Presidency. Scientific Publishers, Jodhpur 1953.
12. Garau C, Cummings E, Phoenix DA and Singh J: Beneficial effect and mechanism of action of *Momordica charantia* in the treatment of diabetes mellitus a mini review. *Int J Diab Metabol* 11: 2003; 46-55.
13. Kumar DS, Sharathnath KV, Yogeswaran P, Harani A, Sudhakar K, Sudha P and Banji D: A medicinal potency of *Momordica charantia*. *Int J Pharmaceu Sci Rev Res* 1(2): 2010; 95.
14. Jagessar R.C, Mohamed A and Gomes G., 2008: An evaluation of the antibacterial and antifungal activity of leaf extracts of *Momordica Charantia* against *Candida albicans*, *Staphylococcus aureus* and *Escherichia coli*. *Nat Sci*; 6(1).
15. Jadhav D: Medicinal plants of Madhya Pradesh and Chhattisgarh 2008; 213-214.
16. [www.rain-tree.com\bittermelon.htm](http://www.rain-tree.com/bittermelon.htm)
17. Grover JK and Yadav SP: Pharmacological actions and potential uses of *Momordica charantia*. *A Rev J Ethnopharmacol* 93(1): 2004; 123-132.

18. Snee LS, Nerurkar VR, Dooley DA, Efird JT, Shovic AC and Nerurkar PV. Strategies to improve palatability and increase consumption intentions for *Momordica charantia* (bitter melon): A vegetable commonly used for diabetes management.
19. Jayasooriya AP, Sakono M, Yukizaki C, et al. Effects of *Momordica charantia* powder on serum glucose levels and various lipid parameters in rats fed with cholesterol-free and cholesterol-enriched diets.
20. Leatherdale BA, Panesar RK, Singh G, et al. Improvement in glucose tolerance due to *Momordica charantia*.
21. Lolitkar MM, et al. Pharmacology of a hypoglycaemic principle isolated from the fruits of *Momordica charantia*. Linn.
22. Anti-diabetic Activity of *Momordica charantia* or Bitter Melon: A Review Ranabir Chanda<sup>1</sup>, Asim Samadder<sup>2</sup> and Janmajoy Banerjee.
23. Olasehinde GI, Ojuronbe O, Adeyeba AO, Fagade OE, Valecha N, Ayanda IO, Ajayi AA and Egwari LO. In Vitro Studies on the Sensitivity Pattern of *Plasmodium Falciparum* to Anti-Malarial Drugs and Local Herbal Extracts.
24. Aljohi A, Matou-Nasri S and Ahmed N. Antiglycation and Antioxidant Properties of *Momordica charantia*.
25. Sathishsekar D and Subramanian S. Antioxidant properties of *Momordica charantia* (bitter gourd) seeds on Streptozotocin induced diabetic rats.
26. Fang EF, Zhang CZY, Wong JH, Shen JY, Li CH and Ng TB. The MAP30 protein from bitter gourd *Momordica charantia* seeds promotes apoptosis in liver cancer cells in vitro and in vivo.
27. Jayasooriya AP, Sakono M, Yukizaki C, et al. Effects of *Momordica charantia* powder on serum glucose levels and various lipid parameters in rats fed with cholesterol-free and cholesterol-enriched diets.
28. Leatherdale BA, Panesar RK, Singh G, et al. Improvement in glucose tolerance due to *Momordica charantia*.
29. Lolitkar MM, et al. Pharmacology of a hypoglycaemic principle isolated from the fruits of *Momordica charantia*. Linn.
30. Anti-diabetic Activity of *Momordica charantia* or Bitter Melon: A Review Ranabir Chanda<sup>1</sup>, Asim Samadder<sup>2</sup> and Janmajoy Banerjee.
31. Olasehinde GI, Ojuronbe O, Adeyeba AO, Fagade OE, Valecha N, Ayanda IO, Ajayi AA and Egwari LO. In Vitro Studies on the Sensitivity Pattern of *Plasmodium Falciparum* to Anti-Malarial Drugs and Local Herbal Extracts.
32. Aljohi A, Matou-Nasri S and Ahmed N. Antiglycation and Antioxidant Properties of *Momordica charantia*.
33. Sathishsekar D and Subramanian S. Antioxidant properties of *Momordica charantia* (bitter gourd) seeds on Streptozotocin induced diabetic rats.
34. Fang EF, Zhang CZY, Wong JH, Shen JY, Li CH and Ng TB. The MAP30 protein from bitter gourd *Momordica charantia* seeds promotes apoptosis in liver cancer cells in vitro and in vivo.

35. Grover JK and Yadav SP. Pharmacological actions and potential uses of Momordica charantia: A review.
36. Nutritional, pharmacological and medicinal properties of Momordica charantia Kandangath Raghavan Anilakumar, Garlapati Phani Kumar, Nallamuthu Ilaiyaraja.
37. Bourinbaiar AS and Lee-Huang S. Potentiation of anti-HIV activity of the anti-inflammatory drugs dexamethasone and indomethacin by MAP30, the antiviral agent from bitter melon.
38. Gupta S, Raychaudhuri B, Banerjee S, Das B, Mukhopadhaya S and Datta SC. Momordicatin purified from fruits of Momordica charantia is effective to act as a potent antileishmania agent.
39. Balboa JG and Lim-Sylianco CY. Antigenotoxic effects of drug preparations Akapulko and Ampalaya.
40. Hussan F, Teoh SL, Muhamad N, Mazlan M and Latiff AA. Momordica charantia Ointment Accelerates Diabetic Wound Healing and Enhances Transforming Growth factor- Expression.
41. Subhashchandra P, Tushar P, Kaushal P, Yagnesh B, Yogesh P and Dr. NM Patel. Isolation, Characterization and antimicrobial activity of charantin from Momordica charantia fruit.

## ANGELMAN SYNDROME & HOMOEOPATHY

**Dr M P Sharma**

Dean & Director, Faculty of Homoeopathic Science, Jayoti Vidyapeeth Women's University,  
Jaipur

### **Abstract:**

Angelman syndrome is a genetic disease condition that causes developmental delays, speech and balance problems, intellectual disability and seizures<sup>1</sup>. The diagnosis is based on history, unusual movements and characteristic facial appearance. There is no current treatment available. Symptomatic treatment according to the symptoms like anticonvulsants for seizures.

### **Introduction**

Angelman syndrome (AS) is characterized by severe developmental delay or intellectual disability, severe speech impairment, gait ataxia and/or tremulousness of the limbs, and unique behavior with an apparent happy demeanor that includes frequent laughing, smiling, and excitability. Microcephaly and seizures are also common. Developmental delays are first noted at around age six months; however, the unique clinical features of AS do not become manifest until after age one year<sup>2</sup>.

Angelman syndrome is due to a lack of function of part of chromosome 15, typically due to a new mutation rather than one inherited from a person's parents. It is due to a deletion or mutation of the UBE3A gene on that chromosome. It affects 1 in 12,000 to 20,000 people. Males and females are affected with equal frequency<sup>3</sup>.

It is named after British pediatrician Harry Angelman, who first described the syndrome in 1965<sup>4</sup>.

### **Clinical Features<sup>5</sup>**

The Symptoms occur at relative frequency and vary from person to person. Common symptoms includes

Developmental delay,

- Speech impairment,
- Movement or balance disorder,
- Behavioral disorders

- Delayed, disproportionate growth in head circumference,
- Seizures, onset usually less than 3 years of age
- Abnormal EEG, characteristic pattern with large amplitude slow-spike waves
- Strabismus
- Hypopigmented skin and eyes
- Tongue thrusting; suck/swallowing disorders
- Hyperactive tendon reflexes

- Feeding problems during infancy
- Uplifted, flexed arms during walking
- Prominent mandible
- Increased sensitivity to heat
- Wide mouth, wide-spaced teeth
- Sleep disturbance
- Frequent drooling, protruding tongue
- Attraction to/fascination with water
- Excessive chewing/mouthing behaviors
- Flat back of head
- Smooth palms

## Diagnosis<sup>5</sup>

The diagnosis of Angelman syndrome is based on

- A history of delayed motor milestones and then later a delay in general development, especially of speech
- Unusual movements including fine tremors, jerky limb movements, hand flapping and a wide-based, stiff-legged gait.
- Characteristic facial appearance (but not in all cases).
- A history of epilepsy and an abnormal EEG tracing.
- A happy disposition with frequent laughter
- A deletion or inactivity on chromosome 15 by array comparative genomic hybridization (aCGH) or by BACs-on-Beads technology.

Diagnostic criteria for the disorder were initially established in 1995 in collaboration with the Angelman syndrome Foundation (US);<sup>6</sup> these criteria underwent revision in 2005.<sup>7</sup>

Seizures are a consequence, but so is excessive laughter<sup>8</sup>, which is a major hindrance to early diagnosis.

## Differential diagnosis

Other conditions that can appear similar include:<sup>9,10</sup>

- Autism spectrum
- Cerebral palsy
- Rett syndrome
- Mowat Wilson syndrome
- Adenylosuccinate lyase deficiency

- Pitt Hopkins syndrome
- Phelan McDermid syndrome
- Prader Willi syndrome

## Treatment

There is currently no cure available. The epilepsy can be controlled by the use of one or more types of anticonvulsant medications.

Occupational therapies like such as finger isolation, motor planning, hand-eye coordination, spatial awareness, and refining gestures<sup>11</sup>.

## Homoeopathic Management<sup>12</sup>

Homoeopathy provides a promising result in such patients. Medicines given on individualistic approach based on totality of the symptoms produces wonderful effect in the treatment of symptoms of Angelman Syndrome. Common Medicines indicated in such cases includes:

- Calcarea carbonica
- Bufo rana
- Cuprum Metallicum
- OEnanthecrocata
- Artemisia vulgaris
- Kali bromatum
- Silicea
- Nux vomica
- Plumbum
- Cicutavivrosa
- Sulphur
- Hyoscyamus
- Belladonna
- Causticum

## References:

1. <https://www.mayoclinic.org/diseases-conditions/angelman-syndrome/symptoms-causes/syc-20355621>
2. <https://www.ncbi.nlm.nih.gov/books/NBK1144/>
3. "Angelman syndrome". *ghr.nlm.nih.gov. Genetics Home Reference, US National Institutes of Health. May 2015. Archived from the original on 27 August 2016. Retrieved 28 April 2017.*
4. "Angelman Syndrome". *rarediseases.org. National Organization for Rare Disorders (NORD). 2015. Archived from the original on 13 November 2016. Retrieved 28 April 2017.*

5. [https://en.wikipedia.org/wiki/Angelman\\_syndrome](https://en.wikipedia.org/wiki/Angelman_syndrome)
6. Williams CA, Angelman H, Clayton-Smith J, et al. (1995). "Angelman syndrome: consensus for diagnostic criteria. Angelman syndrome Foundation". *Am. J. Med. Genet.* **56** (2): 237-8. doi:10.1002/ajmg.1320560224. PMID 7625452.
7. Williams CA, Beaudet AL, Clayton-Smith J, et al. (2006). "Angelman syndrome 2005: updated consensus for diagnostic criteria". *Am. J. Med. Genet. A.* **140** (5): 413-8.
8. Buntinx IM, Hennekam RC, Brouwer OF, et al. (March 1995). "Clinical profile of Angelman syndrome at different ages". *American Journal of Medical Genetics.* **56** (2): 176-83.
9. "Angelman Syndrome". *rarediseases.org*. National Organization for Rare Disorders (NORD). 2015. Archived from the original on 13 November 2016. Retrieved 28 April 2017. "Common Misdiagnoses". *cureangelman.org*. Foundation for Angelman Syndrome Therapeutics (FAST). Retrieved 10 October 2019.
10. Angelman, Harry (1965). "'Puppet' Children: A report of three cases". *Developmental Medicine & Child Neurology.* **7** (6): 681-688. doi:10.1111/j.1469-8749.1965.tb07844.x. S2CID 53730099.
11. Pearson, Effie; Wilde, Lucy; Heald, Mary; Royston, Rachel; Oliver, Chris (November 2019). "Communication in Angelman syndrome: a scoping review". *Developmental Medicine & Child Neurology.* **61** (11): 1266-1274. doi:10.1111/dmcn.14257. ISSN 0012-1622. PMID 31074506. S2CID 149445749.
12. <https://hpathy.com/cause-symptoms-treatment/epilepsy-treatment/>



**“EFFICACY OF HOMEOPATHY IN TREATMENT OF NUMMULAR ECZEMA – A CASE STUDY”**

**Dr M P Sharma**

Dean & Director, Department of Physiology & Biochemistry, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women’s University, Jaipur

**Dr. Anil Kumar Vangani**

Prof. & HOD – Dept. of Repertory, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women’s University, Jaipur

**Dr. Ravi Jain**

Asst. Prof. - Dept of Practice of Medicine, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women’s University, Jaipur

**Dr Pramila Kajla**

Assistant Professor, Department of Physiology & Biochemistry, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women’s University, Jaipur

**Dr Parvinder Singh**

Prof & HOD Dept of Homoeopathy Pharmacy, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women’s University, Jaipur

**ABSTRACT-** The case study of a subject having nummular eczema was done of which the aetio-pathogenesis was not fully known but apprehension and stress was quite prominent which made us repertorize the case from Kent based repertory i.e. Synthesis from RADAR 9.0, and King of Antipsorics i.e. Sulphur was selected as Similimum on reportorial analysis. Result was brilliant, it cured the case after initial aggravation. Result of this research can give indications for making policy for treatment of such irritating and financially depraving skin conditions by Govt. and Corporates, for efficacious management of it and securing quality of life of our employees and citizens by using medicine which is authenticated deeply regarding its principles- in Ancient Indian Literature.

**KEYWORDS:** Nummular eczema; IgE Antibodies, Psora, Repertorization, Similimum, Homoeopathic aggravation, Cure.

## **REVIEW OF LITERATURE**

### **Definition**

Eczema is an inflammatory condition of the skin characterized by itching or burning, redness, scaling and small ulcers. It can also be accompanied by watery discharge which later on leaves by thick crusts. Eczema is more the description of a symptom rather than a disease. Eczema is the result of so many internal and external factors acting singly or in combination with each other.

The term eczema means ‘to boil out’ (ec = out; zema = boil), because it seems that the skin is ‘boiling out’ or ‘oozing out’.

### **Etiology**

The exact cause of eczema is not known. People with eczema do have the IgE antibodies (Immunoglobulin E) produced by the immune system as part of allergic reactions.

**Common triggers of eczema include the following** - Allergies to, Pollen, Molds. Dust, Animal dander, Food and tobacco, Dry air - particularly winter air, with little moisture, Harsh soaps and detergents, Coarse fabrics, Skin care products that contain alcohol; Emotional stress and excessive heat and sweating. People with eczema do have IgE antibodies (immunoglobulin E) produced by the immune system as part of allergic reactions. Weather (hot, cold, humid or dry); Environmental allergens; Jewellery, creams, cosmetics, Rubbing, Bacterial infections etc.

### **Nummular Eczema**

Nummular eczema also known as discoid eczema is a long-term skin condition that cause skin to become itchy, swollen and cracked in circular or oval patches.

It can occur at any age but is seen more frequently in adults. It is slightly more common in adult men than women.

Signs and symptoms-

- Small spots or bumps on the skin
- Or lighter skin these patches will be pink or red
- Initially these patches are often swollen blister eel
- The patches oozing a lot of fluid.
- A yellow crust developing over the patches
- Feeling sick
- Feeling hot or shivery
- Feeling unwell

### **Ancient Indian literature:**

*Bhagvad Puran (3500 BC) which recognizes law of Similia as described in a dialogue between Narad and Maharishi Vyas which says, “The curative drug would be the one having the capacity to produce a similar disease....”;*

*Ayur-veda recognizes “Vishasya Visham Aushadham” which means - Poison is neutralized by poison; about 5000 years back; and*

*Shushrut Samhita in 600 BC recognizes as “Samah Samam Shamayti – means similar will be extinguished by use of similars.*

*Ancient Indian poet Kavi – Kalidasa in 1st Century BC said “Shrutyate hi pura loke, Vishasya Visham Aushadham” means Whole world knows since old times – Poison is the Medicine for Poison”.*

### **METHODOLOGY**

#### **Source of data and Inclusion Criteria**

This study was conducted on, the patients who attended the out patient department of the Medicine unit of JVVU's Suryansh Aarogyashala – in our Homoeopathic Medical College and Hospital.

The patient with round coin like erythematous patches on the limbs quite itchy and irritating, who belong to age group 20-60 years was considered for the study. Both the sexes were included belonging to various socioeconomic group, not having any serious associating disorder and not having allopathic medications for any disease condition.

### **Diagnostic Criteria**

The diagnosis was based on strong clinical history, clinical presentation and local examination findings.

### **Methods of study**

The data was collected by purposive sampling technique as per the inclusion criteria and processed in a Standardized Case Record (SCR). Processing includes analysis and synthesis of the case which were done as per the guidelines and principles of Homoeopathy.

The potency selection and repetition of the dose were done according to the demand of the case, such as Acute or Chronic, Susceptibility, Vitality and Suppression (if any), Changes in structural and functional level, and the degree of correspondence to the remedies.

Follow up in the case was planned for a minimum of 1-2 months as it's related to acute skin condition. During the follow up each case was evaluated according to the scoring criteria, which includes the intensity of the symptoms before and after treatment, using Patient's Visual Analogue Scale.

### **Case Study**

A 40 years of female presented with the complaint of the skin around the Patches becoming hot. Swollen and tender or pain full since 5 days.

Presenting complaints – Itchy eruptions on upper and lower limbs in round spots like coins, itching worse at night and by warmth.

#### **Mental generals-**

- Apprehension of having some serious disease.
- Very sensitive.
- Suffers from poor short term memory.

#### **Physical Generals-**

- Constitution - lean thin person
- Appetite - 2 chappatis, 1 bowl daal, 1 bowl rice at a time
- Thirst - 6-7 glasses/day
- Aversion - Sweets
- Stool - Satisfactory once in a day
- Urine - Frequent urination
- Menses - Cycle 28 days, flow 3 days, spotting 2 days, no clots

- Sleep - 7-8 Hours, not sound
- Dreams - Not specific

**Physical examination-**

BP- 110/70

Pulse- 70/min

RR- 17/min

CNS examination- All reflexes were working properly.

CVS examination- All sounds were clearly heard.

Locomotor examination- All movements ok, Nothing abnormal found.

Abdominal examination- Abdomen is soft at touch and nothing was abnormal.

**Totality of symptoms:**

- Mental generals-
  - Apprehension about some serious disease.
  - Very sensitive.
  - Suffers from poor short term memory.
- Physical Generals-
  - Aversion – Sweets
  - Frequent urination
- Particulars -
  - Cracks fingers tips of
  - Itching < warmth
  - Aggravation – Night

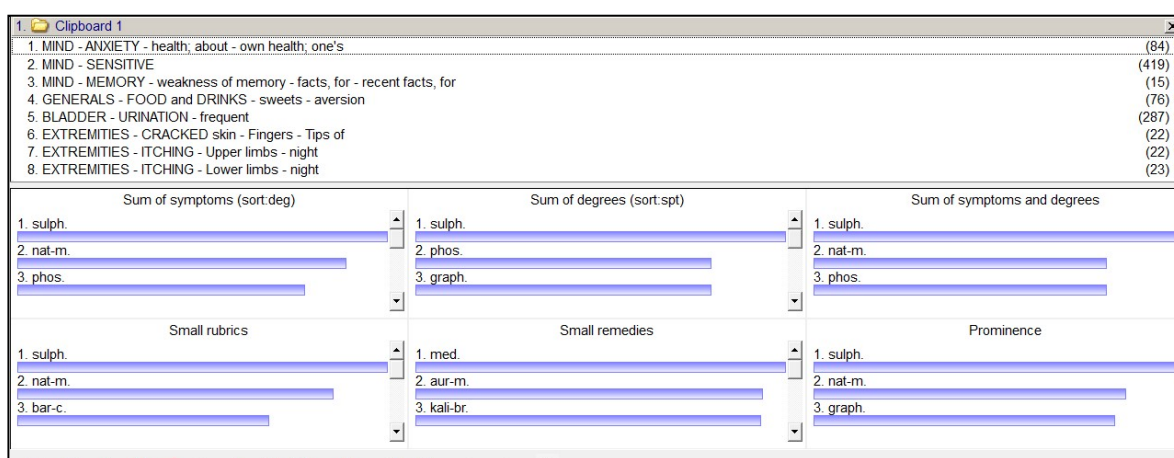
**Repertorization –**

From Synthesis Repertory RADAR 9.0 (Attached below)

1.  Clipboard 1

1. MIND - ANXIETY - health; about - own health; one's
2. MIND - SENSITIVE
3. MIND - MEMORY - weakness of memory - facts, for - recent facts, for
4. GENERALS - FOOD and DRINKS - sweets - aversion
5. BLADDER - URINATION - frequent
6. EXTREMITIES - CRACKED skin - Fingers - Tips of
7. EXTREMITIES - ITCHING - Upper limbs - night
8. EXTREMITIES - ITCHING - Lower limbs - night

	sulph.	nat-m.	phos.	merg	bar-c.	graph.	ars.	calc.	ign.	nux-v.	bell.	canth.	hyos.	med.	sil.	arg-m.	lyc	nit-ac	puls.	kali-c.	petr.	carb-v.	cocc.	ph-ac	zing.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	8	7	6	6	6	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4
	14	10	11	10	9	11	9	9	9	9	8	8	7	7	7	11	10	9	9	8	7	6	6	6	6
1.	1	1	3	1	1	-	3	2	1	1	1	1	1	2	1	3	2	4	2	2	-	-	2	2	-
2.	3	3	3	2	2	1	2	2	3	3	3	2	2	2	3	3	3	3	3	2	1	2	2	1	2
3.	1	1	-	-	-	1	-	1	-	1	1	-	1	-	-	-	-	-	-	-	-	1	-	-	-
4.	2	1	2	2	1	3	2	1	1	1	-	-	1	1	1	2	2	1	1	2	1	-	-	1	2
5.	3	2	1	3	3	3	1	3	3	3	2	3	2	1	1	3	3	1	3	2	2	2	1	2	1
6.	1	1	-	1	1	3	-	-	1	-	1	-	-	1	1	-	-	-	-	-	3	-	-	-	-
7.	1	-	1	1	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-
8.	2	1	1	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	1



- Selection of remedy – Sulphur Hahnemanni
- Selection of Potency -200
- Prescriptions and follow ups: Sulph. 200 1 Dose, Early morning empty stomach, followed by Placebo × TDS x 7 Days (All 3 globules doses), Homoeopathic aggravation noted in first follow up, kept on Placebo TDS with weekly follow ups – the patient got better in every follow up to be cleared totally in 5 weeks.

Result – complete “Cure”, no relapsing even after 6 weeks and feeling no more apprehensions



**Before Treatment**



**After Treatment**

## DISCUSSIONS

We conducted following research study “Efficacy of homeopathy in treatment of Nummular eczema – A case study” in the homeopathic OPD of JWU’s Suryansh Aarogyashala – in our Homoeopathic Medical College and Hospital.

The patient was selected as per the inclusion criteria, having round coin like patches on the limbs with itching, between age group 20-60, having no fatal accompanying disorder and not on any allopathic medication.

Psychological history was quite important in this case as stress seemed to be major factor in its origin than any other cause. Thus Kent repertory was used for repertorization, analyzing the case and find the similimum (the most similar remedy to the case).

As per the review of ancient Indian literature, homeopathy is deep rooted science by its principles and it’s dynamic, single, simple, soothing homeopathic remedies are known for long having the curative power without side effects therefore was tested in this study.

*Result of this research can give indications for making policy for treatment of such irritating and financially depraving skin conditions by Govt. and Corporates, for efficacious management of it and securing quality of life of our employees and citizens by using medicine which is authenticated deeply regarding its principles- in Ancient Indian Literature. More scope of future research is for each type of acute skin condition to be carried out individually, to know there aetiological factors for practicing preventive aspect.*

## CONCLUSIONS

The following conclusions were drawn from the study:

- The cause of it is grossly unknown but episodes of stress is the major factor.
- Psora was found to be the Dominant Miasm.
- Constitutional medicine was found to be effective in the treatment.
- The Homoeopathic medicine is effective in the treatment of Nummular eczema as per case study.

**References: Internet Sources/Book Sources**

1. Organon of Medicine 5<sup>th</sup> Edition - [www.bjainbooks.com/inr/organon-of-medicine-5-6-edition.html](http://www.bjainbooks.com/inr/organon-of-medicine-5-6-edition.html)
2. Organon of Medicine 6<sup>th</sup> Edition - <https://homeopathybooks.in/organon-of-medicine-samuel-hahnemann/>
3. Sushrut Samhita English translation - <https://archive.org/details/englishtranslati00susruoft>
4. Kavi Kalidasa - <https://soniyahomocopathyclinic.weebly.com/profile-drbalkrishna-singh-md-homocopath.html>
5. <https://www.webmd.com/skin-problems-and-treatments/contact-dermatitis>
6. <https://www.webmd.com/allergies/hives-urticaria-angioedema>
7. Synthesis Repertory – RADAR 9.0
8. Wolff and Johnson; Fitzpatrick's Color Atlas and Synopsis of Clinical Dermatology, 8th Edition; **ISBN-13:** 978-1259642197



## KISSING DISEASE & HOMOEOPATHY

### **Dr Ravi Jain**

Assistant Professor, Department of Practice of Medicine, Faculty of Homoeopathic Science, JWU,  
Jaipur

### **Dr. Arti Bansal**

Asso. Prof. & HOD – Deptt of Pathology, Faculty of Homeopathic Science, Jayoti Vidyapeeth  
Women's University, Jaipur

### **Dr. Hemant Vyas**

Asso. Prof. & HOD – Deptt of Surgery, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women's  
University, Jaipur

### **Dr Astha Sikarwar**

Assistant. Prof. – Dept. of Organon of Medicine & Homoeopathic Philosophy (FHS - Jayoti Vidyapeeth  
Women's University, Jaipur

### **Dr. Gaurav Gupta**

Asst. Prof. – Dept. of Forensic Medicine & Toxicology Faculty of Homeopathic Science, Jayoti  
Vidyapeeth Women's University, Jaipur

**Abstract:** Kissing disease or Infectious mononucleosis or glandular fever is an infective disease caused by Epstein Barr Virus. It is characterized by pharyngitis, cervical lymphadenopathy, & Lymphocytosis. It is more common among young adults between 15-19 Years of age. Incidence is around 500 cases per 100000 population<sup>1</sup>. Diagnosis is done by immunofluorescence test. Treatment consists of supportive measures and analgesia.

**Keywords:** Mono, Lymphadenopathy, immunofluorescence, antiviral

### **Introduction**

Infectious mononucleosis or mono is a viral disease caused by Epstein barr virus affecting glands of the body. It is also known as glandular fever. The disease is characterized by pharyngitis, cervical lymphadenopathy, & lymphocytosis. The disease is common in young adults of age group 15-19 Years of age and upper socio economic group. It is spread by oropharyngeal secretions of asymptomatic sero positive carriers.

After entering the body of the affected individual the virus infects the epithelium of the oropharynx and salivary glands & B cells in tonsillar crypts.

The B cells undergo polyclonal activation. The reactive T cells proliferate and direct against Epstein Barr Virus antigen during acute infection.

For controlling the infection Cellular immunity is more important than humoral immunity.

The severity of the disease can be assessed by presence of CD8 + T lymphocytes & presence of Epstein barr virus DNA in the blood. The incubation period of the disease varies from 4 to 6 weeks.

### **Clinical Features**

Most of the children and young adults affected with EBV are asymptomatic. Some patients present with mild pharyngitis with or without Tonsillitis. The clinical features depends upon the age of the patient and the immune status. The prodromal symptoms includes fatigue, malaise and myalgia for 1 to 2 weeks

before fever begins. The fever is of mild character low grade and present for 1 to 2 weeks of illness but may persist for more than 1 month. Splenic enlargement is more prominent in 2<sup>nd</sup> or 3<sup>rd</sup> week.

During first 2 weeks the disease is characterized by presence of exudative pharyngitis with painful and movable symmetric enlargement of posterior cervical lymph nodes.

The exudates in pharyngitis resembles streptococcal infection. Morbilliform and popular rash develops in around 5% of the cases.

Immunocompromised patients can develop lymphoproliferative disease.

The clinical features can be summarized among signs and symptoms as:

**Symptoms:**

Sore Throat

Malaise

Headache

Abdominal Pain

Nausea & Vomiting

Chills

**Signs:**

Lymphadenopathy

Fever

Pharyngitis

Tonsillitis

Splenomegaly

Hepatomegaly

Rash

Periorbital Oedema

Palatal Enanthem

Jaundice

**Investigations**

WBC count is raised with peaks at 10000-20000/Micro litre.

Lymphocytosis with >10% atypical lymphocytes.

Low grade neutropenia and thrombocytopenia during first months of illness.

Abnormal liver function in around 90% of individuals.

Increased concentration of serum bilirubin in around 40% of the cases.

**Diagnosis**

Diagnosis is done by serological testing for the presence of Epstein barr virus done by immunofluorescence testing.

Acute infection is characterized by presence of IgM antibodies against viral antigen.

PCR analysis is helpful in many cases.

**Complications**

Although mononucleosis is a self limiting disease but deaths can occur due to certain complications like splenic rupture, central nervous system complications, upper airway obstruction, or bacterial superinfection.

**Treatment**

The disease is treated by supportive measures which includes adequate rest and administration of

analgesics.

Administration of glucocorticoids to prevent airway obstruction and other complications.

Aspirin gargles to relieve sore throat.

### **Homoeopathic Management**

Homoeopathic treatment is based on symptom similarity where the medicines are prescribed after complete case taking, Analysis & evaluation and after repertorization of the case keeping in mind the miasmatic background. A single simple and minimum dose of the medicine is prescribed to the patient. Although medicines are also prescribed on the basis of similarity of peculiar, queer, rare and strange symptoms which not only saves the time of the physician but also helps in providing quick and effective relief to the patient.

### **Common medicines prescribed in the case of infectious mononucleosis includes:**

**Aconite Napellus:** Throat is dry, red, constricted with prickling, burning and stinging pain. Tonsils are dry and swollen.

**Apis Mellifica:** Constricted stinging pain. Throat swollen inside & out. Tonsils swollen, puffy and fiery red. Ulcers on tonsils. Sensation of fishbone in throat.

**Arsenicum album:** Throat swollen, oedematous, constricted and burning. Unable to swallow. Diphtheric membrane in throat. Fever with great periodicity and adynamia. Paroxysms incomplete with marked exhaustion.

**Baryta Carb:** Takes cold easily. Stitching and smarting pain in throat. Tonsils inflamed with swollen veins. Stinging pain in pharynx or tonsils.

**Belladonna:** Throat is dry as if glazed, angry looking, congested. Tonsils enlarged. Throat feels constricted, difficult deglutition. Fever with swollen glands. No thirst with fever.

**Hepar Sulph:** Plug like sensation in throat. Quinsy with impending suppuration. Sticking pain in throat extending to ears on swallowing.

**Kalium Iodatum:** Glandular swelling. Remitting fever going off in nightly perspiration.

**Lachesis Mutus:** Throat is dry, intensely swollen. Pain aggravated by hot drinks. Chronic sore throat with hawking of mucus. Tonsils purplish.

**Lycopodium Clavatum:** Dryness of throat without thirst. Inflammation of throat with stitches on swallowing. Ulceration of tonsils.

**Merurius Solubilis:** Sore throat with raw smarting, burning pain. Stitching into ear on swallowing.

**Phosphorus:** Hoarseness worse evening. Larynx very painful. Clergyman's sore throat. Violet tickling in larynx while speaking. Can not talk on account of pain in larynx.

**Phytolacca Decandra:** Throat is dark, red, bluish. Sensation of lump in throat. Throat feels rough, narrow, hot. Pain in root of tongue extending to ears.

**Rhus toxicodendron:** Soreness of throat with swollen glands. Sticking pain on swallowing. Fever with adynamia. Restless and trembling.

**Silicea Terra:** Periodical quinsy. Cold settles in the throat. Stinging pain on swallowing. Hard, cold swelling of cervical gland.

**Sulphur:** Burning redness and dryness of throat. Ball seems to rise and close pharynx. Remittent type of fever.

**Conclusion:** Infectious mononucleosis or kissing disease is an infectious disease affecting young adults these days. Due to the affects of social media and western movies the disease is prevalent among the young generation. The disease is characterized by variety of glandular affections and carry a lot of complications which can even lead to the death of the patient. With awareness about the disease and early management the complications of the disease can be prevented. Homoeopathy offers a great relief

in such viral diseases preventing complications at a very early stage leading to early recovery of the case and reducing a load of carrier individuals among the general population.

Reference:

- 1 <http://cfps.org.sg/assets/CPG/SIDS-Adult-Vaccine-Handbook-2020.pdf>
2. Homoeopathic Materia Medica & Repertory by William Boericke, B Jain Publication.
- 3 Harrison's Principles of internal Medicine by Jameson, Anthony S Fauci, Dennis L Kasper 20<sup>th</sup> Edition Published by Mc Graw Hill Professional.
- 4 Harrison Manual of Medicine by Jameson, Fauci, Kasper. Published by Mc Graw Hill, 20<sup>th</sup> Edition.
5. Davidson's Principles and practice of Medicine by Walker. Elsevier Publication.
6. Organon of Medicine by B K Sirkar, B Jain Publication

## ROLE OF HOMOEOPATHIC MEDICINES IN GALL BLADDER STONES

**Dr. Astha Sikarwar**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

**Dr. Rakesh Sharma**

Professor, Faculty of Homoeopathic Science, JVWU, Jaipur

**Dr. Meenakshi Soni**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

**Dr. Ravi Jain**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

**Dr. Gaurav Gupta**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### ABSTRACT-

Gall stone formation is the most common disorder of the biliary tract and it is unusual for the gall bladder to be diseased in the absence of gall stones. Cholelithiasis or gallstone disease is a very common problem worldwide. The prevalence is more in females than males. Although cholecystectomy is considered the gold standard treatment for symptomatic cholelithiasis, it has its own limitations, risks and post-operative complications. Here, an alternative system of medicine, especially Homoeopathy, plays an important role in treating cholelithiasis.

**KEYWORDS** – Cholecystitis, Cholelithiasis, Gall bladder stone, Homoeopathy.

### INTRODUCTION –

Gallstone unwellness refers to the presence of stones within the gall bladder (GB) (cholelithiasis) or common bile duct (choledocholithiasis) and also the symptoms and complications they cause. lithiasis and its associated complications like inflammation, redness and inflammation are one in all the main health issues worldwide. Chronic inflammation is nearly invariably related to gallstones. The imbalance of the chemical constituents of gall leads to precipitation of 1 or additional of the parts and ultimately forms gall stones. Nearly 37%–86% of gallstones are cholesterol-rich stones, 2%–27% are pigment stones and 4%–16% are mixed stones. totally different| completely different} medicine studies have prompted a good variation within the overall prevalence between different populations. The prevalence of gallstones will increase with age, rising markedly when the age of forty years. Older individuals are 4–10 times additional seemingly to possess gall stones than younger individuals. Gallstones are often found in individuals of high socioeconomic standing and in multiparous females. additionally, patients with lithiasis have considerably higher BMI compared to the common population. feminine gender is one in all the main risk factors of lithiasis. compared to men, ladies have 2 to a few times higher prevalence of gallstones. gestation is additionally a significant risk issue for lithiasis. Sex hormones are largely liable for the magnified risk as sex hormone will increase biliary cholesteric secretion, inflicting cholesteric supersaturation within the gall. Chronic calculus inflammation normally presents with perennial attacks of higher abdominal pain. <sup>[1,2,3,4,5,6]</sup>

Liver perform tests and abdominal ultrasound are the prompt investigational procedures in suspected bile stone unwellness. extirpation is that the main selection of treatment in symptomatic bile stone cases,

and cholecystectomy (LC) is that the wide accepted operative management of bile stone unwellness worldwide. However, there are patients WHO are either reluctant to bear surgery or are at high surgical risk. Additionally, LC has some disadvantages because it could result in common bile duct and intestine injury (2.6%), post-operative gall leak (2.3%), stone spillage (2%), post-operative colonic fistula (0.3%), post-operative biliary fistula (0.3%) or post-operative hemorrhage (0.3%) in some cases. Here, medical aid plays a crucial role in combating the sufferings because of bile stone unwellness. There are many medicines within the homoeopathic pharmacological medicine which might be thought of for gall stone disease; some distinguished medicines are common barberry, Calcarea carbonica, Asterid dicot genus marianus, China, Chamomilla, genus Chionanthus, Lycopodium, genus Veratrum album, etc. However, there are only a few studies found in literature, that show positive results of well-selected personal homoeopathic medicines in these conditions. [13,14,15] during this context, the most objective of this case report is to point out the effectiveness of personal homoeopathic medication within the treatment of this often-dreaded condition, sometimes or thought of surgical, with any stress on the need of additional analysis during this field. [1,2,3,4,5,6]

### REVIEW OF LITRETURE –

Gallstones square measure laborious, pebble-like items of fabric, sometimes manufactured from sterol or hematoidin, that kind in your bladder. Gallstones will zero in size from a grain of sand to a golf equipment. The bladder will build one giant concretion, many small stones, or each little and enormous stones.

When gallstones block the digestive juice ducts of your biliary tract, the gallstones will cause unforeseen pain in your higher right abdomen. This pain is named a bladder attack, or biliary hurting. If your symptoms continue and they're left untreated, gallstones will cause serious complications. However, most gallstones don't cause blockages and square measure painless, conjointly referred to as "silent" gallstones. Silent gallstones sometimes don't want medical treatment.

#### Types of gallstones

The two main kinds of gallstones square measure

- a) cholesterol stones
- b) pigment stones

Cholesterol stones square measure sometimes chromatic in color and square measure manufactured from principally hardened sterol. In some countries, sterol stones form up concerning seventy-five % of gallstones. Pigment stones square measure dark in color and square measure manufactured from hematoidin. Some folks have a mixture of each sorts of stones. [19,20,21]

#### Pathogenesis<sup>[1]</sup>

Gallstones square measure composed primarily of sterol, bilirubin, and Ca salts, with smaller amounts of macromolecule and different materials. There square measure 3 kinds of gallstones

- (i) Pure sterol stones, that contain a minimum of ninetieth sterol,
- (ii) pigment stones either brown or black, that contain a minimum of ninetieth hematoidin and
- (iii) mixed composition stones, that contain variable proportions of sterol, hematoidin and different substances like carbonate, inorganic phosphate and Ca palmitate.

Brown pigment stones square measure primarily composed of Ca hematoidinate whereas black pigment stones contain bilirubin, Ca and/or tribasic phosphate. In Western societies and in Asian country over seventieth of gallstones square measure composed primarily of sterol, either pure or mixed with pigment, muco compound protein, and carbonate. Pure sterol crystals square measure quite soft, and

macromolecule contributes significantly to the strength of sterol stones.

In the simplest sense, sterol gallstones kind once the sterol concentration in digestive juice exceeds the power of digestive juice to carry it in resolution, so crystals kind and grow as stones. sterol is just about insoluble in solution, however in digestive juice it's created soluble by association with digestive juice salts and phospholipids within the style of mixed micelles and vesicles.

Three kinds of abnormalities are thought-about to be accountable for sterol concretion formation. sterol supersaturation, the essential demand for sterol concretion formation, would possibly occur via excessive sterol synthesis, that is that the main lithogenic mechanism in weighty persons. within the non-obese, defective conversion of sterol to digestive juice acids, thanks to an occasional or comparatively low activity of sterol sterol hydroxylase, the speed limiting protein for steroid synthesis and sterol elimination may end in excessive sterol secretion. Finally, interruption of the enterohepatic circulation of digestive juice acids may increase digestive juice saturation. Temporary interruption of the enterohepatic steroid circulation throughout nightlong fast ends up in a better cholesterol/phospholipid quantitative relation within the vesicles secreted by the liver. steroid hormone treatment conjointly reduces the synthesis of steroid in ladies.

High biliary macromolecule and lipide concentrations square measure risk factors for the formation of gallstones. bladder sludge, i.e., thickened bladder mucoprotein with small entrapped sterol crystals is assumed to be the same old precursor of gallstones. Sludge will generally cause biliary pain, rubor, or acute inflammation, <sup>[33]</sup> however sludge may resolve while not treatment. The sources of sludge square measure physiological condition, prolonged total duct nutrition, starvation, or speedy weight loss. The antibiotic cephalosporin may precipitate within the bladder as sludge and infrequently, as gallstones.

The biliary Ca concentration plays a vicinity in hematin precipitation and concretion calcification. several patients with gallstones have magnified biliary Ca, with supersaturation of carbonate.

Impaired motility of the bladder as seen in patient with high medulla spinalis injury or with the employment of the somatostatin analogue octreotide, has been cited as another contributory consider the event of gallstones. In theory, microscopic sterol crystals would often be washed out of the bladder if its contractions were effective enough. viscus hypomotility has been recently recognized as a primary consider sterol lithogenesis. Fiber could shield against concretion formation by dashing viscus transit and reducing the generation of secondary digestive juice acids like deoxycholate that has been related to magnified sterol saturation of the digestive juice.

### **Epidemiology**

In westerners, seven-membered of males and 15 August 1945 of female's square measure affected within the age-group eighteen – sixty-five years. In >40 years, age-group, there's a 3:1 feminine preponderance and in old, the quantitative relation is equal. Gallstones square measure additional common in North America, Europe and Australia, and square measure less frequent in Asian country, the Far East and Africa. In developed countries, the incidence of symptomatic gallstones seems to be increasing and that they occur at associate early stage. There has been a lot of discussion over the role of diet in sterol concretion disease; a rise in dietary sterol, fat, total calories and refined saccharide or lack of dietary fiber are all involved.

### **Aetiology**

Bile stone formation is complex, and therefore the factors concerned are associated with the sort of gallstones.

Cholesterol gallstones: cholesterolin is control in resolution in digestive juice by its association with digestive juice acids and phospholipids within the type of micelles and vesicles. Biliary lipoproteins may additionally have a job in solubilizing cholesterolin. In bile stone illness, the liver produces digestive

juice that contains associate way over cholesterol either as a result of there's a relative deficiency of digestive juice salts or a relative way over cholesterol. Such bile, that is concentrated with cholesterol, is termed "lithogenic".

Disorders with the potential to induce the assembly of lithogenic digestive juice are:

- a) Defective salt synthesis
- b) Excessive enteric loss of digestive juice salts
- c) Over-sensitive salt feedback
- d) Excessive cholesterol secretion
- e) Abnormal vesica operate.

Factors initiating crystallization of cholesterol in lithogenic digestive juice (nucleation factors) also are important; patient with cholesterol gall stones have gall bladder digestive juice kinds cholesterol crystals quicker than equally saturated digestive juice from patients WHO don't form gallstones.

Pigment stones: Brown breakable pigment stones are nearly always the consequence of microorganism or parasitic infection within the biliary tree. they're found unremarkably within the Far East, wherever infection within the biliary tree permits microorganism beta-glucuronidase to hydrolyse conjugated animal pigment to its morpheme, that then precipitates as metal bilirubinate. haematolysis is very important as these stones occur in chronic haemolytic illness.

Biliary slug: The term 'biliary sludge' describes digestive juice that is in an exceedingly gel kind that contains various crystals of microspheroliths of metal bilirubinate granules and cholesterol crystals moreover as glyco-proteins. it's a vital precursor to the formation of gallstones within the majority of patients. Biliary sludge is often shaped underneath traditional conditions, then again either dissolves or is cleared by the gallbladder; solely in regarding 15 August 1945 of patients will it persists to create cholesterol stones. Fasting, duct nutrition and maternity also are related to sludge formation.

### **Clinical features**

The bulk of gallstones are well, and stay thus, solely regarding 100% of these with bilestones develop clinical proof of gallstone illness.

Symptomatic gallstones manifest either as biliary pain [biliary colic] or as a consequence of rubor. If a bile stone becomes acutely wedged within the cystic duct, the patient can expertise pain. The term 'biliary intestinal colic' could be a name as a result of the pain will nor rhythmically increase or decrease in intensity as in colic intimate in enteric and urinary organ illness. Instead, the pain is often of abrupt onset and is sustained for regarding a pair of hours. Its continuation for over half-dozen hours suggests that a complication like rubor or rubor has developed. Pain is felt within the region (70% of patients) or right higher quadrant (20% of patients) and radiates to the inter-scapular region or to the tip of right shoulder bone, however different sites embrace the left higher quadrant, the region and therefore the lower chest; the pain will be confused with intra-thoracic illness, rubor, infarct or dissecting cardiovascular disease.

Combinations of fatty food intolerance, upset stomach and flatulence not attributable to different causes are observed as 'gall stones dyspepsia'. These symptoms don't seem to be currently recognized as being caused by gall stones and are best thought to be non-ulcer upset stomach.

### **Diagnosis**

Blood tests showing high levels of exocrine gland enzymes (amylase and lipase) typically indicate an identification of rubor. Elevated levels of the liver accelerator amino acid aminopherase (ALT) are terribly specific in characteristic bile stonerubor.

Imaging techniques are helpful in confirming an identification – Ultrasound, X-radiation (CT) scan, alongside laboratory tests, will verify the severity of the condition.



### **Laboratory Tests**

Bilirubin and therefore the accelerator alkaline phosphatase enzyme are typically elevated in acute cholecystitis, and particularly cholelithiasis (common bile duct stones)

Levels of liver enzymes called aspartate aminotransferase (AST) and amino acid aminotransferase (ALT) are elevated once common bile duct stones are present. A threefold or additional increase in alkaline phosphatase powerfully suggests cholecystitis.

A high white blood cell count could be a common finding in several (but not all) patients with cholecystitis.

A number of techniques – endoscopic retrograde cholangiopancreatography (ERCP), endoscopic ultrasound (EUS) and magnetic resonance cholangiopancreatography (MRCP) – effective for the investigation of common bile duct stones. Only ERCP, however, permits removal of the stones.

### **Imaging Techniques**

Ultrasound. Ultrasound could be a straightforward, rapid, and noninvasive and diagnostic methodology to discover gallstones, acute cholecystitis. Air within the vesical wall could indicate gangrene. X-Rays. Plain x-rays of the abdomen could discover calcified gallstones.

### **Complications**

In the gallbladder:

- a) Silent stones
- b) Chronic cholecystitis
- c) Acute cholecystitis
- d) Gangrene
- e) Perforation
- f) Empyema
- g) Mucocele
- h) Carcinoma

In the digestive juice ducts:

- a) Obstructive jaundice
- b) Cholangitis
- c) Acute cholecystitis

In the gut

- a) Acute obstruction ('gallstone ileus')

Obstruction of the cystic duct for any prolonged amount of your time ends up in acute cholecystitis. Different complications embrace chronic cholecystitis, and a mucocele of the gall-bladder, within which there's slow distension of the gall bladder from continuous secretion of mucous secretion. If this material becomes infected, acute inflammatory disease develops. Pus could also be secreted into the lumen of the distended vesica, inflicting limy digestive juice and if metal salts are precipitated within the gall bladder wall, the tomography looks of 'porcelain' vesica results.

Gall stones within the vesica (cholelithiasis) migrate to the vesica (choledocholithiasis) in or so 15% of patients and cause biliary intestinal colic, however they will be well. Rarely, fistulae develop between the gall bladder and small intestine, colon or abdomen. Air is going to be seen within the biliary tree on plain abdominal radiographs. If a stone larger than a pair of .5 cm in diameter has migrated into the gut it should impact either at the terminal small intestine or often within the small intestine or sigmoid flexure. The resultant obstruction could also be followed by 'gallstone ileus'.

Rarely, gallstones wedged within the cystic duct cause stricting within the common duct (Mirizzi's syndrome), leading to clogging jaundice.

Carcinoma of vesica is rare, though it's recognized additional oftentimes in an exceedingly ageing population and in a 'porcelain' vesica. Cancer is sometimes diagnosed as associate incidental microscopic anatomy finding following extirpation for bile stone illness.

### **Prevention**

Diet may play a role in gallstones.

Fats. Although fats (particularly saturated fats found in meats, butter, and other animal products) have been associated with gallstone attacks, Fiber. High intake of fiber has been associated with a lower risk for gallstones. Nuts. Studies suggest that people may be able to reduce their risk of gallstones by eating more nuts (peanuts and tree nuts, such as walnuts and almonds).

Fruits and Vegetables. had the lowest risk of developing symptomatic gallstones that required removal of the gallbladder.

Lecithin. Lecithin is a key component of bile. It contains choline and inositol, two compounds that are important for the breakdown of fat and cholesterol. Low levels of lecithin may precipitate the formation of cholesterol gallstones. Dietary lecithin is available in health food stores and is found in eggs, soybeans, liver, wheat germ, and peanuts. There is no evidence, however, that lecithin supplements or foods containing it can prevent gallstones in humans.

Sugar. High-intake of sugar has been associated with an increased risk for gallstones.

Alcohol. A few studies have reported a lower risk for gallstones with alcohol consumption. Preventing Gallstones during Weight Loss Maintaining a normal weight and avoiding rapid weight loss are the keys to reducing the risk of gallstones.

### **Management**

Asymptomatic gallstones found incidentally are not usually treated because the majority will never give symptoms. Symptomatic gallstones are best treated surgically, and minimal access techniques have largely replaced non-surgical treatment. Gallstones can be dissolved and fragmented in the gallbladder or removed mechanically from the common bile duct.

Medical dissolution of gallstones can be achieved by oral administration of the bile acid, ursodeoxycholic acid. Radio-lucent gallstones, a gallbladder that opacifies on oral cholecystography. Stones not larger than 15 mm in diameter, moderate obesity and no or almost mild symptoms are the features which suggest that drug therapy may be feasible. Success can be expected in approximately 75% of patients who fulfill their criteria. Occasionally, direct contact dissolution therapy is attempted via percutaneous catheters or catheters placed at ERCP. ESWL is expensive and not widely available. Bile salt therapy is necessary following lithotripsy to dissolve the gallstone fragments within the gallbladder. As in the case of oral bile salt therapy, only 30% of all patients with gallbladder disease are suitable for lithotripsy. All the therapeutic regimens which retain the gall bladder have a 5% reoccurrence of stones after 5 years.

Some rubrics related to it in different repertories:

#### **In synthesis, ver 10.2:**

Abdomen, gallstones: (Pain – liver – colic) ARS, aur, bapt, bell, berb, bold, Bry, calc, calc-f, card-m, Cham, chel, chin, chion, chlf, chol, coloc, cupr, dig, dios, eberth, euon, euon-a, euonin, fab, fel, ferr-s, fuma-ac, gels, guat, hed, Hydr, jug-c, lach, Lept, lith-c, lob, lyc, mag-p, mag-s, mand, mang, MERC, merc-d, myric, morg-g, morg-p, nat-s, nat-sal, nit-s-d, nux-v, Phos.podo, ptel, sang,sulph, tarax, thlas,

verat, vichy-g.

Abdomen, gallstone colic: (see pain – liver – colic) ars, atro, atro-s, Bapt, BELL, BERB, Bry, cal-bil, Calc, CARD-M, Cham, Chel, CHIN, Chion, Chlf, Chlol, colch, Coloc, cupr, dig, Dios, Fab, gels, hep, hydr, Ip, Iris, kali-ar, Kali-bi, Kali-c, Lach, laur, Lept, Lith-c, LYC, mag-bcit, Mag-m, Mag-s, mand, mang, menth, merc, Merc-d, morph-act, NAT-S, Nux-v, op, podo, puls, rhus-t, ric, Sep, sil, staph, sulph, tab, ter, trios, VERAT.

**In Boericke’s repertory:**

Abdomen, gall-bladder – biliary calculi (cholelithiasis) – Aur.; Bapt.; Berb.v.; Bolod.; Bry.; Cal.c.; Card.m.; Chel.; Chionanth.; Cholest.; Cinch.; Diosc.; Feltauri; Ferr.s.; Gels.; Hydr.; Jug.c.; Lach.; Lept.; Myr.; Nux-v.; Pichi.; Pod.; Ptel.; Tarax.

Abdomen, gall-bladder, Biliary colic – Ars.; Atrop. sul.; Bell.; Berb.v.; Calc.c.; Card. m.; Chionanth.; Cinch.; Col.; Dig.; Diosc.; Gels.; Hydr.; Ipec.; Lyc.; Morph. acet.; Nux v.; Op.; Tereb.

**In complete repertory:**

Abdomen, pain, general, liver, colic, gall-stones – Aml-n, Arge, Ars, Atro, Aur, Bamb-a, Bapt, BELL, BERB, Bold, Bry, Calc, Calc-f, CARD-M, Cham, Chel, CHIN, Chion, Chlf, Chlol, Chol, Coloc, Cupr, Dig, Dios, Erig, Euon, Fab, Fel, Ferr-s, Gels, Hep, Hydr, Ip, Iris, Jug-c, Kali-ar, Kali-bi, Kali-c, Kreos, Lach, Laur, Lept, Lith-be, Lith-c, Lob, LYC, Mag-c, Mag-m, Mag-p, Mag-s, Mang, Menth, Merc, Merc-d, MORG, Morph, Myric, NAT-S, Nux-v, Op, Ozone, Phos, Podo, Ptel, Puls, Rhus-t, Ric, Sang, Sep, Sil, Sulph, Tab, Tarax, Ter, Trio, VERAT.

**In Clarke’s clinical repertory:**

Clinical, gall-stones: berb, calc, card-b, chel, chlf, chol, euonin, euon-a, fel, lach, lith-c, lob, mang, nit-s-d, nux-v, fab, podo, ptel, tarax, thlaspi, vichy-g.

**In Murphy’s repertory:**

Liver, gallstone, colic pain from – am-m, alum, ars, aur, bapt, BELL, BERB, bry, CALC, CARD-M, cham, chel, CHIN, chion, CHOL, COLOC, cupr, dig, DIOS, euon, fel, ferr-s, gels, hep, hydr, ip, iris, jug-c, kali-ar, kali-bi, kali-c, lach, laur, lept, lith, LYC, mag-p, mang, merc, merc-d, MORG, myric, NAT-S, nux-v, op, osm, phos, podo, puls, rhus-t, sang, sep, sulph, tab, tarax, ter, thuj, VERAT.

**In Boger’s repertory:**

Hypochondria, gallstones and colic: Ars, bell, Calc-c, card-m, chel, Chin, colo, hep, lach, lyco, Mag-m, Merc-d, Nat-s, nux-v, Pod, sil, Sul, terb, ver-a.

Some indication of frequently prescribed medicines for gall-stones: <sup>[13,14,18,25,27,24,23,22]</sup>

**CARDUS MARINUS:**

One of the great medicines for gallbladder stones. There is increased acidity in the stomach. Empty eructation’s, heartburn and nausea; vomiting of bile, followed by burning, stitching, sore pains in the stomach. Much distension and sharp wandering colic pains and stitching in the abdomen. Terrible attacks of gall-stone colic. Pain on the right, bellow the last ribs in the region of the liver, the taste in mouth is bad and the skin is yellow-colored. The gall-bladder is enlarged and tender, the region of the liver is uncomfortable and there is sensation of fullness and constipation alternates with diarrhea with clay color stools. The complaints are aggravated by lying on the right side, and on stooping causes stitches on the right bellow ribs, worse from motion and pressure on the affected part. Better from sitting

up in bed and from lying on the unaffected side.

**CALCAREA CARBONICA:**

The abdomen may feel swollen on the right and be very sensitive to pressure, with cutting pains that extend to the chest and are worse from stooping, the person feels worse from standing, exertion, and better from lying on the painful side. Calcarea carbonica is often indicated for people who tired easily, feel cold and sluggish with clammy hands and feet, crave sweets, and tend to feel anxious and overwhelmed when ill.

**CHELIDONIUM MAJUS:**

This remedy is indicated when pain upper abdomen extends to the back, right shoulder, and shoulder-blade. The abdomen is distended, with a constricting feeling as if a string were pulled across it. Pain is worse from motion, and lying on the left with the legs drawn up may help. The person may feel nauseous, especially after eating fat or drinking something cold. The person may feel tired, worse from being cold, and worse in the early morning.

**BELLADONNA:**

Extreme sensitiveness: specially to jarring. Face red: hot. Hyperesthesia: extreme irritability of whole economy or nerve centers. Extreme irritability.

**CHINA:**

FARRINGTON says: ‘Bell. Is useful in cholelithiasis, but the remedy to cure the condition permanently is Cinchona. Unless some symptom or symptoms call specifically for another drug, put your patient on a course of Cinchona. Pain in the hepatic region, worse from touch. Shooting in region of liver, tenderness and pain on touching the part. Liver region sensitive to least pressure. Obstruction in gallbladder with colic; periodic reoccurrence; yellow skin and conjunctivae; constipation with dark greenish scydale. Biliary calculi. Intensely sensitive to touch, to motion, to cold air. Periodicity: pains come on regularly at a given time each day; or every night at 12 o’ clock. Drenching night sweats.

**NUX-VOMICA:**

Gall-stone colic with sudden severe pains on right side; spasms of abdominal muscles with stitching pains in liver. Jaundice, aversion to food, fainting turns; gall-stones. Constipation nearly always. Liver swollen, indurated, sensitive, with pressure and stinging. Cannot bear tight clothing. Oversensitive, irritable, touchy. Ineffectual urging to stool, irregular peristalsis. Chilly, if he uncovers or moves.

**BERBERIS:**

“An excellent remedy for renal calculi; also, for gall-stones associated with renal disease. Pain shooting. The patient cannot make the slightest motion, sits bent over to painful side with relief. Symptom peculiar to Berberis is a bubbling feeling as if water coming up through the skin. Stitching pains under border of false ribs in right side, shoot from hepatic region down through abdomen.” FARRINGTON.

Radiating pains from a particular point puts Berberis almost alone for radiating pains. Has cured renal colic many times, because of its well-known ability to shoot out in every direction. It cures gall-stone colic when little twinges go in every direction from that locality. The liver is full of suffering. Sudden stabbing like a knife puncturing the liver. Dreadful suffering. Berberis, when indicated, will let the little gall-sone loos, and it will pass through, and the patient will take a long breath..... Anything that is spasmodic can be relieved instantly.” KENT.

**DIOSCOREA:**

Hard, dull pain, gall-bladder, at 7 p.m. Neuralgia and spasmodic affections of liver and gall-ducts. Cutting, squeezing, twisting pain. Colic begins at umbilicus and radiates to all parts of body, even

extremities. A constant pain, aggravated at regular intervals by paroxysms of intense suffering. Unbearably sharp, cutting, twisting, griping or grinding pains; dart about and radiates to distant parts. Worse doubling up. Better stretching out, or bending back. Better hard pressure.

**LITHIUM CARB:**

Gall-stones. Violent pain in hepatic region between ilium and ribs. Soreness and pain in bladder: sharp, sticking. Red nose is characteristic

**CHIONANTHES:**

A great liver and gall-stone-colic medicine. Better lying on abdomen. Heat with aversion to cover. Very bitter eructation's. Hot, bitter, sour, sets teeth on edge. Hypertrophy of liver: obstruction: jaundice. Soreness. Nausea and retching with desire for stool. Sensation of double action in stomach, while vomiting, one trying to force something up, the other sucked it back. Colic and cold sweat on forehead.

**LYCOPODIUM:**

Pain in liver; recurrent bilious attacks with vomiting of bile. Subject to gall-stone colic. After Lyc. The attacks come on less frequently, the bilious secretion becomes normal and the gall-stones have a spongy appearance, as though being dissolved. Lyc. patients are always belching: sour eructation's like strong acid burning in pharynx. Bloating: obliged to loosen clothes. Worse cold drinks, often > warm drinks. Worse afternoons: 4-8 p.m. aggravation. Generally, craving for sweets.

**HYDRASTIS:**

Skin yellow; stools white and frequent: fullness and tenderness over hepatic region. Catarrhal inflammation of mucous lining of gall-bladder and biliary ducts. Cutting from liver to right scapula. < lying on back on right side.

**HEPAR:**

LILIENTHAL gives Hepar as one of the remedies of gall-stone colic. It has stitches in region of liver. Hepatitis, stools white or green. Is extremely sensitive mentally and physically. Cannot bear the slightest touch: or pain. Cannot stand draughts: craves vinegar.

**VERAT. ALB:**

Is in Kent's repertory for gall-stone colic. It has, Hyperaemia of liver, gastric catarrh, putrid taste, disgust for warm food, great pressure on hepatic region with vomiting and diarrhea. In verat cases, there will be profuse sweating; cold sweat on forehead; Hippocratic face. Pain maddening, driving patient to delirium. Typically, cold skin, cold face, cold back, cold hands, feet and legs, cold sweat.

**MERC.SOL:**

Pressing pains; stitching in liver. Cannot lie on right side. Jaundice: violent rush of blood to head: bad taste: tongue moist and furred: soreness hepatic region: from gall-stones. Violent stitches in hepatic region, could not breathe or eructate. Worse night: worse warm in bed: worse for the profuse sweat. Foulness of mouth and sweat. Merc loves bread and butter.

**PHOSPHORUS:**

Probably more important for the treatment of liver, leading to gall-stones, then for the acute attack? Great tenderness liver region. Craving for ice-cold drinks, vomited when warm, vomiting followed by great thirst. Worse lying on left side. Anxious and restless in the dark.

**ETHER:**

FARRINGTON: "In the passage of gall-stones, when remedies fail to relieve, I find that ether, externally and internally, is very good. Acting better than chloroform."

**CHLOROFORMUM:**

Cholesteric gall-stones and biliary colic. CLARKE says: "Chloroform will dissolve gall stones, and cases have been treated by injection of chloroform into gall-bladder." Hot wet flannels: Squeeze a

flannel out in hot water, and apply. Have a hot bottle over this, to keep up the moist relaxing heat.

### **CARLSBAD WATERS:**

Almost specific, RUDDOCK says, for gall-stone colic.

### **CONCLUSION-**

In conclusion, gall bladder stones are common, morbid, and highly recurrent. The pathophysiology of gall bladder stone formation is diverse, and includes a combination of genetic and environmental factors. Several endocrinological disorders increase the risk of stone formation. Metabolic evaluation of patients with gall bladder stones helps to identify the underlying etiological factors and provides an opportunity to institute preventive lifestyle and/or pharmacologic measures to reduce stone recurrence risk. It is affecting daily routine and decreasing the Quality of Life. Homoeopathy has wonderful role in treatment of it in compare to other conventional treatment. Homeopathy treats the patient as a whole, taking note of causative factors, sign and symptoms and framing a totality of symptoms for the individualization purpose, which in turn helps in selection of similimum. Homoeopathy offers a complete, gentle and permanent cure in case of gall bladder stone.

### **REFERENCECS -**

1. <https://www.nigerianjsurg.com/text.asp?2013/19/2/49/119236>
2. <https://www.ijrh.org/text.asp?2020/14/1/57/282111>
3. Team IC. Gallstone Disease: Diagnosis and Management of Cholelithiasis, Cholecystitis and Choledocholithiasis. UK: National Institute for Health and Care Excellence; 2014. Back to cited text no. 1
4. Shaffer EA. Gallstone disease: Epidemiology of gallbladder stone disease. *Best Pract Res Clin Gastroenterol* 2006; 20:981-96. Back to cited text no. 2
5. Innes JA, editor. Liver and biliary tract disease. In: Davidson's Essentials of Medicine. Edinburgh: Elsevier Limited; 2009. Back to cited text no. 3
6. Lee JY, Keane MG, Pereira S. Diagnosis and treatment of gallstone disease. *Practitioner* 2015; 259:15-9, 2. Back to cited text no. 4
7. Stinton LM, Shaffer EA. Epidemiology of gallbladder disease: Cholelithiasis and cancer. *Gut Liver* 2012; 6:172-87. Back to cited text no. 6
8. Singh V, Trikha B, Nain C, Singh K, Bose S. Epidemiology of gallstone disease in Chandigarh: A community-based study. *J Gastroenterol Hepatol* 2001; 16:560-3. Back to cited text no. 7
9. Frybova B, Drabek J, Lochmannova J, Douda L, Hlava S, Zemkova D, et al. Cholelithiasis and choledocholithiasis in children; risk factors for development. *PLoS One* 2018;13: e0196475. Back to cited text no. 8
10. Novacek G. Gender and gallstone disease. *Wien Med Wochenschr* 2006; 156:527-33. Back to cited text no. 9
11. Pruthi HS, Varadarajulu R. Treatment of gallstones – What is the right choice. *Med J Armed Forces India* 1999; 55:1-2. Back to cited text no. 10
12. Kapoor M, Yasir M, Umar A, Suri A. Complications of laparoscopic cholecystectomy, an analysis of 300 patients. *JK Pract* 2013; 18:7-11. Back to cited text no. 11
13. Boericke W. *New Manual of Homoeopathic Materia Medica with Repertory*. 3rd ed. New Delhi: B. Jain Publishers (P) Ltd.; 2011. Back to cited text no. 12
14. Pathak R. A cured case of cholelithiasis with homeopathic medicines. *Clin Exp Homoeopath* 2018; 5:27-9. Back to cited text no. 13

15. Ghosh MS, Shil RC, Chakma A. A case of gallstone with prostatomegaly. *Indian J Res Homoeopath* 2014; 8:231-5.
16. Hahnemann S, Boericke W, Dudgeon RE. *Organon of Medicine*. 5th, 6th ed. New Delhi: B. Jain Publishers Pvt. Ltd.; 2011. Back to cited text no. 16
17. Mathur KN, Wadia SR. *Principles of Prescribing*. New Delhi: B. Jain Publishers Pvt. Ltd.; 1998. Back to cited text no. 17
18. Kent JT. *Lectures on Homoeopathic Materia Medica*. New Delhi: B. Jain Publishers Pvt. Ltd.; 1971. Back to cited text no. 18
19. Portincasa P, Wang DQ-H. Gallstones. In: Podolsky, DK, Camilleri M, Fitz JG, Kalloo, AN, Shanahan F, Wang, TC, eds. *Yamada's Textbook of Gastroenterology*. Volume 2. 6th edition. Hoboken, NJ: Wiley-Blackwell; 2015:1808–1834.
20. Gallstones. American Gastroenterological Association website. <http://www.gastro.org/patient-care/conditions-diseases/gallstones> External link. Accessed November 27, 2017.
21. <https://www.niddk.nih.gov/health-information/digestive-diseases/gallstones/definition-facts>
22. <https://www.homeobook.com/cholelithiasis-and-homoeopathy/>
23. <https://www.homeobook.com/homoeopthioc-approach-in-gall-stones/>
24. Lippe AV. *Keynotes and red line symptoms of the materia medica*. Reprint. New Delhi: B Jain publishers; 1998.
25. Lesser O. *Textbook of Homoeopathic Materia Medica*. B. Jain Publishers; 2015. 992 p.
26. Farrington MEA. *Lectures on Clinical Materia Medica in Family Order*. B Jain Publishers Pvt Limited; 2010. 1040 p.

## ROLE OF HOMOEOPATHIC MEDICINES IN GALL BLADDER STONES

**Dr. Astha Sikarwar**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

**Dr. Rakesh Sharma**

Professor, Faculty of Homoeopathic Science, JVWU, Jaipur

**Dr. Meenakshi Soni**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

**Dr. Ravi Jain**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

**Dr. Gaurav Gupta**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **ABSTRACT-**

Gall stone formation is the most common disorder of the biliary tract and it is unusual for the gall bladder to be diseased in the absence of gall stones. Cholelithiasis or gallstone disease is a very common problem worldwide. The prevalence is more in females than males. Although cholecystectomy is considered the gold standard treatment for symptomatic cholelithiasis, it has its own limitations, risks and post-operative complications. Here, an alternative system of medicine, especially Homoeopathy, plays an important role in treating cholelithiasis.

**KEYWORDS** – Cholecystitis, Cholelithiasis, Gall bladder stone, Homoeopathy.

### **INTRODUCTION –**

Gallstone unwellness refers to the presence of stones within the gall bladder (GB) (cholelithiasis) or common bile duct (choledocholithiasis) and also the symptoms and complications they cause. lithiasis and its associated complications like inflammation, redness and inflammation are one in all the main health issues worldwide. Chronic inflammation is nearly invariably related to gallstones. The imbalance of the chemical constituents of gall leads to precipitation of 1 or additional of the parts and ultimately forms gall stones. Nearly 37%–86% of gallstones are cholesterol-rich stones, 2%–27% are pigment stones and 4%–16% are mixed stones. totally different| completely different} medicine studies have prompted a good variation within the overall prevalence between different populations. The prevalence of gallstones will increase with age, rising markedly when the age of forty years. Older individuals are 4–10 times additional seemingly to possess gall stones than younger individuals. Gallstones are often found in individuals of high socioeconomic standing and in multiparous females. additionally, patients with lithiasis have considerably higher BMI compared to the common population. feminine gender is one in all the main risk factors of lithiasis. compared to men, ladies have 2 to a few times higher prevalence of gallstones. gestation is additionally a significant risk issue for lithiasis. Sex hormones are largely liable for the magnified risk as sex hormone will increase biliary cholesteric secretion, inflicting cholesteric supersaturation within the gall. Chronic calculus inflammation normally presents with perennial attacks of higher abdominal pain. <sup>[1,2,3,4,5,6]</sup>

Liver perform tests and abdominal ultrasound are the prompt investigational procedures in suspected bile stone unwellness. extirpation is that the main selection of treatment in symptomatic bile stone cases,



and cholecystectomy (LC) is that the wide accepted operative management of bile stone unwellness worldwide. However, there are patients WHO are either reluctant to bear surgery or are at high surgical risk. additionally, LC has some disadvantages because it could result in common bile duct and intestine injury (2.6%), post-operative gall leak (2.3%), stone spillage (2%), post-operative colonic fistula (0.3%), post-operative biliary fistula (0.3%) or post-operative hemorrhage (0.3%) in some cases. Here, medical aid plays a crucial role in combating the sufferings because of bile stone unwellness. There are many medicines within the homoeopathic pharmacological medicine which might be thought of for gall stone disease; some distinguished medicines are common barberry, Calcarea carbonica, asterid dicot genus marianus, China, Chamomilla, genus Chionanthus, Lycopodium, genus Veratrum album, etc. However, there are only a few studies found in literature, that show positive results of well-selected personal homoeopathic medicines in these conditions. [13,14,15] during this context, the most objective of this case report is to point out the effectiveness of personal homoeopathic medication within the treatment of this often-dreaded condition, sometimes or thought of surgical, with any stress on the need of additional analysis during this field. [1,2,3,4,5,6]

### **REVIEW OF LITRETURE –**

Gallstones square measure laborious, pebble-like items of fabric, sometimes manufactured from sterol or hematoidin, that kind in your bladder. Gallstones will zero in size from a grain of sand to a golf equipment. The bladder will build one giant concretion, many small stones, or each little and enormous stones.

When gallstones block the digestive juice ducts of your biliary tract, the gallstones will cause unforeseen pain in your higher right abdomen. This pain is named a bladder attack, or biliary hurting. If your symptoms continue and they're left untreated, gallstones will cause serious complications. However, most gallstones don't cause blockages and square measure painless, conjointly referred to as "silent" gallstones. Silent gallstones sometimes don't want medical treatment.

#### **Types of gallstones**

The two main kinds of gallstones square measure

- a) cholesterol stones
- b) pigment stones

Cholesterol stones square measure sometimes chromatic in color and square measure manufactured from principally hardened sterol. In some countries, sterol stones form up concerning seventy-five % of gallstones. Pigment stones square measure dark in color and square measure manufactured from hematoidin. Some folks have a mixture of each sorts of stones. [19,20,21]

#### **Pathogenesis<sup>[1]</sup>**

Gallstones square measure composed primarily of sterol, bilirubin, and Ca salts, with smaller amounts of macromolecule and different materials. There square measure 3 kinds of gallstones

- (i) Pure sterol stones, that contain a minimum of ninetieth sterol,
- (ii) pigment stones either brown or black, that contain a minimum of ninetieth hematoidin and
- (iii) mixed composition stones, that contain variable proportions of sterol, hematoidin and different substances like carbonate, inorganic phosphate and Ca palmitate.

Brown pigment stones square measure primarily composed of Ca hematoidinate whereas black pigment stones contain bilirubin, Ca and/or tribasic phosphate. In Western societies and in Asian country over seventieth of gallstones square measure composed primarily of sterol, either pure or mixed with pigment, muco compound protein, and carbonate. Pure sterol crystals square measure quite soft, and

macromolecule contributes significantly to the strength of sterol stones.

In the simplest sense, sterol gallstones kind once the sterol concentration in digestive juice exceeds the power of digestive juice to carry it in resolution, so crystals kind and grow as stones. sterol is just about insoluble in solution, however in digestive juice it's created soluble by association with digestive juice salts and phospholipids within the style of mixed micelles and vesicles.

Three kinds of abnormalities are thought-about to be accountable for sterol concretion formation. sterol supersaturation, the essential demand for sterol concretion formation, would possibly occur via excessive sterol synthesis, that is that the main lithogenic mechanism in weighty persons. within the non-obese, defective conversion of sterol to digestive juice acids, thanks to an occasional or comparatively low activity of sterol sterol hydroxylase, the speed limiting protein for steroid synthesis and sterol elimination may end in excessive sterol secretion. Finally, interruption of the enterohepatic circulation of digestive juice acids may increase digestive juice saturation. Temporary interruption of the enterohepatic steroid circulation throughout nightlong fast ends up in a better cholesterol/phospholipid quantitative relation within the vesicles secreted by the liver. steroid hormone treatment conjointly reduces the synthesis of steroid in ladies.

High biliary macromolecule and lipide concentrations square measure risk factors for the formation of gallstones. bladder sludge, i.e., thickened bladder mucoprotein with small entrapped sterol crystals is assumed to be the same old precursor of gallstones. Sludge will generally cause biliary pain, rubor, or acute inflammation, <sup>[33]</sup> however sludge may resolve while not treatment. The sources of sludge square measure physiological condition, prolonged total duct nutrition, starvation, or speedy weight loss. The antibiotic cephalosporin may precipitate within the bladder as sludge and infrequently, as gallstones.

The biliary Ca concentration plays a vicinity in hematin precipitation and concretion calcification. several patients with gallstones have magnified biliary Ca, with supersaturation of carbonate.

Impaired motility of the bladder as seen in patient with high medulla spinalis injury or with the employment of the somatostatin analogue octreotide, has been cited as another contributory consider the event of gallstones. In theory, microscopic sterol crystals would often be washed out of the bladder if its contractions were effective enough. viscus hypomotility has been recently recognized as a primary consider sterol lithogenesis. Fiber could shield against concretion formation by dashing viscus transit and reducing the generation of secondary digestive juice acids like deoxycholate that has been related to magnified sterol saturation of the digestive juice.

### **Epidemiology**

In westerners, seven-membered of males and 15 August 1945 of female's square measure affected within the age-group eighteen – sixty-five years. In >40 years, age-group, there's a 3:1 feminine preponderance and in old, the quantitative relation is equal. Gallstones square measure additional common in North America, Europe and Australia, and square measure less frequent in Asian country, the Far East and Africa. In developed countries, the incidence of symptomatic gallstones seems to be increasing and that they occur at associate early stage. There has been a lot of discussion over the role of diet in sterol concretion disease; a rise in dietary sterol, fat, total calories and refined saccharide or lack of dietary fiber are all involved.

### **Aetiology**

Bile stone formation is complex, and therefore the factors concerned are associated with the sort of gallstones.

Cholesterol gallstones: cholesterolin is control in resolution in digestive juice by its association with digestive juice acids and phospholipids within the type of micelles and vesicles. Biliary lipoproteins may additionally have a job in solubilizing cholesterolin. In bile stone illness, the liver produces digestive

juice that contains associate way over cholesterol either as a result of there's a relative deficiency of digestive juice salts or a relative way over cholesterol. Such bile, that is concentrated with cholesterol, is termed "lithogenic".

Disorders with the potential to induce the assembly of lithogenic digestive juice are:

- a) Defective salt synthesis
- b) Excessive enteric loss of digestive juice salts
- c) Over-sensitive salt feedback
- d) Excessive cholesterol secretion
- e) Abnormal vesica operate.

Factors initiating crystallization of cholesterol in lithogenic digestive juice (nucleation factors) also are important; patient with cholesterol gall stones have gall bladder digestive juice kinds cholesterol crystals quicker than equally saturated digestive juice from patients WHO don't form gallstones.

Pigment stones: Brown breakable pigment stones are nearly always the consequence of microorganism or parasitic infection within the biliary tree. they're found unremarkably within the Far East, wherever infection within the biliary tree permits microorganism beta-glucuronidase to hydrolyse conjugated animal pigment to its morpheme, that then precipitates as metal bilirubinate. haematolysis is very important as these stones occur in chronic haemolytic illness.

Biliary slug: The term 'biliary sludge' describes digestive juice that is in an exceedingly gel kind that contains various crystals of microspheroliths of metal bilirubinate granules and cholesterol crystals moreover as glyco-proteins. it's a vital precursor to the formation of gallstones within the majority of patients. Biliary sludge is often shaped underneath traditional conditions, then again either dissolves or is cleared by the gallbladder; solely in regarding 15 August 1945 of patients will it persists to create cholesterol stones. Fasting, duct nutrition and maternity also are related to sludge formation.

### **Clinical features**

The bulk of gallstones are well, and stay thus, solely regarding 100% of these with bilestones develop clinical proof of gallstone illness.

Symptomatic gallstones manifest either as biliary pain [biliary colic] or as a consequence of rubor. If a bile stone becomes acutely wedged within the cystic duct, the patient can expertise pain. The term 'biliary intestinal colic' could be a name as a result of the pain will nor rhythmically increase or decrease in intensity as in colic intimate in enteric and urinary organ illness. Instead, the pain is often of abrupt onset and is sustained for regarding a pair of hours. Its continuation for over half-dozen hours suggests that a complication like rubor or rubor has developed. Pain is felt within the region (70% of patients) or right higher quadrant (20% of patients) and radiates to the inter-scapular region or to the tip of right shoulder bone, however different sites embrace the left higher quadrant, the region and therefore the lower chest; the pain will be confused with intra-thoracic illness, rubor, infarct or dissecting cardiovascular disease.

Combinations of fatty food intolerance, upset stomach and flatulence not attributable to different causes are observed as 'gall stones dyspepsia'. These symptoms don't seem to be currently recognized as being caused by gall stones and are best thought to be non-ulcer upset stomach.

### **Diagnosis**

Blood tests showing high levels of exocrine gland enzymes (amylase and lipase) typically indicate an identification of rubor. Elevated levels of the liver accelerator amino acid aminopherase (ALT) are terribly specific in characteristic bile stonerubor.

Imaging techniques are helpful in confirming an identification – Ultrasound, X-radiation (CT) scan, alongside laboratory tests, will verify the severity of the condition.

### **Laboratory Tests**

Bilirubin and therefore the accelerator alkaline phosphatase enzyme are typically elevated in acute cholecystitis, and particularly cholelithiasis (common bile duct stones)

Levels of liver enzymes called aspartate aminotransferase (AST) and amino acid aminotransferase (ALT) are elevated once common bile duct stones are present. A threefold or additional increase in alkaline phosphatase powerfully suggests cholecystitis.

A high white blood cell count could be a common finding in several (but not all) patients with cholecystitis.

A number of techniques – endoscopic retrograde cholangiopancreatography (ERCP), endoscopic ultrasound (EUS) and magnetic resonance cholangiopancreatography (MRCP) – effective for the investigation of common bile duct stones. Only ERCP, however, permits removal of the stones.

### **Imaging Techniques**

Ultrasound. Ultrasound could be a straightforward, rapid, and noninvasive and diagnostic methodology to discover gallstones, acute cholecystitis. Air within the vesical wall could indicate gangrene. X-Rays. Plain x-rays of the abdomen could discover calcified gallstones.

### **Complications**

In the gallbladder:

- a) Silent stones
- b) Chronic cholecystitis
- c) Acute cholecystitis
- d) Gangrene
- e) Perforation
- f) Empyema
- g) Mucocele
- h) Carcinoma

In the digestive juice ducts:

- a) Obstructive jaundice
- b) Cholangitis
- c) Acute cholecystitis

In the gut

- a) Acute obstruction ('gallstone ileus')

Obstruction of the cystic duct for any prolonged amount of your time ends up in acute cholecystitis. Different complications embrace chronic cholecystitis, and a mucocele of the gall-bladder, within which there's slow distension of the gall bladder from continuous secretion of mucous secretion. If this material becomes infected, acute inflammatory disease develops. Pus could also be secreted into the lumen of the distended vesica, inflicting limy digestive juice and if metal salts are precipitated within the gall bladder wall, the tomography looks of 'porcelain' vesica results.

Gall stones within the vesica (cholelithiasis) migrate to the vesica (choledocholithiasis) in or so 15% of patients and cause biliary intestinal colic, however they will be well. Rarely, fistulae develop between the gall bladder and small intestine, colon or abdomen. Air is going to be seen within the biliary tree on plain abdominal radiographs. If a stone larger than a pair of .5 cm in diameter has migrated into the gut it should impact either at the terminal small intestine or often within the small intestine or sigmoid flexure. The resultant obstruction could also be followed by 'gallstone ileus'.

Rarely, gallstones wedged within the cystic duct cause stricting within the common duct (Mirizzi's syndrome), leading to clogging jaundice.

Carcinoma of vesica is rare, though it's recognized additional oftentimes in an exceedingly ageing population and in a 'porcelain' vesica. Cancer is sometimes diagnosed as associate incidental microscopic anatomy finding following extirpation for bile stone illness.

### **Prevention**

Diet may play a role in gallstones.

Fats. Although fats (particularly saturated fats found in meats, butter, and other animal products) have been associated with gallstone attacks, Fiber. High intake of fiber has been associated with a lower risk for gallstones. Nuts. Studies suggest that people may be able to reduce their risk of gallstones by eating more nuts (peanuts and tree nuts, such as walnuts and almonds).

Fruits and Vegetables. had the lowest risk of developing symptomatic gallstones that required removal of the gallbladder.

Lecithin. Lecithin is a key component of bile. It contains choline and inositol, two compounds that are important for the breakdown of fat and cholesterol. Low levels of lecithin may precipitate the formation of cholesterol gallstones. Dietary lecithin is available in health food stores and is found in eggs, soybeans, liver, wheat germ, and peanuts. There is no evidence, however, that lecithin supplements or foods containing it can prevent gallstones in humans.

Sugar. High-intake of sugar has been associated with an increased risk for gallstones.

Alcohol. A few studies have reported a lower risk for gallstones with alcohol consumption. Preventing Gallstones during Weight Loss Maintaining a normal weight and avoiding rapid weight loss are the keys to reducing the risk of gallstones.

### **Management**

Asymptomatic gallstones found incidentally are not usually treated because the majority will never give symptoms. Symptomatic gallstones are best treated surgically, and minimal access techniques have largely replaced non-surgical treatment. Gallstones can be dissolved and fragmented in the gallbladder or removed mechanically from the common bile duct.

Medical dissolution of gallstones can be achieved by oral administration of the bile acid, ursodeoxycholic acid. Radio-lucent gallstones, a gallbladder that opacifies on oral cholecystography. Stones not larger than 15 mm in diameter, moderate obesity and no or almost mild symptoms are the features which suggest that drug therapy may be feasible. Success can be expected in approximately 75% of patients who fulfill their criteria. Occasionally, direct contact dissolution therapy is attempted via percutaneous catheters or catheters placed at ERCP. ESWL is expensive and not widely available. Bile salt therapy is necessary following lithotripsy to dissolve the gallstone fragments within the gallbladder. As in the case of oral bile salt therapy, only 30% of all patients with gallbladder disease are suitable for lithotripsy. All the therapeutic regimens which retain the gall bladder have a 5% reoccurrence of stones after 5 years.

Some rubrics related to it in different repertories:

#### **In synthesis, ver 10.2:**

Abdomen, gallstones: (Pain – liver – colic) ARS, aur, bapt, bell, berb, bold, Bry, calc, calc-f, card-m, Cham, chel, chin, chion, chlf, chol, coloc, cupr, dig, dios, eberth, euon, euon-a, euonin, fab, fel, ferr-s, fuma-ac, gels, guat, hed, Hydr, jug-c, lach, Lept, lith-c, lob, lyc, mag-p, mag-s, mand, mang, MERC, merc-d, myric, morg-g, morg-p, nat-s, nat-sal, nit-s-d, nux-v, Phos.podo, ptel, sang,sulph, tarax, thlas,

verat, vichy-g.

Abdomen, gallstone colic: (see pain – liver – colic) ars, atro, atro-s, Bapt, BELL, BERB, Bry, cal-bil, Calc, CARD-M, Cham, Chel, CHIN, Chion, Chlf, Chlol, colch, Coloc, cupr, dig, Dios, Fab, gels, hep, hydr, Ip, Iris, kali-ar, Kali-bi, Kali-c, Lach, laur, Lept, Lith-c, LYC, mag-bcit, Mag-m, Mag-s, mand, mang, menth, merc, Merc-d, morph-act, NAT-S, Nux-v, op, podo, puls, rhus-t, ric, Sep, sil, staph, sulph, tab, ter, trios, VERAT.

**In Boericke’s repertory:**

Abdomen, gall-bladder – biliary calculi (cholelithiasis) – Aur.; Bapt.; Berb.v.; Bolod.; Bry.; Cal.c.; Card.m.; Chel.; Chionanth.; Cholest.; Cinch.; Diosc.; Feltauri; Ferr.s.; Gels.; Hydr.; Jug.c.; Lach.; Lept.; Myr.; Nux-v.; Pichi.; Pod.; Ptel.; Tarax.

Abdomen, gall-bladder, Biliary colic – Ars.; Atrop. sul.; Bell.; Berb.v.; Calc.c.; Card. m.; Chionanth.; Cinch.; Col.; Dig.; Diosc.; Gels.; Hydr.; Ipec.; Lyc.; Morph. acet.; Nux v.; Op.; Tereb.

**In complete repertory:**

Abdomen, pain, general, liver, colic, gall-stones – Aml-n, Arge, Ars, Atro, Aur, Bamb-a, Bapt, BELL, BERB, Bold, Bry, Calc, Calc-f, CARD-M, Cham, Chel, CHIN, Chion, Chlf, Chlol, Chol, Coloc, Cupr, Dig, Dios, Erig, Euon, Fab, Fel, Ferr-s, Gels, Hep, Hydr, Ip, Iris, Jug-c, Kali-ar, Kali-bi, Kali-c, Kreos, Lach, Laur, Lept, Lith-be, Lith-c, Lob, LYC, Mag-c, Mag-m, Mag-p, Mag-s, Mang, Menth, Merc, Merc-d, MORG, Morph, Myric, NAT-S, Nux-v, Op, Ozone, Phos, Podo, Ptel, Puls, Rhus-t, Ric, Sang, Sep, Sil, Sulph, Tab, Tarax, Ter, Trio, VERAT.

**In Clarke’s clinical repertory:**

Clinical, gall-stones: berb, calc, card-b, chel, chlf, chol, euonin, euon-a, fel, lach, lith-c, lob, mang, nit-s-d, nux-v, fab, podo, ptel, tarax, thlaspi, vichy-g.

**In Murphy’s repertory:**

Liver, gallstone, colic pain from – am-m, alum, ars, aur, bapt, BELL, BERB, bry, CALC, CARD-M, cham, chel, CHIN, chion, CHOL, COLOC, cupr, dig, DIOS, euon, fel, ferr-s, gels, hep, hydr, ip, iris, jug-c, kali-ar, kali-bi, kali-c, lach, laur, lept, lith, LYC, mag-p, mang, merc, merc-d, MORG, myric, NAT-S, nux-v, op, osm, phos, podo, puls, rhus-t, sang, sep, sulph, tab, tarax, ter, thuj, VERAT.

**In Boger’s repertory:**

Hypochondria, gallstones and colic: Ars, bell, Calc-c, card-m, chel, Chin, colo, hep, lach, lyco, Mag-m, Merc-d, Nat-s, nux-v, Pod, sil, Sul, terb, ver-a.

Some indication of frequently prescribed medicines for gall-stones: [13,14,18,25,27,24,23,22]

**CARDUS MARINUS:**

One of the great medicines for gallbladder stones. There is increased acidity in the stomach. Empty eructation’s, heartburn and nausea; vomiting of bile, followed by burning, stitching, sore pains in the stomach. Much distension and sharp wandering colic pains and stitching in the abdomen. Terrible attacks of gall-stone colic. Pain on the right, bellow the last ribs in the region of the liver, the taste in mouth is bad and the skin is yellow-colored. The gall-bladder is enlarged and tender, the region of the liver is uncomfortable and there is sensation of fullness and constipation alternates with diarrhea with clay color stools. The complaints are aggravated by lying on the right side, and on stooping causes stitches on the right bellow ribs, worse from motion and pressure on the affected part. Better from sitting

up in bed and from lying on the unaffected side.

**CALCAREA CARBONICA:**

The abdomen may feel swollen on the right and be very sensitive to pressure, with cutting pains that extend to the chest and are worse from stooping, the person feels worse from standing, exertion, and better from lying on the painful side. Calcarea carbonica is often indicated for people who tired easily, feel cold and sluggish with clammy hands and feet, crave sweets, and tend to feel anxious and overwhelmed when ill.

**CHELIDONIUM MAJUS:**

This remedy is indicated when pain upper abdomen extends to the back, right shoulder, and shoulder-blade. The abdomen is distended, with a constricting feeling as if a string were pulled across it. Pain is worse from motion, and lying on the left with the legs drawn up may help. The person may feel nauseous, especially after eating fat or drinking something cold. The person may feel tired, worse from being cold, and worse in the early morning.

**BELLADONNA:**

Extreme sensitiveness: specially to jarring. Face red: hot. Hyperesthesia: extreme irritability of whole economy or nerve centers. Extreme irritability.

**CHINA:**

FARRINGTON says: ‘Bell. Is useful in cholelithiasis, but the remedy to cure the condition permanently is Cinchona. Unless some symptom or symptoms call specifically for another drug, put your patient on a course of Cinchona. Pain in the hepatic region, worse from touch. Shooting in region of liver, tenderness and pain on touching the part. Liver region sensitive to least pressure. Obstruction in gallbladder with colic; periodic reoccurrence; yellow skin and conjunctivae; constipation with dark greenish scydale. Biliary calculi. Intensely sensitive to touch, to motion, to cold air. Periodicity: pains come on regularly at a given time each day; or every night at 12 o’ clock. Drenching night sweats.

**NUX-VOMICA:**

Gall-stone colic with sudden severe pains on right side; spasms of abdominal muscles with stitching pains in liver. Jaundice, aversion to food, fainting turns; gall-stones. Constipation nearly always. Liver swollen, indurated, sensitive, with pressure and stinging. Cannot bear tight clothing. Oversensitive, irritable, touchy. Ineffectual urging to stool, irregular peristalsis. Chilly, if he uncovers or moves.

**BERBERIS:**

“An excellent remedy for renal calculi; also, for gall-stones associated with renal disease. Pain shooting. The patient cannot make the slightest motion, sits bent over to painful side with relief. Symptom peculiar to Berberis is a bubbling feeling as if water coming up through the skin. Stitching pains under border of false ribs in right side, shoot from hepatic region down through abdomen.” FARRINGTON.

Radiating pains from a particular point puts Berberis almost alone for radiating pains. Has cured renal colic many times, because of its well-known ability to shoot out in every direction. It cures gall-stone colic when little twinges go in every direction from that locality. The liver is full of suffering. Sudden stabbing like a knife puncturing the liver. Dreadful suffering. Berberis, when indicated, will let the little gall-sone loos, and it will pass through, and the patient will take a long breath..... Anything that is spasmodic can be relieved instantly.” KENT.

**DIOSCOREA:**

Hard, dull pain, gall-bladder, at 7 p.m. Neuralgia and spasmodic affections of liver and gall-ducts. Cutting, squeezing, twisting pain. Colic begins at umbilicus and radiates to all parts of body, even

extremities. A constant pain, aggravated at regular intervals by paroxysms of intense suffering. Unbearably sharp, cutting, twisting, griping or grinding pains; dart about and radiates to distant parts. Worse doubling up. Better stretching out, or bending back. Better hard pressure.

**LITHIUM CARB:**

Gall-stones. Violent pain in hepatic region between ilium and ribs. Soreness and pain in bladder: sharp, sticking. Red nose is characteristic

**CHIONANTHES:**

A great liver and gall-stone-colic medicine. Better lying on abdomen. Heat with aversion to cover. Very bitter eructation's. Hot, bitter, sour, sets teeth on edge. Hypertrophy of liver: obstruction: jaundice. Soreness. Nausea and retching with desire for stool. Sensation of double action in stomach, while vomiting, one trying to force something up, the other sucked it back. Colic and cold sweat on forehead.

**LYCOPodium:**

Pain in liver; recurrent bilious attacks with vomiting of bile. Subject to gall-stone colic. After Lyc. The attacks come on less frequently, the bilious secretion becomes normal and the gall-stones have a spongy appearance, as though being dissolved. Lyc. patients are always belching: sour eructation's like strong acid burning in pharynx. Bloating: obliged to loosen clothes. Worse cold drinks, often > warm drinks. Worse afternoons: 4-8 p.m. aggravation. Generally, craving for sweets.

**HYDRASTIS:**

Skin yellow; stools white and frequent: fullness and tenderness over hepatic region. Catarrhal inflammation of mucous lining of gall-bladder and biliary ducts. Cutting from liver to right scapula. < lying on back on right side.

**HEPAR:**

LILIENTHAL gives Hepar as one of the remedies of gall-stone colic. It has stitches in region of liver. Hepatitis, stools white or green. Is extremely sensitive mentally and physically. Cannot bear the slightest touch: or pain. Cannot stand draughts: craves vinegar.

**VERAT. ALB:**

Is in Kent's repertory for gall-stone colic. It has, Hyperaemia of liver, gastric catarrh, putrid taste, disgust for warm food, great pressure on hepatic region with vomiting and diarrhea. In verat cases, there will be profuse sweating; cold sweat on forehead; Hippocratic face. Pain maddening, driving patient to delirium. Typically, cold skin, cold face, cold back, cold hands, feet and legs, cold sweat.

**MERC.SOL:**

Pressing pains; stitching in liver. Cannot lie on right side. Jaundice: violent rush of blood to head: bad taste: tongue moist and furred: soreness hepatic region: from gall-stones. Violent stitches in hepatic region, could not breathe or eructate. Worse night: worse warm in bed: worse for the profuse sweat. Foulness of mouth and sweat. Merc loves bread and butter.

**PHOSPHORUS:**

Probably more important for the treatment of liver, leading to gall-stones, then for the acute attack? Great tenderness liver region. Craving for ice-cold drinks, vomited when warm, vomiting followed by great thirst. Worse lying on left side. Anxious and restless in the dark.

**ETHER:**

FARRINGTON: "In the passage of gall-stones, when remedies fail to relieve, I find that ether, externally and internally, is very good. Acting better than chloroform."

**CHLOROFORMUM:**

Cholesteric gall-stones and biliary colic. CLARKE says: "Chloroform will dissolve gall stones, and cases have been treated by injection of chloroform into gall-bladder." Hot wet flannels: Squeeze a



flannel out in hot water, and apply. Have a hot bottle over this, to keep up the moist relaxing heat.

### **CARLSBAD WATERS:**

Almost specific, RUDDOCK says, for gall-stone colic.

### **CONCLUSION-**

In conclusion, gall bladder stones are common, morbid, and highly recurrent. The pathophysiology of gall bladder stone formation is diverse, and includes a combination of genetic and environmental factors. Several endocrinological disorders increase the risk of stone formation. Metabolic evaluation of patients with gall bladder stones helps to identify the underlying etiological factors and provides an opportunity to institute preventive lifestyle and/or pharmacologic measures to reduce stone recurrence risk. It is affecting daily routine and decreasing the Quality of Life. Homoeopathy has wonderful role in treatment of it in compare to other conventional treatment. Homeopathy treats the patient as a whole, taking note of causative factors, sign and symptoms and framing a totality of symptoms for the individualization purpose, which in turn helps in selection of similimum. Homoeopathy offers a complete, gentle and permanent cure in case of gall bladder stone.

### **REFERENCECS -**

1. <https://www.nigerianjsurg.com/text.asp?2013/19/2/49/119236>
2. <https://www.ijrh.org/text.asp?2020/14/1/57/282111>
3. Team IC. Gallstone Disease: Diagnosis and Management of Cholelithiasis, Cholecystitis and Choledocholithiasis. UK: National Institute for Health and Care Excellence; 2014. Back to cited text no. 1
4. Shaffer EA. Gallstone disease: Epidemiology of gallbladder stone disease. *Best Pract Res Clin Gastroenterol* 2006; 20:981-96. Back to cited text no. 2
5. Innes JA, editor. Liver and biliary tract disease. In: Davidson's Essentials of Medicine. Edinburgh: Elsevier Limited; 2009. Back to cited text no. 3
6. Lee JY, Keane MG, Pereira S. Diagnosis and treatment of gallstone disease. *Practitioner* 2015; 259:15-9, 2. Back to cited text no. 4
7. Stinton LM, Shaffer EA. Epidemiology of gallbladder disease: Cholelithiasis and cancer. *Gut Liver* 2012; 6:172-87. Back to cited text no. 6
8. Singh V, Trikha B, Nain C, Singh K, Bose S. Epidemiology of gallstone disease in Chandigarh: A community-based study. *J Gastroenterol Hepatol* 2001; 16:560-3. Back to cited text no. 7
9. Frybova B, Drabek J, Lochmannova J, Douda L, Hlava S, Zemkova D, et al. Cholelithiasis and choledocholithiasis in children; risk factors for development. *PLoS One* 2018;13: e0196475. Back to cited text no. 8
10. Novacek G. Gender and gallstone disease. *Wien Med Wochenschr* 2006; 156:527-33. Back to cited text no. 9
11. Pruthi HS, Varadarajulu R. Treatment of gallstones – What is the right choice. *Med J Armed Forces India* 1999; 55:1-2. Back to cited text no. 10
12. Kapoor M, Yasir M, Umar A, Suri A. Complications of laparoscopic cholecystectomy, an analysis of 300 patients. *JK Pract* 2013; 18:7-11. Back to cited text no. 11
13. Boericke W. *New Manual of Homoeopathic Materia Medica with Repertory*. 3rd ed. New Delhi: B. Jain Publishers (P) Ltd.; 2011. Back to cited text no. 12
14. Pathak R. A cured case of cholelithiasis with homeopathic medicines. *Clin Exp Homoeopath* 2018; 5:27-9. Back to cited text no. 13

15. Ghosh MS, Shil RC, Chakma A. A case of gallstone with prostatomegaly. *Indian J Res Homoeopath* 2014; 8:231-5.
16. Hahnemann S, Boericke W, Dudgeon RE. *Organon of Medicine*. 5th, 6th ed. New Delhi: B. Jain Publishers Pvt. Ltd.; 2011. Back to cited text no. 16
17. Mathur KN, Wadia SR. *Principles of Prescribing*. New Delhi: B. Jain Publishers Pvt. Ltd.; 1998. Back to cited text no. 17
18. Kent JT. *Lectures on Homoeopathic Materia Medica*. New Delhi: B. Jain Publishers Pvt. Ltd.; 1971. Back to cited text no. 18
19. Portincasa P, Wang DQ-H. Gallstones. In: Podolsky, DK, Camilleri M, Fitz JG, Kalloo, AN, Shanahan F, Wang, TC, eds. *Yamada's Textbook of Gastroenterology*. Volume 2. 6th edition. Hoboken, NJ: Wiley-Blackwell; 2015:1808–1834.
20. Gallstones. American Gastroenterological Association website. <http://www.gastro.org/patient-care/conditions-diseases/gallstones> External link. Accessed November 27, 2017.
21. <https://www.niddk.nih.gov/health-information/digestive-diseases/gallstones/definition-facts>
22. <https://www.homeobook.com/cholelithiasis-and-homoeopathy/>
23. <https://www.homeobook.com/homoeopthioc-approach-in-gall-stones/>
24. Lippe AV. *Keynotes and red line symptoms of the materia medica*. Reprint. New Delhi: B Jain publishers; 1998.
25. Lesser O. *Textbook of Homoeopathic Materia Medica*. B. Jain Publishers; 2015. 992 p.
26. Farrington MEA. *Lectures on Clinical Materia Medica in Family Order*. B Jain Publishers Pvt Limited; 2010. 1040 p.

**SEXUAL HARASSMENT AT WORK PLACE IN INDIA****JV'n Dr. (Prof) Beena Dewan**

(Faculty of law and Governance, Jayoti Vidyapeeth women's University)

As enshrined within the Preamble to the Constitution of Asian nation, "equality of standing and opportunity" should be secured for all its citizens; equality of each person beneath the law is bonded by Article fourteen of the Constitution. a secure geographical point is so a woman's right. Harassment constitutes a gross violation of women's proper to equality and dignity. it's its roots in social system and its attendant perception that men area unit superior to ladies which some varieties of violence against women area unit acceptable. one in all these is geographical point harassment, that views numerous varieties of such harassment, as harmless and trivial. This paper analyses the event of harassment law right from Vishakha pointers to the introduction of a replacement legislation in 2013. The paper highlights the key options of the Act.

**Key Words: Sexual Harassment, Legal Framework**

**Introduction**

The elimination of gender-based discrimination has been one among the basics of the Constitutional construction of Bharat. The principle of gender equality is enshrined within the Constitution, in its Preamble, elementary rights, elementary duties and Directive Principles. However, workplace sexual harassment in Bharat, was for the terribly 1st time recognized by the Supreme Court of Bharat in its landmark judgment of Vishaka v. State of Rajasthan one . In

1992, Bhanwari Devi, a dalit lady employed with the agricultural development programme of the

govt. of Rajasthan, was savagely gang raped on account of her efforts to curb the then prevailing follow of kid wedding. This incident disclosed the hazards that operating ladies were exposed to on every day to day

basis and highlighted the urgency for safeguards to be enforced during this regard. The Supreme Court framed certain pointers associated issued directions to the Union of Bharat to enact an applicable law for combating geographical point harassment.

**Development of Harassment Law**

Later, in attire Export Promotion Council v. A.K Chopra two the Supreme Court reiterated the law set down within the Vishaka Judgment and upheld the dismissal of a superior officer of the Delhi based mostly Apparel Export Promotion Council WHO was found guilty of sexually harassing a subordinate feminine employee at the geographical point. during this judgment, the Supreme Court enlarged the definition of sexual harassment by ruling that physical contact wasn't essential for it to quantity to associate act of sexual harassment. The Supreme Court explained that "sexual harassment may be a sort of sex discrimination projected through unwelcome sexual advances, request for sexual favors and alternative verbal or physical conduct with sexual overtones, whether or not directly or by implication, significantly once submission to or rejection of such conduct by the feminine worker was capable of getting used for affecting the use of the feminine worker and immoderately meddling together with her work performance associated had the impact of making an discouraging or hostile work surroundings for her." The Supreme Court undertook watching of implementation of the Vishaka pointers across the country by leading State Governments to file affidavits accenting on the steps taken by them to implement the Vishaka pointers within the case of B. Medha Kotwal Lele & Ors. V. Union of Bharat & Ors. three In its judgment, the Supreme Court



discovered that “the implementation of the Vishaka Guidelines must be not solely in kind however conjointly in substance and spirit thus on create accessible safe and secure surroundings for girls at geographical point in each side and thereby sanctioning operating women to figure with dignity, decency and due respect.’ Not being happy with the implementation of the Vishaka pointers, it directed States to place in situ comfortable mechanisms to make sure effective implementation of the Vishaka pointers. Finally, the Supreme Court declared that just in case of a non-compliance or non-adherence of the Vishaka pointers, it might be hospitable the aggrieved persons to approach the several High Courts.

#### **Amendment in Nirbhaya Case In 2013(IPC Post)**

Section 354A. molestation is: unwelcome physical contact and advances, including unwanted and specific sexual overtures, a requirement or request for sexual favours, showing somebody sexual pictures (pornography) while not their consent, and making unwelcome sexual remarks. Punishment: Up to a few years in jail, and a fine.

Section 354B. Forcing a girl to undress. Punishment: From 3 to seven years in jail, and a fine.

Section 354C. observance or capturing pictures of a girl while not her consent (voyeurism).

Punishment: 1st conviction – one to a few years in jail and a fine. quite one conviction – 3 to 7 years in jail and a fine.

Section 354D. Following a girl and contacting her or making an attempt to contact her despite her saying she doesn't wish contact. Observation a girl victimisation the net or the other form of transmission (stalking).

Punishment: 1st conviction – up to 3 years in jail and a fine. More one conviction – up to 5 years in jail and a fine.

#### **Sexual Harassment of ladies at geographic point (Prevention, Prohibition and**

#### **Redressal) Act, 2013 :**

##### **An Insight**

The Act defines harassment on the work place and creates a mechanism for redressal of complaints. It additionally provides safeguards against false or malicious charges. The definition of "aggrieved woman", World Health Organization can get protection below the Act is very wide to cover all ladies, regardless of her age or employment standing, whether or not within the union or unorganised sectors, public or non-public and covers shoppers, customers and domestic workers additionally. each leader is needed to represent an inside Complaints Committee at every workplace or branch with ten or a lot of staff.

The District Officer is needed to represent an area Complaints Committee at every district, and if needed at the block level The Complaints Committees are **had to** produce for omplaints Committees have the powers of civil courts for **accumulating** proof... The Complaints Committees are needed to produce for conciliation before initiating An inquiry, if requested by the litigant.

The inquiry method below the Act ought to be confidential and therefore the Act lays down a penalty of Rs 5000 on the one who has broken confidentiality. The Act needs employers to conduct education and sensitization Programmes and develop policies against harassment, among alternative obligations Penalties are prescribed for employers. Non-compliance with the provisions of the Act will be punishable with a fine as much as Rs 50,000. recurrent violations might cause higher penalties and cancellation of license or registration to conduct business. Government will order a politician to look at geographic point and records associated with sexual harassment at any organization.

#### **CONCLUSION**

Sexual harassment causes serious damage and is additionally a robust manifestation of sex discrimination at the geographic point. Not solely is it An infringement of the basic rights of a lady,



below Article 19(1) (g) of the Constitution of Republic of India “to follow any profession or To keep out any occupation, exchange or business”; it erodes equality and places the distinction and consequently the bodily and mental health of people in danger. This consequences in terrible productiveness and a bad effect on lives and livelihoods.. To further compound the matter, constituted socio-cultural behavioral patterns, that produce a gender hierarchy; tend to put responsibility on the victim, thereby increasing difference within the workplace and within the society at giant. Today, with the appearance of harassment law, all workplaces in Republic of India are mandated by law to produce a secure and secure operating setting free from harassment for all ladies.

- <http://www.lawyerscollective.org/wp-content/uploads/2014/04/Dos-and-Donts.pdf>
- <https://www.google.com/search?q=development+of+harassment++law&ie=utf-8&oe=utf-8&client=firefox>

\*\*\*

## **ROLE OF HOMOEOPATHY IN IRRITABLE BOWEL SYNDROME**

### **Dr. Gaurav Gupta**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **Dr. Hemant Vyas**

Asso. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **Dr. Arti Bansal**

Asso. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **Dr. Ravi Jain**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **Dr. Astha Sikarwar**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **ABSTRACT**

Irritable Bowel Syndrome (IBS) is characterized by recurrent abdominal pain and discomfort with altered bowel habits. It affects approx. 20% population across the world, among which only around 10% takes medical consultation for it. Its pathology is not clear but many factors seem to play role in this pathology. Its diagnosis is based on clinical findings and ROME criteria is widely used for the diagnosis. IBS has multiple complications and affects quality of life. Its treatment includes change in dietary habits, psychological counselling, exercise etc. Homoeopathy is widely accepted mode of treatment based on totality of symptoms and individualization and is able to cure IBS.

**KEYWORDS-** Irritable Bowel Syndrome, Diarrhoea, Constipation, GIT Disorder, Homoeopathy.

### **INTRODUCTION**

Irritable bowel syndrome (IBS) is characterised by recurrent abdominal pain in association with abnormal defecation in the absence of a structural abnormality of the gut. <sup>[1]</sup> Irritable bowel syndrome (IBS) is a chronic and debilitating functional gastrointestinal disorder that affects 9%-23% of the population across the world. <sup>[2]</sup> About 10–15% of the population are affected at some time but only 10% of these consult their doctors because of symptoms. <sup>[1]</sup> Among this population most studies show a female predominance. The main cause of disease is not entirely apparent as various factors play key roles in its aetiology. <sup>[3]</sup> Although gains have been made in understanding the patho-physiology of IBS, exact mechanisms leading to symptom development are not completely understood. <sup>[4]</sup> No clear diagnostic markers exist for IBS; thus the diagnosis of the disorder is based on clinical presentation. <sup>[5]</sup> Its diagnosis is made according to a symptom-based classification system, the Rome Criteria, with the latest version, Rome IV. <sup>[4]</sup> IBS is not a fatal disease but it does greatly reduce quality of life. <sup>[6]</sup> Across the IBS subtypes, the presentation of symptoms may vary among patients and change over time. Patients report the most distressing symptoms to be abdominal pain, straining, myalgia, urgency, bloating and feelings of serious illness. The complexity and diversity of IBS presentation makes treatment difficult. <sup>[2]</sup> IBS has high comorbidity rates, reduces the quality of life, and causes negative impact on the monetary resources of both patients and society. In modern medicine despite the substantial cost of IBS to both patients and society, curative, medical interventions have yet to be discovered. The development and

persistence of IBS symptoms have been acknowledged as multi-factorial in nature, making treatment of the disorder a complicated, clinical endeavour. Approaches are based on the reduction of patient symptomatology, and current pharmacological management often provides suboptimal relief<sup>[4]</sup> IBS has high comorbidity rates, reduces the quality of life, and causes negative impact on the monetary resources of both patients and society.

Homoeopathy is a therapeutic system of medicine based on the principle, “*Similia Similibus Curentur*” or ‘likes cured by likes’. It is a method of treatment for treating the patient by medicines that possess the power of producing similar symptoms in a healthy human being simulating the natural disease, which it can cure in the diseased person. In homoeopathy, individualization is done and for this purpose physical symptoms as well as psyche symptoms. Homoeopathy is a system which does not treat the disease but treats the patient and has been proved effective in treatment of IBS and is able to not just relieve but to cure the patient.

## **EPIDEMIOLOGY**

Population-based studies estimate the prevalence of irritable bowel syndrome (IBS) at 10%-20% and the incidence of irritable bowel syndrome at 1%-2% per year.<sup>[7]</sup> A meta-analysis shows a pooled estimate of international IBS prevalence of 11.2% with variation by geographic region; the lowest occurring in South Asia and the highest in South America. The prevalence is known to be higher in Western countries as compared to Asian countries. The prevalence of IBS within the community is between 10% and 25%. the ratio of females to males in India reversed, i.e. 1:3 to that of the Western countries. The disorder is usually found in the age group of 15–50 years and may also occur in children and elderly.<sup>[8]</sup>

In a study, prevalence of IBS in India was seen in 12.27% of the study population with male-to-female ratio of 1.44:1. The prevalence rates of IBS was maximum in 45–50 years age group. The prevalence rates of IBS was in lower economic class (Kuppuswamy's scale). There was no significant association of IBS with socioeconomic status, educational status, marital status, or religion.<sup>[8]</sup>

IBS is classified into four subtypes according to predominant stool consistency:<sup>[6]</sup>

1. IBS with constipation (IBS-C);
2. IBS with Diarrhoea (IBS-D);
3. Mixed IBS (IBS-M); and
4. Unsubtyped IBS (IBS-U).

## **AETIOLOGY**

- Genetic factors
- Infection and trauma
- Colonic motility
- Increased sensitivity to food

## **RISK FACTORS OF IBS**

- Physical and psychological stress
- Smoking
- Frequent alcohol consumption

## **PATHOPHYSIOLOGY**

IBS is recognized as a multi-factorial disorder, with the following among the proposed mechanisms contributing to symptomatology: gastrointestinal dysmotility, inflammation, visceral hypersensitivity,

and altered intestinal microbiota. [4] IBS has been conceptualized as a condition of visceral hypersensitivity (leading to abdominal discomfort or pain) and gastrointestinal motor disturbances (leading to Diarrhoea or constipation). Some have suggested that these abnormalities are secondary to psychological disturbances rather than being of primary relevance. [3]

**1. Gastrointestinal Motor Abnormalities-** Studies of colonic myoelectrical and motor activity under unstimulated conditions have not shown consistent abnormalities in IBS. In contrast, colonic motor abnormalities are more prominent under stimulated conditions in IBS. IBS patients may exhibit increased recto-sigmoid motor activity for up to 3 h after eating. [5]

**2. Central Neural Dysregulation And Brain-Gut Interaction-** Psychosocial factors appear to be important in IBS, although whether these factors directly alter gastrointestinal function remains uncertain. It is also possible that gastrointestinal dysfunction modulates central processes too. [2]

**3. Visceral Hypersensitivity:** IBS patients frequently exhibit exaggerated sensory responses to visceral stimulation. The frequency of perceptions of food intolerance is at least twofold more common than in the general population. [5]

**4. Abnormal Psychological Features-** The amygdala located in the CNS is known as an important structure active in the response to anxiety. This center activates the hypothalamic-pituitary-adrenal (HPA) axis and the autonomic system when patients find themselves in anxious situations. Chronic anxiety increases the activity of the amygdala leading to the formation of an HPA axis which will ultimately cause induced visceral hyperalgesia. [3] Most of the patients demonstrates exaggerated symptoms in response to visceral distension, and this abnormality persists even after exclusion of psychological factors. Psychological factors influence pain thresholds in IBS patients, as stress alters sensory thresholds. An association between prior sexual or physical abuse and development of IBS has been reported. [5]

**5. Post-Infectious IBS-** IBS may be induced by GI infection. Approximately 1 in ten patients with IBS believe their IBS began with an infectious illness. [2] Between 3 and 35% of patients assessed progress on to develop IBS symptoms three to twelve months after suffering from GI infections. [3]

**6. Immune Activation and Mucosal Inflammation-** Some patients with IBS display persistent signs of low-grade mucosal inflammation with activated lymphocytes, mast cells, and enhanced expression of pro-inflammatory cytokines. These abnormalities may contribute to abnormal epithelial secretion and visceral hypersensitivity. [5] Exposure to intestinal infection induces persistent low-grade systemic and mucosal inflammation, which is characterized by an altered population of circulating cells, mucosal infiltration of immune cells and increased production of various cytokines in IBS patients. [2]

Bio psychosocial factors are thought to play an important role along with luminal factors such as diet and micro biota. [5]

**7. Altered Gut Flora-** A high prevalence of small intestinal bacterial overgrowth in IBS patients has been noted based on positive lactulose hydrogen breath test. [5] Changes in the quantity and quality of bacteria present can convey selective effects on sensory-motor dysfunctions which can be influenced through bile acid malabsorption, mucosal irritation and inflammation, increased food fermentation and gas production. Increased faecal numbers of *Lactobacilli*, *coliform* and *Bifidobacteria* have been reported in patients affected by IBS. [3]

## CLINICAL MANIFESTATIONS

Both GI and extra-intestinal complaints are included with the primary symptoms of chronic abdominal pain and altered bowel habits.



### **Chronic Abdominal Pain:**

According to the current IBS diagnostic criteria, abdominal pain or discomfort is a prerequisite clinical feature of IBS. [5] Abdominal pain is usually described as a sensation of cramps of varying intensity along with periodic exacerbations. The pain is usually located in the lower abdomen, often felt in the lower left quadrant. [3]

### **Altered Bowel Habits:**

Patients suffering with IBS often complain of altered bowel habits; this can be observed in the volume, frequency and consistency of the patient's stools. [3] Alteration in bowel habits is the most consistent clinical feature in IBS. The most common pattern is constipation alternating with Diarrhoea, usually with one of these symptoms predominating. At first, constipation may be episodic, but eventually it becomes continuous and increasingly intractable to treatment with laxatives. [5]

#### **Diarrhoea:**

Diarrhoea is usually characterized as frequent loose stools of small to moderate volume. Stools generally occur during the hours in which patients are awake; frequently in the morning or after mealtimes. Most bowel movements are preceded by lower abdominal cramps (tenesmus), urgency to defecate and often fecal incontinence is perceived which may be followed by a feeling of incomplete defecation. Approximately half of all patients suffering with IBS complain of a mucosal discharge occurring along with their stools. [3] Bleeding is not a feature of IBS unless haemorrhoids are present, and malabsorption or weight loss does not occur. [5]

#### **Constipation:**

Stools are usually hard with narrowed calibre, possibly reflecting excessive dehydration caused by prolonged colonic retention and spasm. [5] Patients may experience a sense of incomplete evacuation occurring even when the rectum is completely empty. This can lead to long periods of time spent in the bathroom. [3]

### **Gas and Flatulence:**

Patients with IBS frequently complaints of abdominal distension and increased belching or flatulence, all of which they attribute to increased gas. [5]

**Upper GI Symptoms:** Between 25 and 50% of patients with IBS complaints of dyspepsia, heartburn, nausea, and vomiting. Prolonged ambulant recordings of small-bowel motility in patients with IBS show a high incidence of abnormalities in the small bowel during the diurnal (waking) period.

### **Extra-Intestinal Symptoms:**

These include impaired sexual function, dysmenorrhea, dyspareunia and an increase in the frequency and urgency to urinate. Patients are more likely to suffer from hypertension, asthma or fibromyalgia.

## **DIAGNOSIS**

Diagnosis is clinical in nature and investigations are performed to rule out other pathological conditions. Its diagnosis can be made confidently in most patients using Rome criteria combined with absence of alarm symptoms without complicated test. Full blood count and sigmoidoscopy should be undertaken in older patients (over 40 years). Endoscopic examination is required in patients with bleeding per

rectum. Diagnostic procedures are performed to rule out coeliac disease, microscopic colitis, lactose intolerance, bile acid malabsorption etc.

Different diagnostic criteria have been evolved starting from Manning’s criteria to Kruis criteria to Rome IV criteria. Rome criteria is most accepted method for diagnosis of IBS. In 1980, The Rome I criteria was proposed by a working team as a new diagnostic guideline and upon use was found to be more valuable than previously established criteria followed by Rome II in 1999, then Rome III in 2006 and the recent one Rome IV in 2016.

	Manning	Rome I	Rome II	Rome III	Rome IV
Diagnostic Timeframe	Symptoms given below with no duration of symptoms with no number of symptoms described but a threshold of three positive is the most commonly used.	Abdominal pain or discomfort relieved with defecation, or associated with a change in stool frequency or consistency, with two or more of the following on at least 25% of occasions or days for 3 months	Abdominal discomfort or pain that has two of three features for 12 wk (need not be consecutive) in the last one year.	Abdominal pain or discomfort three days per month in the last 3 mo associated with two or more symptoms.	Abdominal pain on average at least 1 day per week during the previous 3 months that is associated with two or more of the following symptoms.
Chief Symptom	Abdominal pain relieved by defecation	Abdominal pain or discomfort	Abdominal pain or discomfort	Abdominal pain or discomfort	Abdominal pain
Associated Symptoms	<ul style="list-style-type: none"> <li>• More frequent stools with onset of pain</li> <li>• Looser stools with onset of pain</li> <li>• Mucus per rectum</li> <li>• Feeling of incomplete emptying</li> <li>• Patient-reported visible abdominal distension</li> </ul>	<ul style="list-style-type: none"> <li>• Altered stool frequency</li> <li>• Altered stool form</li> <li>• Altered stool passage</li> <li>• Passage of mucus</li> <li>• Bloating or distension</li> </ul>	<ul style="list-style-type: none"> <li>• Relieved with defecation</li> <li>• Onset associated with a change in frequency of stool</li> <li>• Onset associated with a change in form of stool</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement with defecation.</li> <li>• Onset associated with change in the form of stool.</li> <li>• Onset associated with a change in the frequency of stool.</li> </ul>	<ul style="list-style-type: none"> <li>• Related to defecation.</li> <li>• Associated with a change in the form of stool.</li> <li>• Associated with a change in the frequency of stool.</li> </ul>

**Table-1 Different Criteria Developed for Diagnosis of IBS** <sup>[2]</sup> <sup>[4]</sup>

## **Additional Diagnostic Features and Alarming Features in IBS** <sup>[1]</sup> - Features supporting diagnosis of IBD

- Symptoms > six months.
- Frequent consultation unexplained symptoms.
- Stress worsens symptoms.

### **Alarming Features-**

- Age > 50 years male, gender.
- Weight loss
- Nocturnal symptoms
- Rectal bleeding
- Anaemia

## **MANAGEMENT**

Most important steps are to make a diagnosis and reassure the diagnosed patients. Many patients are concerned about their disease that causes a cycle of anxiety leading to colonic symptoms which further heighten anxiety.

### **GENERAL MANAGEMENT**

The goal of treatment interventions is to provide IBS patients with symptomatic relief; often this is attempted through the use of non-pharmacological interventions such as mind-body therapies, diet modification, exercise, and other complementary and alternative approaches. cognitive behavioural therapy, multi-component psychological therapy, dynamic psychotherapy, and hypnotherapy have been found beneficial. <sup>[4]</sup> Relaxation training may be beneficial for symptom improvement and appears to be at least as effective as standard pharmacological treatment. Acupuncture can cause physiological changes that affect various endogenous neurotransmitter systems and can help in IBS. <sup>[2]</sup>

Changes in dietary habits can be recommended. A reduction in inflammation in GI tract can be achieved by avoiding the consumption of inflammatory stimulants such as allergens or chemicals, namely benzoates, alcohol, methylxanthines and caffeine consumption that cause the release of inflammatory mediators. Patients should be educated on how best to consume their three daily meals, by partaking of non-processed and fresh foods that consist of whole grains, fibers and vitamins two or three times a day. People having both IBS and lactase deficiency should avoid dairy products. People with bloating and increased gas (flatulence) should try to avoid foods such as beans, onions, celery, carrots, raisins, bananas, apricots and plums. It is recommended that foods containing vinegar, mustard, ketchup and pickled foodstuffs not be consumed either They should avoid foods that trigger an onset of their symptoms, consume a minimum of high fat foods and take part in regular physical activity. <sup>[3]</sup>

### **ROLE OF HOMOEOPATHY IN IRRITABLE BOWEL SYNDROME**

A homoeopathic physician considers the man as a whole. He considers the life as a trinity of body, mind and soul. Homeopathy is a system of therapeutics based on law of similars. “Like cures like” ‘Similia Similibus Curentur’. It is an universal law, where patient is prescribed a similitum on the basis of ‘Totality of Symptoms’. The disease is a reaction of the patient to unfavorable environment factors and that this reaction manifests through signs and symptoms the patterns of this reaction and the essence of these sign and symptoms gives totality of symptoms. [Anxiety] This totality of symptoms guides in selection of remedy for individual patient.

Some commonly indicated homoeopathic medicines in IBS are:

1. **Nux vomica** - Nausea in morning, after eating. Weight and pain in stomach with flatulence and pyrosis. Epigastrium is bloated with difficult belching of gas. Feeling of bruised soreness in abdomen wall. Spasmodic colic with desire for stool. Constipation with frequent ineffective

- urging.<sup>[9]</sup> Alternate constipation and Diarrhoea, scanty stool with mucus.<sup>[10]</sup> Frequent but ineffectual and anxious effort to evacuate (in infants) or sensation as if anus were contracted or closed. A constipated feeling, whatever the state of the bowels.<sup>[11]</sup>
2. **Podophyllum** - Distended abdomen and emptiness, with sensation of weakness and sinking Gurgling in abdomen. Feels better by rubbing abdomen, heartburn, gagging or empty retching.<sup>[9]</sup> Abdomen swelled almost to bursting. Bloating feeling with soreness, uneasiness which aggravates after stool. Rumbling in abdomen with colic. Awakened by violent pains in stomach and bowels.<sup>[11]</sup>
  3. **Sulphur**- Sensation of burning in stomach. Weak, empty or faint feeling in stomach about 11.am. Diarrhoea after midnight which is painless. Driving out of bed early in morning, as if bowel are too weak to retain their contents. Constipation with hard, dry painful, large stool.<sup>[10]</sup> Constipation with hard, knotty stool with insufficient evacuations. Frequent and often ineffectual want to evacuate, chiefly at night, and sometimes with pressure on rectum and bladder and pain in anus. Urgent want to evacuate. Looseness of bowels; redness about anus; obstructed evacuation, particularly if hard stools are retained.<sup>[11]</sup>
  4. **Lycopodium**- Great weakness of digestion, bulimia with mucus bloating with rolling of flatulence. Wakes at night feels hungry, incomplete burning eructation. Eating ever so little created fullness.<sup>[9]</sup> Excessive accumulation of flatulence, few mouthfuls upto throat and he feel bloated with gurgling and cracking.<sup>[10]</sup> Constipation of long standing with hard stools with ineffectual desire to evacuate. Desire for stool followed by painful constriction of rectum or anus. Small stool, with the sensation as if much remained behind, followed by excessive and painful accumulations of flatulence. Haemorrhage from rectum, even after a soft stool. Feeling of fullness in rectum continues after a copious stool.<sup>[11]</sup>
  5. **Naturm carbonicum** – Waterbrash, very weak digestion caused by slightest error of diet, feels swollen and sensitive averse to milk.<sup>[9]</sup> Urgent want to evacuate, without result, or followed by a scanty and insufficient evacuation. Hard and difficult evacuation. Soft or liquid faeces, with strong and very urgent want to go to stool, and tenesmus ani. Loose, yellow evacuations. Diarrhoea which is marked by a sudden and obligatory call to stool, which escapes with great haste, noise, and rushing, often producing considerable commotion in abdomen.<sup>[11]</sup>
  6. **Argentum nitricum** – Digestive upsets accompanied by nervousness and anxiety, Bloating, rumbling flatulence, nausea, and greenish Diarrhoea can be sudden and intense, Diarrhoea may come on immediately after drinking water, Eating too much sweet or salty food, expressive, impulsive, and claustrophobic, and may have blood sugar problems.<sup>[9]</sup> Green, slimy, shreddy stools, with severe bearing-down in hypogastrium. Membranous stool like unsegmented tapeworm, blood, slime, and epithelium with much flatus, after eating sugar, after drinking "as soon as the least drink is taken it goes through".<sup>[11]</sup>
  7. **Asafoetida**- Flatulence and regurgitation, hysterical flatulence, great distension, sensation of weakness and emptiness, forcible eructation of gas. Cutting and burning in stomach, gurgling and rolling of wind, violent gastralgia, pulsations in pit of stomach.<sup>[9]</sup> Pain in perineum, as from something dull pressing out. Stool profuse, watery, or thick, brown, and exceedingly offensive. Diarrhoea, very offensive, with pain in the abdomen and discharge of fetid flatus. Stool stinking; slow; difficult; hard.<sup>[11]</sup>
  8. **Colocynthis**- Agonizing cutting pain in abdomen causing patients to end over double and pressing on abdomen, intestine feels as if burst, colic with cramps in calves, pain in small spot below navel.<sup>[9]</sup> Warm feeling followed by copious discharge of flatus. Colic with inflation in

umbilical region; colic below umbilicus. Irresistible inclination to stool; scanty brownish-red evacuation with painful tenesmus lasting ten minutes. <sup>[11]</sup>

9. **Pulsatilla-** Painful, distended; loud rumbling. Pressure as from a stone. Colic, with chilliness in evening. Rumbling in abdomen with watery; worse, night. No two stools alike. Two or three normal stools daily. <sup>[9]</sup> Thirstlessness with nearly all complaints; gastric difficulties from eating rich food, cake, pastry, especially after pork or sausage; the sight or even the thought of pork causes disgust. <sup>[10]</sup>
10. **Silicea-** Pain or painful cold feeling in abdomen, better external heat. Hard, bloated. Colic; cutting pain, with constipation; yellow hands and blue nails. Much rumbling in bowels. Great straining; rectum stings; closes upon stool. Faeces remain a long time in rectum. Constipation always before and during menses; with irritable sphincter ani. Diarrhoea of cadaverous odour. <sup>[9]</sup>

## CONCLUSION

IBS is a functional disorder that has affected a large population and has caused a burden on patient as well as state. It causes recurrent abdominal pain and discomfort with altered bowel habit. It not only affects patient physically but also affects Quality of Life. Homoeopathy is a system which not only treats the disease but treats the patient as a whole and also helps in improvement of Quality of Life.

## REFERENCES

1. Penman ID, Lees CW. Davidson's Principles & Practice of Medicine. 22nd Ed. China: Churchill Livingstone Elsevier; 2014: 907-908.
2. Saha L. Irritable bowel syndrome: pathogenesis, diagnosis, treatment, and evidence-based medicine. World J Gastroenterol. 2014;20(22):6759-6773. doi:10.3748/wjg.v20.i22.6759
3. Vahedi H, Ansari R, Mir-Nasseri M, Jafari E. Irritable bowel syndrome: a review article. Middle East J Dig Dis. 2010;2(2):66-77
4. Weaver KR, Melkus GD, Henderson WA. Irritable Bowel Syndrome. Am J Nurs. 2017;117(6):48-55. doi:10.1097/01.NAJ.0000520253.57459.01
5. Owyang C. Harrison's Principles of Internal Medicine. 19th Ed. New York: McGraw Hill Education; 2015: 1965-1970.
6. Endo Y, Shoji T, Fukudo S. Epidemiology of irritable bowel syndrome. Ann Gastroenterol. 2015;28(2):158-159
7. <https://emedicine.medscape.com/article/180389-overview#a5>
8. Nagaonkar SN, Singh VS, Kangule DT, Sadhanala S. A study of prevalence and determinants of irritable bowel syndrome in an urban slum community in Mumbai. J Datta Meghe Inst Med Sci Univ [serial online] 2018 [cited 2020 Dec 8];13:87-90. Available from: <http://www.journaldmims.com/text.asp?2018/13/2/87/246010>
9. Boericke W. Boericke's New Manual of Homeopathic Materia Medica with Repertory. 9th Ed. New Delhi: B Jain Publishers(P) Ltd.; 2007.
10. Allen HC. Allen's Keynote With Leading Remedies of the Materia Medica & Bowel Nosodes. 9th Ed. New Delhi: B Jain Publishers(P) Ltd.; 1999.
11. Clarke JH. A Dictionary of Practical Materia Medica Student Edition. New Delhi: B Jain Publishers(P) Ltd.

## **ROLE OF HOMOEOPATHY IN IRRITABLE BOWEL SYNDROME**

### **Dr. Gaurav Gupta**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **Dr. Hemant Vyas**

Asso. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **Dr. Arti Bansal**

Asso. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **Dr. Ravi Jain**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **Dr. Astha Sikarwar**

Asst. Prof. Faculty of Homoeopathic Science, JVWU, Jaipur

### **ABSTRACT**

Irritable Bowel Syndrome (IBS) is characterized by recurrent abdominal pain and discomfort with altered bowel habits. It affects approx. 20% population across the world, among which only around 10% takes medical consultation for it. Its pathology is not clear but many factors seem to play role in this pathology. Its diagnosis is based on clinical findings and ROME criteria is widely used for the diagnosis. IBS has multiple complications and affects quality of life. Its treatment includes change in dietary habits, psychological counselling, exercise etc. Homoeopathy is widely accepted mode of treatment based on totality of symptoms and individualization and is able to cure IBS.

**KEYWORDS-** Irritable Bowel Syndrome, Diarrhoea, Constipation, GIT Disorder, Homoeopathy.

### **INTRODUCTION**

Irritable bowel syndrome (IBS) is characterised by recurrent abdominal pain in association with abnormal defecation in the absence of a structural abnormality of the gut. <sup>[1]</sup> Irritable bowel syndrome (IBS) is a chronic and debilitating functional gastrointestinal disorder that affects 9%-23% of the population across the world. <sup>[2]</sup> About 10–15% of the population are affected at some time but only 10% of these consult their doctors because of symptoms. <sup>[1]</sup> Among this population most studies show a female predominance. The main cause of disease is not entirely apparent as various factors play key roles in its aetiology. <sup>[3]</sup> Although gains have been made in understanding the patho-physiology of IBS, exact mechanisms leading to symptom development are not completely understood. <sup>[4]</sup> No clear diagnostic markers exist for IBS; thus the diagnosis of the disorder is based on clinical presentation. <sup>[5]</sup> Its diagnosis is made according to a symptom-based classification system, the Rome Criteria, with the latest version, Rome IV. <sup>[4]</sup> IBS is not a fatal disease but it does greatly reduce quality of life. <sup>[6]</sup> Across the IBS subtypes, the presentation of symptoms may vary among patients and change over time. Patients report the most distressing symptoms to be abdominal pain, straining, myalgia, urgency, bloating and feelings of serious illness. The complexity and diversity of IBS presentation makes treatment difficult. <sup>[2]</sup> IBS has high comorbidity rates, reduces the quality of life, and causes negative impact on the monetary resources of both patients and society. In modern medicine despite the substantial cost of IBS to both patients and society, curative, medical interventions have yet to be discovered. The development and

persistence of IBS symptoms have been acknowledged as multi-factorial in nature, making treatment of the disorder a complicated, clinical endeavour. Approaches are based on the reduction of patient symptomatology, and current pharmacological management often provides suboptimal relief<sup>[4]</sup> IBS has high comorbidity rates, reduces the quality of life, and causes negative impact on the monetary resources of both patients and society.

Homoeopathy is a therapeutic system of medicine based on the principle, “*Similia Similibus Curentur*” or ‘likes cured by likes’. It is a method of treatment for treating the patient by medicines that possess the power of producing similar symptoms in a healthy human being simulating the natural disease, which it can cure in the diseased person. In homoeopathy, individualization is done and for this purpose physical symptoms as well as psyche symptoms. Homoeopathy is a system which does not treat the disease but treats the patient and has been proved effective in treatment of IBS and is able to not just relieve but to cure the patient.

## **EPIDEMIOLOGY**

Population-based studies estimate the prevalence of irritable bowel syndrome (IBS) at 10%-20% and the incidence of irritable bowel syndrome at 1%-2% per year.<sup>[7]</sup> A meta-analysis shows a pooled estimate of international IBS prevalence of 11.2% with variation by geographic region; the lowest occurring in South Asia and the highest in South America. The prevalence is known to be higher in Western countries as compared to Asian countries. The prevalence of IBS within the community is between 10% and 25%. the ratio of females to males in India reversed, i.e. 1:3 to that of the Western countries. The disorder is usually found in the age group of 15–50 years and may also occur in children and elderly.<sup>[8]</sup>

In a study, prevalence of IBS in India was seen in 12.27% of the study population with male-to-female ratio of 1.44:1. The prevalence rates of IBS was maximum in 45–50 years age group. The prevalence rates of IBS was in lower economic class (Kuppuswamy's scale). There was no significant association of IBS with socioeconomic status, educational status, marital status, or religion.<sup>[8]</sup>

IBS is classified into four subtypes according to predominant stool consistency:<sup>[6]</sup>

1. IBS with constipation (IBS-C);
2. IBS with Diarrhoea (IBS-D);
3. Mixed IBS (IBS-M); and
4. Unsubtyped IBS (IBS-U).

## **AETIOLOGY**

- Genetic factors
- Infection and trauma
- Colonic motility
- Increased sensitivity to food

## **RISK FACTORS OF IBS**

- Physical and psychological stress
- Smoking
- Frequent alcohol consumption

## **PATHOPHYSIOLOGY**

IBS is recognized as a multi-factorial disorder, with the following among the proposed mechanisms contributing to symptomatology: gastrointestinal dysmotility, inflammation, visceral hypersensitivity,

and altered intestinal microbiota. [4] IBS has been conceptualized as a condition of visceral hypersensitivity (leading to abdominal discomfort or pain) and gastrointestinal motor disturbances (leading to Diarrhoea or constipation). Some have suggested that these abnormalities are secondary to psychological disturbances rather than being of primary relevance. [3]

**1. Gastrointestinal Motor Abnormalities-** Studies of colonic myoelectrical and motor activity under unstimulated conditions have not shown consistent abnormalities in IBS. In contrast, colonic motor abnormalities are more prominent under stimulated conditions in IBS. IBS patients may exhibit increased recto-sigmoid motor activity for up to 3 h after eating. [5]

**2. Central Neural Dysregulation And Brain-Gut Interaction-** Psychosocial factors appear to be important in IBS, although whether these factors directly alter gastrointestinal function remains uncertain. It is also possible that gastrointestinal dysfunction modulates central processes too. [2]

**3. Visceral Hypersensitivity:** IBS patients frequently exhibit exaggerated sensory responses to visceral stimulation. The frequency of perceptions of food intolerance is at least twofold more common than in the general population. [5]

**4. Abnormal Psychological Features-** The amygdala located in the CNS is known as an important structure active in the response to anxiety. This center activates the hypothalamic-pituitary-adrenal (HPA) axis and the autonomic system when patients find themselves in anxious situations. Chronic anxiety increases the activity of the amygdala leading to the formation of an HPA axis which will ultimately cause induced visceral hyperalgesia. [3] Most of the patients demonstrates exaggerated symptoms in response to visceral distension, and this abnormality persists even after exclusion of psychological factors. Psychological factors influence pain thresholds in IBS patients, as stress alters sensory thresholds. An association between prior sexual or physical abuse and development of IBS has been reported. [5]

**5. Post-Infectious IBS-** IBS may be induced by GI infection. Approximately 1 in ten patients with IBS believe their IBS began with an infectious illness. [2] Between 3 and 35% of patients assessed progress on to develop IBS symptoms three to twelve months after suffering from GI infections. [3]

**6. Immune Activation and Mucosal Inflammation-** Some patients with IBS display persistent signs of low-grade mucosal inflammation with activated lymphocytes, mast cells, and enhanced expression of pro-inflammatory cytokines. These abnormalities may contribute to abnormal epithelial secretion and visceral hypersensitivity. [5] Exposure to intestinal infection induces persistent low-grade systemic and mucosal inflammation, which is characterized by an altered population of circulating cells, mucosal infiltration of immune cells and increased production of various cytokines in IBS patients. [2]

Bio psychosocial factors are thought to play an important role along with luminal factors such as diet and micro biota. [5]

**7. Altered Gut Flora-** A high prevalence of small intestinal bacterial overgrowth in IBS patients has been noted based on positive lactulose hydrogen breath test. [5] Changes in the quantity and quality of bacteria present can convey selective effects on sensory-motor dysfunctions which can be influenced through bile acid malabsorption, mucosal irritation and inflammation, increased food fermentation and gas production. Increased faecal numbers of *Lactobacilli*, *coliform* and *Bifidobacteria* have been reported in patients affected by IBS. [3]

## CLINICAL MANIFESTATIONS

Both GI and extra-intestinal complaints are included with the primary symptoms of chronic abdominal pain and altered bowel habits.



### **Chronic Abdominal Pain:**

According to the current IBS diagnostic criteria, abdominal pain or discomfort is a prerequisite clinical feature of IBS. [5] Abdominal pain is usually described as a sensation of cramps of varying intensity along with periodic exacerbations. The pain is usually located in the lower abdomen, often felt in the lower left quadrant. [3]

### **Altered Bowel Habits:**

Patients suffering with IBS often complain of altered bowel habits; this can be observed in the volume, frequency and consistency of the patient's stools. [3] Alteration in bowel habits is the most consistent clinical feature in IBS. The most common pattern is constipation alternating with Diarrhoea, usually with one of these symptoms predominating. At first, constipation may be episodic, but eventually it becomes continuous and increasingly intractable to treatment with laxatives. [5]

#### **Diarrhoea:**

Diarrhoea is usually characterized as frequent loose stools of small to moderate volume. Stools generally occur during the hours in which patients are awake; frequently in the morning or after mealtimes. Most bowel movements are preceded by lower abdominal cramps (tenesmus), urgency to defecate and often fecal incontinence is perceived which may be followed by a feeling of incomplete defecation. Approximately half of all patients suffering with IBS complain of a mucosal discharge occurring along with their stools. [3] Bleeding is not a feature of IBS unless haemorrhoids are present, and malabsorption or weight loss does not occur. [5]

#### **Constipation:**

Stools are usually hard with narrowed calibre, possibly reflecting excessive dehydration caused by prolonged colonic retention and spasm. [5] Patients may experience a sense of incomplete evacuation occurring even when the rectum is completely empty. This can lead to long periods of time spent in the bathroom. [3]

### **Gas and Flatulence:**

Patients with IBS frequently complaints of abdominal distension and increased belching or flatulence, all of which they attribute to increased gas. [5]

**Upper GI Symptoms:** Between 25 and 50% of patients with IBS complaints of dyspepsia, heartburn, nausea, and vomiting. Prolonged ambulant recordings of small-bowel motility in patients with IBS show a high incidence of abnormalities in the small bowel during the diurnal (waking) period.

### **Extra-Intestinal Symptoms:**

These include impaired sexual function, dysmenorrhea, dyspareunia and an increase in the frequency and urgency to urinate. Patients are more likely to suffer from hypertension, asthma or fibromyalgia.

## **DIAGNOSIS**

Diagnosis is clinical in nature and investigations are performed to rule out other pathological conditions. Its diagnosis can be made confidently in most patients using Rome criteria combined with absence of alarm symptoms without complicated test. Full blood count and sigmoidoscopy should be undertaken in older patients (over 40 years). Endoscopic examination is required in patients with bleeding per

rectum. Diagnostic procedures are performed to rule out coeliac disease, microscopic colitis, lactose intolerance, bile acid malabsorption etc.

Different diagnostic criteria have been evolved starting from Manning’s criteria to Kruis criteria to Rome IV criteria. Rome criteria is most accepted method for diagnosis of IBS. In 1980, The Rome I criteria was proposed by a working team as a new diagnostic guideline and upon use was found to be more valuable than previously established criteria followed by Rome II in 1999, then Rome III in 2006 and the recent one Rome IV in 2016.

	Manning	Rome I	Rome II	Rome III	Rome IV
Diagnostic Timeframe	Symptoms given below with no duration of symptoms with no number of symptoms described but a threshold of three positive is the most commonly used.	Abdominal pain or discomfort relieved with defecation, or associated with a change in stool frequency or consistency, with two or more of the following on at least 25% of occasions or days for 3 months	Abdominal discomfort or pain that has two of three features for 12 wk (need not be consecutive) in the last one year.	Abdominal pain or discomfort three days per month in the last 3 mo associated with two or more symptoms.	Abdominal pain on average at least 1 day per week during the previous 3 months that is associated with two or more of the following symptoms.
Chief Symptom	Abdominal pain relieved by defecation	Abdominal pain or discomfort	Abdominal pain or discomfort	Abdominal pain or discomfort	Abdominal pain
Associated Symptoms	<ul style="list-style-type: none"> <li>• More frequent stools with onset of pain</li> <li>• Looser stools with onset of pain</li> <li>• Mucus per rectum</li> <li>• Feeling of incomplete emptying</li> <li>• Patient-reported visible abdominal distension</li> </ul>	<ul style="list-style-type: none"> <li>• Altered stool frequency</li> <li>• Altered stool form</li> <li>• Altered stool passage</li> <li>• Passage of mucus</li> <li>• Bloating or distension</li> </ul>	<ul style="list-style-type: none"> <li>• Relieved with defecation</li> <li>• Onset associated with a change in frequency of stool</li> <li>• Onset associated with a change in form of stool</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement with defecation.</li> <li>• Onset associated with change in the form of stool.</li> <li>• Onset associated with a change in the frequency of stool.</li> </ul>	<ul style="list-style-type: none"> <li>• Related to defecation.</li> <li>• Associated with a change in the form of stool.</li> <li>• Associated with a change in the frequency of stool.</li> </ul>

**Table-1 Different Criteria Developed for Diagnosis of IBS** <sup>[2]</sup> <sup>[4]</sup>

## **Additional Diagnostic Features and Alarming Features in IBS** <sup>[1]</sup> - Features supporting diagnosis of IBD

- Symptoms > six months.
- Frequent consultation unexplained symptoms.
- Stress worsens symptoms.

### **Alarming Features-**

- Age > 50 years male, gender.
- Weight loss
- Nocturnal symptoms
- Rectal bleeding
- Anaemia

## **MANAGEMENT**

Most important steps are to make a diagnosis and reassure the diagnosed patients. Many patients are concerned about their disease that causes a cycle of anxiety leading to colonic symptoms which further heighten anxiety.

### **GENERAL MANAGEMENT**

The goal of treatment interventions is to provide IBS patients with symptomatic relief; often this is attempted through the use of non-pharmacological interventions such as mind-body therapies, diet modification, exercise, and other complementary and alternative approaches. cognitive behavioural therapy, multi-component psychological therapy, dynamic psychotherapy, and hypnotherapy have been found beneficial. <sup>[4]</sup> Relaxation training may be beneficial for symptom improvement and appears to be at least as effective as standard pharmacological treatment. Acupuncture can cause physiological changes that affect various endogenous neurotransmitter systems and can help in IBS. <sup>[2]</sup>

Changes in dietary habits can be recommended. A reduction in inflammation in GI tract can be achieved by avoiding the consumption of inflammatory stimulants such as allergens or chemicals, namely benzoates, alcohol, methylxanthines and caffeine consumption that cause the release of inflammatory mediators. Patients should be educated on how best to consume their three daily meals, by partaking of non-processed and fresh foods that consist of whole grains, fibers and vitamins two or three times a day. People having both IBS and lactase deficiency should avoid dairy products. People with bloating and increased gas (flatulence) should try to avoid foods such as beans, onions, celery, carrots, raisins, bananas, apricots and plums. It is recommended that foods containing vinegar, mustard, ketchup and pickled foodstuffs not be consumed either They should avoid foods that trigger an onset of their symptoms, consume a minimum of high fat foods and take part in regular physical activity. <sup>[3]</sup>

### **ROLE OF HOMOEOPATHY IN IRRITABLE BOWEL SYNDROME**

A homoeopathic physician considers the man as a whole. He considers the life as a trinity of body, mind and soul. Homeopathy is a system of therapeutics based on law of similars. “Like cures like” ‘Similia Similibus Curentur’. It is an universal law, where patient is prescribed a similimum on the basis of ‘Totality of Symptoms’. The disease is a reaction of the patient to unfavorable environment factors and that this reaction manifests through signs and symptoms the patterns of this reaction and the essence of these sign and symptoms gives totality of symptoms. [Anxiety] This totality of symptoms guides in selection of remedy for individual patient.

Some commonly indicated homoeopathic medicines in IBS are:

1. **Nux vomica** - Nausea in morning, after eating. Weight and pain in stomach with flatulence and pyrosis. Epigastrium is bloated with difficult belching of gas. Feeling of bruised soreness in abdomen wall. Spasmodic colic with desire for stool. Constipation with frequent ineffective

- urging.<sup>[9]</sup> Alternate constipation and Diarrhoea, scanty stool with mucus.<sup>[10]</sup> Frequent but ineffectual and anxious effort to evacuate (in infants) or sensation as if anus were contracted or closed. A constipated feeling, whatever the state of the bowels.<sup>[11]</sup>
2. **Podophyllum** - Distended abdomen and emptiness, with sensation of weakness and sinking Gurgling in abdomen. Feels better by rubbing abdomen, heartburn, gagging or empty retching.<sup>[9]</sup> Abdomen swelled almost to bursting. Bloating feeling with soreness, uneasiness which aggravates after stool. Rumbling in abdomen with colic. Awakened by violent pains in stomach and bowels.<sup>[11]</sup>
  3. **Sulphur**- Sensation of burning in stomach. Weak, empty or faint feeling in stomach about 11.am. Diarrhoea after midnight which is painless. Driving out of bed early in morning, as if bowel are too weak to retain their contents. Constipation with hard ,dry painful , large stool.<sup>[10]</sup> Constipation with hard, knotty stool with insufficient evacuations. Frequent and often ineffectual want to evacuate, chiefly at night, and sometimes with pressure on rectum and bladder and pain in anus. Urgent want to evacuate. Looseness of bowels; redness about anus; obstructed evacuation, particularly if hard stools are retained.<sup>[11]</sup>
  4. **Lycopodium**- Great weakness of digestion, bulimia with mucus bloating with rolling of flatulence. Wakes at night feels hungry, incomplete burning eructation. Eating ever so little created fullness.<sup>[9]</sup> Excessive accumulation of flatulence, few mouthfuls upto throat and he feel bloated with gurgling and cracking.<sup>[10]</sup> Constipation of long standing with hard stools with ineffectual desire to evacuate. Desire for stool followed by painful constriction of rectum or anus. Small stool, with the sensation as if much remained behind, followed by excessive and painful accumulations of flatulence. Haemorrhage from rectum, even after a soft stool. Feeling of fullness in rectum continues after a copious stool.<sup>[11]</sup>
  5. **Naturm carbonicum** – Waterbrash, very weak digestion caused by slightest error of diet, feels swollen and sensitive averse to milk.<sup>[9]</sup> Urgent want to evacuate, without result, or followed by a scanty and insufficient evacuation. Hard and difficult evacuation. Soft or liquid faeces, with strong and very urgent want to go to stool, and tenesmus ani. Loose, yellow evacuations. Diarrhoea which is marked by a sudden and obligatory call to stool, which escapes with great haste, noise, and rushing, often producing considerable commotion in abdomen.<sup>[11]</sup>
  6. **Argentum nitricum** – Digestive upsets accompanied by nervousness and anxiety, Bloating, rumbling flatulence, nausea, and greenish Diarrhoea can be sudden and intense, Diarrhoea may come on immediately after drinking water, Eating too much sweet or salty food, expressive, impulsive, and claustrophobic, and may have blood sugar problems.<sup>[9]</sup> Green, slimy, shreddy stools, with severe bearing-down in hypogastrium. Membranous stool like unsegmented tapeworm, blood, slime, and epithelium with much flatus, after eating sugar, after drinking "as soon as the least drink is taken it goes through".<sup>[11]</sup>
  7. **Asafoetida**- Flatulence and regurgitation, hysterical flatulence, great distension, sensation of weakness and emptiness, forcible eructation of gas. Cutting and burning in stomach, gurgling and rolling of wind, violent gastralgia, pulsations in pit of stomach.<sup>[9]</sup> Pain in perineum, as from something dull pressing out. Stool profuse, watery, or thick, brown, and exceedingly offensive. Diarrhoea, very offensive, with pain in the abdomen and discharge of fetid flatus. Stool stinking; slow; difficult; hard.<sup>[11]</sup>
  8. **Colocynthis**- Agonizing cutting pain in abdomen causing patients to end over double and pressing on abdomen, intestine feels as if burst, colic with cramps in calves , pain in small spot below navel.<sup>[9]</sup> Warm feeling followed by copious discharge of flatus. Colic with inflation in

umbilical region; colic below umbilicus. Irresistible inclination to stool; scanty brownish-red evacuation with painful tenesmus lasting ten minutes. <sup>[11]</sup>

9. **Pulsatilla-** Painful, distended; loud rumbling. Pressure as from a stone. Colic, with chilliness in evening. Rumbling in abdomen with watery; worse, night. No two stools alike. Two or three normal stools daily. <sup>[9]</sup> Thirstlessness with nearly all complaints; gastric difficulties from eating rich food, cake, pastry, especially after pork or sausage; the sight or even the thought of pork causes disgust. <sup>[10]</sup>
10. **Silicea-** Pain or painful cold feeling in abdomen, better external heat. Hard, bloated. Colic; cutting pain, with constipation; yellow hands and blue nails. Much rumbling in bowels. Great straining; rectum stings; closes upon stool. Faeces remain a long time in rectum. Constipation always before and during menses; with irritable sphincter ani. Diarrhoea of cadaverous odour. <sup>[9]</sup>

## CONCLUSION

IBS is a functional disorder that has affected a large population and has caused a burden on patient as well as state. It causes recurrent abdominal pain and discomfort with altered bowel habit. It not only affects patient physically but also affects Quality of Life. Homoeopathy is a system which not only treats the disease but treats the patient as a whole and also helps in improvement of Quality of Life.

## REFERENCES

1. Penman ID, Lees CW. Davidson's Principles & Practice of Medicine. 22nd Ed. China: Churchill Livingstone Elsevier; 2014: 907-908.
2. Saha L. Irritable bowel syndrome: pathogenesis, diagnosis, treatment, and evidence-based medicine. World J Gastroenterol. 2014;20(22):6759-6773. doi:10.3748/wjg.v20.i22.6759
3. Vahedi H, Ansari R, Mir-Nasseri M, Jafari E. Irritable bowel syndrome: a review article. Middle East J Dig Dis. 2010;2(2):66-77
4. Weaver KR, Melkus GD, Henderson WA. Irritable Bowel Syndrome. Am J Nurs. 2017;117(6):48-55. doi:10.1097/01.NAJ.0000520253.57459.01
5. Owyang C. Harrison's Principles of Internal Medicine. 19th Ed. New York: McGraw Hill Education; 2015: 1965-1970.
6. Endo Y, Shoji T, Fukudo S. Epidemiology of irritable bowel syndrome. Ann Gastroenterol. 2015;28(2):158-159
7. <https://emedicine.medscape.com/article/180389-overview#a5>
8. Nagaonkar SN, Singh VS, Kangule DT, Sadhanala S. A study of prevalence and determinants of irritable bowel syndrome in an urban slum community in Mumbai. J Datta Meghe Inst Med Sci Univ [serial online] 2018 [cited 2020 Dec 8];13:87-90. Available from: <http://www.journaldmims.com/text.asp?2018/13/2/87/246010>
9. Boericke W. Boericke's New Manual of Homeopathic Materia Medica with Repertory. 9th Ed. New Delhi: B Jain Publishers(P) Ltd.; 2007.
10. Allen HC. Allen's Keynote With Leading Remedies of the Materia Medica & Bowel Nosodes. 9th Ed. New Delhi: B Jain Publishers(P) Ltd.; 1999.
11. Clarke JH. A Dictionary of Practical Materia Medica Student Edition. New Delhi: B Jain Publishers(P) Ltd.

**EVALUATION OF ANTIOXIDANTS (CAT AND SOD) ROLE IN *CYAMOPSIS TETRAGONOLOBA* (L.) AND *VIGNA RADIATA* (L.) UNDER FLUORIDE INDUCED OXIDATIVE STRESS**

**Dr. Khusboo Verma**

Assistant Professor, Jayoti Vidyapeeth Women's University, Jaipur

**Abstract**

Fluoride affects plants in negative mode by escalating the ROS (Reactive oxygen species) level and reducing the plant growth. In this study Guar (*Cyamopsis Tetragonoloba* Taub.L.) and Moong (*Vigna radiata* L.) was exposed to fluoride (NaF) treatment in a half-strength Hoagland solution. In this study, a concentration- dependent analysis (*Cyamopsis Tetragonoloba* L. 0, 10, 20, 30, 40, 50, and 60 mM NaF) and (*Vigna radiata* L. 0, 2.5, 5, 7.5, 10, 12.5, and 15 mM NaF). Biochemical expression CAT and SOD activity was highly elevated in Guar (*Cyamopsis Tetragonoloba* L. Taub.) at 30 mM NaF and in Moong (*Vigna radiata* L.) at 7.5 mM NaF. The current study reveals, as a consequence of the high stress produced by fluoride, SOD and CAT gene showed significant changes in both Plant Root's treated samples. However the only up-regulation changes observed in treated root sample is more evident for CAT at 30 mM NaF for Guar (*Cyamopsis Tetragonoloba* L. Taub.) and for 7.5 mM NaF for Moong (*Vigna radiata* L.). However, molecular analysis of SOD showed the down regulation in both plants. In the fluoride concentration based analysis, the highest expression of CAT was observed in the roots compared to the control. This study would help to understand the role of antioxidants for endurance of plants under fluoride stress condition.

**Key words:** Antioxidant enzymes, Abiotic stress, (*Cyamopsis Tetragonoloba* L.), *Vigna radiata* (L.). Fluoride stress (NaF), Catalase (CAT) Glutathione reductase (GR)

**Introduction**

Fluoride is a common environmental pollutant and Fluoride rich soil is a potential source of its contamination in the groundwater, in the food chain and ultimately in the human body. Many regions of India are heavily affected by Fluoride pollution (Meenakshi and Maheshwari 2006).

Fluoride toxicity affects the most morphological, physiological and biochemical parameters in the plant due to germination and early seedling growth. Changes in enzyme activity and intermediate metabolism caused by chronic fluoride exposure may cause the organism to grow, develop and multiply (McCune and Weinstein, 1971). Fluoride occurs mainly in plants of two forms. First, the deposition of gaseous Fluoride in the air occurs through stomata diffusion. Through the stomata of the leaves, the iron flesh penetrates the cell walls and migrates to the edges and tips, which are the places with the highest evaporation (Kamaluddin and Zwiazek, 2003). Fluoride is transferred to the crotch via the apoplastic and symplastic pathways in unidirectional distal move men (Pant et al., 2008). Fluoride is toxic due to changes in metabolic chains (Miller, 1993). Fluoride is taken up from the soil through the roots and then transported via the xylem to the leaves, where it accumulates and visible effects become visible (Klump et al., 1996).

Typical symptoms that can be attributed to fluoride contamination are marginal necrosis (maximum burns), which is characterized by a red-brown line in both monocotyledons and dicotyledons (Ruthsatz and Wey, 1991). The phytotoxicity of fluoride impaired germination and decreased in different ways

Physiological parameters such as dry weight, fresh weight, root weight and rice plant length (Gupta et al., 2009). Different tolerance mechanisms have been proposed based on the biochemical and physiological changes associated with dryness. A lack of water can increase the formation of free oxygen radicals. These reactive oxygen species (ROS) include superoxide O<sub>2</sub><sup>-</sup>, hydroxyl radical (•OH), hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) and single oxygen (O<sub>2</sub>). To protect cell membranes and organelles from the harmful effects of ROS, plants are equipped with an antioxidant system. This system consists of antioxidants such as Superoxide Dismutase (SOD, EC 1.15.1.1) and Catalase (CAT, CE1.11.1.6). SOD is an enzyme that catalyzes the dismutation of O<sub>2</sub> to H<sub>2</sub>O<sub>2</sub>. CAT is responsible for the removal of H<sub>2</sub>O<sub>2</sub> by reducing H<sub>2</sub>O<sub>2</sub> to 2 H<sub>2</sub>O. Most but not all, of CATs are found in Peroxisome (Foyer et al., 1994).

This study's aim to investigate the expression pattern of SOD and CAT at biochemical and molecular level for *Cyamopsis Tetragonoloba* L. and *Vigna radiata* L. under fluoride stress.

### **Materials & Methods**

#### **Collection of plants**

Guar (*Cyamopsis tetragonoloba* L. Taub.) seeds Var. RGC-1038 was collected from the Agricultural Research Station (Swami Keshwanand Agricultural University of Rajasthan SKRAU Bikaner), Rajasthan, India. Moong (*Vigna. Radiata* L.) Var. RMG-492 was obtained from Agricultural Research Institute (Sri Karan Narendra Jobner University of Agriculture), Rajasthan.

#### **Seed Germination and plant growth**

Guar (*Cyamopsis tetragonoloba* L. Taub.) and Mung beans (*Vigna radiata* L.) seeds sterilization was performed with 0.5% sodium hypochlorite and Triton X 100. Sterilized seeds were germinated in a petridish (10 cm) containing autoclaved filter paper soaked in distilled water under dark conditions. Germinated seeds (10 in one pot) were transferred to Half Strength Hoagland Solution (Hoagland and Arnon, 1950) with a 16-hour photoperiod under thermostatically controlled culture room, maintained at 25 ± 2 ° C and 50% relative humidity.

**“EFFICACY OF HOMEOPATHY IN TREATMENT OF NUMMULAR ECZEMA – A CASE STUDY”**

**Dr M P Sharma**

Dean & Director, Department of Physiology & Biochemistry, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women’s University, Jaipur

**Dr. Anil Kumar Vangani**

Prof. & HOD – Dept. of Repertory, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women’s University, Jaipur

**Dr. Ravi Jain**

Asst. Prof. - Dept of Practice of Medicine, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women’s University, Jaipur

**Dr Pramila Kajla**

Assistant Professor, Department of Physiology & Biochemistry, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women’s University, Jaipur

**Dr Parvinder Singh**

Prof & HOD Dept of Homoeopathy Pharmacy, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women’s University, Jaipur

**ABSTRACT-** The case study of a subject having nummular eczema was done of which the aetio-pathogenesis was not fully known but apprehension and stress was quite prominent which made us repertorize the case from Kent based repertory i.e. Synthesis from RADAR 9.0, and King of Antipsorics i.e. Sulphur was selected as Similimum on reportorial analysis. Result was brilliant, it cured the case after initial aggravation. Result of this research can give indications for making policy for treatment of such irritating and financially depraving skin conditions by Govt. and Corporates, for efficacious management of it and securing quality of life of our employees and citizens by using medicine which is authenticated deeply regarding its principles- in Ancient Indian Literature.

**KEYWORDS:** Nummular eczema; IgE Antibodies, Psora, Repertorization, Similimum, Homoeopathic aggravation, Cure.

## **REVIEW OF LITERATURE**

### **Definition**

Eczema is an inflammatory condition of the skin characterized by itching or burning, redness, scaling and small ulcers. It can also be accompanied by watery discharge which later on leaves by thick crusts. Eczema is more the description of a symptom rather than a disease. Eczema is the result of so many internal and external factors acting singly or in combination with each other.

The term eczema means ‘to boil out’ (ec = out; zema = boil), because it seems that the skin is ‘boiling out’ or ‘oozing out’.

### **Etiology**



The exact cause of eczema is not known. People with eczema do have the IgE antibodies (Immunoglobulin E) produced by the immune system as part of allergic reactions.

**Common triggers of eczema include the following** - Allergies to, Pollen, Molds. Dust, Animal dander, Food and tobacco, Dry air - particularly winter air, with little moisture, Harsh soaps and detergents, Coarse fabrics, Skin care products that contain alcohol; Emotional stress and excessive heat and sweating. People with eczema do have IgE antibodies (immunoglobulin E) produced by the immune system as part of allergic reactions. Weather (hot, cold, humid or dry); Environmental allergens; Jewellery, creams, cosmetics, Rubbing, Bacterial infections etc.

### **Nummular Eczema**

Nummular eczema also known as discoid eczema is a long-term skin condition that cause skin to become itchy, swollen and cracked in circular or oval patches.

It can occur at any age but is seen more frequently in adults. It is slightly more common in adult men than women.

Signs and symptoms-

- Small spots or bumps on the skin
- Or lighter skin these patches will be pink or red
- Initially these patches are often swollen blister eel
- The patches oozing a lot of fluid.
- A yellow crust developing over the patches
- Feeling sick
- Feeling hot or shivery
- Feeling unwell

### **Ancient Indian literature:**

*Bhagvad Puran (3500 BC) which recognizes law of Similia as described in a dialogue between Narad and Maharishi Vyas which says, “The curative drug would be the one having the capacity to produce a similar disease....”;*

*Ayur-veda recognizes “Vishasya Visham Aushadham” which means - Poison is neutralized by poison; about 5000 years back; and*

*Shushrut Samhita in 600 BC recognizes as “Samah Samam Shamayti – means similar will be extinguished by use of similars.*

*Ancient Indian poet Kavi – Kalidasa in 1st Century BC said “Shrutyate hi pura loke, Vishasya Visham Aushadham” means Whole world knows since old times – Poison is the Medicine for Poison”.*

### **METHODOLOGY**

#### **Source of data and Inclusion Criteria**

This study was conducted on, the patients who attended the out patient department of the Medicine unit of JVVU's Suryansh Aarogyashala – in our Homoeopathic Medical College and Hospital.

The patient with round coin like erythematous patches on the limbs quite itchy and irritating, who belong to age group 20-60 years was considered for the study. Both the sexes were included belonging to various socioeconomic group, not having any serious associating disorder and not having allopathic medications for any disease condition.

### **Diagnostic Criteria**

The diagnosis was based on strong clinical history, clinical presentation and local examination findings.

### **Methods of study**

The data was collected by purposive sampling technique as per the inclusion criteria and processed in a Standardized Case Record (SCR). Processing includes analysis and synthesis of the case which were done as per the guidelines and principles of Homoeopathy.

The potency selection and repetition of the dose were done according to the demand of the case, such as Acute or Chronic, Susceptibility, Vitality and Suppression (if any), Changes in structural and functional level, and the degree of correspondence to the remedies.

Follow up in the case was planned for a minimum of 1-2 months as it's related to acute skin condition. During the follow up each case was evaluated according to the scoring criteria, which includes the intensity of the symptoms before and after treatment, using Patient's Visual Analogue Scale.

### **Case Study**

A 40 years of female presented with the complaint of the skin around the Patches becoming hot. Swollen and tender or pain full since 5 days.

Presenting complaints – Itchy eruptions on upper and lower limbs in round spots like coins, itching worse at night and by warmth.

#### **Mental generals-**

- Apprehension of having some serious disease.
- Very sensitive.
- Suffers from poor short term memory.

#### **Physical Generals-**

- Constitution - lean thin person
- Appetite - 2 chappatis, 1 bowl daal, 1 bowl rice at a time
- Thirst - 6-7 glasses/day
- Aversion - Sweets
- Stool - Satisfactory once in a day
- Urine - Frequent urination
- Menses - Cycle 28 days, flow 3 days, spotting 2 days, no clots

- Sleep - 7-8 Hours, not sound
- Dreams - Not specific

**Physical examination-**

BP- 110/70

Pulse- 70/min

RR- 17/min

CNS examination- All reflexes were working properly.

CVS examination- All sounds were clearly heard.

Locomotor examination- All movements ok, Nothing abnormal found.

Abdominal examination- Abdomen is soft at touch and nothing was abnormal.

**Totality of symptoms:**

- Mental generals-
  - Apprehension about some serious disease.
  - Very sensitive.
  - Suffers from poor short term memory.
- Physical Generals-
  - Aversion – Sweets
  - Frequent urination
- Particulars -
  - Cracks fingers tips of
  - Itching < warmth
  - Aggravation – Night

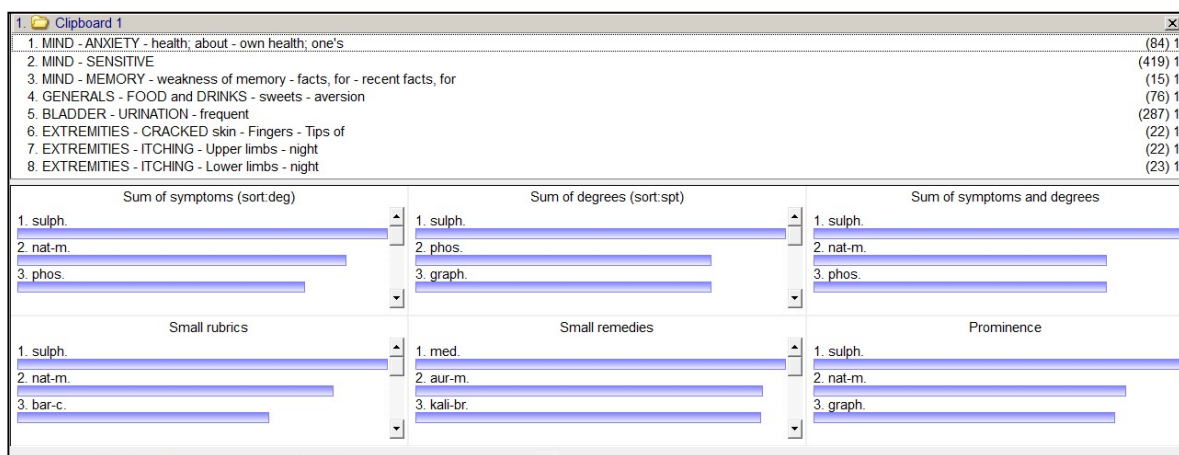
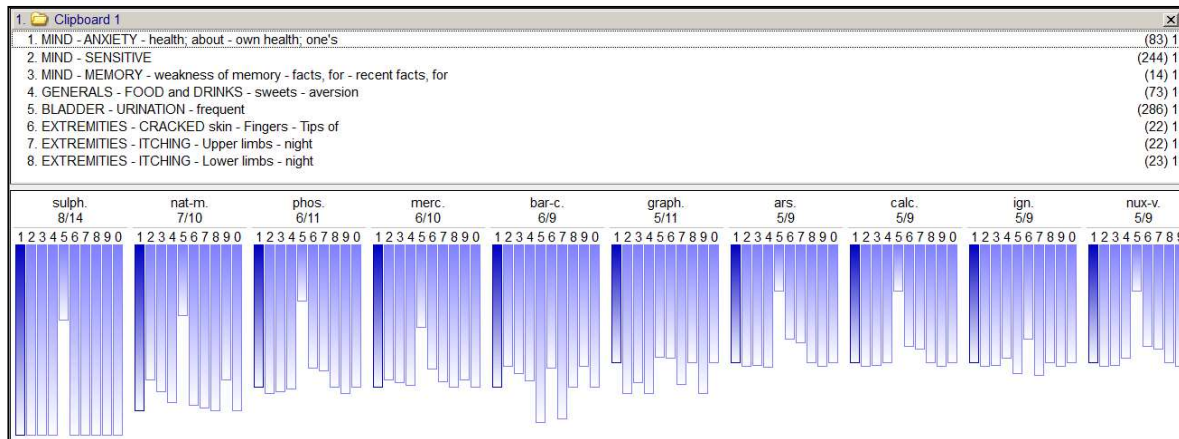
**Repertorization –**

From Synthesis Repertory RADAR 9.0 (Attached below)

1.  Clipboard 1

1. MIND - ANXIETY - health; about - own health; one's
2. MIND - SENSITIVE
3. MIND - MEMORY - weakness of memory - facts, for - recent facts, for
4. GENERALS - FOOD and DRINKS - sweets - aversion
5. BLADDER - URINATION - frequent
6. EXTREMITIES - CRACKED skin - Fingers - Tips of
7. EXTREMITIES - ITCHING - Upper limbs - night
8. EXTREMITIES - ITCHING - Lower limbs - night

	sulph.	nat-m.	phos.	merg	bar-c.	graph.	ars.	calc.	ign.	nux-v.	bell.	canth.	hyos.	med.	sil.	arg-m.	lyc	nit-ac	puls.	kali-c.	petr.	carb-v.	cocc.	ph-ac	zing.	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
	8	7	6	6	6	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4
	14	10	11	10	9	11	9	9	9	9	8	8	7	7	7	11	10	9	9	8	7	6	6	6	6	6
1.	1	1	3	1	1	-	3	2	1	1	1	1	1	2	1	3	2	4	2	2	-	-	2	2	-	-
2.	3	3	3	2	2	1	2	2	3	3	3	2	2	2	3	3	3	3	3	2	1	2	2	1	2	2
3.	1	1	-	-	-	1	-	1	-	1	1	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-
4.	2	1	2	2	1	3	2	1	1	1	-	-	1	1	1	2	2	1	1	2	1	-	-	1	2	2
5.	3	2	1	3	3	3	1	3	3	3	2	3	2	1	1	3	3	1	3	2	2	2	1	2	1	1
6.	1	1	-	1	1	3	-	-	1	-	1	-	-	1	1	-	-	-	-	-	3	-	-	-	-	-
7.	1	-	1	1	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-
8.	2	1	1	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	1	1



- Selection of remedy – Sulphur Hahnemanni
- Selection of Potency -200
- Prescriptions and follow ups: Sulph. 200 1 Dose, Early morning empty stomach, followed by Placebo × TDS x 7 Days (All 3 globules doses), Homoeopathic aggravation noted in first follow up, kept on Placebo TDS with weekly follow ups – the patient got better in every follow up to be cleared totally in 5 weeks.

Result – complete “Cure”, no relapsing even after 6 weeks and feeling no more apprehensions



**Before Treatment**



**After Treatment**

## DISCUSSIONS

We conducted following research study “Efficacy of homeopathy in treatment of Nummular eczema – A case study” in the homeopathic OPD of JWU’s Suryansh Aarogyashala – in our Homoeopathic Medical College and Hospital.

The patient was selected as per the inclusion criteria, having round coin like patches on the limbs with itching, between age group 20-60, having no fatal accompanying disorder and not on any allopathic medication.

Psychological history was quite important in this case as stress seemed to be major factor in its origin than any other cause. Thus Kent repertory was used for repertorization, analyzing the case and find the similimum (the most similar remedy to the case).

As per the review of ancient Indian literature, homeopathy is deep rooted science by its principles and it’s dynamic, single, simple, soothing homeopathic remedies are known for long having the curative power without side effects therefore was tested in this study.

*Result of this research can give indications for making policy for treatment of such irritating and financially depraving skin conditions by Govt. and Corporates, for efficacious management of it and securing quality of life of our employees and citizens by using medicine which is authenticated deeply regarding its principles- in Ancient Indian Literature. More scope of future research is for each type of acute skin condition to be carried out individually, to know there aetiological factors for practicing preventive aspect.*

## CONCLUSIONS

The following conclusions were drawn from the study:

- The cause of it is grossly unknown but episodes of stress is the major factor.
- Psora was found to be the Dominant Miasm.
- Constitutional medicine was found to be effective in the treatment.
- The Homoeopathic medicine is effective in the treatment of Nummular eczema as per case study.

**References: Internet Sources/Book Sources**

1. Organon of Medicine 5<sup>th</sup> Edition - [www.bjainbooks.com/inr/organon-of-medicine-5-6-edition.html](http://www.bjainbooks.com/inr/organon-of-medicine-5-6-edition.html)
2. Organon of Medicine 6<sup>th</sup> Edition - <https://homeopathybooks.in/organon-of-medicine-samuel-hahnemann/>
3. Sushrut Samhita English translation - <https://archive.org/details/englishtranslati00susruoft>
4. Kavi Kalidasa - <https://soniyahomocopathyclinic.weebly.com/profile-drbalkrishna-singh-md-homocopath.html>
5. <https://www.webmd.com/skin-problems-and-treatments/contact-dermatitis>
6. <https://www.webmd.com/allergies/hives-urticaria-angioedema>
7. Synthesis Repertory – RADAR 9.0
8. Wolff and Johnson; Fitzpatrick's Color Atlas and Synopsis of Clinical Dermatology, 8th Edition; **ISBN-13:** 978-1259642197

**महिला उत्थान में शिक्षा का योगदान****गिरिजा शर्मा**

शोधकर्त्री (शिक्षा), ज्योति विद्यापीठ महिला विश्वविद्यालय

sgirija98@yahoo.com

**डॉक्टर मंजू शर्मा**

एसोसिएट प्रोफेसर, (शिक्षा विभाग), ज्योति विद्यापीठ महिला विश्वविद्यालय

dean.edu@jvwu.ac.in

**सार**

शोध पत्र में “महिला उत्थान में शिक्षा का योगदान” देश व समाज में जब भी महिलाओं के उत्थान व शिक्षा के बारे में बात की जाती है। वर्तमान अध्ययन से संकेत मिलता है कि महिलाओं को अपनी विभिन्न शिक्षा समस्याओं के समाधान खोजने और अच्छी तरह से समायोजित नारी बनने के लिए प्रोत्साहित और निर्देशित किया जाना चाहिए। महिलाओं को तार्किक रूप से और गंभीर रूप से सोचने के लिए उचित ज्ञान व समझ होनी चाहिए की उनके उत्थान के लिए शिक्षा ही एकमात्र तरीका है क्योंकि शिक्षा से ही पारिवारिक, आर्थिक व सामाजिक विकास किया जा सकता है और महिलाओं का सशक्तिकरण हर क्षेत्र में किया जा सकता है। महिलाओं को घर, समाज और उनके समुदाय में अच्छी तरह से समायोजित करने के लिए अध्ययन उपयोगी आवश्यक सुविधाओं को उपलब्ध करवाना होगा। यह अध्ययन महिलाओं व बालिकाओं के परिवारों व समाज के लिए मददगार होगा, वे अपनी घर व समाज की महिलाओं के उत्थान और समायोजन समस्याओं को समझेंगे और उच्च शिक्षा को प्राप्त करने में उनकी मदद करेंगे।

**मुख्य शब्दावली:** शिक्षा, उत्थान, सशक्तिकरण, समायोजन, व्यवसाय, पारिवारिक, आर्थिक, सामाजिक कार्य।

**प्रस्तावना**

शिक्षा वस्तुतः हमारे जीवन में बहुत ही महत्वपूर्ण है। शिक्षा व्यक्ति द्वारा समाज के बारे में उस सोचे समझे प्रयत्न का नाम है जिसे वह इसलिए ग्रहण करता है ताकि मनुष्य का अस्तित्व शेष रहे तथा व्यक्तियों में यह सामर्थ्य उत्पन्न हो कि वे बदले हुए वातावरण के साथ सामाजिक जीवन में भी उचित एवं आवश्यक परिवर्तन कर सकें। राष्ट्रीय-जीवन में शिक्षा मनुष्य के बिते हुए समय व वर्तमान को जोड़ती है जो ‘समाज शिक्षा’ का प्रबन्ध ठीक नहीं रख पाता है, वह अपने अस्तित्व को संकट में डालता है। जिस प्रकार स्मरण शक्ति के समाप्त हो जाने पर जीवन का गणित बिगड़ जाता है, उसी प्रकार शिक्षा के बिगड़ जाने पर राष्ट्रीय जीवन का क्रम बिगड़ जाता है। शिक्षा व्यक्ति के मानसिक विकास एवं सामाजिक विकास का नाम है। जिस प्रकार मनुष्य का शरीर छोटे से अंकुर से प्रारम्भ होता है और उचित भोजन एवं वातावरण प्राप्त कर मनुष्य का निर्माण करता है।

**शिक्षा का अर्थ:**— शिक्षा, मनुष्य को सभ्य एवं विवेकशील बनाने का एक माध्यम है। यह उचित व अनुचित में भेद करना सिखाती है इसलिए शिक्षा के बिना मनुष्य का जीवन का विकास अधुरा है।



शिक्षा बालक की सर्वांगीण उन्नति का साधन है, उसके व्यक्तित्व के पूर्ण विकास का सोपान है। शिक्षा वह ज्ञान है, जो बालक रूपी हीरे की जन्मजात शक्तियों का विकास करके उसके आन्तरिक गुणों को जगमगा देती है। जिसके प्रकाश से व्यक्ति स्वयं अपने व्यक्तित्व का निर्माण करता है और समाज को लाभ पहुँचता है। शिक्षा प्रकाश और शक्तियों का ऐसा स्रोत माना जाता है कि हमारे शारीरिक, मानसिक, बौद्धिक तथा आध्यात्मिक शक्तियों के प्रगतिशील और सुसंगत विकास द्वारा हमारी प्रकृति को ही बदल देती है तथा उदात्त बनाती है। शिक्षा के द्वारा ही मनुष्य को सभ्य, सुसंस्कृत एवं योग्य नागरिक बनाया जाता है। इस तरह शिक्षा मानव विकास का मूल साधन है। इसके द्वारा व्यक्ति, समाज एवं राष्ट्र सभी का विकास होता है। सम्पूर्ण शिक्षा व्यवस्था का केन्द्र बिन्दु शिक्षक होता है। शिक्षा हम सभी के उज्ज्वल भविष्य के लिए आवश्यक साधन है। हम जीवन में शिक्षा के इस साधन का प्रयोग करके अपने जीवन में अच्छे से अच्छा स्थान प्राप्त कर सकते हैं। शिक्षा का उच्च स्तर, लोगों को सामाजिक और पारिवारिक आदर और एक अलग पहचान बनाने में मदद करता है। शिक्षा सभी के लिए सामाजिक और व्यक्तिगत रूप से बहुत महत्वपूर्ण होती है। यह एक व्यक्ति को जीवन में एक अलग स्तर और अच्छाई की भावना को विकसित करती है। शिक्षा किसी भी बड़ी पारिवारिक, सामाजिक और यहाँ तक कि राष्ट्रीय और अन्तर्राष्ट्रीय समस्याओं को भी हल करने की क्षमता प्रदान करती है। यह लोगों की सोच में सकारात्मक सोच का विकास करके विचारों में बदलाव लाती है और नकारात्मक विचारों को हटाती है। बचपन में ही हमारे माता-पिता हमारे मस्तिष्क को शिक्षा की ओर ले जाने में बहुत महत्वपूर्ण भूमिका निभाते हैं। अपने कौशल और ज्ञान को उपयोगी बनाने में ये विचार भी हमारी सहायता करते हैं।

### **शिक्षा के उद्देश्य :-**

इस अध्ययन से कई मौलिक उद्देश्यों की पूर्ति की संभावनाएँ बनती है। एक तो समाज व देश में महिलाओं की स्थिति को बदला जा सकता है और यह बदलाव शिक्षा के माध्यम से ही हो सकता है। महिलाओं व बालिकाओं की शिक्षा व उत्थान के लिए समाज में चेतना के वैचारिक व सांस्कृतिक अस्त्रों की खोज हो सकती है। समाज में महिलाएँ शिक्षित होकर अपना व परिवार का भविष्य संवार सकती है और अपना अस्तित्व बना सकती है। शिक्षा के उद्देश्य का व्यक्ति के जीवन तथा समाज के आदर्शों व उद्देश्यों से घनिष्ठ संबंध होता है। इसलिए शिक्षा के उद्देश्यों का निर्माण करना भी ठीक ऐसे ही है जैसे जीवन के उद्देश्यों को निर्धारित करना। यदि हम व्यक्ति तथा समाज दोनों के लिए अलग-अलग शिक्षा के उद्देश्य का निर्माण करना चाहें, तो हम दोनों की आवश्यकताओं तथा आदर्शों को ध्यान रखना होगा। परिस्थिति के अनुसार लोगों की जैसी आवश्यकता तथा अकाक्षाएँ होती है। शिक्षा के उद्देश्य में उसी के अनुसार परिवर्तन होता है।

### **वर्तमान में शिक्षा के प्रमुख उद्देश्य निम्नलिखित हैं:-**

1. जीविकोपार्जन हेतु व्यवसायिक शिक्षा देना
2. बौद्धिक विकास
3. पूर्णजीवन की तैयारी
4. संतुलित विकास
5. धार्मिकता, सामाजिक व नैतिकता चारित्रिकता का स्रोत बनाना

4.स्त्रियों का सर्वांगीण व्यक्तित्व का विकास

5.सांस्कृतिक प्रसार रखने हेतु दीक्षा

6.शिक्षा और वातावरण की व्यवस्था उत्तरदायित्व की भावना का विकास

7.लोकतांत्रिक भारत में नागरिकता की शिक्षा इत्यादि उद्देश्य है।

**हिटलर के अनुसार**—“उस समय जर्मनी की शिक्षा का उद्देश्य वहाँ की जनता में अपने देश के प्रति श्रद्धा, अपारभक्ति तथा त्याग की भावना को ही विकसित करना था।”

**प्रयोजनवादी विचारधारा के अनुसार**—“सत्य सदैव बदलता रहता है, इसलिए शिक्षा के उद्देश्य भी सदैव देश, काल तथा परिस्थितियों के अनुसार बदलते रहते हैं।”

**यर्थाथवादी के अनुसार**— “वह भी प्रयोजनवादीयों की भांति समाज की निम्नलिखित भौतिक परिस्थितियों को आधार मानते हुए शिक्षा के लचीले, अनुकूलन योग्य तथा परिवर्तनशील विशिष्ट उद्देश्य का निर्माण करते हैं।”

**सर पर्सी नून**— (1870-1942) जैसे शैक्षिक विचारक इस बात की वकालत करते हैं कि शिक्षा का मुख्य उद्देश्य व्यक्तिगत व्यक्तित्व का विकास है। महान राष्ट्रों की प्रगति व्यक्तियों के कारण होती है। इसलिए व्यक्तित्व को पूर्णता के लिए पूर्ण अवसर दिया जाना चाहिए।

**एडम्स यह भी कहते हैं**— “कि शिक्षा आत्म-साक्षात्कार के लिए एक की मदद करने का प्रयास है। शिक्षा व्यक्तियों के लिए दिया जाने वाला प्रशिक्षण है ताकि उनमें से प्रत्येक में निहित चारित्रिक क्षमता का विकास हो सके। सभी को एक ही सांचे में नहीं ढाला जा सकता है और सभी के लिए इस तरह की समान शिक्षा बेकार और निरर्थक है।”

शिक्षा बच्चों को तेजी से बढ़ते ज्ञान के साथ तालमेल रखने और उन्हें ज्ञान की खोज करने में मदद करने में सक्षम बनाती है। शिक्षा मनुष्य के सर्वांगीण विकास की प्रक्रिया है। प्राचीन शिक्षा ने मानसिक विकास पर जोर दिया। अधिक से अधिक ज्ञान प्राप्त करना मुख्य उद्देश्य के रूप में माना जाता था। इसके विपरीत, आधुनिक शिक्षाविदों ने शारीरिक, मानसिक, भावनात्मक और सामाजिक जैसे विकास के अन्य पहलुओं पर समान रूप से जोर दिया। इस प्रकार आधुनिक शिक्षा का उद्देश्य व्यक्तित्व को पूर्ण विकसित करना और सामाजिक दक्षता और गतिशीलता प्राप्त करना है। शिक्षा के उद्देश्यों में व्यक्तिगत के साथ-साथ सामाजिक भी शामिल हैं। सामाजिक पुनर्निर्माण, सामाजिक परिवर्तन पर जोर देना, समाज को आधुनिक बनाने के लिए उत्पादक सहभागी, मूल्य उन्मुखता और राष्ट्र के संवैधानिक दायित्वों के लिए प्रतिबद्धता है।

### **भारत में महिला शिक्षा—**

भारत में महिलाओं ने सभ्यता की स्थापना के बाद से अच्छी स्थिति का अनुभव किया है। महिलाओं उत्थान व शिक्षा के क्षेत्र में शिक्षित हुए बिना देश और समाज का विकास नहीं कर सकती। यह तथ्य सत्य है की महिला और पुरुष दोनों मिलकर ही देश को हर क्षेत्र में पूर्ण रूप से विकसित कर सकते हैं। महिलाओं की शिक्षा समाज में उनकी स्थिति के परिवर्तन का सबसे शक्तिशाली साधन है। शिक्षा भी परिवार के भीतर महिलाओं की स्थिति में सुधार के साधन के रूप में, असमानताओं और कार्य में कमी लाती है। भारत में प्राचीन दिनों में महिलाओं को कुछ अधिकार दिए गए थे। प्राचीन भारत में

महिला शिक्षा में वृद्धि हुई। प्राचीन भारत में महिलाओं की स्थिति महत्वपूर्ण थी। वे महत्वपूर्ण निर्णय लेती थी और उन्हें "स्वयंवर" के माध्यम से वर चुनने का अधिकार प्राप्त था। महिला का सम्मान किया जाता था और उसे समाज में उचित महत्त्व दिया जाता था। वैदिक काल में प्राचीन भारत में नारी शिक्षा प्रचलित थी। प्राचीन काल में भारतीय महिलाओं को महत्त्व दिया जाता था। प्राचीन भारत में बड़े पैमाने पर महिला शिक्षा के माध्यम से गार्गी और मैत्रेयी जैसे प्राचीन काल में कई महिला द्रष्टाओं और विचारकों की उत्पत्ति हुई। वाल्मीकि की रामायण में सीता के प्रभाव को दर्शाया गया है। वेद व्यास द्वारा महाभारत में कौरवों को उखाड़ फेंकने के लिए पतियों पर द्रौपदी के अनुनय का चित्रण करता है। प्राचीन भारत में महिला शिक्षा ने महिलाओं को महत्त्वपूर्ण अधिकार दिया। प्राचीन भारतीय ग्रंथ समाज में महिलाओं के प्रभाव का वर्णन करते हैं।

### महिला शिक्षा की महत्ता

"एक पुरुष के शिक्षित और सुसंस्कृत होने का अर्थ है अकेले उसी का उपयोगी बनना किन्तु एक महिला यदि शिक्षित, समझदार और सुयोग्य है तो समझना चाहिये कि पुरे परिवार के संसंस्कृत बनने का सद्गुण आधार बन गया"

### स्वामी दयानन्द सरस्वती

महिलाओं को आगे बढ़ाने के लिए आवश्यकता है शिक्षित बनने की है, शिक्षा ही महिलाओं में आत्मविश्वास पैदा कर सकती है। शिक्षित होने पर ही उनमें किसी क्षेत्र में सफलतापूर्वक काम करने व आगे बढ़ने की क्षमता विकसित हो सकती है। यद्यपि महिलाएँ प्रशासन, शिक्षण, चिकित्सा, विज्ञान, राजनीति आदि क्षेत्रों में आगे आई हैं और अच्छा काम कर रही हैं। वे पुलिस और सेना में भी काम कर रही हैं किन्तु उनकी संख्या अभी बहुत कम है शिक्षा में अवसरों के विस्तार से विभिन्न क्षेत्रों में उनकी उपस्थिति निःसंदेह बढ़ेगी। शिक्षा से ही महिलाएँ शक्ति अर्जित करेगी। शिक्षित और सशक्त महिलाएँ देश व समाज को भी शक्तिशाली बनाएँगी।

### महिला शिक्षा से उत्थान

"जिद है एक सूर्य उगाना है

अम्बर से ऊँचे जाना।"

"शिक्षा के बिना नारी उत्थान संभव नहीं। शिक्षा ही इनकी मुक्ति का द्वार है।"

### सावित्री बाई फुले

महिलाओं के उत्थान व सशक्तीकरण की राष्ट्रीय नीति 2001 में पारित की गयी थी। भारत सरकार ने 2001 को महिलाओं के सशक्तीकरण (स्वशक्ति) वर्ष के रूपमें घोषित किया था। ग्रामीण महिलाओं के उत्थान के उद्देश्य के लिए लागू की गई शुरुआती आर्थिक नीतियां काफी हद तक असफल रही। एकीकृत ग्रामीण विकास कार्यक्रम की उप-योजना ग्रामीण क्षेत्रों में महिला व बालिकाओं के विकास (वैब्ल) का कार्य 1982-83 में 50 ग्रामीण जिलों में शुरू किया गया। भारत में महिलाएँ अब सभी तरह की गतिविधियाँ जैसे-शिक्षा, राजनीति, मीडिया, कला और संस्कृति, सेवा का क्षेत्र, चिकित्सा व विज्ञान, अभियन्ता, विधि विभाग, विज्ञान एवं प्रौद्योगिकी आदि में हिस्सा ले रही हैं। महिलाओं के उत्थान में क्रांति-ज्योति को ओर आगे प्रज्वलित करने में संस्थापक पंकज गर्ग जी की भूमिका भी महत्त्वपूर्ण रही है। 21वीं सदी में महिलाओं को शिक्षित करने का जो अलख जगाया, आज उसी का परिणाम है

कि भारत की महिलाएँ हर क्षेत्र में पुरुषों से कंधे से कंधा मिलाकर चल रही है।

मावन समाज के दो पक्ष हैं—स्त्री और पुरुष प्राचीन काल से ही पुरुषों को स्त्री से अधिक अधिकार प्राप्त रहें हैं। स्त्री को पुरुषों के नियंत्रण में रहना पड़ता है। नारी स्वतंत्रता के योग्य नहीं, कहकर स्मृतिकार मनु ने स्त्री को बन्धन में रखने का मार्ग खोल दिया है। किन्तु वर्तमान शताब्दी प्राचीन रूढ़ियों को तोड़कर आगे बढ़ने का समय है। स्त्री भी पुराने बन्धनों से मुक्त होकर आगे बढ़ रही है। समाज के उत्थान एवं राष्ट्र निर्माण में नारी की अहं भूमिका है। यह कहना अतिशयोक्ति न होगी कि नारी के बिना समाज का अस्तित्व, विकास, उत्थान तथा कल्याण असंभव है। वेदों में नारी गृह साम्राज्ञी है (ऋग्वेद), राष्ट्र के लिए ध्वजा है, समाज की मूर्धा है, शत्रु का संहार करने वाली वीरांगना है। इन सभी गुणों के लिए नारी का शिक्षित होना जरूरी है। शिक्षा ही वह कवच है जिसके माध्यम से स्त्री समाज में अपनी प्रतिष्ठा कायम रख सकती है।

**निष्कर्ष:**—महिलाओं के उत्थान व शिक्षा के द्वारा महिलाओं को समाज और देश—दुनिया में अपनी बेहतर जगह बनाने में मदद मिलती है और साथ ही उनकी समावेशी भागीदारी के रास्ते पर चलने में सहायता करता है। शिक्षा द्वारा महिलाओं का परिवार व समाज में प्रभाव व स्थान निर्धारित होता है। शिक्षा ही जीवन है इस विचार के माध्यम से शहरी व ग्रामीण समाज में महिलाओं के उत्थान व शिक्षा के स्तर में काफी बदलाव होता है। लेकिन ग्रामीण समाज की महिलाओं के लिए अलग से विशेष योजनाएँ चलाई गयी हैं। ग्रामीण क्षेत्र में महिलाओं को शिक्षित करने के साथ-साथ उनके लिए रोजगार संबंधी अवसर भी बढ़ाये जाने चाहिए जिससे वे अच्छी अपना व अपने परिवार का पालन-पोषण में अपने साथी का सहयोग कर सकें। सभी क्षेत्रों महिलाओं के उत्थान में राष्ट्र की प्राथमिकता में होना चाहिए। महिला व पुरुषों के बीच जो असमानता की खाई है वह शिक्षा के द्वारा ही दूर हो सकती है।

### संदर्भ ग्रंथ सूची—

1. खंडेला, प्रोफेसर मान चंद्र" महिला और बदलता सामाजिक परिवेश" आविष्कार पब्लिकेशन, जयपुर
2. शर्मा, प्रज्ञा, "महिला विकास और सशक्तिकरण" आविष्कार पब्लिकेशन, जयपुर
3. कटारिया, कमलेश, "नारी जीवन: वैदिक काल से आज तक" यूनिक ट्रेडर्स, जयपुर
4. आप्ते, प्रभा (1996): "भारतीय समाज में नारी", क्लासिक पब्लिशिंग हाउस जयपुर अग्रवाल, 5. जे. सी. (1976): "इण्डियन वुमन एजुकेशन एण्ड स्टैटस", आर्य बुक डिपो, न्यू देहली
6. भट्टाचार्य एस. (2001): "डवलपमेंट ऑफ वमुन एजुकेशन इन इण्डिया, जोसेफ बारा, चीना रॉय, 1850—1920, कलेक्शन ऑफ डाक्यूमेंटस", योनगती, बी.एम. शंखधर कनिष्का पब्लिशर, न्यू देहली
7. बी.एम.शर्मा (2005): "वुमन एण्ड एजुकेशन", कॉमन वेल्थ (एडिटर) पब्लिशर, न्यू देहली
8. द्विवेदी किरण (2009): "भारत की विश्वविद्यालयी व्यवसायिक शिक्षा में महिला सहभागिता", शिक्षा संकाय, वनस्थली विद्यापीठ
9. धामीजा, नीलम एण्ड पाण्डा एस.के. (2006): "वुमन एम्पावरमेंट प्रोजेक्ट्स"; रोल ऑफ यूनिवर्सिटी, यूनिवर्सिटी न्यूज, 44 (27), जुलाई, 3—9, 2006
10. डॉ. डी. विनोद कुमार (2004): "वुमन एजुकेशन इन 21 सेंचुरी", मिरेकल ऑफ टीचिंग, क्वाटरली जनरल ऑफ टीचिंग, क्वाटरली जनरल ऑफ टीचिंग प्रोफेशन, वॉल्यूम टप्प, जनवरी, फरवरी, मार्च, अप्रैल, 2004

## **A REVIEW ON ONYCHOPHAGIA & ITS MANAGEMENT BY HOMOEOPATHY**

### **Dr. Meenakshi Soni**

Associate Professor, Dept of Case taking & Homoeopathic Repertory. Faculty of Homoeopathic Science JVWU Jaipur, Rajasthan

### **Dr Rakesh Sharma**

HOD & Professor Dept. of Organon of Medicine, Faculty of Homoeopathic Science JVWU Jaipur, Rajasthan

### **Dr M P Sharma**

Dean & Director, Prof & HOD, Department of Physiology & Biochemistry, Faculty of Homoeopathic Science JVWU Jaipur, Rajasthan

### **Dr Ravi Jain**

Assistant Professor Dept. of Practice of Medicine, Faculty of Homoeopathic Science JVWU Jaipur, Rajasthan

### **Introduction:**

**Onychophagia is Body Focused Repetitive behaviours also called Nail biting. It is a non destructive behaviour of person.**

It is considered a pathological oral habit and grooming disorder, it's an uncontrollable mania that is destructive to fingernails and surrounding tissue.

Nail biting is a common and frustrating habit for many children, teenager especially girls, and patients those are suffering from any mental disorder like depression. Children are the main victim those who start growth age 2-8 year .Nail biting occurs most often during puberty in female because of hormonal misbalance. Even though some young adults, ages 1 to 22 years, bite their nails. Most people stop biting their nails on their own by age 30. Boys bite their nails more often than girls after age 10.



### **CAUSES OF NAIL BITING**

- Genetic link to nail biting behaviour.
- Anxiety, depression, over thinking etc, because this act relieves stress, tension, or boredom.

- It can be a habit usually in children and girls.
- Some people do not use nail cutter because of laziness and cut the nail by biting.
- Babies have also addiction of nail biting during growth period.
- Over thinking is another cause of nail biting.

#### **HOW WE OBSERVE:**

- Visually see the damages of nails with frizyness
- Patient mouth damage, abscess or ulceration found in inside the lips.
- The unattractive appearance of physical damage to skin and nails may cause feeling of shame, embarrassment, and guilt, leading to complicated family and social relationships.
- It can be associated with deficit hyperactivity disorder or ADHD, oppositional defiant disorder, separation anxiety, enuresis, tic disorder and other mental issues.
- Skin of fingers looking weak thin and sometimes bleeds easily.

#### **Some of the risks of nail biting include:**

- ✓ Soreness or infection in and on the skin around the nails.
- ✓ Damage to the tissue that makes the nails grow.
- ✓ Changes in how your nails look.
- ✓ Abnormal growth.
- ✓ More frequent colds and other illness from placing dirty fingers in mouth.
- ✓ Damage to teeth from chewing hard nails.

#### **Prevention:**

Some tips for preventing the habit of nail biting behaviour.

- Cut nails short—If there's not enough nail to grab with your teeth, it won't feel as satisfying when you give biting a try.
- Coat nails with a bad taste---There are special nail polishes available in market with a bitter flavour you can paint on your nails. The terrible taste will make you think twice before chewing
- Splurge on manicures—Spending money and time at a nail salon will give you both good looking nails and a reason to keep them that way.
- Wear gloves—wear gloves regularly for ignore the habit of nail biting.
- find out the reasons when your mood starts to cut the nail by bite so you can overcome on this problem.
- Keep your hands or mouth busy.—Find something to fiddle with – a stress ball, a worry stone, or even a pen to click. Chew gum so your mouth has a job. Give your nail-biting energy another place to go.

#### **Management by Homoeopathic Remedies:**

Homeopathy is a system of alternative medicine; it is totally based on the law of similia similibus curenter. On the basis of this first totality of symptoms is compulsory to take before selection of medicine. Traditional homeopathy is based on these philosophical foundations which is first Hahnemann established and have become refined over the two centuries that have passed since. Homeopaths believe treatment that obeys the laws of natural healing must lead to heal the disease in one way. Same as in onychophagia in this condition first we can see the root cause and then apply the rule of homeopathy on the basis of totality of symptoms. Homeopathy is a holistic science and considers the individuality of the person while treating in every disease such as his mental state, disposition, physical generals and his constitution.

### Homeopathic medicines:

**Argentum Nitricum:** Great Anxiety, Fear and Persistent Impulsive Thoughts. Fears and Anxieties, Hidden Irrational Motives For Actions. Dreads Ordeals. Fear of Impending Evil of Crowds, Passing a Certain Point of High Buildings of Dark. Fear of high buildings, Heights, Flying In Air-planes.

**Calcarea Carb:** They Are Easily Frightened Or Offended. Child Afraid Of Everything He Sees. Desire For Chalk, Pencil Etc.

**Medorrhinum:** Common Fears Are The Dark, Being Alone At Night Large Bodies Of Water, Closed In Spaces, Animals, Dogs, Slimy Animals Like Toads A Snakes, Of Being Observed, That Someone Is Behind Him, Cancer, Heart Disease, Death, Insanity. They Bite Their Nails

**Natrum Muriaticum:** Nail Biting In Children, With Nervousness. They Are Depressed And Introverted. They Are Irritable And Cannot Cry In Front Of Others. Children Learn To Talk Slowly. Awkward In Talking, Hasty, Drops Things. They Prefer For Salt And Salty Foods.

**Ammonium Bromate:** Irritability under the Nails Causing Nail Bite. Due to Nervous Irritation. Irritable Feeling in Fingernails, Better By Biting It

**Sanicula:** Nail Biting and Enuresis In Children.

**Dr. Boger In His Little Synoptic Key, Gives 3 Remedies For Nail Biting; Arsenicum, Sanicula, Hyocyamus.**

### REFERENCE:

- Boerick Materia Medica & Repertory By W.E. Boerick
- Boger-Boenninghausen Characteristic Repertory By C.M. Boger
- How to Stop Nail Biting
- Truth about Nail-Biting Book By Audrey Ciccarelli.
- Allen's Key Note.
- [http://www.homeowatch.org/books/crews\\_workbook.pdf](http://www.homeowatch.org/books/crews_workbook.pdf)
- [www.senseaboutscience.org/data/files/resources/54/Homeopathy.pdf](http://www.senseaboutscience.org/data/files/resources/54/Homeopathy.pdf)
- [www.nhmrc.gov.au/.../...opathy\\_overview\\_report\\_october\\_2013\\_140407.pdf](http://www.nhmrc.gov.au/.../...opathy_overview_report_october_2013_140407.pdf)
- [www.homeopathyzone.com/.../overview-of-classical-homeopathic-philosophy](http://www.homeopathyzone.com/.../overview-of-classical-homeopathic-philosophy)
- <http://homeopathy.inbaltimore.org/saine2.html>



## ROLE & CHALLENGES – HEALTH INFORMATION TECHNOLOGY

**Dr. Hema Bafila<sup>1</sup>, Dr. Mini Amit Arrawatia<sup>2</sup>**

1. Expert of Physiotherapy & Administration, Jayoti Vidyapeeth Women's University Jaipur
2. Professor, Management & Commerce, Jayoti Vidyapeeth Women's University Jaipur

Corresponding mail ID: [admission@jvwu.ac.in](mailto:admission@jvwu.ac.in)

### **Abstract:**

In the healthcare industry, mysterious acronyms and ambiguous job titles are not uncommon. You've lately come across a term that's unfamiliar to you and are keen to learn more about it: information technology in the field of health (HIT).

What exactly is health information technology, and how does it affect the medical community today? In a healthcare facility, technology can be found everywhere, from electronically checking in patients and updating their medical records to providing them the results of a blood draw in their online chart. Health information technology is the field that works behind the scenes to ensure that all of these systems are working smoothly.

This health science specialty may be unfamiliar to you if you have never heard the phrase before, but you may be surprised by the impact that these tech professionals have on the healthcare business. Join us as we delve into the field of health information technology to gain a better understanding of this tech-driven healthcare profession.

Patient safety is a subset of healthcare and is defined as the avoidance, prevention, and amelioration of adverse outcomes or injuries stemming from the processes of health care. In 1999 the Institute of Medicine's (IOM) report "To err is human" called for developing and testing new technologies to reduce medical error,<sup>1</sup> and the subsequent 2001 report "crossing the quality chiasm" called for using information technology as a key first step in transforming and changing the healthcare environment to achieve better and safer care.<sup>2</sup>

**Keywords:** Health, Information, Technology, Care, Community.

### **INTRODUCTION**

#### **Healthcare information technology (HIT)**

Healthcare information technology (HIT) has been defined as "the application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making".<sup>3</sup>

Health information technology encompasses a wide range of technologies that range from simple charting to more advanced decision support and connection with medical devices. Among the numerous opportunities for improving and transforming healthcare offered by health information technology are the reduction of human error and the improvement of clinical outcomes, the facilitation of care coordination, the improvement of practice efficiencies, and the tracking of data over time. Since the publication of the initial IOM study, there has been a significant acceleration in the development and implementation of health information technology, with varied degrees of evidence regarding the influence of health information technology on patient safety becoming available.

EHRs and e-prescriptions are examples of health information technology (HIT), as are technology solutions that assist individuals in meeting health goals such as quitting smoking or controlling diabetes. This integration of technology and healthcare has resulted in more accurate electronic health records (EHRs) that accompany a patient to different healthcare institutions, as





well as greater control over one's own health through applications and better access to information for patients.

Despite the fact that health information technology (HIT) comprises a wide range of systems and types of technology, its primary focus is on protecting patient privacy while simultaneously improving patient care. Advances in secure health information technology networks have enabled physicians and other members of a patient's care team to communicate more effectively than ever before.

### **What is the importance of HIT?**

In today's digital age, health information technology is critical for many reasons. According to Patrick Gauthier, director of healthcare solutions at Advocates for Human Potential, Inc., "in 2019, healthcare customers will continue to demand greater openness, accessibility, and customization." All of the aforementioned factors, as well as others, are supported by HIT.

For some patients, the capacity to promptly communicate patient information between hospitals and clinics—a feature known as "interoperability"—can mean the difference between life and death. According to the ONC, electronic health records (EHRs) and other health information technology (HIT) tools assist patient care teams coordinate with one another, resulting in higher-quality patient care and more inexpensive healthcare expenses. Gauthier believes that, despite the fact that the health information technology field was struggling to keep up just a few years ago as clinics and hospitals made the transition to new technology in order to comply with government mandates such as meaningful use, the field has now found its stride and will only continue to grow in importance as technology transforms the healthcare industry. "The majority of consumers today have greater confidence in health information technology than they have ever had."

### **The following are the components of health information technology:**

Electronic health records (EHRs). EHRs help doctors to keep better track of your health information and may even allow them to examine your medical records. Even if their office is closed, you can still contact them if you have an issue. EHRs are also used to facilitate the sharing of information between your doctor and specialists; in order for specialists who want your information to have it available when they need it, it's absolutely necessary.

### **Personal health records (PHRs)**

A personal health record (PHR) is similar to an electronic health record (EHR). Save for the fact that you have complete control over the information that enters into it. You can use a personal health record (PHR) to keep track of information from your doctor visits, however, your personal health record (PHR) can also reflect your life outside of the doctor's office. Your health priorities, such as keeping note of what you eat and how much exercise you get. Exercise is good for your heart and your blood pressure. Your personal health record (PHR) may occasionally link with your doctor's electronic health record.

### **Electronic prescribing (E-prescribing)**

A printed prescription can be useful, get disoriented or misunderstood. E-prescribing enables you and your doctor to communicate electronically. In direct communication with your pharmacy this implies that you can visit the drugstore. It is possible to pick up drugs without needing to bring a formal prescription.



### **Confidentiality and security**

All of these electronic systems have the potential to boost the safeguards in place to secure your health information as an illustration, electronic it is possible to encrypt information so that only authorized persons can access it. Take a look at it, Health information technology can also make it easier to document and track who is receiving care. Has gained access to your personal information.

### **Benefits of health information technology**

While some opponents claim that electronic health records (EHRs) have resulted in physicians spending more time inputting data than interacting with patients and that government rules have become burdensome, there is widespread agreement on the benefits of health information technology. These advantages are as follows:

- The ability to use data analytics and big data to effectively manage population health management programs and reduce the incidence of expensive chronic health conditions;
- The use of cognitive computing and analytics to perform precision medicine (PM) tailored to individual patients;
- The ability to share health data among academic researchers to develop new medical therapies and drugs; and
- The rights of patients to obtain and use their own health data and collaborate in their own care with clinicians.

### **Challenges and Issues**

The implementation of policies regarding HIT adoption has always been on the government's radar and serious exploratory initiatives are underway to explore coordination of a national health IT infrastructure and network.

However, the challenges faced for adopting HIT are:

#### **• Government Funding:**

Further development in government funding for health information technology (HIT) is essential in order to avoid the restricted use of HIT in government health facilities. Aside from that, it is necessary to ensure that the number of medical informatics specialists who have received training continues to grow.

#### **• Computer literacy:**

It should be one of the primary goals of the government that an extremely high percentage of government employees, as well as a significant number of the private sector, have a working knowledge of computers.

#### **• Infrastructure and Coordination:**

Improved support infrastructure and collaboration between the public and commercial sectors are needed to achieve this.

#### **• Legacy Systems:**

With the exception of a small number of privately held large hospitals, the vast majority of patient records are kept on paper and are extremely difficult to convert to an electronic format.



• **Standards and Guidelines:**

Local information technology systems that do not adhere to internationally recognized standards for information representation and interchange. HL7 and DICOM standards, on the other hand, have been under discussion in a number of nations, including India.

• **Interoperability:**

Concerning interoperability, discussions center on the development of standards for content and messages, as well as on the establishment of suitable security and privacy safeguards. Interoperability must be realized in the fast developing applications in areas such as home telehealth and remote monitoring for patients and customers, among other areas of interest.

• **Privacy:**

It is an outstanding question whether patient confidentiality should be protected, and the Supreme Court of India has not addressed the specific right to privacy problem relating to health information.

• **Information Overload:**

Health information technology (HIT) or telemedicine is not a panacea for the flaws in the health-care delivery system, and it is not intended to be one. It is possible that too much information transmitted via wireless media and information transmitted from a big number of patients to a single doctor or a small group of doctors will result in either an excess of information or insufficient corrective action.

**The Indian government's 'Make in India' initiative (2014)**

The Indian health care system, despite its flaws, has a lot going for it on a number of fronts. Because of a government-led campaign to encourage health-care providers to use electronic medical records, artificial intelligence (AI) is now able to draw insights from patient data and use them to give better treatment to more people. Telemedicine and tele consulting programs, delivered over mobile phones, are becoming more accessible to underserved rural regions as a result of the availability of broadband internet access and telecom bandwidth.

Make in India is a major national program of the Government of India designed to facilitate investment, foster innovation, enhance skill development, protect intellectual property and build best in class manufacturing infrastructure in the country. The primary objective of this initiative is to attract investments from across the globe and strengthen India's manufacturing sector. It is being led by the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India. The Make in India program is very important for the economic growth of India as it aims at utilizing the existing Indian talent base, creating additional employment opportunities and empowering secondary and tertiary sector. The program also aims at improving India's rank on the Ease of Doing Business index by eliminating the unnecessary laws and regulations, making bureaucratic processes easier, making the government more transparent, responsive and accountable.

Make in India is an initiative by the Government of India to make and encourage companies to manufacture in India and incentivize dedicated investments into manufacturing.<sup>4</sup> The policy approach was to create a conducive environment for investments, develop a modern and efficient infrastructure, and open up new sectors for foreign capital. The initiative targeted 25 economic



sectors for job creation and skill enhancement,<sup>5</sup> and aimed "to transform India into a global design and manufacturing hub."

**"Make in India" had three stated objectives:**

- to increase the manufacturing sector's growth rate to 12-14% per annum;
- to create 100 million additional manufacturing jobs in the economy by 2022;
- to ensure that the manufacturing sector's contribution to GDP is increased to 25% by 2022 (later revised to 2025).<sup>6</sup>

The Indian government's **"Make in India"** effort is supporting the domestic production of medical devices, which is helping to cut the prices that patients pay for products such as stents and implants, which were previously imported from other countries. According to the panelists, the regulatory environment and regulators in India must be flexible enough to embrace technological interventions such as the expansion of online pharmacies while still putting in place the necessary restrictions. Because of the large number of disadvantaged communities in India, health care innovation there could serve as a global paradigm for a shift away from treating the sick and toward preventative care and wellness, according to the authors.

The focus of Make in India program is on 25 sectors. These include: automobiles, automobile components, aviation, biotechnology, chemicals, construction, defence manufacturing electrical machinery, electronic systems, food processing, IT & BPM, leather, media and entertainment, mining, oil and gas, pharmaceuticals, ports and shipping, railways, renewable energy, roads and highways, space, textile and garments, thermal power, tourism and hospitality and wellness.

**REFERENCES:**

1. Patient Safety Dictionary [Internet] National Patient Safety Foundation. [[Update 2017; Accessed 2017 September]]. Available from: <http://www.npsf.org/?page=dictionarynz> . [Ref list]
2. Crossing the Quality Chasm [Internet] [[cited 2001]]. Available from: <http://www.nap.edu/catalog/10027> .
3. Brailer D. The decade of health information technology, Framework for Strategic Action [Internet] [[cited 2004]]. Available from: [http://www.providersedge.com/ehdocs/ehr\\_articles/the\\_decade\\_of\\_hitdelivering\\_customers-centric\\_and\\_info-rich\\_hc.pdf](http://www.providersedge.com/ehdocs/ehr_articles/the_decade_of_hitdelivering_customers-centric_and_info-rich_hc.pdf).
4. Look East, Link West, says PM Modi at Make in India launch". Hindustan Times. 25 September 2014.
5. "Focus on 'Make In India'". Business Standard. 25 September 2014. Retrieved 27 February 2015.
6. Babu, M. Suresh (20 January 2020). "Why 'Make in India' has failed". The Hindu. ISSN 0971-751X
7. Arrawatia M.A., Meel P., "Information and communication technologies & woman empowerment in India", International Journal of Advanced Research in Computer Engineering & Technology (IJARCET), 2012/10



## REVIEW ARTICLE

# Smart food for better health and nutrition – a promising concept

Aastha Garg, Kirti Joshi, Pramod K. Raghav\*

Department of Food and Biotechnology, Jayoti Vidyapeeth Women's University, Jaipur-303122, Rajasthan, India

Received: 22.09.2022

Accepted: 11.10.2022

## ABSTRACT

Smart food can be defined as foods that benefit us by providing sustainability in three ways by being good for our health, good for environment and favoring farmers' livelihood. An initiative started by ICRISAT (International Crops Research Institute for the Semi-Arid Tropics) with an aim of increasing the staples from just big three crops and including millets and legumes in place due to the immense health benefits offered by them. Following 16 crops are included under the criteria: Pearl millet, Sorghum, Finger millet, Proso millet, Barnyard millet, Browntop millet, Foxtail millet, Little millet, Kodo millet, Teff, Fonio, Job's Tear, Chickpea, Pigeon pea, Ground nuts and Green gram. Each of the mentioned crops is nutritionally rich and leads to improvement of overall health and nutritional status of people. Out of which pearl millet is one of most promising millet cultivated in Rajasthan, India that offers high nutritional and health benefits in addition of being staple growing crop of the region. These crops can be easily included in the daily meals due to their easy incorporation into daily recipes.

**Keywords:** ICRISAT, Pearl Millet, Smart Food and Sorghum

**Citation:** Garg, A., Joshi, K. and Raghav, P.K. 2022. Smart food for better health and nutrition – a promising concept. *Journal of Postharvest Technology*, 10(4): 179-190.

## INTRODUCTION

Food is an indispensable part of life. This is a basic and utmost important need of any living organism, making it essential for a quality life. Availability of proper and healthy food that too all the time round the year is vital for sustaining life and becomes an elementary outline of food security. Thus the definition agreed upon at the World Food Summit in 1996 is that food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life (Pinstrup-Andersen, 2009). Hence, having proper food to eat has always been important.

Historically, elevating starvation among the mass was the major focus, leading to over focus over few crops during green reevaluation. Wheat, rice and maize became the dominant and most consumed crops. That has resultant in cyclic production of same crops which can have negative impact on farmers and natural resources and consumption of similar type food leading to emergence of a new threat of 'hidden hunger' (Kane-Potaka et al., 2021). Recently, UN and organizations talk about 'sustainable diets' that are explained as a diet that have less impact over the environment and even have a contribution in food and nutritional

\* For correspondence: P. K. Raghav (Email: [pramodraghav31@gmail.com](mailto:pramodraghav31@gmail.com))

security. Combining all these points of focus together, ICRISAT (International Crops Research Institute for the Semi-Arid Tropics) came with new foci called as 'SMART FOOD' (Kane-Potaka, 2018). 'Smart Food is food that fulfill all criteria of being good for you (nutritious and healthy); good for the planet (environmentally sustainable); and good for the farmer (climate smart, potential to increase yields, multiple uses)' (Smart Food, 2020). Millets and sorghum were the first one to be added into the list of smart foods (Diama et al., 2020) and then pulses were included under the criteria.

Millets are small-seeded, highly nutritious staple crops grown in many parts of the world. Many types of millets are known pearl millet being one of them. (Saini et al., 2021). Pearl millet is a hardy crop with a relatively short growth period compared to maize (*Zea mays* L.), wheat (*Triticum aestivum*) and rice (*Oryza sativa* L.) that are widely grown in Africa. They are highly nutritious and palatable when consumed (Dube et al., 2021). The aim of the paper is to understand what smart foods are and to study the crops which have been identified as smart food along-with their nutritional potential and health benefits.

## SMART FOODS

With the development process a shift have been observed in the need of a food system from just being able to fulfill hunger i.e. food security to nutritional security and from it to sustainable diets, that cover more recent issue by being more sustainable to environment. To cover all this in an inclusion, ICRISAT came with a new term 'Smart Food', it is an initiative that tries find a solution in unison by being able to promote the health, being less harmful to the earth and being good to the farmers as well (OBE and Kane-Potaka, 2020). The main objective of 'smart food initiative' is to focus on diversifying staples and not just restricting the choice to the Big 3 commonly consumed crops. For this millets and sorghum were the first selected staples to be focused on. The high nutritional values, great health benefits and ability to grow with minimal resources made them the first choice (Kane-Potaka et al., 2021). Considering the benefits offered by the pulses, they were the next to be the part of smart food initiative. Analysis of the combination of millets and pulses in a ratio of 3:1 showed to have a complete protein content that to being highly digestible and full of various essential micronutrients (Anitha et al., 2019; ICRISAT, 2019).

These crops were used traditionally to form many dishes and were consumed locally, making them important staple food in the local culture. But recently, usage of these wonderful crops has been decreasing over years majorly due to policies that focus over production and consumption of few selected cereals (Kane-Potaka et al., 2021). Staples make the most of our diet; most of the calories consumed are obtained from the staples in our plates. Smart food initiative tends to focuses on diversifying these staples from just being the 'Big 3' crops to 'Big 5' and eventually 'Big 7'. Hence, a change in the peoples' habit, by including the traditional staple crops is required for bringing desired changes required for nutritional, environmental and farmer's sakes (Kane-Potaka, 2018). Following are the crops included under the criteria of smart food.

### Pearl Millet

Pearl millet (*Pennisetum glaucum*) also known as Bajra, belongs to the section *Paniceae* of *Poaceae* family is a crop that can adapt in extreme conditions where other crops such as wheat and maize can't survive (Nambiar et al., 2011). It is rich in quality protein, minerals like phosphorous, iron as well as zinc and contains good amount of antioxidants making it beneficial for human health and wellbeing (Rani et al., 2018) and additional qualities such as low glycemic index, being gluten free, high fibre content makes it a great possible alternative for food diversification (Nambiar et al., 2011).

## Sorghum

Sorghum (*Sorghum bicolor* L.) also known as Jowar is the fifth most cultivated cereal in the world after wheat, rice, maize and barley whose cultivation for human consumption began from 3700 to 4000 yr ago. It is a cereal crop of the *Poaceae* family and is native to Africa (de Morais Cardoso et al., 2017). It is an important crop not just because it is climate smart but also because of its high nutritional and health values. Dietary values and chemical composition of whole sorghum are mostly similar to rice, maize and wheat but it is gluten free, rich in resistant starch and possesses nearly all classes of diverse phenolic compounds in abundance that make sorghum full of numerous health benefits such as reducing oxidative stress and benefiting people with diabetes (Xiong et al., 2019).

## Finger Millet

*Eleusine coracana* (Finger Millet) is a cereal crop that is a part of subfamily *Chloridideae* within family *Poaceae*, commonly grown in Africa, Southern Asia, Nepal and many states of India such as Uttar Pradesh, Bihar, Tamil Nadu, Karnataka and Andhra Pradesh (Dida and Devos, 2006). Commonly known as *Ragi* and *Mundua* in India is the sixth most cultivated cereal after wheat, rice, maize, sorghum and bajra. Offering multiple health benefits, these minor cereals have calcium content that is highest of all other cereals, rich in dietary fibre and phenolic compounds. Regular consumption of them aids by providing protection against diabetes, cardiovascular diseases by being anti-diabetic, antitumorigenic, anti-diarrheal, antiulcer, anti-inflammatory, atherosclerogenic and possessing antioxidant and antimicrobial properties (Chandra et al., 2016; Devi et al., 2014).

## Proso Millet

Proso millet (*Panicum miliaceum*) commonly known as *Chenna*, *Barri*, *Baragu*, *Vari*, *Panivaragu* and *Swahili* in India, is a warm season grass commonly used to feed birds, human consumption and production of ethanol (Habiyaremye et al., 2017; ICRISAT, 2020). Being one of the underutilized crop Proso millets fulfill the nutritional needs when consumed by being rich in minerals (such as phosphorus, calcium, zinc and iron), dietary fibre, vitamins (such as niacin, vitamin B-complex, and folic acid), polyphenols and essential amino acids (methionine and cysteine) (Das et al., 2019).

## Barnyard Millet

Barnyard millet (*Echinochloa frumentacea*) generally known as *Sanwa*, *Shyama*, *oodalu*, *Kavadapullu*, *Kuthiravali*, *Udalu* and *Kira* in India is another nutritionally rich yet underutilized millet (ICRISAT, 2020). They have high nutritional values that offer great health benefits on consumption. They contain decent amount of protein that are easily digestible, low amount of carbohydrate that is slowly digested, contain linoleic acid and oleic acid making them a naturally prepared gift for diabetic and CVD patients (Kaur and Sharma, 2020).

## Browntop Millet

Browntop millet (*Urochloa ramosa*) an annual warm-season grass is minor millet commonly known with names as *Korale*, *Karlakki* and *Andukorralu* in different regions of India (Sravan et al., 2020). It is one of the rarest crop able to survive in adverse climatic condition, which becomes an excellent choice for people dealing with lifestyle diseases as it is gluten-free, full of essential nutrients, good source of zinc, iron, fibre and a rich source of natural fibre (Mohapatra et al., 2021).

### **Foxtail Millet**

Foxtail millet (*Setaria italica*) of *Poaceae* family is one of the oldest cultivated crop generally known as *Italian Millet*, *Kangni*, *Kankum*, *Rala*, *Navane*, *Thinai*, *Kang*, *Rala*, *Kangu*, *Kora* across India (ICRISAT, 2020). This millet is known to have a suitable nutritional constituents especially protein (contain essential amino acids such as methionine), high fibre content, needed minerals and phytochemical (Verma et al., 2015). It have been seen that consuming foxtail millet regularly provides several health benefits such as lowering blood glucose levels, prevention against cancer, aid in weight loss and may lower blood pressure (Hou et al., 2018).

### **Little Millet**

Little millet (*Panicum miliare*) is known by many names such as *Kutki*, *Saame*, *Saave*, *Chama*, *Saamai*, *Samalu*, *Sava*, *Halvi* and *Suan* (ICRISAT, 2020). These millets might be called little but that does not make them any less in the nutritive content. They are good source of B-vitamins, needed minerals like calcium, iron, zinc, potassium, essential fats which aids in weight loss, high fibre content and nutraceutical components such as phenols, tannins and phytates (Ambati and Sucharitha, 2019; Mannuramath et al., 2015) which imparts numerous health benefits.

### **Kodo Millet**

Kodo millet (*Paspalum scrobiculatum* L) is known by many common names such as *Koden*, *Kodra*, *Harka*, *Koovaragu*, *Varagu*, *Arikelu*, *Kodua* (ICRISAT, 2020). Rich in nutrition kodo millet offer higher protein, fibre and minerals than major cereals and can be used as a good substitute for wheat and rice (Deshpande et al., 2015). Rich in phytochemicals and antioxidants it is very easily digested which makes it helpful in combating various lifestyle disorders. It even aids in decreasing joint pain and normalizing the menstruation cycle in women (Ambati and Sucharitha, 2019).

### **Teff**

Teff (*Eragrostis tef* (Zucc.) Trotter) is a small highly nutritional nutty flavored seed originated from horn of Africa. It is tolerant to stress, storage pests and grows in variety of environment making it a low risk crop. Its small size barely gives any idea about the nutritional benefits offered; Teff is a gluten free seed, rich in essential amino acids levels, have impressive contents of required minerals and crude fibre which makes it a beneficial cereal for celiac, diabetic and anemic patients (Gebru et al., 2020; Hackett, 2021).

### **Fonio**

Fonio is a small sized underutilized traditional cereal that belongs to genus *Digitaria* grown in Western Africa. There are generally two types of Fonio grains, white Fonio and black Fonio commonly known as fundi/hungry rice and iburu respectively. It usually grows on marginal lands and requires minimal input as it is adaptable to drought and less fertile soil. Nutritionally Fonio seeds provide all macronutrients such as starch, dietary fibre, proteins especially methionine and fats; micronutrients that include polyphenols, minerals like iron and B vitamin (Salahudeen and Orhevba, 2021; Zhu, 2020).



## Job's Tears

Job's tear (*Coix lacryma-Jobi L.*) a pear shaped seed with shiny dark brown to gray black hull is a member of *Graminae* family. These seeds provide phenols, flavonoids, polysaccharides, proteins, fibres, vitamins and oil on consumption all this made them well known in Chinese medications. Chemical composition of the seeds inhibits enzyme COX, synthesis of fatty acids, synthesis of liver cholesterol and offers high antioxidant, anti-inflammatory, anti-obesity activity, maintain levels of reproductive hormones, uterine contractions and maintain gut microflora (Devaraj et al., 2020).

## Chickpea

Chickpea (*Cicer arietinum L*) one of the oldest vegetarian protein sources is also known as Garbanzo beans, an important crop grown and consumed all over the world. Due to the presence of numerous health promoting components, that includes vegetable protein (all essential amino-acids except sulphur containing amino-acids), complex carbohydrate, dietary fibres, nutritionally important unsaturated fatty acids (linoleic and oleic acids), important vitamins and minerals, oligosaccharides, isoflavones, phospholipids and antioxidants, they have several potential health benefits and are considered an important part of healthy diet (Jukanti et al., 2012; Gupta et al., 2017).

## Pigeonpea

Pigeon pea or red gram (*Cajanus cajan (L.) Millspaugh*) is known by different names such as Cajan pea, no-eyed pea, and tropical green pea around the world, whereas in India it is known as red gram, tur or arhar. They are full of carbohydrates, dietary fibre, proteins (essential amino acids), vitamins and minerals (both micr and macro), which impact health in numerous ways by aiding in management of blood pressure, weight, hearth health, gives energy boast and helps in growth and development (Abebe, 2022; Saxena et al., 2010; ICRISAT, 2020).

**Table 1: Health Benefits Offered by the Crops Included Under the Criteria of Smart Food**

Name	Nutrients/ Characteristics	Health Benefits
Peal Millet	Iron and Folic Acid	Reduces chances of neural tube defects in pregnant women and helps in preventing anemia
Sorghum	Resistant Starch, Low Glycemic Index	Slows down the absorption of carbohydrates that prevent from sudden fluctuations in glucose levels
Finger Millet	Calcium Niacin	Bone strengthening, relieves joint pains and reduces the risk of bone fractures
Proso Millet	Lecithin	Pellagra, Intensify metabolism of brain cells and helps in regeneration and repairing of myelin fibre
Barnyard Millet	Low carbohydrates, High Fibre and Resistant Starch	Nature gift for diabetic and cardiovascular disease patients
Browntop Millet	Dietary Fibre	Good for people with lifestyle disease
Foxtail Millet	Magnesium	Makes it a healthy heart food
Little Millet	Rich in fiber, slow digesting carbohydrates and antioxidants	Low glycemic index that's helps in maintaining blood glucose levels and helps in body detoxification
Kodo Millet	Photochemical and antioxidant	Reduce joint and knee pain and regularize menstrual cycle
Teff	Resistant starch and high dietary fibre	Aids in blood glucose management, beneficial in diarrhea and constipation
Job's Tear	Various Phytoconstituent,	Antioxidant, anti-inflammatory, weight reduction, simulative reproductive hormones, uterine contractions and gut health

Fonio	Polysaccharides, Phenols, Flavonoids Iron and folic acid isoflavones and phytosterols,	Helps against anemia and detoxify liver and the body Limits the absorption of cholesterol
Chickpea	selenium and manganese	Support functions of liver enzymes and detoxify cancer causing substances
Pigeopea	Potassium	Prevent from cardiovascular diseases Helps in lowering blood pressure
Green Gram	Protein	Vegetarian source of lean protein that aids in weight loss by keeping you filled
Ground Nuts	Biotin and Vitamin E	Helps in releasing energy from the carbohydrates and strengthens the immune system

### Green Gram

Green gram (*Vigna radiata* (L.) Wilczek) is commonly called by names as mung bean, Chickasaw pea, moong, chiroko, Oregon pea, Chickasaw pea, and golden gram. Green pearl is the name given to the pulse because of its high nutrient content (Nair et al., 2013). Being rich in nutrients like proteins, carbohydrate, dietary fiber, vitamins, and minerals and low in fat content, makes them a lean protein source for vegetarians, helps in weight management and lowering blood pressure (Mekkara et al., 2021; ICRISAT, 2020).

### Groundnut

Groundnut also known as peanut (*Arachis hypogaea*) is an edible seed from legume family. These nutritious seeds are an important food crop by being easily available, affordable when compared to other nuts and nutritionally rich. They offer a desirable profile of lipids that is high in unsaturated and not in saturated fatty acids, rich source of protein, good amount of fiber, vitamins (biotin, niacin, thiamine), minerals (manganese, phosphorus, magnesium), carbohydrates and consumed around the world (Bonku and Yu, 2020; Suchoszek-Lukaniuk et al., 2011; ICRISAT, 2020).

### MILLETS

Millets are tiny, round seeds of small seeded grass family (*Poaceae*) with different varieties, which are widely cultivated all around the world as cereal crops for fodder and human consumption (Dayakar Rao et al., 2017). Around 27.83 million tones of millets are produced around the world (Malathi et al., 2016) and Indian millets cultivation covers an area of 12.09 hectares which produces 13.71 million tones yielding 1134kg millets per hectare. Rajasthan covers the highest area for millet cultivation (31.3%) after that Maharashtra (18.9%), Karnataka (13.3%), Uttar Pradesh (8.9%), Tamil Nadu (4.2%) and Madhya Pradesh (3.9%). Yet highest production was observed in Tamil Nadu (Rao et al., 2021).

Millets show remarkable abilities by being drought-resistant, able to grow in less fertile soil, resistant to attack of pests and diseases, harvested in less time and able to be cultivated round the year. They are among the most ancient cereals cultivated from the starting of human civilization under rainfed conditions (Sarita and Singh, 2016). Millets are nutri-cereals, as they are highly nutritious and are full of health promoting nutrients. They are full of protein, essential fatty acids, crude fibre, and excellent source of B-vitamin, minerals and polyphenols. They provide numerous health benefits by lowering blood sugar levels in diabetes, regulating blood pressure, thyroid, CVD and gluten allergies (Dayakar Rao et al., 2017).

Millets are classified into two groups, namely, major and minor / small millets. Pearl millet (*Pennisetum typhoides* L.) and Sorghum (*Sorghum bicolor* L.) are part of major millet group, whereas millets like finger millet/ragi (*Eleusine coracana* L. Gaertn),

barnyard millet (*Echinochloa frumentacea* L.), foxtail or Italian millet (*Setaria italica* L.), kodo millet (*Paspalum scrobiculatum* L.), little millet (*Panicum sumatrense* L.), proso millet (*Panicum miliaceum* L.) and brown-top millet (*Brachiaria ramosa* L. Stapf; *Panicum ramosum* L.) comes under the category of minor or small millets (Maitra, 2020).

### Pearl Millet

Pearl millet or Bajra is a fast growing vertical grass crop with a summer annual cycle of 75 to 120 days depending on the environment that can reach an average height of 1.5 to 3 m. It is a coarse grain crop with oval seeds that resembles a pearl hence got its name 'pearl millet' (Dias-Martins et al., 2018). The plant can easily adapt to cultivation system characterized by less rainfall (nearly 200-600 mm), soil with low fertility, extreme high temperatures and with stand drought much better than any other cereals and millets, which makes it a crop that can survive where other cereal crops can't (Nambiar et al., 2011). Pearl millet is primarily considered a fodder crop during summers in western regions of Rajasthan and Gujarat when there is a lack of green fodder. Rajasthan state covers highest producing area for pearl millet, followed by Uttar Pradesh, Maharashtra, Haryana, Gujarat and Madhya Pradesh. (Rao et al., 2021).

Pearl millet are even known as 'nutri-cereals' due to the excellent nutritional profile that they offer, which is comparable and even superior to most of the commonly consumed cereals (Florence et al., 2014). Pearl millet offers 360 kcal per 100 gm being consumed, making it a rich source of energy. Macronutrients content of the millet per 100 gm are 67 gm carbohydrates of which 1 gm is the dietary fibre, nearly 12 gm of protein with a good amino-acid balance and 5 gm of total fat majority of which are unsaturated fatty acids (Malik, 2015). Overall content of minerals offered is 2.3 gm/100 gm being rich source of potassium, phosphorous, magnesium, iron, zinc, copper and manganese. It is a very rich source of phytochemicals and micronutrients, which impart pearl millet with many health benefits (Nambiar et al., 2011).

**Table 2: Nutritional Content of Pearl Millet per 100 gm.**

<b>Nutrients</b>	<b>Amount</b>
Energy	350 Kcal
Protein	11.09 gm
<b>Carbohydrates</b>	62.2 gm
Total Fibre	11.8 gm
Total Free Sugar	0.81 gm
<b>Total Fat</b>	5.75 gm
Total Saturated Fatty Acids	892.25 mg
Total Monounsaturated Fatty Acids	1067 mg
Total Polyunsaturated Fatty Acids	2012 mg
<b>Ash content</b>	1.45 gm
Iron	6.94 mg
Magnesium	133.75 mg
Phosphorous	301.65 mg
Zinc	2.94 mg

Source (IFCT, 2017) / (Longvah et al., 2017)

The possible health benefits offered by pearl millets comprises of an aid that may help in rising Hb levels due to high iron (8 mg/100 gm) and zinc (3.1 mg/100 gm) content, may give relief in constipation, help in lowering blood glucose levels (low glycemic index), an alternative for people suffering from celiac disease (gluten free), diarrhea as contain lactic acid bacteria that provide

a probiotic treatment, helps in growth of bones and their development as it have a good amount of phosphorous and calcium, presence of flavonoids, phenolic omega 3 fatty acids may provide protection against non-communicable diseases, the ability of bajra to maintain its alkaline property helps it in providing protection against stomach ulcers (Patni and Agrawal, 2017).

Pearl millet has every quality that makes it an intelligent choice among available major cereals in the market. Offering high nutritional qualities and health benefits efforts should be made for changing the attitude of people towards the underutilized crop and increasing its consumption among all the groups of people. It can be easily included in the daily lifestyle and meal pattern of any individual. Pearl millet can be easily incorporated in the chapatti flour, porridge formation, baking of breads and cookies, making of malted drinks and many more. Hence diversifying our daily meals with it would enhance the nutritional profile of the meals and benefit our health.

## CONCLUSION

Smart food is an initiative started by ICRISAT with an aim to diversify the staples to enhance the nutritional quality of the meal consumed. Diversifying the diet with underutilized neglected crops of the areas can bring a great impact by benefiting health, being good to planet and farmers as well. Millets are comparably same or more nutritional dense to majorly consumed cereals offering better macro and micro nutrient composition. Consuming millets with the combination of legumes complements with the deficient amino acids providing all the required essential amino acids by the body. Pearl millet is one of the many crops included under smart food criterion, which is full of nutrients and health benefits. Its consumption and incorporation is easy and palatable and can be incorporated in our daily diets. There is an urgent need to enhance the awareness and knowledge among the people regarding the utilization of these wonderful nutritional crops. Sufficient efforts should be made in order to bring these neglected crops among the staple and enhance the area of their utilization. In future such ways should be focused on that can enhance their consumption as well as their inclusion in the industrial manufacturing of ready to use food products.

## REFERENCES

- Ambati, K. and Sucharitha, K.V. 2019. Millets-review on nutritional profiles and health benefits. *International Journal of Recent Scientific Research*, 10(7): 33943-33948.
- Anitha, S., Kane-Potaka, J., Tsusaka, T.W., Tripathi, D., Upadhyay, S., Kavishwar, A., Jalagam, A., Sharma, N. and Nedumaran, S. 2019. Acceptance and impact of millet-based mid-day meal on the nutritional status of adolescent school going children in a peri urban region of Karnataka State in India. *Nutrients*, 11(9): 1-16.
- Bonku, R. and Yu, J. 2020. Health aspects of peanuts as an outcome of its chemical composition. *Food Science and Human Wellness*, 9(1): 21-30.
- Chandra, D., Chandra, S. and Sharma, A. K. 2016. Review of Finger millet (*Eleusine coracana* (L.) Gaertn): a powerhouse of health benefiting nutrients. *Food Science and Human Wellness*, 5(3): 149-155.
- Das, S., Khound, R., Santra, M. and Santra, D.K. 2019. Beyond bird feed: Proso millet for human health and environment. *Agriculture*, 9(3): 1-19.

- Dayakar Rao, B., Bhaskarachary, K., Arlene Christina, G.D., Sudha Devi, G., Vilas, A.T. and Tonapi, A. 2017. Nutritional and health benefits of millets. ICAR\_Indian Institute of Millets Research (IIMR), Rajendranagar, Hyderabad: 1-112.
- de Morais Cardoso, L., Pinheiro, S.S., Martino, H.S.D. and Pinheiro-Sant'Ana, H.M. 2017. Sorghum (*Sorghum bicolor* L.): Nutrients, bioactive compounds, and potential impact on human health. *Critical Reviews in Food Science and Nutrition*, 57(2): 372-390.
- Deshpande, S.S., Mohapatra, D., Tripathi, M.K. and Sadvatha, R.H. 2015. Kodo millet-nutritional value and utilization in Indian foods. *Journal of Grain Processing and Storage*, 2(2): 16-23.
- Devaraj, R.D., Jeepipalli, S.P. and Xu, B. 2020. Phytochemistry and health promoting effects of Job's tears (*Coix lacryma-jobi*) - A critical review. *Food Bioscience*, 1(34): 100537: 1-10.
- Devi, P.B., Vijayabharathi, R., Sathyabama, S., Malleshi, N.G. and Priyadarshini, V.B. 2014. Health benefits of finger millet (*Eleusine coracana* L.) polyphenols and dietary fiber: a review. *Journal of Food Science and Technology*, 51: 1021-1040.
- Diama, A., Anitha, S., Kane-Potaka, J., Htut, T.T., Jalagam, A., Kumar, P., Worou, O.N. and Tabo, R. 2020. How the smart food concept can lead to the transformation of food systems and combat malnutrition: different approaches in Africa, globally, and a case study from Myanmar with lessons learnt for creating behavior change in diets. In *Hidden Hunger and the Transformation of Food Systems*, 121: 149-158. Karger Publishers.
- Dias-Martins, A.M., Pessanha, K.L.F., Pacheco, S., Rodrigues, J.A.S. and Carvalho, C.W.P. 2018. Potential use of pearl millet (*Pennisetum glaucum* (L.) R. Br.) in Brazil: Food security, processing, health benefits and nutritional products. *Food Research International*, 109: 175-186.
- Dida, M.M. and Devos, K.M. 2006. Finger millet. *Cereals and Millets*, 333-343.
- Dube, M., Nyoni, N., Bhebhe, S., Maphosa, M. and Bombom, A. 2021. Pearl Millet as a Sustainable Alternative Cereal for Novel Valueadded Products in Sub-Saharan Africa: A Review.
- Florence, S.P., Urooj, A., Asha, M.R. and Rajiv, J. 2014. Sensory, physical and nutritional qualities of cookies prepared from pearl millet (*Pennisetum typhoideum*). *Journal of Food Processing and Technology*, 5(10): 1.
- Gebru, Y.A., Sbhatu, D.B. and Kim, K.P. 2020. Nutritional composition and health benefits of teff (*Eragrostis tef* (Zucc.) Trotter). *Journal of Food Quality*, 2020: 1-6.
- Gupta, R.K., Gupta, K., Sharma, A., Das, M., Ansari, I.A. and Dwivedi, P.D. 2017. Health risks and benefits of chickpea (*Cicer arietinum*) consumption. *Journal of Agricultural and Food Chemistry*, 65(1): 6-22.
- Habiyaremye, C., Matanguihan, J.B., D'Alpoim Guedes, J., Ganjyal, G.M., Whiteman, M.R., Kidwell, K.K. and Murphy, K.M. 2017. Proso millet (*Panicum miliaceum* L.) and its potential for cultivation in the Pacific Northwest, US: a review. *Frontiers in Plant Science*, 1961.


- Hackett, J. 2021. What is Teff? Buying, cooking, and recipes. The Spruce Eats. <https://www.thespruceeats.com/teff-gluten-free-whole-grain-3376844>
- ICRISAT. 2020. Millets and sorghum. [www.smart.org](http://www.smart.org). <https://www.smartfood.org/smart-food-foxtail-millet/>
- ICRISAT. 2020. Millets and sorghum. [www.smart.org](http://www.smart.org). <https://www.smartfood.org/smart-foods/pigeon-pea/>
- ICRISAT. 2020. Millets and sorghum. [www.smart.org](http://www.smart.org). <https://www.smartfood.org/smart-foods/green-gram/>
- ICRISAT. 2020. Millets and sorghum. [www.smart.org](http://www.smart.org). <https://www.smartfood.org/smart-food-proso-millet/>
- ICRISAT. 2020. Millets and sorghum. [www.smart.org](http://www.smart.org). <https://www.smartfood.org/smart-food-barnyard-millet/>
- ICRISAT. 2020. Millets and sorghum. [www.smart.org](http://www.smart.org). <https://www.smartfood.org/smart-food-kodo-millet/>
- ICRISAT. 2020. Millets and sorghum. [www.smart.org](http://www.smart.org). <https://www.smartfood.org/smart-food-little-millet/>
- ICRISAT. 2020. Millets and sorghum. [www.smart.org](http://www.smart.org). <https://www.smartfood.org/smart-foods/groundnut/>
- Jukanti, A.K., Gaur, P.M., Gowda, C.L.L. and Chibbar, R.N. 2012. Nutritional quality and health benefits of chickpea (*Cicer arietinum* L.): a review. *British Journal of Nutrition*, 108(S1): S11-S26.
- Kane-Potaka, J. 2018. Breaking the food-system divide with Smart Food: good for you, the planet and the farmer. In: Proceedings of the Crawford Fund 2018 Annual Conference, 13–14 August 2018, Parliament House, Canberra ACT, Australia. pp. 57-61.
- Kane-Potaka, J., Anitha, S., Tsusaka, T.W., Botha, R., Budumuru, M., Upadhyay, S., Kumar, P., Mallesh, K., Hunasgi, R., Jalagam, A.K. and Nedumaran, S. 2021. Assessing millets and sorghum consumption behavior in urban India: A large-scale survey. *Frontiers in Sustainable Food Systems*, 5: 1-12
- Kane-Potaka, J and Poole, N and Diama, A and Kumar, P and Anitha, S and Akinbamijo, O. 2021. The smart food approach: the importance of the triple bottom line and diversifying staples. In: *Orphan Crops for Sustainable Food and Nutrition Security*. Earthscan from Routledge, London, pp. 327-334.
- Kaur, H. and Sharma, S. 2020. An overview of Barnyard millet (*Echinochloa frumentacea*). *Journal of Pharmacognosy and Phytochemistry*, 9(4): 819-822.
- Kuraz Abebe, B. 2022. The dietary use of pigeon pea for human and animal diets. *The Scientific World Journal*, 2022: 1-12
- Longvah, T., Anantaji, I., Bhaskarachary, K., Venkaiah, K. and Longvah, T. 2017. Indian food composition tables. Hyderabad: National Institute of Nutrition, Indian Council of Medical Research, pp. 2-58.
- Maitra, S. 2020. Potential horizon of brown-top millet cultivation in drylands: A review. *Crop Research*, 55(1and2): 57-63.

- Malathi, B., Appaji, C., Reddy, G.R., Dattatri, K. and Sudhakar, N. 2016. Growth pattern of millets in India. *Indian Journal of Agricultural Research*, 50(4): 382-386.
- Malik, S. 2015. Pearl millet-nutritional value and medicinal uses. *International Journal of Advance Research and Innovative Ideas in Education*, 1(3): 414-418.
- Mannuramath, M., Yenagi, N. and Orsat, V. 2015. Quality evaluation of little millet (*Panicum miliare*) incorporated functional bread. *Journal of Food Science and Technology*, 52: 8357-8363.
- Mohapatra, S.R., Panwar, N.S., Kumar, R. and Kumar, A. 2021. Quality enhancement of nutri-cereal browntop millet through agronomic practices. *Current Science*, 120(3): 468.
- Nair, R.M., Yang, R.Y., Easdown, W.J., Thavarajah, D., Thavarajah, P., Hughes, J.D.A. and Keatinge, J.D.H. 2013. Biofortification of mungbean (*Vigna radiata*) as a whole food to enhance human health. *Journal of the Science of Food and Agriculture*, 93(8): 1805-1813.
- Nambiar, V.S., Dhaduk, J.J., Sareen, N., Shahu, T. and Desai, R. 2011. Potential functional implications of pearl millet (*Pennisetum glaucum*) in health and disease. *Journal of Applied Pharmaceutical Science*, 1(10): 62-67.
- OBE, N.P. and Kane-Potaka, J., The smart food triple bottom line—starting with diversifying staples. TAA Executive Committee, 21.
- Poole, N and Kane-Potaka, J. 2020. The smart food triple bottom line – starting with diversifying staples. *Agriculture for Development*, 41: 21-23.
- Rani, S., Singh, R., Sehrawat, R., Kaur, B.P. and Upadhyay, A. 2018. Pearl millet processing: a review. *Nutrition and Food Science*, 48(1): 30-44.
- Saini, S., Saxena, S., Samtiya, M., Puniya, M. and Dhewa, T. 2021. Potential of underutilized millets as Nutri-cereal: an overview. *Journal of Food Science and Technology*, 1-13.
- Salahudeen, H.O. and Orhevba, B.A. 2021. Nutritional Composition, Health Benefits and Utilization of Fonio (*Digitaria exilis*) Grains: A Review. Pan African Society for Agricultural Engineering and The Nigerian Institution of Agricultural Engineers (A Division of the Nigerian Society of Engineers). 2021 Virtual International Conference.
- Sarita, E.S. and Singh, E. 2016. Potential of millets: nutrients composition and health benefits. *Journal of Scientific and Innovative Research*, 5(2), 46-50.
- Saxena, K.B., Kumar, R.V. and Sultana, R. 2010. Quality nutrition through pigeonpea-a review. *Health*, 2(11), 1335-1344.
- Smart Food: The initiative. 2020. <https://www.smartfood.org/the-initiative/>

- Sravani, M., Kuna, A., Devi, S.S., Rao, K.S. and Gayatri, B. 2020. Effect of processing on the Physico-chemical properties of Browntop millet (*Brachiaria ramosa*). *Journal of Pharmacognosy and Phytochemistry*, 9(5): 1480-1483.
- Suchoszek-Łukaniuk, K., Jaromin, A., Korycińska, M. and Kozubek, A. 2011. Health benefits of peanut (*Arachis hypogaea* L.) seeds and peanut oil consumption. In *Nuts and seeds in health and disease prevention*, Academic Press, pp. 873-880.
- Ugare, R., Chimmad, B., Naik, R., Bharati, P. and Itagi, S. 2014. Glycemic index and significance of barnyard millet (*Echinochloa frumentacea*) in type II diabetics. *Journal of Food Science and Technology*, 51: 392-395.
- Verma, S., Srivastava, S. and Tiwari, N. 2015. Comparative study on nutritional and sensory quality of barnyard and foxtail millet food products with traditional rice products. *Journal of Food Science and Technology*, 52(8): 5147-5155.
- Xiong, Y., Zhang, P., Warner, R.D. and Fang, Z. 2019. Sorghum grain: From genotype, nutrition, and phenolic profile to its health benefits and food applications. *Comprehensive Reviews in Food Science and Food Safety*, 18(6): 2025-2046.
- Zhu, F. 2020. Fonio grains: Physicochemical properties, nutritional potential, and food applications. *Comprehensive Reviews in Food Science and Food Safety*, 19(6): 3365-3389.



© The Author(s)

This is an  Open Access article licensed under a Creative Commons license: Attribution 4.0 International (CC-BY).



## KISSING DISEASE & HOMOEOPATHY

### **Dr Ravi Jain**

Assistant Professor, Department of Practice of Medicine, Faculty of Homoeopathic Science, JVVU,  
Jaipur

### **Dr. Arti Bansal**

Asso. Prof. & HOD – Deptt of Pathology, Faculty of Homeopathic Science, Jayoti Vidyapeeth  
Women's University, Jaipur

### **Dr. Hemant Vyas**

Asso. Prof. & HOD – Deptt of Surgery, Faculty of Homeopathic Science, Jayoti Vidyapeeth Women's  
University, Jaipur

### **Dr Astha Sikarwar**

Assistant. Prof. – Dept. of Organon of Medicine & Homoeopathic Philosophy (FHS - Jayoti Vidyapeeth  
Women's University, Jaipur

### **Dr. Gaurav Gupta**

Asst. Prof. – Dept. of Forensic Medicine & Toxicology Faculty of Homeopathic Science, Jayoti  
Vidyapeeth Women's University, Jaipur

**Abstract:** Kissing disease or Infectious mononucleosis or glandular fever is an infective disease caused by Epstein Barr Virus. It is characterized by pharyngitis, cervical lymphadenopathy, & Lymphocytosis. It is more common among young adults between 15-19 Years of age. Incidence is around 500 cases per 100000 population<sup>1</sup>. Diagnosis is done by immunofluorescence test. Treatment consists of supportive measures and analgesia.

**Keywords:** Mono, Lymphadenopathy, immunofluorescence, antiviral

### **Introduction**

Infectious mononucleosis or mono is a viral disease caused by Epstein barr virus affecting glands of the body. It is also known as glandular fever. The disease is characterized by pharyngitis, cervical lymphadenopathy, & lymphocytosis. The disease is common in young adults of age group 15-19 Years of age and upper socio economic group. It is spread by oropharyngeal secretions of asymptomatic sero positive carriers.

After entering the body of the affected individual the virus infects the epithelium of the oropharynx and salivary glands & B cells in tonsillar crypts.

The B cells undergo polyclonal activation. The reactive T cells proliferate and direct against Epstein Barr Virus antigen during acute infection.

For controlling the infection Cellular immunity is more important then humoral immunity.

The severity of the disease can be assessed by presence of CD8 + T lymphocytes & presence of Epstein barr virus DNA in the blood. The incubation period of the disease varies from 4 to 6 weeks.

### **Clinical Features**

Most of the children and young adults affected with EBV are asymptomatic. Some patients present with mild pharyngitis with or without Tonsillitis. The clinical features depends upon the age of the patient and the immune status. The prodromal symptoms includes fatigue, malaise and myalgia for 1 to 2 weeks

before fever begins. The fever is of mild character low grade and present for 1 to 2 weeks of illness but may persist for more than 1 month. Splenic enlargement is more prominent in 2<sup>nd</sup> or 3<sup>rd</sup> week.

During first 2 weeks the disease is characterized by presence of exudative pharyngitis with painful and movable symmetric enlargement of posterior cervical lymph nodes.

The exudates in pharyngitis resembles streptococcal infection. Morbilliform and popular rash develops in around 5% of the cases.

Immunocompromised patients can develop lymphoproliferative disease.

The clinical features can be summarized among signs and symptoms as:

**Symptoms:**

Sore Throat

Malaise

Headache

Abdominal Pain

Nausea & Vomiting

Chills

**Signs:**

Lymphadenopathy

Fever

Pharyngitis

Tonsillitis

Splenomegaly

Hepatomegaly

Rash

Periorbital Oedema

Palatal Enanthem

Jaundice

**Investigations**

WBC count is raised with peaks at 10000-20000/Micro litre.

Lymphocytosis with >10% atypical lymphocytes.

Low grade neutropenia and thrombocytopenia during first months of illness.

Abnormal liver function in around 90% of individuals.

Increased concentration of serum bilirubin in around 40% of the cases.

**Diagnosis**

Diagnosis is done by serological testing for the presence of Epstein barr virus done by immunofluorescence testing.

Acute infection is characterized by presence of IgM antibodies against viral antigen.

PCR analysis is helpful in many cases.

**Complications**

Although mononucleosis is a self limiting disease but deaths can occur due to certain complications like splenic rupture, central nervous system complications, upper airway obstruction, or bacterial superinfection.

**Treatment**

The disease is treated by supportive measures which includes adequate rest and administration of

analgesics.

Administration of glucocorticoids to prevent airway obstruction and other complications.

Aspirin gargles to relieve sore throat.

### **Homoeopathic Management**

Homoeopathic treatment is based on symptom similarity where the medicines are prescribed after complete case taking, Analysis & evaluation and after repertorization of the case keeping in mind the miasmatic background. A single simple and minimum dose of the medicine is prescribed to the patient. Although medicines are also prescribed on the basis of similarity of peculiar, queer, rare and strange symptoms which not only saves the time of the physician but also helps in providing quick and effective relief to the patient.

### **Common medicines prescribed in the case of infectious mononucleosis includes:**

**Aconite Napellus:** Throat is dry, red, constricted with prickling, burning and stinging pain. Tonsils are dry and swollen.

**Apis Mellifica:** Constricted stinging pain. Throat swollen inside & out. Tonsils swollen, puffy and fiery red. Ulcers on tonsils. Sensation of fishbone in throat.

**Arsenicum album:** Throat swollen, oedematous, constricted and burning. Unable to swallow. Diphtheric membrane in throat. Fever with great periodicity and adynamia. Paroxysms incomplete with marked exhaustion.

**Baryta Carb:** Takes cold easily. Stitching and smarting pain in throat. Tonsils inflamed with swollen veins. Stinging pain in pharynx or tonsils.

**Belladonna:** Throat is dry as if glazed, angry looking, congested. Tonsils enlarged. Throat feels constricted, difficult deglutition. Fever with swollen glands. No thirst with fever.

**Hepar Sulph:** Plug like sensation in throat. Quinsy with impending suppuration. Sticking pain in throat extending to ears on swallowing.

**Kalium Iodatum:** Glandular swelling. Remitting fever going off in nightly perspiration.

**Lachesis Mutus:** Throat is dry, intensely swollen. Pain aggravated by hot drinks. Chronic sore throat with hawking of mucus. Tonsils purplish.

**Lycopodium Clavatum:** Dryness of throat without thirst. Inflammation of throat with stitches on swallowing. Ulceration of tonsils.

**Merurius Solubilis:** Sore throat with raw smarting, burning pain. Stitching into ear on swallowing.

**Phosphorus:** Hoarseness worse evening. Larynx very painful. Clergyman's sore throat. Violet tickling in larynx while speaking. Can not talk on account of pain in larynx.

**Phytolacca Decandra:** Throat is dark, red, bluish. Sensation of lump in throat. Throat feels rough, narrow, hot. Pain in root of tongue extending to ears.

**Rhus toxicodendron:** Soreness of throat with swollen glands. Sticking pain on swallowing. Fever with adynamia. Restless and trembling.

**Silicea Terra:** Periodical quinsy. Cold settles in the throat. Stinging pain on swallowing. Hard, cold swelling of cervical gland.

**Sulphur:** Burning redness and dryness of throat. Ball seems to rise and close pharynx. Remittent type of fever.

**Conclusion:** Infectious mononucleosis or kissing disease is an infectious disease affecting young adults these days. Due to the affects of social media and western movies the disease is prevalent among the young generation. The disease is characterized by variety of glandular affections and carry a lot of complications which can even lead to the death of the patient. With awareness about the disease and early management the complications of the disease can be prevented. Homoeopathy offers a great relief

in such viral diseases preventing complications at a very early stage leading to early recovery of the case and reducing a load of carrier individuals among the general population.

Reference:

- 1 <http://cfps.org.sg/assets/CPG/SIDS-Adult-Vaccine-Handbook-2020.pdf>
2. Homoeopathic Materia Medica & Repertory by William Boericke, B Jain Publication.
- 3 Harrison's Principles of internal Medicine by Jameson, Anthony S Fauci, Dennis L Kasper 20<sup>th</sup> Edition Published by Mc Graw Hill Professional.
- 4 Harrison Manual of Medicine by Jameson, Fauci, Kasper. Published by Mc Graw Hill, 20<sup>th</sup> Edition.
5. Davidson's Principles and practice of Medicine by Walker. Elsevier Publication.
6. Organon of Medicine by B K Sirkar, B Jain Publication

## SCHIZOPHRENIA, A PSYCHOTIC DISORDER – HAHNEMANIAN PERSPECTIVE

### Dr. Ravi Jain

M.D (Hom.) Assistant. Prof. – Dept. of Practice of Medicine (FHS - Jayoti Vidyapeeth Women's University, Jaipur

### Dr Hemant Vyas

M.D (Hom.) Asso. Prof. & HOD – Dept. of Surgery (FHS - Jayoti Vidyapeeth Women's University, Jaipur

### Dr Astha Sikarwar

Assistant. Prof. – Dept. of Organon of Medicine & Homoeopathic Philosophy (FHS - Jayoti Vidyapeeth Women's University, Jaipur

### Dr Pramila Kajla

Assistant Professor, Department of Physiology & Biochemistry (FHS - Jayoti Vidyapeeth Women's University, Jaipur)(FHS - Jayoti Vidyapeeth Women's University, Jaipur

### Dr. Mona Pathak

Assistant Professor, Department of Pathology, (FHS - Jayoti Vidyapeeth Women's University, Jaipur

**Abstract:** The term schizophrenia is Greek in origin, and in the Greek meant "*split mind*". Schizophrenia affects around 1% of the world's population and it's really an alarming figure. Curability is limited in allopathic system of medicine and so it's time to demonstrate homoeopathy in psychotic disorders like schizophrenia and to help the humanity with its benefits.

**Keywords:** schizophrenia, homoeopathy, mental diseases

### Introduction

Schizophrenia is a group of heterogeneous symptoms characterized by disturbance in language, perception, thinking, social activity, affect, and volition. The syndrome commonly begins in late adolescence and has an insidious onset. Schizophrenia is associated with suicide, with up to 1 in 10 patients taking their own lives.<sup>1</sup>

Many studies have been done on schizophrenia and found that the curability is limited in allopathic system but as far as homoeopathy is concerned it treats the person as a whole, which means it deals with the person's body, mind, emotions and his diseased condition. It works on the person's own vital force towards equilibrium and healing. It also influences the brain chemistry and assists the patient in resuming psychological strength. The homoeopathic understanding of health considers that body and mind are dynamically interconnected and that both directly influence each other.

**History of schizophrenia:** This disorder was first time named "Dementia Praecox (premature dementia)" by Emil Kraepelin in 1896. Later Eugen Bleuler in 1911 renamed dementia praecox as "Schizophrenia" (meaning mental splitting). In 1959 Kurt Schneider described symptoms which were of great significance in making a clinical diagnosis of schizophrenia.<sup>2</sup>

**Epidemiology:** The spread of schizophrenia is universal. About 1% of the population world-wide is

affected. This disorder is more common in males compared to that of females. The incidence of schizophrenia is noticeably genetic. The children of one of the affected parent have approximately 10% risk of having schizophrenia, but approximately 50% of the monozygotic (identical) twins get affected with it.<sup>3</sup>

**Aetiology:**<sup>3</sup>

- Genetic contribution, probably involving many susceptibility genes
- Environmental risk factors include obstetric complications and urban birth
- Abnormalities in brain development
- Social stress
- Drugs which increases dopamine turnover and sensitivity

**Signs and Symptoms:** a gradual change in the person's personality is an indication of the onset of schizophrenia

- **Hallucinations-** The person has sensory perceptions without a stimulus. This may be visual, auditory, gustatory, tactile or olfactory.
- **Delusions-** These are false beliefs that conflict with the reality. These may be in the form of suspiciousness, directed against one or many people.
- **Other essential symptoms** to make a diagnosis of schizophrenia include disorganised speech or behaviour and negative symptoms like affective flattening, amotivation, alogia and apathy
- **Cognitive impairment** is characterised by deficits in attention, learning, memory and executive functions.<sup>4</sup>

**International Classification of Diseases WHO (ICD-10)** has given diagnostic guidelines

- Duration of symptoms should be at least one month or more
- One very clear-cut symptom or two or more symptoms if symptoms are not very clear
  - (a) Thought echo, thought insertion or thought withdrawal and thought broadcasting
  - (b) Delusions of control, influence, or passivity; or specific thoughts, actions or sensation, delusional perception
  - (c) Hallucination voices
  - (d) Persistent delusions
  - (e) Persistent hallucinations
  - (f) Breaks in interpolations in train of thoughts, resulting in incoherence or irrelevant speech or neologism
  - (g) Catatonic behaviour such as excitement, posturing, or waxy-flexibility, negativism, stupor
  - (h) Negative symptoms such as marked apathy, paucity of speech, blunting or incongruity of emotional responses, usually resulting into social withdrawal<sup>4</sup>

**Subtypes of Schizophrenia:** Several subtypes of schizophrenia, based on the clinical picture are-

- **Paranoid type:** Delusions and auditory hallucinations are present.
- **Catatonic type:** The subjects are mostly immobile or exhibit purposeless movements.
- **Simple schizophrenia:** Insidious or progressive development of prominent negative symptoms
- **Undifferentiated schizophrenia:** Psychotic symptoms are present but are without sufficient symptoms to meet the criteria for any of subtypes
- **Hebephrenic schizophrenia:** Where thought disorder and flat affect both are present

- **Residual schizophrenia:** Prominent negative symptoms and positive symptoms are present at low intensity<sup>4</sup>

**Treatment:** The goals of care are to identify the illness early, treat the symptoms, prevent relapses and reintegrate the ill person in the community. The treatment of schizophrenia has three major components. First, there are medications to relieve symptoms and prevent relapse. Second, education and psychosocial interventions assist patients and families cope with the illness. Third, rehabilitation helps patients reintegrate into the community and regain occupational functioning.

- **Medical Treatment:** Anti-psychotic drugs help control acute symptoms and some symptoms of the chronic state too. Occasionally, electroconvulsive therapy or shock treatment (ECT) is given during an acute phase of schizophrenia.
- **Psychosocial Rehabilitation:** Psychosocial rehabilitation is an important component in the management of schizophrenia. It is a set of techniques aimed at reducing symptoms and decrease impact of illness, improve skills and capability of the person.<sup>4</sup>

#### **Prognosis:**

- Good prognosis –acute or abrupt onset
  - more than 35 years of age
  - Presence of stressor
  - predominant positive symptoms<sup>2</sup>
- Poor prognosis – insidious or gradual onset
  - less than 20 years of age
  - predominant negative symptoms
  - family history of schizophrenia<sup>2</sup>

#### **Dr Hahnemann as a psychiatrist**

In 1792, the Duke Ernst Von Sachsen-Gotha have heard about the good reputation of Samuel Hahnemann as a physician, and about his intention to devote himself to this kind of work, placed a wing of his hunting cottage. Being now provided with a chance of treating the insane under ideal conditions, Hahnemann acknowledged that for several years previously he had made a special study of “diseases of the most lingering and hopeless nature generally, and of hypochondria and insanity in particular.”

The patient was the one who had been suggested for treatment by the Duke, Klockenbring by name. This man was the author of highly susceptible disposition, having become insane through a malevolent attack made on him, apparently without any justification by a poet. His family physician in Hanover had done all in his potential to cure the patient. Alas in vain! Despite there was a clear interval at times, the fury of the illness was soon redoubled. In June 1792 Klockenbring was brought with an appropriate escort to Georgenthal. He kept on rambling and was excited for a quarter of an hour at a time. At one minute he spoke as a judge and at another he would recite as Agamemnon. He used to destroy anything that came to hand at that period. For the first week Hahnemann just observed the patient without giving any medical treatment till February of the following year he then treated him both psychically and by medicine finally he was restored. There was, further, no relapse, though Klockenbring’s death two years after his discharge was preceded by marked apathy.<sup>5</sup>

**Homoeopathic Approach:** As stated by Dr. Hahnemann, the mental diseases fall under chronic disease as *one sided disease (aphorism 210)*. To treat such conditions, the symptoms of the altered state of mind and disposition (aphorism 210), are to be observed carefully by the physician and to be taken from the patient's attendants beside that the other symptoms like physical generals, past and family history of patient, any drug abuse, his domestic position, social relations, occupational stress, symptoms of altered behavior in his childhood, parental disharmony, any birth trauma or any maternal stress during her pregnancy are to be taken into consideration.

The medicine prescribed must be capable of producing strikingly similar symptoms and especially an analogous disorder of mind and disposition (aphorism 220). Whatever the name of illness, the symptoms plays an important role in homoeopathic prescribing.<sup>6</sup>

Aphorism 215 : “Almost all so called mental and emotional diseases are nothing more than corporeal diseases in which the symptoms of derangement of mind and disposition peculiar to each of them is increased, while the corporeal symptoms decline”<sup>7</sup>

**Miasmatic analysis:** As stated by Dr. Hahnemann the mental diseases falls under the psora miasm. In aphorism 210, 222, 228 mental diseases are said to be psoric in origin and to be treated with antipsoric medicines.

**Treatment:** Dr. Hahnemann since ages described the treatment of mental diseases in aphorisms 210-230 which includes supportive psychotherapy and constitutional antipsoric medicine.

➤ Treatment of chronic mental diseases

In aphorism 220 he states that “thus constructed the complete picture of the disease, for which, in order to effect the homeopathic cure of the disease, a medicine capable of producing strikingly similar symptoms, and especially an analogous disorder of the mind, must be sought for among the antipsoric remedies, if the psychical disease have already lasted sometime.”<sup>7</sup>

➤ Treatment of acute mental diseases

In aphorism 221 he states that “If, however, insanity or mania have suddenly broken out as an acute disease in the patient's ordinary calm state, although it almost always arises from internal psora, like a flame bursting forth from it, yet when it occurs in this acute manner it should not be immediately treated with antipsorics, but in the first place with remedies indicated for it out of the other class of proved medicaments in highly potentized, minute, homeopathic doses, in order to subdue it so far that the psora shall for the time revert to its former latent state, wherein the patient appears as if quite well.”<sup>7</sup>

In aphorism 222 he states “such a patient, who has recovered from an acute mental or emotional disease by the use of these non-antipsoric medicines, should never be regarded as cured; on the contrary, no time should be lost in attempting to free him completely, by means of a prolonged antipsoric treatment”<sup>7</sup>

In aphorism 223 he states that “if the antipsoric treatment be omitted, then we may almost assuredly expect, from a much slighter cause than brought on the first attack of the insanity, the speedy occurrence of a new and more lasting and severe fit”<sup>7</sup>

**Attribute of physician while taking psychotic case:** Dr. Hahnemann told us how a physician should act or conduct himself while taking a psychotic case in aphorisms 228 and 229.

(a) To furious mania – we must oppose calm intrepidity and cool, firm resolution

(b) To doleful (expressing sorrow), querulous (complaining in whining manner) lamentation – a mute display of commiseration (the feeling of expression of pity and sorrow) in looks and gestures.



- (c) To senseless chattering – a silence not wholly inattentive
- (d) To disgusting and abominable conduct (causing disgust or hatred) – and to conversation of a similar character – total inattention.
- (e) We must merely endeavor to prevent the destruction and injury of surrounding objects, without reproaching the patient for his acts
- (f) Everything must be arranged in such a way that the necessity for any corporeal punishments and tortures whatever may be avoided.
- (g) Contradiction, eager explanations, rude corrections and invectives, as also weak, timorous yielding, are quite out of place with such patients; they are equally pernicious modes of treating mental and emotional maladies.
- (h) The physician and keeper must always pretend to believe them to be possessed of reason.
- (i) All kinds of external disturbing influences on their senses and disposition should, if possible, be removed; there are no amusements for their clouded spirit, no salutary distractions.<sup>7</sup>

### **Homoeopathic Medicines for Schizophrenia**

The treatment of a case of Schizophrenia should be done on the basis of individuality of the person after complete case taking administering the dose based on Homoeopathic principles of single, simple minimum dose sufficient enough to produce effective change in the nature of the individual curatively. Some common medicines indicated in Schizophrenia with their indications includes:

1. **Absinthium:** Sudden and severe giddiness, delirium with hallucinations and loss of consciousness. Nervous excitement and sleeplessness. Hallucinations. Frightful visions. Loss of memory. Forgets what has recently happened. Wants nothing to do with anybody. Brutal.
2. **Anacardium Orientale:** impaired memory, depression, and irritability; diminution of senses - smell, sight, hearing. Fear of examination in students. Aversion to work; lacks self-confidence; irresistible desire to swear and curse. Fixed ideas. Hallucinations; thinks he is possessed of two persons or wills. Anxiety when walking, as if pursued. Profound melancholy and hypochondriasis, with tendency to use violent language. Brain-fag. Absent mindedness. Very easily offended. Malicious; seems bent on wickedness. Lack of confidence in himself or others. Suspicious. Clairaudient, hears voices far away or of the dead. Senile dementia. Absence of all moral restraint.
3. **Baryta Carbonica:** Child backward mentally and physically dwarfish. Diseases of old men when degenerative changes begin. Loss of memory, mental weakness. Irresolute. Lost confidence in himself. Senile dementia. Confusion. Bashful. Aversion to strangers. Childish; grief over trifles.
4. **Belladonna:** -Patient lives in a world of his own, engrossed by specters and visions and oblivious to surrounding realities. Visual hallucinations. He is acutely alive and crazed by a flood of subjective visual impressions and fantastic illusions. Hallucinations; sees monsters, hideous faces. Delirium; frightful images; furious; rages, bites, strikes; desire to escape. Loss of consciousness. Disinclined to talk. Perversity, with tears. Acuteness of all senses. Changeableness.
5. **Hyoscyamus Niger:** Disturbs the nervous system profoundly. mania of a quarrelsome and obscene character. Inclined to be unseemly and immodest in acts, gestures and expressions. Very talkative, and persists in stripping herself, or uncovering genitals. Is jealous, afraid of being poisoned. Its symptoms also point to weakness and nervous agitation. very suspicious. Talkative, obscene, lascivious mania, uncovers body; jealous, foolish. Great hilarity; inclined to laugh at

- everything. Delirium, with attempt to run away. Low, muttering speech; constant carphologia, deep stupor.
6. **Nux Moschata:** Strange feeling, with irresistible drowsiness. General inclination to become unconscious during acute attacks. Changeable; laughing and crying. Confused, impaired memory. Bewildered sense, as in a dream. Thinks she has two heads.
  7. **Nux Vomica:** - Very irritable: sensitive to all impressions. Ugly, malicious. Cannot bear noises, odors, light, etc. Does not want to be touched. Time passes too slowly. Even the least ailment affects her greatly. Disposed to reproach others. Sullen, fault-finding. Irritable, nervous system, hypersensitive and over-impressionable.
  8. **Pulsatilla Pratensis:** Mild, gentle yielding disposition. Sad cries readily. Weeps when talking, changeable, contradictory. Timid, irresolute. Fear in the evening of being alone, ghosts. Likes sympathy. Easily discouraged. Religious melancholy. Highly emotional.
  9. **Staphysagria:** Nervous affection with marked irritability. Impetuous, violent outbursts of passion, hypochondriacal, sad. Very sensitive to what others say about her. Dwells on sexual matters. Prefers solitude. Peevish. Child cries for many things and refuses them when offered.
  10. **Veratrum album:** Behavior disorder- schizophrenia. Melancholy, with stupor and mania. Sits in a stupid manner, notices nothing. Sullen indifference. Frenzy of excitement; shrieks, curses. Aimless wandering from home. Delusions of impending misfortunes. Mania, with a desire to cut and tear things.

**Conclusion:** Homoeopathic treatment is based on individualistic and holistic approach so, it does not treat the particular diseases but treats interior of man. Homoeopathy is based on the fact that the person emotional and mental life experience cannot be isolated and that prolonged, unresolved emotions lead to physical reaction. Therefore, Homoeopathic treatment has a better chance to relieve the symptoms of Schizophrenia giving the patient an improved awareness of the disease and a deeper self-consciousness, thus contributing to enable the patient a healthier life quality.

#### Reference:

1. Kasper D L, Braunwald E, Fauci A S, Hauser, Longo, Jameson. Harrison's principles of internal medicine. 19<sup>th</sup> ed. USA: Mc Graw Hill; 2015: 2720-1
2. Ahuja Niraj. A Short Textbook of Psychiatry. 7<sup>th</sup> ed. Jaypee Brothers. New Delhi, 2011: 54, 62
3. Colledge Nicki R, Walker Brian R, Ralston Stuart H. Davidson's Principle and Practice of Medicine. 22<sup>nd</sup> Edi. Edinburgh: Churchill Livingstone Elsevier; 2014: 247-8
4. Munjal YP, Sharma SK, Agarwal AK, Singal RK, Gupta P, Kamath SA, Shah SN. API text book of medicine. 9<sup>th</sup> ed. Mumbai: The Association of physicians of India; 2012: 1652-6
5. Hobhouse Rosa Waugh. Life of Christian Samuel Hahnemann. B Jain Publishers (p) Ltd; New Delhi: 85-99
6. Sarkar BK. Hahnemann's Organon of Medicine. 9<sup>th</sup> revised edition. New Delhi. Birla Publications, 2011: 413-4
7. Hahnemann Samuel. Organon of medicine. 6<sup>th</sup> ed. New Delhi: B Jain publishers Pvt Ltd; Reprint 1998: 250, 253-5, 257-9
8. New Manual of Homoeopathic Materia Medica & Repertory by William Boericke. Augmented Edition. B Jain Publishers (p) Ltd; New Delhi

## SCHIZOPHRENIA, A PSYCHOTIC DISORDER – HAHNEMANIAN PERSPECTIVE

### Dr. Ravi Jain

M.D (Hom.) Assistant. Prof. – Dept. of Practice of Medicine (FHS - Jayoti Vidyapeeth Women's University, Jaipur

### Dr Hemant Vyas

M.D (Hom.) Asso. Prof. & HOD – Dept. of Surgery (FHS - Jayoti Vidyapeeth Women's University, Jaipur

### Dr Astha Sikarwar

Assistant. Prof. – Dept. of Organon of Medicine & Homoeopathic Philosophy (FHS - Jayoti Vidyapeeth Women's University, Jaipur

### Dr Pramila Kajla

Assistant Professor, Department of Physiology & Biochemistry (FHS - Jayoti Vidyapeeth Women's University, Jaipur(FHS - Jayoti Vidyapeeth Women's University, Jaipur

### Dr. Mona Pathak

Assistant Professor, Department of Pathology, (FHS - Jayoti Vidyapeeth Women's University, Jaipur

**Abstract:** The term schizophrenia is Greek in origin, and in the Greek meant "*split mind*". Schizophrenia affects around 1% of the world's population and it's really an alarming figure. Curability is limited in allopathic system of medicine and so it's time to demonstrate homoeopathy in psychotic disorders like schizophrenia and to help the humanity with its benefits.

**Keywords:** schizophrenia, homoeopathy, mental diseases

### Introduction

Schizophrenia is a group of heterogeneous symptoms characterized by disturbance in language, perception, thinking, social activity, affect, and volition. The syndrome commonly begins in late adolescence and has an insidious onset. Schizophrenia is associated with suicide, with up to 1 in 10 patients taking their own lives.<sup>1</sup>

Many studies have been done on schizophrenia and found that the curability is limited in allopathic system but as far as homoeopathy is concerned it treats the person as a whole, which means it deals with the person's body, mind, emotions and his diseased condition. It works on the person's own vital force towards equilibrium and healing. It also influences the brain chemistry and assists the patient in resuming psychological strength. The homoeopathic understanding of health considers that body and mind are dynamically interconnected and that both directly influence each other.

**History of schizophrenia:** This disorder was first time named "Dementia Praecox (premature dementia)" by Emil Kraepelin in 1896. Later Eugen Bleuler in 1911 renamed dementia praecox as "Schizophrenia" (meaning mental splitting). In 1959 Kurt Schneider described symptoms which were of great significance in making a clinical diagnosis of schizophrenia.<sup>2</sup>

**Epidemiology:** The spread of schizophrenia is universal. About 1% of the population world-wide is

affected. This disorder is more common in males compared to that of females. The incidence of schizophrenia is noticeably genetic. The children of one of the affected parent have approximately 10% risk of having schizophrenia, but approximately 50% of the monozygotic (identical) twins get affected with it.<sup>3</sup>

**Aetiology:**<sup>3</sup>

- Genetic contribution, probably involving many susceptibility genes
- Environmental risk factors include obstetric complications and urban birth
- Abnormalities in brain development
- Social stress
- Drugs which increases dopamine turnover and sensitivity

**Signs and Symptoms:** a gradual change in the person's personality is an indication of the onset of schizophrenia

- **Hallucinations-** The person has sensory perceptions without a stimulus. This may be visual, auditory, gustatory, tactile or olfactory.
- **Delusions-** These are false beliefs that conflict with the reality. These may be in the form of suspiciousness, directed against one or many people.
- **Other essential symptoms** to make a diagnosis of schizophrenia include disorganised speech or behaviour and negative symptoms like affective flattening, amotivation, alogia and apathy
- **Cognitive impairment** is characterised by deficits in attention, learning, memory and executive functions.<sup>4</sup>

**International Classification of Diseases WHO (ICD-10)** has given diagnostic guidelines

- Duration of symptoms should be at least one month or more
- One very clear-cut symptom or two or more symptoms if symptoms are not very clear
  - (a) Thought echo, thought insertion or thought withdrawal and thought broadcasting
  - (b) Delusions of control, influence, or passivity; or specific thoughts, actions or sensation, delusional perception
  - (c) Hallucination voices
  - (d) Persistent delusions
  - (e) Persistent hallucinations
  - (f) Breaks in interpolations in train of thoughts, resulting in incoherence or irrelevant speech or neologism
  - (g) Catatonic behaviour such as excitement, posturing, or waxy-flexibility, negativism, stupor
  - (h) Negative symptoms such as marked apathy, paucity of speech, blunting or incongruity of emotional responses, usually resulting into social withdrawal<sup>4</sup>

**Subtypes of Schizophrenia:** Several subtypes of schizophrenia, based on the clinical picture are-

- **Paranoid type:** Delusions and auditory hallucinations are present.
- **Catatonic type:** The subjects are mostly immobile or exhibit purposeless movements.
- **Simple schizophrenia:** Insidious or progressive development of prominent negative symptoms
- **Undifferentiated schizophrenia:** Psychotic symptoms are present but are without sufficient symptoms to meet the criteria for any of subtypes
- **Hebephrenic schizophrenia:** Where thought disorder and flat affect both are present

- **Residual schizophrenia:** Prominent negative symptoms and positive symptoms are present at low intensity<sup>4</sup>

**Treatment:** The goals of care are to identify the illness early, treat the symptoms, prevent relapses and reintegrate the ill person in the community. The treatment of schizophrenia has three major components. First, there are medications to relieve symptoms and prevent relapse. Second, education and psychosocial interventions assist patients and families cope with the illness. Third, rehabilitation helps patients reintegrate into the community and regain occupational functioning.

- **Medical Treatment:** Anti-psychotic drugs help control acute symptoms and some symptoms of the chronic state too. Occasionally, electroconvulsive therapy or shock treatment (ECT) is given during an acute phase of schizophrenia.
- **Psychosocial Rehabilitation:** Psychosocial rehabilitation is an important component in the management of schizophrenia. It is a set of techniques aimed at reducing symptoms and decrease impact of illness, improve skills and capability of the person.<sup>4</sup>

#### **Prognosis:**

- Good prognosis –acute or abrupt onset
  - more than 35 years of age
  - Presence of stressor
  - predominant positive symptoms<sup>2</sup>
- Poor prognosis – insidious or gradual onset
  - less than 20 years of age
  - predominant negative symptoms
  - family history of schizophrenia<sup>2</sup>

#### **Dr Hahnemann as a psychiatrist**

In 1792, the Duke Ernst Von Sachsen-Gotha have heard about the good reputation of Samuel Hahnemann as a physician, and about his intention to devote himself to this kind of work, placed a wing of his hunting cottage. Being now provided with a chance of treating the insane under ideal conditions, Hahnemann acknowledged that for several years previously he had made a special study of “diseases of the most lingering and hopeless nature generally, and of hypochondria and insanity in particular.”

The patient was the one who had been suggested for treatment by the Duke, Klockenbring by name. This man was the author of highly susceptible disposition, having become insane through a malevolent attack made on him, apparently without any justification by a poet. His family physician in Hanover had done all in his potential to cure the patient. Alas in vain! Despite there was a clear interval at times, the fury of the illness was soon redoubled. In June 1792 Klockenbring was brought with an appropriate escort to Georgenthal. He kept on rambling and was excited for a quarter of an hour at a time. At one minute he spoke as a judge and at another he would recite as Agamemnon. He used to destroy anything that came to hand at that period. For the first week Hahnemann just observed the patient without giving any medical treatment till February of the following year he then treated him both psychically and by medicine finally he was restored. There was, further, no relapse, though Klockenbring’s death two years after his discharge was preceded by marked apathy.<sup>5</sup>

**Homoeopathic Approach:** As stated by Dr. Hahnemann, the mental diseases fall under chronic disease as *one sided disease (aphorism 210)*. To treat such conditions, the symptoms of the altered state of mind and disposition (aphorism 210), are to be observed carefully by the physician and to be taken from the patient's attendants beside that the other symptoms like physical generals, past and family history of patient, any drug abuse, his domestic position, social relations, occupational stress, symptoms of altered behavior in his childhood, parental disharmony, any birth trauma or any maternal stress during her pregnancy are to be taken into consideration.

The medicine prescribed must be capable of producing strikingly similar symptoms and especially an analogous disorder of mind and disposition (aphorism 220). Whatever the name of illness, the symptoms plays an important role in homoeopathic prescribing.<sup>6</sup>

Aphorism 215 : “Almost all so called mental and emotional diseases are nothing more than corporeal diseases in which the symptoms of derangement of mind and disposition peculiar to each of them is increased, while the corporeal symptoms decline”<sup>7</sup>

**Miasmatic analysis:** As stated by Dr. Hahnemann the mental diseases falls under the psora miasm. In aphorism 210, 222, 228 mental diseases are said to be psoric in origin and to be treated with antipsoric medicines.

**Treatment:** Dr. Hahnemann since ages described the treatment of mental diseases in aphorisms 210-230 which includes supportive psychotherapy and constitutional antipsoric medicine.

➤ Treatment of chronic mental diseases

In aphorism 220 he states that “thus constructed the complete picture of the disease, for which, in order to effect the homeopathic cure of the disease, a medicine capable of producing strikingly similar symptoms, and especially an analogous disorder of the mind, must be sought for among the antipsoric remedies, if the psychical disease have already lasted sometime.”<sup>7</sup>

➤ Treatment of acute mental diseases

In aphorism 221 he states that “If, however, insanity or mania have suddenly broken out as an acute disease in the patient's ordinary calm state, although it almost always arises from internal psora, like a flame bursting forth from it, yet when it occurs in this acute manner it should not be immediately treated with antipsorics, but in the first place with remedies indicated for it out of the other class of proved medicaments in highly potentized, minute, homeopathic doses, in order to subdue it so far that the psora shall for the time revert to its former latent state, wherein the patient appears as if quite well.”<sup>7</sup>

In aphorism 222 he states “such a patient, who has recovered from an acute mental or emotional disease by the use of these non-antipsoric medicines, should never be regarded as cured; on the contrary, no time should be lost in attempting to free him completely, by means of a prolonged antipsoric treatment”<sup>7</sup>

In aphorism 223 he states that “if the antipsoric treatment be omitted, then we may almost assuredly expect, from a much slighter cause than brought on the first attack of the insanity, the speedy occurrence of a new and more lasting and severe fit”<sup>7</sup>

**Attribute of physician while taking psychotic case:** Dr. Hahnemann told us how a physician should act or conduct himself while taking a psychotic case in aphorisms 228 and 229.

(a) To furious mania – we must oppose calm intrepidity and cool, firm resolution

(b) To doleful (expressing sorrow), querulous (complaining in whining manner) lamentation – a mute display of commiseration (the feeling of expression of pity and sorrow) in looks and gestures.

- (c) To senseless chattering – a silence not wholly inattentive
- (d) To disgusting and abominable conduct (causing disgust or hatred) – and to conversation of a similar character – total inattention.
- (e) We must merely endeavor to prevent the destruction and injury of surrounding objects, without reproaching the patient for his acts
- (f) Everything must be arranged in such a way that the necessity for any corporeal punishments and tortures whatever may be avoided.
- (g) Contradiction, eager explanations, rude corrections and invectives, as also weak, timorous yielding, are quite out of place with such patients; they are equally pernicious modes of treating mental and emotional maladies.
- (h) The physician and keeper must always pretend to believe them to be possessed of reason.
- (i) All kinds of external disturbing influences on their senses and disposition should, if possible, be removed; there are no amusements for their clouded spirit, no salutary distractions.<sup>7</sup>

### Homoeopathic Medicines for Schizophrenia

The treatment of a case of Schizophrenia should be done on the basis of individuality of the person after complete case taking administering the dose based on Homoeopathic principles of single, simple minimum dose sufficient enough to produce effective change in the nature of the individual curatively. Some common medicines indicated in Schizophrenia with their indications includes:

1. **Absinthium:** Sudden and severe giddiness, delirium with hallucinations and loss of consciousness. Nervous excitement and sleeplessness. Hallucinations. Frightful visions. Loss of memory. Forgets what has recently happened. Wants nothing to do with anybody. Brutal.
2. **Anacardium Orientale:** impaired memory, depression, and irritability; diminution of senses - smell, sight, hearing. Fear of examination in students. Aversion to work; lacks self-confidence; irresistible desire to swear and curse. Fixed ideas. Hallucinations; thinks he is possessed of two persons or wills. Anxiety when walking, as if pursued. Profound melancholy and hypochondriasis, with tendency to use violent language. Brain-fag. Absent mindedness. Very easily offended. Malicious; seems bent on wickedness. Lack of confidence in himself or others. Suspicious. Clairaudient, hears voices far away or of the dead. Senile dementia. Absence of all moral restraint.
3. **Baryta Carbonica:** Child backward mentally and physically dwarfish. Diseases of old men when degenerative changes begin. Loss of memory, mental weakness. Irresolute. Lost confidence in himself. Senile dementia. Confusion. Bashful. Aversion to strangers. Childish; grief over trifles.
4. **Belladonna:** -Patient lives in a world of his own, engrossed by specters and visions and oblivious to surrounding realities. Visual hallucinations. He is acutely alive and crazed by a flood of subjective visual impressions and fantastic illusions. Hallucinations; sees monsters, hideous faces. Delirium; frightful images; furious; rages, bites, strikes; desire to escape. Loss of consciousness. Disinclined to talk. Perversity, with tears. Acuteness of all senses. Changeableness.
5. **Hyoscyamus Niger:** Disturbs the nervous system profoundly. mania of a quarrelsome and obscene character. Inclined to be unseemly and immodest in acts, gestures and expressions. Very talkative, and persists in stripping herself, or uncovering genitals. Is jealous, afraid of being poisoned. Its symptoms also point to weakness and nervous agitation. very suspicious. Talkative, obscene, lascivious mania, uncovers body; jealous, foolish. Great hilarity; inclined to laugh at

- everything. Delirium, with attempt to run away. Low, muttering speech; constant carphologia, deep stupor.
6. **Nux Moschata:** Strange feeling, with irresistible drowsiness. General inclination to become unconscious during acute attacks. Changeable; laughing and crying. Confused, impaired memory. Bewildered sense, as in a dream. Thinks she has two heads.
  7. **Nux Vomica:** - Very irritable: sensitive to all impressions. Ugly, malicious. Cannot bear noises, odors, light, etc. Does not want to be touched. Time passes too slowly. Even the least ailment affects her greatly. Disposed to reproach others. Sullen, fault-finding. Irritable, nervous system, hypersensitive and over-impressionable.
  8. **Pulsatilla Pratensis:** Mild, gentle yielding disposition. Sad cries readily. Weeps when talking, changeable, contradictory. Timid, irresolute. Fear in the evening of being alone, ghosts. Likes sympathy. Easily discouraged. Religious melancholy. Highly emotional.
  9. **Staphysagria:** Nervous affection with marked irritability. Impetuous, violent outbursts of passion, hypochondriacal, sad. Very sensitive to what others say about her. Dwells on sexual matters. Prefers solitude. Peevish. Child cries for many things and refuses them when offered.
  10. **Veratrum album:** Behavior disorder- schizophrenia. Melancholy, with stupor and mania. Sits in a stupid manner, notices nothing. Sullen indifference. Frenzy of excitement; shrieks, curses. Aimless wandering from home. Delusions of impending misfortunes. Mania, with a desire to cut and tear things.

**Conclusion:** Homoeopathic treatment is based on individualistic and holistic approach so, it does not treat the particular diseases but treats interior of man. Homoeopathy is based on the fact that the person emotional and mental life experience cannot be isolated and that prolonged, unresolved emotions lead to physical reaction. Therefore, Homoeopathic treatment has a better chance to relieve the symptoms of Schizophrenia giving the patient an improved awareness of the disease and a deeper self-consciousness, thus contributing to enable the patient a healthier life quality.

#### Reference:

1. Kasper D L, Braunwald E, Fauci A S, Hauser, Longo, Jameson. Harrison's principles of internal medicine. 19<sup>th</sup> ed. USA: Mc Graw Hill; 2015: 2720-1
2. Ahuja Niraj. A Short Textbook of Psychiatry. 7<sup>th</sup> ed. Jaypee Brothers. New Delhi, 2011: 54, 62
3. Colledge Nicki R, Walker Brian R, Ralston Stuart H. Davidson's Principle and Practice of Medicine. 22<sup>nd</sup> Edi. Edinburgh: Churchill Livingstone Elsevier; 2014: 247-8
4. Munjal YP, Sharma SK, Agarwal AK, Singal RK, Gupta P, Kamath SA, Shah SN. API text book of medicine. 9<sup>th</sup> ed. Mumbai: The Association of physicians of India; 2012: 1652-6
5. Hobhouse Rosa Waugh. Life of Christian Samuel Hahnemann. B Jain Publishers (p) Ltd; New Delhi: 85-99
6. Sarkar BK. Hahnemann's Organon of Medicine. 9<sup>th</sup> revised edition. New Delhi. Birla Publications, 2011: 413-4
7. Hahnemann Samuel. Organon of medicine. 6<sup>th</sup> ed. New Delhi: B Jain publishers Pvt Ltd; Reprint 1998: 250, 253-5, 257-9
8. New Manual of Homoeopathic Materia Medica & Repertory by William Boericke. Augmented Edition. B Jain Publishers (p) Ltd; New Delhi



## A MICROWAVE IRRADIATED FACILE AND CONVENIENT SYNTHESIS OF 6-PHENYLINDOLO[2,1-A]ISOQUINOLINE DERIVATIVES

**Sangeeta Choudhary**

Research Scholar, Jayoti Vidyapeeth Women's University, Jaipur  
Email - sangeeta.jangu@gmail.com

**Dr. Rishi Sharma**

Jayoti Vidyapeeth Women's University, Jaipur

### **Abstract**

Diversity-oriented, uncomplicated, proficient, microwave irradiated novel green procedure is developed for the quantitative synthesis of medicinally significant 6-phenylindolo[2,1-a]isoquinoline libraries. The present process is more convenient and competent as compared to other conventional processes.

### **Introduction:**

Over the years, scientists have started investigate environmentally benign synthetic organic conversion. The green chemistry has concerned the concentration of the academia as well as industry. Research for finding other alternating reaction media, which can replacement, the harmful, toxic, and inflammable organic solvents, which pose a serious threat to the environment, is gaining much progress. In view with this perspective, the development of newer synthetic strategies with greener perspectives is indisputably appealing to accomplish more sustainable chemistry. In addition, if the new reaction media, catalysts and alternative energy resource can independently or in a synergistic approach can provide some additional merits on the reaction performance such as on the reactivity, catalyst efficiency, and catalyst reuse when applied, then this can certainly be very interesting.

Microwave assisted chemical synthesis expansion is at the present time a well successful technique for synthesis of a variety of organic compounds. It has emerged as a powerful synthetic tool to speed up a wide range of chemical reactions. The remarkable results are obtained including remarkably cutting the required time, improving the yields, experimental simplicity, selectivity, purity of the desired products and easy work up etc. were obtained giving clear suggestion on the potentialities of this technique than reactions under conventional heating.

Extensive studies have demonstrated that isoquinoline and there analogues exhibit various pharmacological activity including Anticancer, Antibacterial and Antiinflammatory. The unique structure together with a potential therapeutic function of isoquinoline has sparked much interest among synthetic chemist. We have synthesized tetracyclic isoquinoline derivatives to optimize their biological activities.

### **RESULTS AND DISCUSSION:**

In the first step commercially available 4-iodoanisoole was reacted with 2-methyl-3-butyne-2-ol, palladium catalyst, copper iodide, triethylamine as base and solvent under nitrogen atmosphere at room temperature. 2-iodobromobenzene reacts with different phenylacetylene derivative under Sonogashira coupling condition to form the 1-bromo-2-(phenylethynyl)benzene derivatives under N<sub>2</sub> atmosphere. The 1-bromo-2-(phenylethynyl)benzene derivatives reacts with 3-methyl indole, through C-2 arylation in the presence of benzotriazole methanol as ligand to form 6-phenylindolo[2, 1- a]isoquinoline derivatives.

Final synthesized compounds

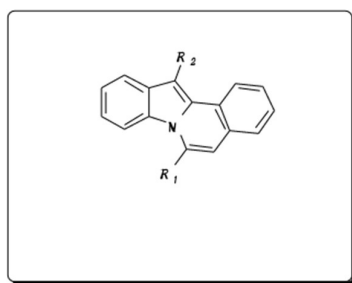
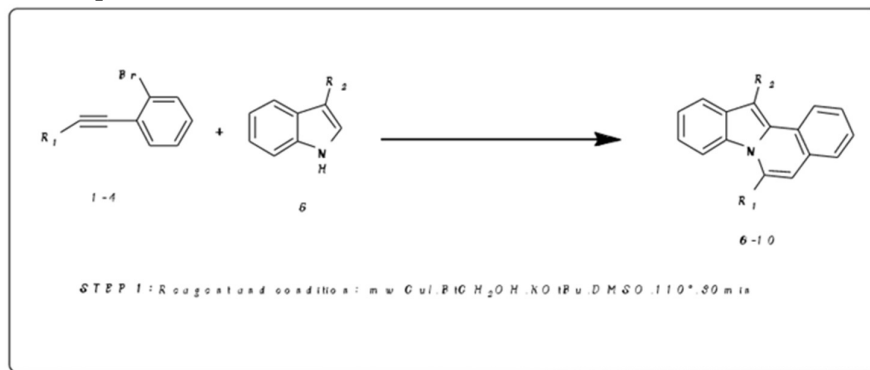


Table-I

Compound	R1	R2	Yield%
6	4-methoxyphenyl	-methyl	44
7	4-methylphenyl	-methyl	46
8	4-fluorophenyl	-methyl	45
9	2-pyridyl	-methyl	45
10	Phenyl	-hydrogen	54

**CONCLUSION:** In summary, we have reported an exceptionally efficient green approach for the synthesis of 6-phenylindolo[2,1-a]isoquinoline via microwave-assisted synthesis. This synthetic approach has a variety of excellent characteristics such as excellent yields, less reaction time, recyclability of catalyst and operational simplicity, ultimately foremost to a diverse array of medicinally-relevant 6-phenylindolo[2,1-a]isoquinoline ring systems.

**EXPERIMENTAL**

Commercially available reagent grade chemicals were purchased from Sigma-Aldrich or Spectrochem Pvt Ltd and were used as received. Melting points were taken in open capillaries on an electrically heated melting point apparatus complab and are uncorrected. IR spectra were recorded on perkin- elmer RX-1 spectrophotometer using KBr pallets. The FAB spectra were recorded using a beam of argon (2-8eV) on joel SX 102/ DA-6000 mass spectrometer, <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra were

recorded on bruker DPX-200 (200 MHz for <sup>1</sup>H and at 50 MHz for <sup>13</sup>C) or DRX-300 (300 MHz for <sup>1</sup>H and at 75 MHz for <sup>13</sup>C) spectrometers using CDCl<sub>3</sub>, DMSO-d<sub>6</sub> and CD<sub>3</sub>OH as solvent. Tetramethylsilane served as an internal standard in <sup>1</sup>H NMR and CDCl<sub>3</sub> in <sup>13</sup>C spectra. Silica gel (60-120 mesh) was used for column chromatography while silica gel (230-400 mesh) was used for flash chromatography. TLC was run either on precoated silica gel 60F 254 and RP-18 F 254 (merck) or handmade plates. Detection of spots was done either by iodine vapors or spraying with 1% ceric sulfate in 1M H<sub>2</sub>SO<sub>4</sub> followed by heating at 110°C.

General experimental procedure for the Synthesis of 6-phenylindolo[2, 1-a]isoquinoline derivatives:

To the stirring mixture of copper iodide (5mol%), Benzotriazole methanol(10 mol%) the N-heterocycle(1mmol) and 1.1 equivalent of 2-haloarylalkyne was added and followed by addition of base potassium tertiary butoxide (1.4 eq), degassing with N<sub>2</sub> atmosphere for 10 min. Then add Dimethyl sulphoxide (2 ml) by syringe, reaction mixture was heated to 110°C in microwave until 2-haloarylalkyne had been completely consumed. The reaction mixture was extracted using ethyl acetate and water. Ethyl acetate layer was concentrated under reduced pressure. Crude obtained was purified by flash chromatography Hexane as eluent to give compounds (6-10).

6-(4-methoxyphenyl)-12-methylindolo [2,1-a] isoquinoline(6): Chemical formula: C<sub>24</sub>H<sub>19</sub>NO MW: 337, State: Yellow solid, MP: 145°C, Yield: 44% , MS (ESI) m/z (M+H): 338.19 <sup>1</sup>H NMR(300 MHz, CDCl<sub>3</sub>): : 8.47-8.44(d, J=7.56Hz, 1H), 7.83-7.80(d, J=7.98Hz, 1H), 7.56-7.44(m, 5H), 7.10-7.07(d, J=8.46Hz, 3H), 6.97-6.95(d, J=7.8Hz, 1H), 6.53-6.50(d, J=8.7Hz, 1H), 6.45(s, 1H), 3.96(s, 3H), 2.91(s, 3H). <sup>13</sup>C(CDCl<sub>3</sub>, 50MHz): : 160.28, 138.28, 131.52, 130.24, 129.33, 128.44, 12.25, 126.69, 126.19, 124.43, 121.04, 120.32, 118.06, 114.44, 114.28, 110.89, 105.45, 55.46, 11.89.

12-methyl-6-p-tolylindolo [2, 1-a] isoquinoline(7): Chemical formula: C<sub>24</sub>H<sub>19</sub>N, MW: 321, State: Sticky oily, Yield: 46%, MS (ESI) m/z (M+H): 322.13 <sup>1</sup>H NMR(300 MHz, CDCl<sub>3</sub>): : 8.48-8.45(d, J=7.98Hz, 1H), 7.83-7.81(d, J=7.92Hz, 1H), 7.54-7.36(m, 8H), 6.97-6.92(t, J=8.31Hz, 1H), 6.52-6.46(t, J=8.61Hz, 2H), 2.92(s, 3H), 2.54(s, 3H).

6-(4-fluorophenyl)-12-methylindolo [2, 1-a] isoquinoline(8): Chemical formula: C<sub>23</sub>H<sub>16</sub>FN, MW: 325, State: Oily, Yield: 45%, MS (ESI) m/z (M+H): 326.07, <sup>1</sup>H NMR(300 MHz, CDCl<sub>3</sub>): : 7.71-7.51(m,8H), 7.36-7.18(m, 5H), 2.42(s, 3H). <sup>13</sup>C(CDCl<sub>3</sub>, 50MHz): :14.10, 135.70, 133.11, 132.99, 132.50, 129.45, 127.07, 125.66, 125.03, 123.42, 122.68, 120.16, 119.34, 113.66, 110.42, 9.59.

12-methyl-6-(pyridin-2-yl)indolo[2,1-a]isoquinoline( 9): Chemical formula: C<sub>22</sub>H<sub>16</sub>N<sub>2</sub>, MW: 308, State: Oily, Yield: 45%, MS (ESI) m/z (M+H): 309.15, <sup>1</sup>H NMR(300 MHz, CDCl<sub>3</sub>): : 8.65- 8.64(d, J=4.02Hz, 1H), 7.70-7.58(m, 7H), 7.34-7.22(m, 5H), 2.17(s, 3H)

6-phenylindolo[2,1-a]isoquinoline(10): Chemical formula: C<sub>22</sub>H<sub>15</sub>N, MW: 293, State: Oily Yield: 54% MS (ESI) m/z (M+H): 294.4 <sup>1</sup>H NMR(300 MHz, CDCl<sub>3</sub>):: 8.26-8.24(d, J=7.35Hz, 1H), 7.83-7.80(d, J=7.80Hz, 1H), 7.60-7.47(m, 8H), 7.39(s, 1H), 7.25-7.20(t, J=7.26Hz, 1H), 6.94-6.89(t, J=7.38Hz, 1H), 6.56(s, 1), 6.48-6.45(d, J=8.16Hz,1H).

Piyush N. Kalaria, Shailesh P. Satasia, Dipak K. Raval, European Journal of Medicinal Chemistry 78 (2014) 207-216.

Mohammad Abdollahi-Alibeik n, Ali Rezaeipoor-Anari, Journal of Magnetism and Magnetic Materials 398 (2016) 205–214.

R.A. Mekheimer, A.A. Hameed, K.U. Sadek, Green Chem. 10 (2008) 592–593.

Journal of Fluorine Chemistry 130 (2009) 609–614, One-step, synthesis of Hantzsch esters and polyhydroquinoline derivatives in fluoro alcohols Akbar Heydari a,\*, Samad Khaksar a, Mahmood Tajbakhsh b, Hamid Reza Bijanzadeh.

Chinese Chemical Letters 19 (2008) 775–779, Cerium(IV) ammonium nitrate catalysed facile and efficient synthesis of polyhydroquinoline derivatives through Hantzsch multicomponent condensation, Cherkupally Sanjeeva Reddy \*, Mekala Raghu.

Journal of Saudi Chemical Society (2014) xxx, xxx–xxx, One pot four component sequential synthesis of hexahydroquinoline derivatives in aqueous media via enamionone intermediates: A green protocol D. Patil a, D. Chandam a, A. Mulik a, S. Jagdale a, P. Patil, M. Deshmukh.

Chinese Chemical Letters 21 (2010) 563–567, One-step, synthesis of Hantzsch esters and polyhydroquinoline derivatives using new organocatalyst Seyed Meysam Baghbanian a,\*,

Samad Khaksar b, Seyed Mohammad Vahdat b, Maryam Farhang c, Mahmood Tajbakhsh.

Chinese Chemical Letters 22 (2011) 1407–1410, Microwave assisted synthesis of novel Hantzsch 1,4-dihydropyridines, acridine-1,8-diones and polyhydroquinolines bearing the tetrazolo[1,5-a]quinoline moiety and their antimicrobial activity assess, Niraj K. Ladani, Divyesh C. Mungra \*, Manish P. Patel, Ranjan G. Patel.

Tetrahedron Letters 50 (2009) 1754–1756, Nickel nanoparticle-catalyzed facile and efficient one-pot synthesis of polyhydroquinoline derivatives via Hantzsch condensation under solvent- free conditions, Suryakant B. Sapkal, Kiran F. Shelke, Bapurao B. Shingate, Murlidhar S. Shingare.

Journal of Molecular Structure 1039 (2013) 119–129, Synthesis and fluorescence behavior of photoactive polyhydroquinoline derivatives: A combined experimental and DFT study, Smritakshi Phukan, Mithu Saha, Amarta Kumar Pal, Sivaprasad Mitra.

Journal of Saudi Chemical Society (2014) xxx, xxx–xxx, Nano TiO<sub>2</sub>/SiO<sub>2</sub>: An efficient and reusable catalyst for the synthesis of oxindole derivatives, Maryam Haghghi, Kobra Nikoofar.

Arabian Journal of Chemistry (2012) 5, 315–318 An efficient and rapid Mn(III) complex catalyzed synthesis of polyhydropyridine derivatives via Hantzsch four component condensation, Elaheh Mosaddegh a,\*, Asadollah Hassankhani.

Tetrahedron 61 (2005) 12386–12397, Ionic liquid phase technology supported the three component synthesis of Hantzsch 1,4-dihydropyridines and Biginelli 3,4-dihydropyrimidin- 2(1H)-ones under microwave dielectric heating, Jean-Christophe Legeay, a Jean Jacques Vanden Eyndeb, † and Jean Pierre Bazureau.

Tetrahedron 62 (2006) 7293–7299, Ceric Ammonium Nitrate (CAN) catalyzes the one-pot synthesis of polyhydroquinoline via the Hantzsch reaction, Shengkai Ko and Ching-Fa Yao.

Tetrahedron 63 (2007) 1946–1952, Synthesis of polyhydroquinoline derivatives through unsymmetric Hantzsch reaction using organocatalysts, Atul Kumar\* and Ram Awatar Maurya.

Tetrahedron Letters 48 (2007) 3887–3890, Bakers' yeast catalyzed synthesis of polyhydroquinoline derivatives via an unsymmetrical Hantzsch reaction, Atul Kumar\* and Ram Awatar Maurya.

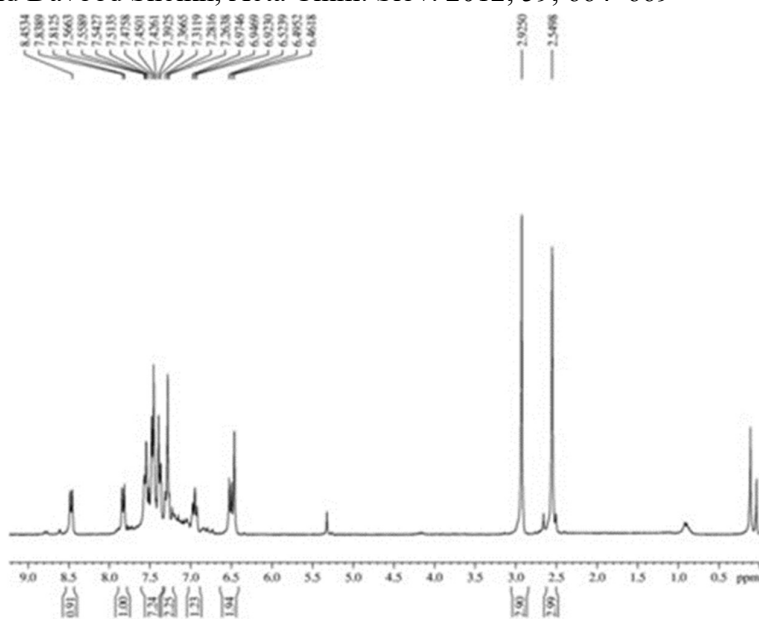
Journal of Molecular Liquids 177 (2013) 44–48, Protic pyridinium ionic liquid as a green and highly efficient catalyst for the synthesis of polyhydroquinoline derivatives via Hantzsch condensation in water, Mahmood Tajbakhsh a, Heshmatollah Alinezhad a, Mohammad Norouzi, Saeed Baghery c, Maryam Akbari.

Journal of Fluorine Chemistry 135 (2012) 91–96, FeF<sub>3</sub> as a novel catalyst for the synthesis of polyhydroquinoline derivatives via unsymmetrical Hantzsch reaction, Rajendra Surasani a,c, Dipak Kalita a,\* , A.V. Dhanunjaya Rao a, Kaviraj Yarbagi b, K.B. Chandrasekhar.

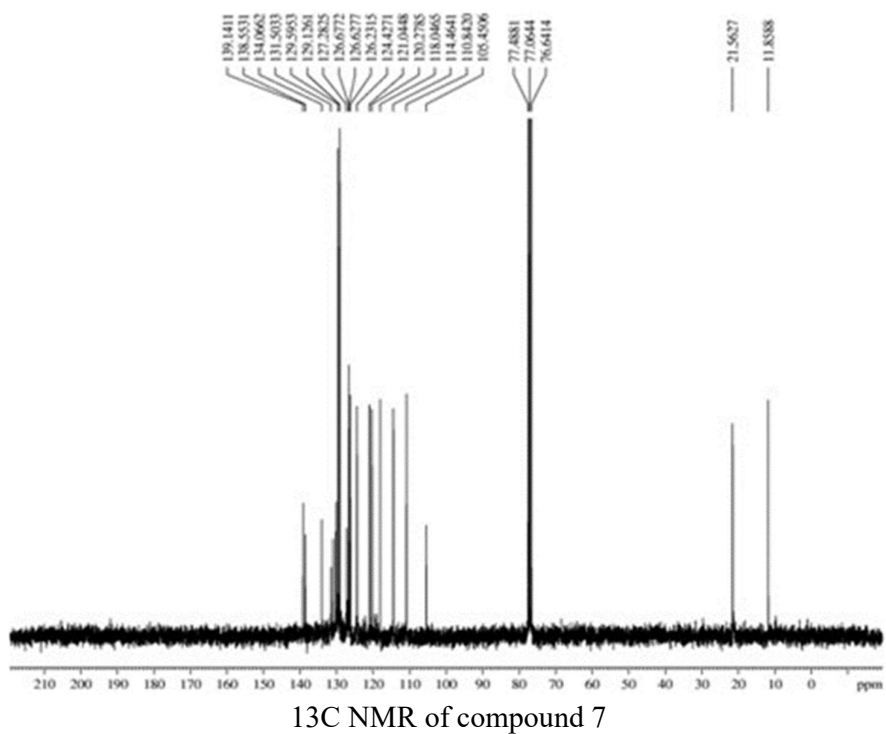
Dyes and Pigments Volume 113, February 2015, Pages 27–37 A microwave-assisted and environmentally benign approach to the synthesis of near-infrared fluorescent pentamethine cyanine dyes , Eric A. Owensa, b, c, Nicholas Bruschia, Joseph G. Tawneya, Maged Henarya;

Electrochimica Acta 83 (2012) 216– 220, Visible-light photocatalytic degradation of methyl orange by CdS–TiO<sub>2</sub>–Au composites synthesized via microwave-assisted reaction, Tian Lv, Likun Pan\*, Xinjuan Liu, Zhuo Sun.

Davood Azarifar and Davood Sheikh, Acta Chim. Slov. 2012, 59, 664–669



<sup>1</sup>H NMR of compound 7





**TECHNOLOGICAL REFORMAND ITS IMPLICATIONS FOR INTERNATIONAL  
BUSINESS DEVELOPMENT**

**Dr. Shahnawaz Alam**

Assistant Professor, Faculty of Law and Governance, Jayoti Vidyapeeth Women's University, Jaipur  
Email ID: Shahnawazeco@gmail.com

**Abstract**

The significant use of technology for production is the reality of today's developed world because financial development, trade openness, and technological innovation have a causal relationship that affected trade performance those consequences for the growth and development of countries. Generally, everybody identifies the nature of international business and international trade is the same but international trade may be part of international business. The term international business summation of international trade and a wide variety of other ways in which firms operated globally. It may start with lower trade barriers that possess theoretical and practical possibilities of globalization. Technology is a prosperous tool that makes possible effective global marketing. However without technology, international business would be slow. The author adopts a multidisciplinary approach based on secondary data. The paper makes to attempt the implications of modern technologies for sustainable development and prospects of International Business

**Keywords:** Trade Openness, Growth, and Development, Globalization, International Business

**Introduction**

Deals occurring inside geological limits are alluded to as inward business or home exchange. Manufacturing and trade beyond the boundaries of one own country are known as international business. The basis of international trade theory highlights the importance of technological innovation in explaining a country's international competitiveness except for the classical theory because classical economists believe that labour is the only factor of production and capital is taken as constant during the production process However, trading relationships heavily influence patterns of production and consumption, and the use of technology. The Heckhscher-Ohlin model, enriched to account for endogenous factor accumulation, predicts that trade amplifies initial differences in factor endowments and comparative advantage. In the absence of capital mobility endogenous growth models carry even more discouraging implications for laggard economies. In this case trade between parametrically distinct economies reinforces the position of the technological leader, intensifies the initial pattern of comparative advantage, and increases the disparities in factor endowments to further uneven growth. The significant use of technology for production is the reality of today's developed world because financial development, trade openness, and technological innovation have a causal relationship that affected trade performance that consequences for the growth and development of countries.

**Objective of the Study**

1. To examine the application of modern technologies for the sustainable development of international Business
2. To evaluate the implications of modern technologies for sustainable development and prospects of International Business



## Source of Data and Methodology

The present study is based on the collection of data from secondary sources. However, useful data has been applied to authenticate the study to make it more useful and practicable. Secondary data is obtained from various published and unpublished records, books, magazines, and journals. The paper makes to attempt to investigate the role of technological improvement in the sustainable business environment and also adopts a multidisciplinary approach to examine the implications of technologies for international business.

## The Goal of International Business

The key sense behind the worldwide business is that the nations can't deliver similarly well or economically all that they require. This is a result of the inconsistent conveyance of regular assets among them or contrasts in their efficiency levels. The accessibility of different variables of creation like work, capital, and natural substances that are expected for delivering various labor and products contrasts among countries. Besides, work efficiency and creation costs contrast among countries due to different financial, geological, and political reasons. Because of these distinctions, it is entirely expected to find one specific country in a superior situation to deliver better quality items at lower costs than different countries can.

## Scope of the International Business

Worldwide business is a lot more extensive than global exchange. It incorporates global exchange as well as a wide assortment of alternate manners by which the organizations work universally. Significant structures of business activity in global business are as per the following.

**Merchandise exports and imports:** Merchandise exports and imports, also known as trade in goods, include only tangible goods and exclude trade in services,

**Exports and imports of service:** export and imports of services comprise trade in an invisible item. It is a result of the elusive part of administrations. A wide assortment of administrations are exchanged universally and these include: the travel industry and travel, boarding and housing, diversion and entertainment, transportation, proficient administrations such as training, recruitment, consultancy, and research, and communication like postal, telephone, fax, courier and other audio-visual services, construction and engineering, marketing like wholesaling, retailing, advertising, marketing research, and warehousing, educational and financial services

**Licensing and franchising:** Allowing one more party in a far-off country to deliver and sell products under your brand names, patents, or copyrights instead of some fee is another way of entering into international business. It is under the authorizing framework that Pepsi and Coca-Cola are delivered and sold all around the world by neighborhood bottlers in outside nations. Diversifying is like permitting, yet it is a term utilized regarding the arrangement of administrations. McDonald's, for example, works with drive-through eateries the world over through its diversifying framework.

**Foreign direct and portfolio investment:** Foreign investment is one more significant type of worldwide business. Foreign investments include ventures of assets abroad in exchange for monetary return. Direct investment takes place when a company directly invests in properties such as plants and machinery in foreign countries intending to undertake the production and marketing of goods and services in those countries. Direct investment provides the investor with a controlling interest in a





foreign company, known as Foreign Direct Investment. An organization, if it so wants, can likewise set up an entirely claimed auxiliary abroad by making 100 percent interest for investment in foreign ventures, and thus acquiring full control over the subsidiary's operations in the foreign market. Portfolio investment of foreign institutional investment that acquires shares and provides loans giving credits to the last option, and procures pay via profits or interest on credits. Unlike foreign direct investments, the investor under portfolio investment does not get directly involved in production and marketing operations. It essentially procures pay by putting resources into shares, bonds, bills, or notes in an outside country or giving credits to unfamiliar business firms.

### **Significant Advantages of International Business:**

Despite more noteworthy intricacies and dangers, worldwide business is critical to the two countries and business firms. It offers them several benefits. The growing realization of these benefits over time has been a contributory factor to the expansion of trade and investment amongst nations, resulting in the phenomenon of globalization. Some of the advantages of global business to the countries and business firms are discussed below.

- ) Earning foreign exchange
- ) More efficient use of resources
- ) Improving prospective growth and employment opportunities
- ) Way out to intense competition in the domestic market
- ) Improved business vision

### **Modern Technology and the Evolution of International Business**

The history of international business began with the development of Human Civilization. International trade has a rich history beginning with the deal framework under this the trading of factors of production and goods and services at least two gatherings without the usage of money. It is the principal type of trade. People and organizations bargain goods and services with one another in light of identical appraisals of the price of merchandise goods. The barter system was replaced in the 16th and 17th Centuries by the theory of Mercantilism which was created by some group of mercantilists. The 18th Century saw a shift toward liberalization. It was in this period that Adam Smith and David Ricardo which stands true even today. The liberalized international business was based on free trade. Adam Smith developed the absolute cost advantage principle, under this he directly criticize the theory of Mercantilism that was based on restricted trade. He argued that the growth and development of the nation does not depend upon the accumulation of gold, it also depends upon availability of goods and services for the future generation. The absolute advantage principle gives an idea about bilateral trade. Adam Smith believed trade between two countries will be possible when one country has specialization in the production of one good and other countries have specialization in the production of other goods. Another hand David Ricardo developed the comparative cost advantage principle that was also based on free trade but he argued that trade between two countries does not depend upon absolute advantage because it is possible one country may have absolute specialization in the production of both the goods, in this case trade depends upon comparative cost difference of two countries. The invention of money led to the end of the barter system and international businesses adopted a cash base system but these days business was done without the help of technical support. It was tremendously complex to conduct smooth business as compared technology base system. Today the comprehension of open trade and its factors are vastly improved perceived. The context of global markets has been guided by the understanding and theories developed by economists based on Natural



resources available with different nations which give them the relative benefit, Economies of Size of huge scope creation, innovation regarding web-based business as well as product life cycle changes in tune with the advancement of technology as well as the financial market structures. Nowadays the amount of information that is transferred through smartphones and the Internet is very huge. Latest innovations in innovation have opened doors for global trade for small and medium-sized companies. Communicating through Mobile Phones and Smart Phones is essential for owners of small and medium-sized companies. For keeping the correspondence channel just getting started interchanges and client relations cellphones have turned into a need. Inventions in technology have helped small and medium-sized businesses in marketing through different kinds of media where the restrictions of print ads are minimum. Marketing through the Internet now involves setting up websites and selling products and services online. Promoting through Email has additionally helped in getting more openness to the items and administrations the organization is giving. Versatile showcasing and Application advertising are additionally acquiring notoriety for business-related promoting purposes. Efficiency has likewise expanded with the most recent advancements in innovation. Keeping the employees more focused on work and tracking the manufacturing operations has become easy with various developments in technological inventions. Providing the right amount of tools that are having a technological advantage helps increase productivity factors. The use of technology has made businesses and customers closer in many areas. Email and Social Media are being used for answering queries related to products and services with customers. Giving customers all possible ways to contact the company is easy with the latest technologies and applications over the Internet.

### **Implications of Modern Technology for International Business**

Technology is useful to worldwide business. It may be stated that lowering trade barriers has made globalization of markets and production a theoretical possibility, technology has made it a practical reality. Technology is facilitating international business in at least six ways telecommunications, Transportation, Globalization of Production, Globalization of Markets, E-Commerce, and Technology Transfer. In the past decade, innovation has developed dramatically and has impacted our ordinary lifestyle and influenced pretty much every industry, including worldwide business. Innovation eventually makes flourishing global exchanges and organizations conceivable, and without innovation, worldwide business would be sluggish, drawn out, and time-consuming. Technology is not generally saved for explicit nations or certain gatherings. Nowadays, even the normal individual approaches some type of innovation, which has supported the mechanical and global business revolution. Technology plays had a significant impact on the creative processes we know today and related cycles, for example, creation arranging, monetary preparation, and showcasing. On account of innovation, organizations might have created and assembled plants in a few distinct nations and you can pick where to make your assembling plant in light of where materials are effortlessly obtained and where talented work is reasonable. The globalized market began growing its roots when it became more affordable and workable for the transportation and marketing of goods and services in different countries. The Internet is viewed as a minimal-expense market globalization network in an electronic structure. Due to online entertainment, TV, and the low costs associated with moving items all over globalization, there has become a sort of convergence in consumer preferences and tastes that created a global culture in which different countries begin having similar lists of wants and demands. Technology has also played a significant role in online banking, regardless of where you're situated on the planet has genuinely become more straightforward than at any time in recent memory, and there are countless choices accessible to you! You can utilize your charge card, installment



arrangements, for example, the famous PayPal, as well as computerized monetary standards like Bitcoin in certain cases. Moreover, trade rates and installment expenses have become lower, making shopping globally simple and reasonable.

## Technological Improvement and Prospects of International Business

Technology is always developing and things in the worldwide business scene couldn't at any point remain something similar for extremely lengthy. While it is consistently difficult to foresee the future precisely as a business expert. We expect to see trends in international business learning more towards service than products, the inclusion of digital currencies as forms of payments, and as on eco-friendliness and transparency. If you are interested in getting involved in international business, remember that technology is your friend. The more you understand technology; the better can use it to your business advantage.

## Conclusion

The significant use of technology for production is the reality of today's developed world because financial development, trade openness, and technological innovation have a causal relationship that affected trade performance those consequences for the growth and development of countries. Technology is useful to worldwide business. It may be stated that lowering trade barriers has made globalization of markets and production a theoretical possibility, technology has made it a practical reality. Technology is facilitating international business in at least six ways telecommunications, Transportation, Globalization of Production, Globalization of Markets, E-Commerce, and Technology Transfer. Worldwide business is a lot more extensive than global exchange. It incorporates global exchange as well as a wide assortment of alternate manners by which the organizations work universally. Technology is always developing and things in the worldwide business scene couldn't at any point remain something similar for extremely lengthy. While it is consistently difficult to foresee the future precisely as a business expert. The trends of international business learning more towards service than products, the inclusion of digital currencies as forms of payments, and as on eco-friendliness and transparency.

## Reference

- J Cantwell, J. (2017). Innovation and international business. *Industry and Innovation*, 24(1), 41-60
- J Spulber, D. F. (2008). Innovation and international trade in technology. *Journal of Economic Theory*, 138(1), 1-20.
- J Rafique, M. Z., Li, Y., Larik, A. R., & Monaheng, M. P. (2020). The effects of FDI, technological innovation, and financial development on CO 2 emissions: Evidence from the BRICS countries. *Environmental Science and Pollution Research*, 27, 23899-23913.
- J Elmawazini, K., & Nwankwo, S. (2012). Foreign direct investment: Technology gap effects on international business capabilities of sub Saharan Africa. *Thunderbird International Business Review*, 54(4), 457-467.
- J Diaconu, M. (2011). Technological Innovation: Concept, Process, Typology and Implications in the Economy. *Theoretical & Applied Economics*, 18(10).
- J Wang, N., Cui, D., & Dong, Y. (2023). Study on the impact of business environment on private enterprises' technological innovation from the perspective of transaction cost. *Innovation and Green Development*, 2(1), 100034.



- ) Stjernholm Madsen, A., &Ulhøi, J. P. (2005). Technology innovation, human resources and dysfunctional integration. *International Journal of Manpower*, 26(6), 488-501.
- ) Costa, C., Lages, L. F., &Hortinha, P. (2015). The bright and dark side of CSR in export markets: Its impact on innovation and performance. *International Business Review*, 24(5), 749-757.
- ) Khan, Z., Ali, M., Kirikkaleli, D., Wahab, S., & Jiao, Z. (2020). The impact of technological innovation and public private partnership investment on sustainable environment in China: Consumption based carbon emissions analysis. *Sustainable Development*, 28(5), 1317-1330.
- ) Xu, B., & Chiang, E. P. (2005). Trade, patents and international technology diffusion. *The Journal of International Trade & Economic Development*, 14(1), 115-135.
- ) ener, S., &Sarido an, E. (2011). The effects of science-technology-innovation on competitiveness and economic growth. *Procedia-Social and Behavioral Sciences*, 24, 815-828.
- ) Ganda, F. (2019). The impact of innovation and technology investments on carbon emissions in selected organisation for economic Co-operation and development countries. *Journal of cleaner production*, 217, 469-483.
- ) <https://www.mywestford.com/blog/importance-of-technology-on-international-business/>
- ) <https://realbusiness.co.uk/technology-affecting-growth-international-business>
- ) <https://www.yourarticlelibrary.com/technology/6-important-ways-in-which-technology-is-facilitating-international-business/5960>

## DATA ANALYTICS IN HIGHER EDUCATION IN KASHMIR VALLEY-AN OVERVIEW

**NAIRA SHAH**

Research Scholar, Department of Computer Science and Engineering, JayotiVidyapeeth Women's University, jaipur.

**Dr.SHOBHA LAL**

Professor, Department of Computer Science and Engineering, JayotiVidyapeeth Women's University, jaipur.

### **Abstract:**

Big Data provides platform to the higher institutions to use Information Technology as resources to improve quality of education and help students in achieving the high degree of completion, and to improve student the outcome. This paper highlights the big data attributes which are relevant to educational institutions and establish the factors to limit adoption and use of big data by for higher learning in institutions. This paper is to highlight challenges faced for implementation of Data analytics. The study has been done through a desk search and sources of literature including scientific research journals and reports have been thoroughly reviewed. Various Online journals found over internet were also viewed and examined using searching by Google Scholar. The paper concludes Big Data Analytics and its relevance in Educational systems with a view of helping instructional establishments in Kashmir valley to undertake Big Data Analytics. The paper recommends that academic establishments in Kashmir valley, to make investments in analytics programs and in developing expertise with a purpose to get price of large facts.

**Keywords:** Big Data, Real-Time decision making tools, Analytics, Higher Education, analytics program.

### **Introduction:**

In higher education, Big Data Analytics can be the forerunner of transformation as against the earlier approach of using analytics to just determining individual and class performance.

The Information Systems (IS) in education is under tremendous pressure to address the growing social demands and global changes. For example, IS education must be adapted in all workplaces in order to embrace IT related skills and ability to innovate. Students' concerns about job availability impact their intentions to choose Information Systems as a major (Zhang, 2007). It is challenging for IS educators and researchers to respond effectively and in time to the social demands and global changes (Lasi et al., 2014; Daniel, 2015). Fortunately, the advancement of data analytics has brought unique opportunities for dealing with these rapid changes (Daniel, 2015; Nguyen, Gardner, & Sheridan, 2017).

The data analytics help to choose right information at a right time .The higher education is a vast area for the utilization of the analysis of data as it comprises of learner data, faculty data and administrative data Educational structures, together with learning control structures and path authoring systems, generate enormous datasets all through every day operation .Massive data generated by educational systems are becoming more and more available for collecting and mining. This immense amount of data has heightened the need for well-established data management and analytics in the learning and teaching environment (Siemens and Long,

2011; Greller and Drachsler, 2012; Nguyen, Gardner, and Sheridan, 2017). The educational datasets, specifically, contribute to the evolution of getting to know theories, learning help, getting to know layout, learner feedback, and the development of learning support systems. Pistilli, Arnold, and Bethune (2012) show the use of data analytics for improving student success by producing real-time feedback to students.

From the attempts to apply data analytics in education, new disciplines have emerged called learning analytics, academic analytics, and educational data mining. While all of these concepts are related to the use of data analytics in education, they are completely overlapping. Learning analytics focuses on the application of data analytic techniques and tools for purposes of understanding and enhancing learning and teaching, whereas academic learning aims for the purposes of supporting institutional operations and decision making. Besides, educational data mining focuses on the development and evaluation of data analytics methods for exploring educational data. As a newly emerged area of research and practice, a variety of terms have been raised and adopted to describe similar concepts and processes (Nguyen, Gardner, and Sheridan, 2018b). However, the clarification and consensus of these terms are not yet understood fully (Barneveld, Arnold, and Campbell, 2012; Nguyen, Gardner, and Sheridan, 2017, 2018b). Various disciplines have emerged as a result for the data analysis over education. The terms like Learning Analysis, Academic Analysis (Barneveld, Arnold, and Campbell, 2012; Cooper, 2012) and education data mining (Zouaq, Joksimovic, and Gasevic, 2013; Baker and Inventado, 2014; Sin and Muthu, 2015) are well known. However their linkage has been researched several times by the researchers.

### **Objective:**

Following are the specific objectives which guide the paper:

1. To highlight the attributes of data which are relevant to educational institutions.
2. To establish the factors to limit adoption and use of big data by for higher learning in institutions.
3. To highlight challenges faced for implementation of Data analytics.

### **Methodology:**

This paper is based on a desk research. The articles, papers and journals accessed through internet using Google scholar, Research gate and other online articles have been taken as the source of the information.

### **Need for Data analysis in Higher education in Kashmir valley**

Many academic institutions are moving to cloud architectures and with the increased use of digital devices by users in these ecosystems is leading to a situation more data is being collected in these institutions than ever before, creating considerable opportunities for using Big Data to analyze and correlate information that enhance decision making (Marsh, O., Maurovich-Horvat, L., & Stevenson, 2014). Big Data presents to Institutions a good framework for efficiently utilizing the vast array of data in shaping the future of higher

education( Görnerup, O., Gillblad, D., Holst, A., & Bjurling, B. ,2013).For higher education, access to the data and the analytics allows for peer and internal evaluation. The higher education using data analytics can collect information about learners,educators to evolve the system of learning and give higher education a new edge.The educational system is increasingly coming under pressure to respond to economic, political and social changes such as the need to increase the number of students in certain disciplines, and training graduates with skills and attributes required by industry (Görnerup, O., Gillblad, D., Holst, A., & Bjurling, B. 2013).For these establishments to be responsive to those changes, it is vital that they use Information Technologies inclusive of Big Data which has sizable opportunities in better schooling. Educational information has in the beyond been accumulated through conventional tests mainly but is now an increasing number of being accrued through online academic structures, instructional games and simulations main to lots of data, which might be in turn growing possibilities for big data analytics...By using data analysis an institute can

1. Improve its branding by improving the ranking of the institution as the data collected can be used in policy and decision making.
2. In order to minimize the drop out ,the data analysis can be used for student retention.
3. Data collected can be used to save resources and time for institutional operations.

Kashmir valley consists of many government and non-government institutions under higher education which impart knowledge to the learners. The traditional way of teaching learning and process had earlier been whiteboard .But as per the growing needs of society and pressure by the Government department of higher education run by the government strictly puts higher institutions mandatory to have National Assessment and accreditation from the council for the ensuring quality education.

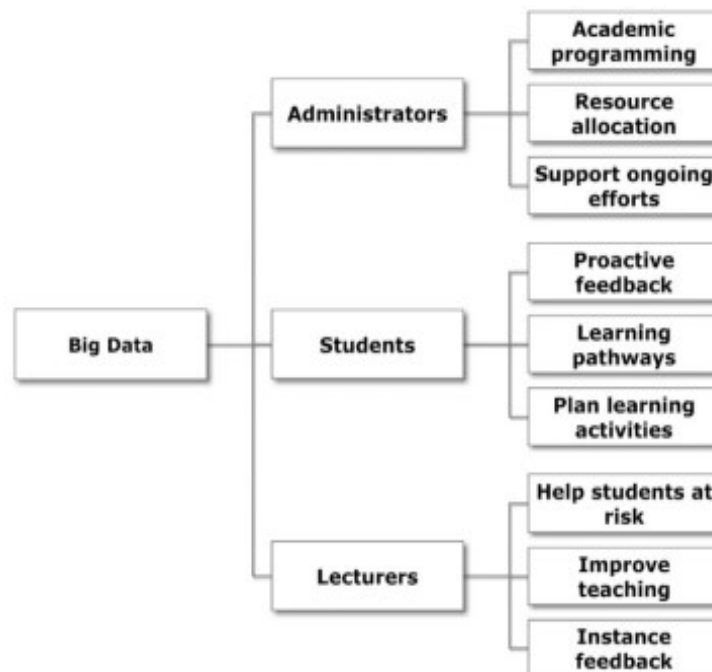
### **Factors and Implementation of data Analytics**

Since the cost of Big Data and Analytic tools is coming down drastically, they are becoming easier to use. Therefore it opens the opportunities to use these tools by educational institutions to achieve better outcomes and efficient use of the resources. Expectations of accurate practices of duty via stakeholders and growing demands for proof based totally guidelines to aid selection-making are among the factors which are contributing to the emergence of Big Data in higher education. Therefore, we can say that finding technology that will help in big data analytics and the relevant technological skills for example data scientists is the initial step. This is because data can no longer be viewed as a back office accounts settling tool but rather a real time decision making tool that can be used by data scientists to derive useful information that would otherwise remain hidden in the terabytes of data (Drigas, A. S., & Leliopoulos, P. 2014).

The decreasing costs of big data storage, open source software such as Apache Hadoop, NoSQL databases ,network bandwidth and on-demand access to resources through cloud computing are bringing these complex technologies close to nearly everyone( Ohri, A. 2015). In addition with the growing pressure of society, economy the need for data analysis has increased .It has also being an important factor to its implementation.

The big data analysis is implemented on the following levels:

- 1. Administrators:** it helps them to check Academic performance, provide efficient resource allocation and help and support ongoing efforts of the institutional up gradation.
- 2. Students:** It helps students to provide feedback about their classes, studies, teachers and other administrative works and helps them in grasping learning platforms and likewise plan learning activities
- 3. Teachers/Lecturers:** It helps them to helps students which face problems, improve their teaching methodology, and provide instance to student feedback.



**Fig1. Implementation of big data analysis at higher education Adapted from (Ben Daniel, 2014)**

**Challenges in The implementation:**

There are various challenges for the use of big data analysis in higher institutions of kashmir valley .The biggest challenge is the knowledge of big data which is very less confined to the stakeholders of IT(Information technology) and the people in such field are less yet emerging. The second challenge is the collaboration and co-operation between different departments as it is an institutional work. Furthermore, most of institutional data systems are not interoperable, so aggregating administrative data, classroom and online data can pose additional challenges (Daniel &Butson, 2013). However, there is still a divide among folks that understand how to extract facts and what facts are available, and people who realize what facts are required and how it'd nice be used, all which make collaboration difficult.



Furthermore, as Romero and Ventura (2010) note, analytics has traditionally been difficult for non-specialists to generate (and generate in meaningful context), to visualize in compelling ways, or to understand, limiting their observability and decreasing their impact (Macfadyen & Dawson, 2012).

### **Conclusion:**

This paper has explored Big Data Analytics and its relevance in Educational systems with a view of helping instructional establishments undertake Big Data Analytics. The paper has explored the attributes of large statistics which are applicable to educational institutions, the elements influencing adoption of big facts and analytics in educational institutions and checked out the elements hindering use of big information in those Institutions. Big Data is a ways greater than surely gathering information and generating reports.

It is a strategic useful resource that can be used to enhance academic high-quality. This paper recommends that academic establishments in Kashmir valley, to make investments in analytics programs and in developing expertise with a purpose to get price of large facts. Big Data allows reducing charges and enhancing education by using permitting administrators make decisions which might be more unique and presents instructors valuable gear to select from for an expansion of learning. The Big Data approach to statistics control will assist lessen problems associated with traditional facts evaluation; and this has the potential of enriching the schooling machine with new getting to know methods, and making choice making through policy makers more efficient and focused.

### **References:**

- 1) Arnold, K. & Pistilli, M. D. (2012). Course Signals: Using Learning Analytics to Increase Student Success. In Proceedings of the 2nd International Conference on Learning Analytics and Knowledge, 267–270, ACM.
- 2) Asif, R., Merceron, A., Ali, S. A., & Haider, N. G. (2017). Analyzing Undergraduate Students' Performance using Educational Data Mining. *Computers & Education*, 113, 177–194.
- 3) Baker, R. (2010). Data Mining for Education. *International Encyclopedia of Education*, 7, 112–118
- 4) Baker, R. & Inventado, P. S. (2014). Educational Data Mining and Learning Analytics. In J. A. Larusson & B. White (Eds.), *Learning Analytics: From Research to Practice*, 61–75, New York, NY: Springer.
- 5) Barahate, S. R. (2012). Educational Data Mining as a Trend of Data Mining in Educational System. In *IJCA Proceedings on International Conference and Workshop on Emerging Trends in Technology*, 11–16.
- 6) van Barneveld, A., Arnold, K., & Campbell, J. P. (2012). Analytics in higher education: Establishing a common language. EDUCAUSE. Retrieved from <https://library.educause.edu/resources/2012/1/analytics-in-higher-education-establishing-a-common-language>.
- 7) Bharara, S., Sabitha, S., & Bansal, A. (2018). Application of Learning Analytics using Clustering Data Mining for Students Disposition Analysis. *Education and Information Technologies*, 23(2), 957–984.
- 8) Marsh, O., Maurovich-Horvat, L., & Stevenson, O. (2014). Big Data and Education: What's the Big Idea. Big Data and Education conference. UCL .

- 9) Görnerup, O., Gillblad, D., Holst, A., & Bjurling, B. (2013). Big Data Analytics: A Research and Innovation Agenda for Sweden. The Swedish Big Data Analytics Network.
- 10) Drigas, A. S., & Leliopoulos, P. (2014). The Use of Big Data in Education. *International Journal of Computer Science Issues*, 11 (5), 58-63.
- 11) Ohri, A. (2015, March 6). Big Data Initiatives in Developing Nations. Retrieved April 10, 2017, from Big Data & Analytics Hub: <http://www.ibmbigdatahub.com/blog/big-data-initiatives-developing-nations>
- 12) Big Data and analytics in higher education: Opportunities and challenges *British Journal of Educational Technology* (2014) doi:10.1111/bjet.12230
- 13) Daniel, B. K. & Butson, R. (2013). Technology enhanced analytics (TEA) in higher education, *Proceedings of the International Conference on Educational Technologies*, 29 Novemebr–1 December, 2013, Kuala Lumpur, Malaysia, pp. 89–96.
- 14) Romero, C. R. & Ventura, S. (2010). Educational data mining: a review of the state of the art. *IEEE Transactions on Systems, Man and Cybernetics, Part C: Applications and Reviews*, 40, 6, 601–618.
- 15) Macfadyen, L. P. & Dawson, S. (2012). Numbers are not enough. Why e-learning analytics failed to inform an institutional strategic plan. *Educational Technology & Society*, 15, 3, 149–163.

**MOBILE PHONE: FRIEND OR FOE DURING THE ACADEMIC JOURNEY****Prof.(Dr.) Shobha Lal**

Department of Science and Technology, Jayoti Vidyapeeth Women's University, Jaipur  
e-mail: dean.fet@jvwu.ac.in

**ABSTRACT:** In this examination, we inspected the effect of cell phone utilization, during class address, on understudy learning. The selection of the cell phone by youngsters has been a worldwide marvel as of late. It is presently a basic piece of youths' everyday lives and is for the lion's share, the most well known type of electronic correspondence. Truth be told, the cell phone has abandoned a mechanical device to a social device. This paper investigates the effect of the cell phone on youth peer connections, on family connections and on the institution. Young individuals utilize the cell phone in positive manners to sort out and keep up their interpersonal organizations. Notwithstanding, there are additionally contrary effects on youthful people groups' friend connections. These can incorporate exclusion what's more, digital bullying. Demographic instruments are utilized to pick up bits of knowledge into how understudies esteem different cell phone applications and devices.

**Keywords:** Technology, radiation, Hybrid mode, students, Addiction,

**Scope of future Research**

This research, with its blended technique for examination, has discovered that the accessibility of such registering gadgets to understudies resembles a twofold edged blade and accompanies the two positives and negatives. In the previous scarcely any years, inferable from uncommon accomplishments in mechanical progression, countless processing gadgets have gotten versatile. In this way, they can be handily gotten to even outside conventional study hall settings. Henceforth, it is normal that the versatile idea of these gadgets and their high openness will considerably affect how understudies use them.

While these gadgets can be utilized for scholarly work along these lines influencing their scholastic execution, at long last they likewise offer various interruptions, which can meddle with understudy scholastic learning. Among the indicated benefits offered by the gadgets to the scholarly learning and its results, the rundown is a long-extending one and has been summed up in this closing segment.

The future scope of this research paper was to see better the effect that the utilization of cell phones in the homeroom/address theater has on the scholastic execution of first-year college understudies. The essential research was done through the assortment of data by means of an online study. In any case, this methodology considered a to be level of constraint as not all the understudies, who were conveyed the overviews, reacted, and among the respondents, some decided to miss a couple of inquiries. The self-determination of inquiries among respondents lines up with the way that couple of understudies referenced they couldn't see all the inquiries completely shows that the

examination confronted some degree of constraint. This segment diagrams five potential expansions to this exploration that could help further comprehension of the issue.

### **To utilize a contextual investigation way to deal with examine**

A contextual investigation approach investigating the encounters and convictions of the principal year understudies would additionally help recognize the effect of such gadgets on their scholastic learning. Such an intensive and top to bottom investigate the exploration would give a progressively comprehensive appreciation of the principal year understudies' getting, convictions and encounters. Such an information assortment technique could furthermore incorporate perceptions drawn from and bits of knowledge into the meetings with the principal year understudies, extended years, covering various groups of first-year understudies.

Inside and out, a future heading of study and examination into the theme, as referenced above, would help recognize the potential advantages that cell phones offer to the scholarly learning of understudies. Such information would help the field of instruction by helping offer understudies better scholarly assets, by coordinating the utilization of cell phones in their learning procedure in the study halls and talk stages.

### **Research Outcomes**

Result shows that most of the youth is suffering from mental and physical health issue like anxiety, weakness of eye-side, dissatisfaction and many more. Students are getting more dependent on technology and finding less interest in human interaction. They are just lost into their gadgets and avoid to take proper rest. Students get distracted by various functions of the technology like Social sites, gaming etc. These things in limit is good but over the limit can be a cause of depression. Oscitation of mobile security can be a big issue in students life as their is many hacking software's available to access the personal information. The research state that the amount of time for using mobile should to be limited for students to alter their performance and health.

### **INTRODUCTION**

An expanded utilization of figuring gadgets has been supported in the homeroom with the expectation of improving understudy learning and upgrading instructing rehearses. The current research writing recommends positive results for understudy commitment and understudy inspiration when 1:1 access for registering gadgets is given in study hall settings . In any case, there is conflicting outcome detailing for understudy accomplishment through the usage of registering gadgets. Consequently, there is a need to comprehend the potential effects of these gadgets for understudy results. In the previous hardly any years, many processing gadgets have become versatile in this way permitting them to be available outside conventional study hall settings. Thusly, it is characteristic, that the portable idea of these gadgets and their availability ought to substantially affect how understudies use them and how they influence the scholarly presentation of understudies.

The effect of the cell phone on learning is sweeping and extensive. Regardless, at the start, it is the naturalization of trend setting innovation inside the homeroom setting for understudies. This implies understudies who may as of now be grasping innovation will become accustomed to

utilizing it for learning and advancement purposes, rather than just games. Upgraded learning materials, for example, the utilization of dynamic visual mediums like pictures and recordings and gifts are had conceivable through the effect of the cell phone in the homeroom.

The impact of utilizing the cell phone in understudy adapting likewise has results past the school – understudies are utilizing apparatuses they will use in their work, in this way preparing the future during their tutoring itself.

Be that as it may, what considers realizing on a cell phone? Whenever a cell phone, for example, a tablet, portable or PDA, PC or Chromebook is utilized to help in instructing or learning of the homeroom educational plan, it very well may be considered learning on a cell phone. This may include everything from perusing course materials on the cell phone to playing instructive games on the cell phone, to noting assessments on the cell phone.

The utilization of the cell phone in the study hall can without much of a stretch be coordinated into the most customary and antiquated homeroom effectively, with the venture of an underlying beginning up cost and some preparation for the two instructors and understudies.

The effect of the cell phone on understudy learning is in this way as far reaching and broad as its utilization inside the study hall or instructive establishment.

The impact of the cell phone on understudy's and understudy learning is very expansive. With the development of training innovation and its inescapability inside the instructive environment, the effect of the cell phone on understudy learning is significant. Broad research has in this way been led about the effect of the cell phone on understudy learning.

The performance of students in their studies has been poor. Execution of an understudy regularly relies upon how genuine he is with his investigations. What's more, this may not be detached with the understudy's ownership of cell phones, among other diverting components.

Scholastic accomplishment is the result of instruction — the degree to which an understudy, instructor or foundation has accomplished their instructive objectives, scholarly execution is the capacity to contemplate and recollect realities and having the option to convey your insight verbally or on paper or its how understudies manage their investigations and how they duplicate with or achieve various assignments given to them by their educators.

A cell phone (likewise called versatile cell phone, or cell ) is an electronic gadget utilized for two-way radio media transmission over a phone system of base stations known as cell locales. The root of cell phones can be followed back to the late forties (1940s). The idea of the cell phone was created from the development of a radio utilized in a cab, police-taxis, ambulances and different vehicles that pre-owned two-route radio to speak with each other or a principle central station. In 1960's cell phone innovation was accessible, yet the 'get' was that the versatile client needed to remain inside a specific communicate zone.

We are currently in the third era, cell phone which we can utilize our telephones to do numerous things, for instance: content informing, web and making calls any wherein the world. Cell phones

have changed the manner in which we live our lives and to numerous the possibility of a world without voice calling, content informing and versatile web get to is an unsettling one.

As indicated by Shreiner (2012) mobile phones present new chances and difficulties for understudies. Alongside their books and school supplies, numerous understudies make their excursion to class with their cell phone. The nearness of wireless gives a large group of alternatives and difficulties for the present understudies.

Cell phones can be a useful scholarly apparatus, or a pernicious scholastic disturbance relying on the demeanor and use example of the understudy proprietor.

In the ongoing past, it has been seen that there has been a genuine decrease in scholastic execution of understudies in the scholastics outer assessments. The pattern influences the instructors just as guardians who bear the monetary obligations of the understudies. Some portion of the fault (for horrible showing) has been laid on the entryway of cell phone use. There are various negative and unfortunate effects and impacts of cell phone on understudies' exhibition. As indicated by Ansari (2004), these incorporate the wastage of time and cash, its vibration and utilize might be hurtful to wellbeing.

With phones, cheating has turned high. Understudies can content responses to tests, step through pictures of examinations or quest the web for answers. Regardless of rules about mobile phones, understudies despite everything use them during school hour . A few instructors offer zero to any understudy got with a telephone during an assessment. As indicated by (Watson 2006), many accept that the understudies are cheating in the event that they have mobile phone during a test.

Taking into account this, partners in training are stressed by the threat that the terrible showing of understudies presents. To be sure, they are worried that the fate of this incredible country is in question. This examination will, along these lines; research the impacts of cell phone use on scholastic execution of understudies.

## REVIEW OF LITERATURE

There are numerous investigations which propose that cell phones are affecting our childhood's training and their evaluations gravely. Mobiles are not in any event, affecting the adolescent's training it additionally influencing the school's condition. In an article on web sakazaki4693 (2009) [ [HYPERLINK "" \l "sakazaki4693" 1](#) ] proposes that cell phone ought to be restricted in schools as understudies consistently appears to glance occupied in short message administration (SMS) mixed media message administration (MMS) taking photos of companions and personnel even without knowing them and some more. It burns through such an extensive amount their time. In an exploration paper Olofinniyi OE et al. (2012) [ [HYPERLINK "" \l "OEO12" 1](#) ] prposed that mobiles telephones are affecting auxiliary schools' Academic execution and they inferred that mobiles are not affecting their exhibition yet additionally presenting some negative propensities in studs like utilize versatile during address or in library which coming up short on their presentation, so guardians and organization ought to debilitate thm to utilize cell phone.

### **Materials and Methodology**

This research was led with an intend to discover the parts of cell phone use among Pakistani clients. The motivation behind this examination was to find that how cell phones are affecting the evaluations and instruction of understudies. The system of poll was utilized to gather the reactions. The understudies of colleges and universities were taken as populace with the method of straightforward arbitrary inspecting. From the chose populace 100 understudies were chosen as test out of which 80 understudies reacted back hence the reaction pace of this examination is 80%. And afterward SPSS 20 was utilized to examine the gathered information.

### **SOME AREAS WHERE MOBILE IS NOT GOOD FOR HUMANS**

#### **A. Health issue due to Mobile Phones**

There are sure hurtful wellbeing impacts, which may be brought about by the unbalanced utilization of phones. As per present day inquires about, the most threatening issue is association between mobile phones and malignant growth. Despite the fact that the information stays questionable, most researchers concur that there is a sure danger from utilizing Phones to an extreme. It is accounted for, that individuals who chat on the telephone for a few hours daily are half bound to create mind malignant growth. The explanation behind this is the radio waves created by cell phones. It is determined, that the radio waves are not that much harmful for humans but daily using mobiles and being in aura of radio waves certainly influence the mind in instances of delayed effect. Late examinations report two sorts of mind malignancy may happen – glioma and acoustic neuroma. Aside from malignancy chance, cell phones impact our sensory system.

They may cause cerebral pains, diminished consideration, brevity of temper, rest issue and discouragement, for the most part among young people. Radio waves are by all account not the only explanation behind such side effects. It is the fact that the peoples, mostly youth like to communicate via phones and they like to make themselves more attractive towards their cellphones rather than interaction with persons. Today's youth is replacing human contact in an attempt to repay it by the technology and phones, this behavior of them surely makes them social influence but keep them apart from realistic fun and culture. Immaturity isn't a simple time of life, and around then a youngster is particularly powerless. In instances of inordinate cell phone use there is a chance of getting dependent on the telephone; this present reality appears to blur in correlation with hours-long visits and many messages. These perspectives cause mental issues, as individuals begin to feel awkward in vis-à-vis correspondence.

There are additionally different impacts that ought to be referenced. There is sure hazard for pregnant ladies and their youngsters, so they are firmly prescribed to decrease utilization of mobile phones. A few examinations give data about unsafe impacts of mobile phones on the male conceptive framework, so men ought not convey telephones in the pockets of their pants.

#### **B. Impact of Radio frequency**

Kids use mobile phones to sit in front of the TV, mess around, make calls, and send instant messages. Numerous more seasoned children and youngsters have their own phones, which they

are appended to every minute of every day. There is some different risk for children as well as for adults.

Cell phones produce a kind of radiation that is known as Radio Frequency-Electromagnetic Radiation (RF-EMR), likewise alluded to as microwave radiation. There have been worries from established researchers about whether phones are sheltered. Malignant growth is a specific concern, yet since tumors take 10-20 years to create and kids' regular PDA use is a moderately late turn of events, there are a larger number of inquiries than answers. To peruse progressively about whether we ought to be stressed over mobile phone radiation by and large, read our article here.

Some studies that shows impact of radiation on students:

- In an investigation of wireless radiation noticed that the children suffer more than adults. The radiation's effect the child brain more as compared to any adult or teen. This is on the grounds that kids have relatively littler heads and cerebrums, yet get similar degrees of PDA radiation as adults. The American Academy of Pediatrics concurs, saying that "when utilized by kids, the normal RF vitality affidavit is multiple times higher in the mind and multiple times higher in the bone marrow of the skull, contrasted and cell phone use by adults."
- Another investigation found that individuals who start utilizing mobile phones (and cordless landline telephones) before the age of 20 are at a significantly higher danger of creating mind tumors than individuals who start utilizing these remote telephones as adults. This is a direct result of the closer vicinity of the wellspring of radiation to the cerebrum of children (they have more slender tissues and bones than grown-ups).
- Research likewise recommends that mobile phone presentation could influence youngsters' behavior. The kids in the examination who were hyperactive or had enthusiastic or conduct issues, incorporating inconvenience coexisting with different children, were significantly more liable to have moms who utilized PDAs during pregnancy. Subsequent to representing different variables that could influence conduct, the offspring of these moms were 80% bound to have social issues than kids whose moms once in a while or didn't utilize PDAs. In any case, this is hard to consider in light of the fact that moms who use mobile phones much of the time during pregnancy or after the infant is conceived, may give less consideration to their kids, bringing about the youngsters' terrible conduct. More research is expected to comprehend the connection between mother's mobile phone use and youngsters' conduct.

### **C. Phones an Addiction:**

In a study found that the rate of students using phones and spending most of the time on their phones is increasing. While smartphones are used for many good things like for learning and communication, they are also can be used for many evil things. Understudies are discovering it ever-simpler to cheat and are turning out to be increasingly diverted.

An investigation distributed in the Journal of Media Education found around 97 percent of undergrads normally utilize their telephones in class for non-instructive purposes. Texting was



hailed as the fundamental wrongdoer, with roughly 90 percent of respondents guaranteeing it was their primary interruption in class.

The Education Advisory Board (EAB) even case telephones are "something other than an interruption" yet really "a dependence".

There is also a word for one who uses their phone additionally are 'nomophobic', and number of students using phones are being analyzed. As indicated by the Baylor study, 60 percent of undergrads confess to being nomophobic.

Being nomophobic is also a cause of anxiety. It was discovered that for some nomophobic undergrads, removing themselves from their telephones caused significant levels of uneasiness. This nervousness could affect their learning considerably more seriously than utilizing their telephone.

## **RESULTS AND DISCUSSION:**

Positive And Negative Effects Of Mobile Phones On Students

### **1. Accommodation**

Decades back, brilliant cell phones were not as convenient as they are these days, so undergrads relied upon PCs in the library to continue ahead with things. This hindered quick and significant homeroom look into. Cell phones today are easy to move around with, fusing a wide range of current innovation.

### **2. Simple entry To Info And Tech**

Learning despite everything proceeds after the study hall. These telephones help undergrads to have live information and updates as they approach their scholastic lives. Understudy commitment is better when innovation driven devices are banded together with to help learning and not the old fashioned strategies. Most present day specialists are imaginative to stay aware of the present innovation time.

### **3. Improved Security and crisis correspondence**

Undergrads can utilize their cell phones to advise their folks and gatekeepers regarding their present area. Guardians would now be able to screen the whereabouts of their children and it helps the decrease of the remaining tasks at hand of managerial staff who would've been called to move messages from guardians to their wards.

### **4. Social-tainment**

These cell phones engage undergrads. They use it to take a break from all their scholarly work while they unwind with great motion pictures or music. Games can likewise be played on it or in any event, surfing of the web.

### **5. Memory**

During class work, these cell phones are valuable for taking pictures of troublesome outlines, live record clarifications from instructors e.t.c.

Must Read: Top 4 Amazing Tech Gadgets To Help You Study

This guides the understudies to return to the put away data at the ideal time. It wouldn't have been conceivable without a cell phone.

## **6. Correspondence**

Clear as crystal. It very well may be utilized to hand-off data between at least two people at some random time.

## **7. Adjustment To A Modern World**

Understudies that utilize this gadget help themselves to be comfortable with present day aptitudes. Since cell phones are key in a few professions, understudies with telephones are conceded an edge in the activity advertise.

## **8. Causes You Organize Yourself**

Apparatuses like cautions, word reference, schedule, reference book, notes, watch are critical to making this a chance. It makes life simple for understudies.

## **9. Route**

Guide applications on cell phones let you get to any area at whatever point you need.

## **10. A Delighted Student**

These understudies are more joyful when their cell phones are close by. What's more, a graduate understudy will in all likelihood exceed expectations in school.

## **Negative Effects Of Mobile Phones On Students:**

### **1. Interruption**

While the telephones are valuable, they can accompany their own interruptions. A few understudies utilize these handsets during class or study hours, consequently no an ideal opportunity to peruse. The web, music, motion pictures, Snapchat, Instagram e.t.c. help this interruption.

### **2. Presentation To Wrong Contents**

I'm talking understudies that wind up sexting, sharing naked pictures, or accessing a pornography site all for the sake of playing around with their telephones.

### **3. Wellbeing Risk**

Studies have been discharged to discuss the association between radiation transmitted from the gadget and interminable wellbeing sicknesses like malignant growth and mind tumor. Lack of sleep from telephone utilization is likewise a reason for pressure, which in the long run influences your wellbeing.

#### **4. Cyberbullying**

Verbally abusing, Threats, Body disgracing still go on the web. Understudies are presented to this and it can wind up negatively affecting whoever is included.

#### **5. Assessment Malpractice**

Answers that should come directly from the understudy's mind can emerge out of their telephone. Each school doesn't approve misbehavior, so such an understudy can be removed, henceforth, the youngster's training is influenced.

#### **6. Cost Of Purchase**

Most telephones are sold at a significant expense and most understudies do everything conceivable to have the option to manage the cost of them. Regardless of whether it requires including themselves in taking to get that going. Information membership is in some cases exorbitant also, which is a weight on these children.

#### **7. Decrease In Social Skills**

It hoses socialization. Understudies that live the me-and-my-telephone life once in a while possess energy for companions. They like to stay confined with their mobile phones and be separated from everything else. This makes them against social, which isn't the best.

#### **8. Security Issues**

Programmers of this world present this hazard understudy are presented to.

#### **9. Wrong Educational Resources**

The web is free for all, it is difficult to guarantee every single instructive asset seen online are correct and genuine. Understudies are presented to a ton of these off-base and bogus data.

#### **10. Mishap**

This is the awful debacle understudies can meet with when they content, call and drive simultaneously. Or then again in any event, when they content, call and talk when a crazy driver is close by.

#### **CONCLUSION:**

Mobile phones have welcomed on an entirely different period of innovation and they do make life progressively advantageous regarding correspondence. In any case, the reactions of mobile phones and the interruptions that they are cause numerous hazardous and unfortunate circumstances to happen. Mobile phones cause cerebrum harm, fender benders, and are interruptions at school. What's more, they are likewise enormous dangers to the earth. When looking at the soundness of ourselves and our reality to comfort, our reality is progressively significant. Therefore, we have demonstrated our point that Cell telephones accomplish more damage than anything else.

As indicated by conversation above, it is currently simple to reach inference on the effect of cell phone on the scholarly execution of higher learning understudies, in which the outcomes has uncovered that the cell phone welcome negative outcomes or movement on understudies' execution scholastically. So there is a need to assess and see better the utilization of cell phones for higher learning understudies because students settle on their own decision and inclination on which versatile application to use, as it is talked about above practically 48% of the respondents concurred that they will in general use cell phone for around 5 – 7 hours for every day on social correspondence locales (65%) like Facebook, twitter, Instagram, WhatsApp and such without thinking about that those time spent on social system could have been utilized on scholarly related works and thus yield great outcomes toward the finish of semester assessments. Likewise among the cell phone dependent gathering, female are more dependent than male since 57% of the respondents were female and among those female the greater part of them 75% are underneath 25 a long time old of the age which demonstrates that adolescents are progressively dependent on cell phone use, and most remarkable outcomes are that they are taking single guy degree (65%), recognition (12%) or declaration (8%) so they are not self-controlled.

Moreover, there is sure connection between's sexual orientations, age gathering, conjugal status, dependence on cell phone use, program taken at University and the use of cell phone as in there is a certain gathering influenced by those components referenced. In any case there is additionally a negative relationship between's high scholastic execution and the elements referenced prior on the grounds that the larger part GPAs of the overviewed respondents were seen as underneath 3. In this way to close, there is negative effect of cell phone use on higher learning understudies .

### **Correlation with Ancient Indian Literature:**

In today's life of full of technology and gadgets it's hard to imagine our life without technology specially cellphones. Now technology is an essential part of our day to day life from morning to night. Although technology help us in growing, being smart and make our work easier, but if we look back in past, before 50 years life weren't same as compared to today's life. People were not count on technology, they were not leaned on gadgets. They were more self dependent, they were optimist rather than being socialist. Now if we talk about the education sector, people before were not have phones and internet to learn from the online tutorials and YouTube videos. They used to learn from books and persons. They were doing more practical aspect than the virtual one. Now a question arises , is the education without technology were more effective than nowday's digital study?, The sprouting of technology is a cause of distraction or is supportive in human growth?

The more we find out about learning, the further we appear to escape from the essential showing exercises of the past. Talks, albeit vital, are not, at this point the focal point of instructing approach. Learning from gadgets like phone, tablets and computers is good, it do help students learning new things and growing but it is also a major cause of distraction. Apart from study students get attracted with social sites, whenever a pop-up appear their concentration is flushed and students get fascinated toward it. At this point learning from books and without any technology were far

better than seeking for a digital device. In 90's people were more effective as they don't have to depend on technology. They used to read books and novels to gain knowledge. We took example of Kiran Bedi, Savitribai Phule and Kadambini Ganguly. These are proud of our nation who made a number of sacrifices so that they could further their education and be successful. They are from various fields like Kiran Bedi an Indian social activist and retired Indian Police Service (IPS) officer, Saraswatibai Phule from the field of singing and Kadambini Ganguly from medical field. At that time technology wasn't developed that much they all completed their study by learning from the books and gained that much knowledge by practicing practically. It defines that the knowledge isn't depend on technology and books are more effective than any learning device.

We can also take an example of Gurukul which is an ancient way of education. Gurukul instruction framework gives students the information about Hindu religion, carries near nature, yogasanas, information about useful circumstances of life and so on. Present day instruction gives information about innovation, electronic frameworks, most recent contraptions and so forth. Modern education makes us more dependent on technology. As in Gurukul students were close to nature in today's generation students are close to gadgets, they are deprived from human interaction and it also affects their health. In Gurukul yoga and meditation were in daily routine of students but today's technology makes students stuck on a place and makes them more laggard. Gurukul education was more practical in contrast modern education is moving toward more virtual aspect.

#### References:

- [1] Md. Moyazzem Hossain(2019) Impact of Mobile Phone Usage on Academic Performance
- [2] Enyi Uko Jairus, Upelle Uko Christian , Agada John Ogwuche , Ominyin Ida Thomas , Taiyol Tyavlum .T. , Eru John Ode , Ekpo Steve .O., Adoga Isaac Agama(25 May 2017) Impact of Mobile Phone Usage on Students' Academic Performance Among Public Secondary Schools in Oju Local Government Area of Benue State
- [3] Hasan Balfagihv(2017) A Study of the Impact of mobile Devices on first year University Students
- [4] Fareeha Tariq(2013) Effects of Mobile Phones on Studies Sadaf Nawaz, Zahoor Ahmad(Sep-Oct. 2012), Statistical Study of Impact of Mobile on Student's Life
- [5] Sadaf Nawaz, Zahoor Ahmad(Sep-Oct. 2012), PP 43-49 Statistical Study of Impact of Mobile on Student's Life
- [6] <https://ecfsapi.fcc.gov/file/7520941199.pdf>
- [7] <http://www.center4research.org/children-cell-phones-phone-radiation-risky-kids/>
- [8] <https://www.studyinternational.com/news/smartphone-damaging-education/>
- [9] <https://askopinion.com/gurukul-system-of-education-vs-modern-education-system>
- [10] <https://www.projecttopics.org/impact-of-social-media-on-students-academic-performance-among-senior-secondary-school-students.html>

**A COMPARATIVE ANALYSIS OF SOLUTIONS FOR TWO SIGNIFICANT NUMERICAL METHODS****Dr. Vishal Saxena**

Professor in Mathematics, Jayoti Vidyapeeth Women's University, Jaipur, Rajasthan.

**Abstract:**

In the present study, the numerical solutions of ordinary differential equations with initial value problems have been found using the Runge Kutta method and the Modified Euler's method. The accuracy of the numerical approximate solutions was then verified by comparing them to the precise solutions. When the step size ( $h$ ) is very small, we discovered that the solution becomes more precise. We discovered that the relative error for the Runge Kutta fourth order technique is nominal among the two methods.

**Keywords:** Numerical solution, Modified Euler's method, Runge Kutta method, Initial value problem.

**INTRODUCTION:**

Almost all the areas of science, mathematics, engineering and medical, benefit greatly from the use of differential equations to solve challenging mathematical problems. Differential equations are a common occurrence in mathematics to represent a variety of actual and practical problems. Either ordinary differential equations or partial differential equations are used to represent these differential equations. Most of the time, because the solutions to such problems are used to model are so complex, one of two mentioned methods should be used to approximate the solution and obtaining the results. The first method we'll employ is lowering the differential equations into a form that can be precisely solved, from which we may utilize the obtained results to approximate the original problems. The approximation method, which yields a more accurate answer and less relative error, is another way that will be employed here. Numerical approaches are employed to solve those mathematical conundrums for which it is extremely challenging or almost impossible to identify the precise solution. Differential equations can only be solved analytically for only few one. The well-known analytical techniques cannot be used to find the solutions of many differential equations. Therefore, in these situations, we must use numerical methods to solve a differential equation under one or more initial limitations. There are several numerical methods for solving the initial value problem of ordinary differential equations.

In this research study, we will show two numerical techniques for solving initial value problems for ordinary differential equations, including the Runge Kutta method and the Modified Euler's approach. Several investigators [1-8] have studied various numerical methods and obtained the numerical solutions to different initial value problems for ordinary differential equations. Kaw and Kalu [9] investigated the numerical methods and gave its various applications. The study of different numerical methods using computational languages were done by many researchers and obtained the numerical solutions of some very complicated problems [10-12]. A number of authors tried to solve the

initial value problems using the Runge Kutta method and the Modified Euler's approach in order to assess high precision.. The Runge Kutta technique is the most widely used numerical approach because it consistently produces initial values and is excellent for complex higher derivative calculations. The numerical results are quite encouraging [13-14].

Finally, an example is taken for the comparative study of these two methods. The results to the problem show that the approach performance in terms of convergence is convincing. Since the Modified Euler approach needs 'h' to be very small for determining logical accuracy, it is less convenient to find the numerical solution of differential equation. The Runge Kutta approach has the advantage of just requiring the functional values at a few selected points on the sub interval, improving precision, and not requiring the high order derivatives. We discovered that the Euler modified approach requires more approximations since its very small step size converges to an analytical solution. The Runge Kutta approach, on the other hand, yields findings that converge more closely to analytical answers and requires less iterations to produce precise solutions.

### Runge-Kutta method:

The Runge-Kutta method is a reliable and very popular technique to get the solution of initial value problems of differential equations. Without the necessity for high order derivatives of functions, the Runge-Kutta method can be utilised to build high order accurate numerical methods by functions alone.

If the equation be  $\frac{dy}{dx} = f(x, y)$ ,  $x \in [x_0, x_n]$  and  $y(at x = x_0) = y_0$

The solution is  $y = y_n + K$ , where  $K = (K_1 + 2K_2 + 2K_3 + K_4)$

$$K_1 = hf(x_n, y_n)$$

$$K_2 = hf\left(x_n + \frac{h}{2}, y_n + \frac{K_1}{2}\right)$$

$$K_3 = hf\left(x_n + \frac{h}{2}, y_n + \frac{K_2}{2}\right)$$

$$K_4 = hf(x_n + h, y_n + K_3)$$

### Modified Euler's Method:

If the equation be  $\frac{dy}{dx} = f(x, y)$ ,  $x \in [x_0, x_n]$  and  $y(at x = x_0) = y_0$

In this method following two equations will be used in each step and the second equation will give the modified result.

$$y_{n+1} = y_n + hf(x_n, y_n)$$

$$y_{n+1} = y_n + \frac{h}{2}[f(x_n, y_n) + f(x_{n+1}, y_{n+1})]$$

**Problem:** Let the problem of initial value be

$$\frac{dz}{dt} = t^2 - tz, z(t = 0) = 1, t \in [0,1].$$

**Solution:** The analytic (exact) solution for the problem is given by

$$z = \frac{2e^{t^2/2}}{\sqrt{2\pi} \operatorname{erf}(t / \sqrt{2}) + 2}$$

The numerical solutions by the above two mentioned methods can be shown as:

**(i) For h = 0.1**

<b>Exact Solution</b>	<b>Runge-Kutta Method</b>	<b>Modified Euler's Method</b>
<b>Value of z</b>	<b>Value of z</b>	<b>Value of z</b>
0.91350912789	0.91350893202	0.9145000 0000
0.84921851870	0.84921817106	0.85070087260
0.80182339795	0.80182294486	0.80353972229
0.76778358615	0.76778306212	0.76959823666
0.74468970047	0.74468912824	0.74653085282
0.73088840277	0.73088779615	0.73271856936
0.72525129927	0.72525066587	0.72705174941
0.72702708621	0.72702642958	0.72878935089
0.73574358854	0.73574290958	0.73746472131
0.75114035195	0.75113964993	0.75282025566

**(ii) For h = 0.05**

<b>Exact Solution</b>	<b>Runge-Kutta Method</b>	<b>Modified Euler's Method</b>
<b>Value of z</b>	<b>Value of z</b>	<b>Value of z</b>
0.91350912789	0.91350912131	0.9137386 3169
0.84921851870	0.84921850484	0.84956297653
0.80182339795	0.80182337822	0.80222338856
0.76778358615	0.76778356203	0.76820759057
0.74468970047	0.74468967309	0.74512088740
0.73088840277	0.73088837289	0.73131788780
0.72525129927	0.72525126733	0.72567456581
0.72702708621	0.72702705246	0.72744202414

**(iii) For h = 0.025**



Exact Solution	Runge-Kutta Method	Modified Euler's Method
Value of z	Value of z	Value of z
0.91350912789	0.91350912763	0.9137386 3169
0.84921851870	0.84921851805	0.84956297653
0.80182339795	0.80182339695	0.80222338856
0.76778358615	0.76778358488	0.76820759057
0.74468970047	0.74468969899	0.74512088740
0.73088840277	0.73088840113	0.73131788780
0.72525129927	0.72525129748	0.72567456581
0.72702708621	0.72702708431	0.72744202414
0.73574358854	0.73574358652	0.73614939455
0.75114035195	0.75114034981	0.75153690660

(iv) For  $h = 0.0125$

Exact Solution	Runge-Kutta Method	Modified Euler's Method
Value of z	Value of z	Value of z
0.91350912789	0.91350912788	0.91352264673
0.84921851870	0.84921851866	0.84923887245
0.80182339795	0.80182339790	0.80184709604
0.76778358615	0.76778358608	0.76780876429
0.74468970047	0.74468970039	0.74471535545
0.73088840277	0.73088840268	0.73091399993
0.72525129927	0.72525129916	0.72527656295
0.72702708621	0.72702708610	0.72705188435
0.73574358854	0.73574358842	0.73576786764
0.75114035195	0.75114035182	0.75116410010

## RESULTS:

In the present study, we have acquired the knowledge of numerical methods to solve initial value problems. We have used two methods, namely Euler Modified method and Runge Kutta method. We have discussed these two methods with an example. The outcomes of the example are displayed in Tables [1-4]. According to the tables for each technique, a numerical solution converges to an accurate answer if the step size decreases. We have also observed that the convergence to the results for Runge Kutta technique is more fast as the Euler modified method.

## REFERENCES

- [1]. Gear C. W. (1971): Numerical Initial Value Problems in Ordinary Differential Equations. Prentice - Hall, Upper Saddle River.

- [2]. Hall G. and Watt J. M. (1976): Modern Numerical Methods for Ordinary Differential Equations. Oxford University Press
- [3]. Sastry S. S.(2000): Introductory Methods of Numerical Analysis. Prentice-Hall, India.
- [4]. Burden R. L. and Faires J. D. (2002): Numerical Analysis. Bangalore, India.
- [5]. Gerald C. F. and Wheatley P. O.(2002): Applied Numerical Analysis. Pearson Education, India.
- [6]. Balagurusamy E. (2006): Numerical Methods. Tata McGraw-Hill, New Delhi.
- [7]. Butcher John C. (2008), Numerical Methods for Ordinary Differential Equations. New York, John Wiley & Sons.
- [8]. Hossain M. S., Bhattacharjee P. K. and Hossain M. E. (2013): Numerical Analysis. Titas Publications, Dhaka.
- [9]. Kaw Autar, Kalu Egwu and Nguyen Duc (2011): Numerical Methods with Applications, University of South Florida.
- [10]. Eaquab Ali and S. M. (2006): A Text Book of Numerical Methods with Computer Programming. Beauty Publication, Khulna.
- [11]. Lambert J. D. (1973): Computational Methods in Ordinary Differential Equations. Wiley, New York.
- [12]. Forsythe G. E., Malcolm M. A. and Moler C. B. (1977): Computer Methods for Mathematical Computations, Prentice-Hall.
- [13]. Tan Delin and Chen Zheng (2012): On a General Formula of Fourth Order Runge-Kutta Method. Journal of Mathematical Science & Mathematics Education, 7 (2); 1–10.
- [14]. Islam M. A. (2015): Accurate solution of initial problems for ordinary differential equation with fourth order Runge- Kutta method. Journal of Mathematical Research.



**TO STUDY THE QUADRATURE FORMULA FOR NUMERICAL INTEGRATION**

**Sonia**

Research Scholar, Jayoti Vidyapeet Women's University, Jaipur  
Kalyansonia05@gmail.com

**Prof. Vishal Saxena**

Jayoti Vidyapeet Women's University, Jaipur  
vishaljpr.raj@gmail.com

**ABSTRACT**

Based on moment fitting equations, we provide effective quadrature's for the integration of polynomials over irregular convex polygons and polyhedrons. The quadrature construction strategy requires the solution of a small linear system of equations and the integration of monomial basis functions using homogeneous quadrature's with a limited number of integration points. In this study, we show that the numerical integration of polynomial functions may be performed with the same precision and efficiency as the Gauss quadrature, provided that the same points and nodes are used for the determination of the polynomial's form. The locations of the chosen points are random, and the resulting deduced formulae are therefore distinct, as will be shown below and executed in order to benefit from the values of the polynomials at those sites and nodes and also from their first derivatives.

Keywords: Numerical integration, Polynomials, Derivatives, Matrix, Degree

**INTRODUCTION**

Approximating definite integrals numerically is the goal of numerical integration. Numerical integration is useful in a wide variety of contexts. As an illustration, there are a number of well-defined functions whose anti-derivatives cannot be written in terms of fundamental functions. This operation appears in many contexts, particularly those dealing with probability and statistical testing. In addition, integro-differential equations, which are used to describe many applications in science and engineering, need a particular treatment for the integral terms (e.g. expansion, linearization, closure ...). Therefore, not only may integrals be evaluated numerically, but special functions specified in terms of integrals can also be approximated using numerical integration.

There are two types of issues where numerical integration is necessary without sacrificing generality. The first kind involves determining the value of an integral for a known function. Because of this, the integrand may be assessed at a number of places, and numerical integration techniques can be used to determine both the best locations and the optimal number of these sites.

Secondly, differential equations, the most popular of which embody conservation principles, provide a class of problems amenable to numerical integration. Example: the well-known partial differential equation seen in process modeling and biological systems, the population balance equation, has source terms that are integrals of the solution variable (e.g. the number density function).

Quadrature is by far the most typical method for doing numerical integration. Following these three measures will result in a quadrature:

Approximate the integrand by an interpolating polynomial using a specified number of points or nodes  
Substitute the interpolating polynomial into the integral

Integration

**THE INTEGRAL EXPRESSIONS OF THE POLYNOMIAL FUNCTIONS**

**For the polynomials of first degree (Number of integral point - One):**

For the polynomial functions in first degree, their integral expression is obtained as

$$I = \int_{-1}^{+1} P(\xi)d\xi = \left[ \phi_0 \xi + \frac{\phi'_0}{2} \xi^2 \right]_{-1}^{+1}$$

On simplification,



$$I = 2 \times \Phi_0$$

In Cartesian coordinate system

$$\frac{L}{2} \times 2 \times \Phi_0 = L \times \Phi_0 = (x_2 - x_1) \times \Phi \left( x = \frac{x_2 + x_1}{2} \right)$$

Where,  $\Phi_0$  is the value of  $\Phi(x)$  at

$$x = \frac{x_2 + x_1}{2} \text{ (i.e. at } x = \frac{x_2 - x_1}{2} \xi + \frac{x_2 + x_1}{2}, \text{ and } \xi = 0)$$

**For the polynomials of third degree (Number of integral point - Two):**

On the basis of determination of  $a_i$  on the values of  $\Phi(\xi)$  and  $\Phi'(\xi)$  at  $-1$  and  $+1$ . (i.e. at  $x_1$  and  $x_2$ ), the polynomials of third degree are defined by the expression, and their integral in the parametric formulation.

$$I = \int_{-1}^{+1} P(\xi) d\xi = 2a_0 + \frac{2}{3}a_2 = 2 \frac{2(\Phi_1 + \Phi_{-1}) - (\Phi'_1 - \Phi'_{-1})}{4} + \frac{2(\Phi'_1 - \Phi'_{-1})}{3 \cdot 4}$$

Thus,

$$I = 1 \times (\Phi_1 + \Phi_{-1}) - \frac{1}{3} \times (\Phi'_1 - \Phi'_{-1})$$

In Cartesian coordinate system

$$I = \int_{x_1}^{x_2} P(x) dx = \frac{(x_2 - x_1)}{2} \times \left[ (\Phi(x_2) + \Phi(x_1)) - \frac{1}{3} \times \frac{(x_2 - x_1)}{2} \times (\Phi'(x_2) - \Phi'(x_1)) \right]$$

Where ' $\Phi'$ ' is the first derivative of the function  $\Phi$  with respect to  $\xi$  and,

$$\frac{d\Phi(x)}{d\xi} = \frac{dx}{d\xi} \frac{d\Phi(x)}{dx} = \frac{L}{2} \frac{d\Phi(x)}{dx}$$

Also, the multiplication factor  $(x_2 - x_1)/2$  appear before, represent the Jacobean of the transformation, and appears also before the derivatives with respect to  $\xi$  according to above equation.

**For the polynomial functions of fifth degree (Number of integral point - Three):**

In the present method, the locations of the integral points are chosen, and the derivatives are eliminated by using Gaussian fixed points. As an added bonus, if the interval's beginning and endpoints as well as its midpoint are all set to the same distance from one another, the constants  $a_0$ ,  $a_2$  and  $a_4$  are thus given by

$$a_0 = \Phi_0$$

$$a_2 = \frac{4(\Phi_1 + \Phi_{-1}) - 8\Phi_0 - (\Phi'_1 - \Phi'_{-1})}{4}$$

$$a_4 = \frac{-2(\Phi_1 + \Phi_{-1}) + 4\Phi_0 + (\Phi'_1 - \Phi'_{-1})}{4}$$

So, the integral of the polynomials of fifth degree (related to  $a_0$ ,  $a_2$  and  $a_4$ ) is given by,

$$I = \int_{-1}^{+1} P(\xi) d\xi = 2a_0 + \frac{2}{3}a_2 + \frac{2}{5}a_4$$

On simplification:

$$I = \frac{7}{15} \times (\Phi_1 + \Phi_{-1}) + \frac{16}{15} \times \Phi_0 - \frac{1}{15} \times (\Phi'_1 - \Phi'_{-1})$$

In parametric coordinate system, it is given by,

$$I = \int_{x_1}^{x_2} P(x) dx = \frac{(x_2 - x_1)}{2} \times \left[ \frac{7}{15} \times (\Phi(x_2) + \Phi(x_1)) + \frac{16}{15} \times \frac{x_2 + x_1}{2} - \frac{1}{15} \times \frac{(x_2 - x_1)}{2} \times (\Phi'(x_2) - \Phi'(x_1)) \right]$$

**For the polynomial functions of seventh degree (Number of integral point - Four):**

If  $P(\xi)$  is a polynomial function of seventh degree, then its exact integral in the parametric coordinates (related to  $a_0, a_2, a_4$  and  $a_6$ ) is given by,

$$I = \int_{-1}^{+1} P(\xi) d\xi = 2a_0 + \frac{2}{3}a_2 + \frac{2}{5}a_4 + \frac{2}{7}a_6$$

Otherwise, can be shown as,

$$I = W_1 \times (\Phi_1 + \Phi_{-1}) + W_2 \times (\Phi_{1/6} + \Phi_{-1/6}) + \overline{W}_1 \times (\Phi'_1 - \Phi'_{-1}) + \overline{W}_2 \times (\Phi'_{1/6} - \Phi'_{-1/6})$$

On replacement of  $\Phi_i$  and  $\Phi'_i$ , we get

$$I = W_1(2a_0 + 2a_2 + 2a_4 + 2a_6) + W_2 \left( 2a_0 + \frac{2}{6^2}a_2 + \frac{2}{6^4}a_4 + \frac{2}{6^6}a_6 \right) + \overline{W}_1(4a_2 + 28 + 16a_6) + \overline{W}_2 \left( \frac{14}{6^1}a_2 + \frac{2}{6^3}a_4 + \frac{2}{6^5}a_6 \right)$$

Here, above two representations will be same. The following system of equations becomes

$$\begin{cases} W_1 + W_2 = 1 \\ W_1 + \frac{1}{6^2}W_2 + 2\overline{W}_1 + \frac{2}{6}\overline{W}_2 = \frac{1}{3} \\ W_1 + \frac{1}{6^4}W_2 + 4\overline{W}_1 + \frac{4}{6^3}\overline{W}_2 = \frac{1}{5} \\ W_1 + \frac{1}{6^6}W_2 + 6\overline{W}_1 + \frac{6}{6^5}\overline{W}_2 = \frac{1}{7} \end{cases}$$

**For the polynomial functions of ninth degree (Number of integral point - Five):**

Using the above similar process, we obtain the polynomial functions of ninth degree (five integral points).

$$\begin{cases} W_1 + 2W_2 + 2W_3 = 2 \\ W_2 + \frac{1}{4}W_3 + 2\overline{W}_1 + \overline{W}_2 = \frac{1}{3} \\ W_2 + \frac{1}{4^2}W_3 + 4\overline{W}_1 + \frac{1}{2}\overline{W}_2 = \frac{1}{5} \\ W_2 + \frac{1}{4^3}W_3 + 6\overline{W}_1 + \frac{3}{16}\overline{W}_2 = \frac{1}{7} \\ W_2 + \frac{1}{4^4}W_3 + 8\overline{W}_1 + \frac{3}{16}\overline{W}_2 = \frac{1}{9} \end{cases}$$

With the use of above one to five integral points, we can determine the weights  $W_i$  and  $\overline{W}_i$  of functions  $\Phi(\xi_i)$  and  $\Phi'(\xi_i)$  for various points and their selected positions  $\xi_i$ .

Similarly for two dimensions, the quadrature formulas for  $P=P(\xi, \eta)$  can be obtained (from integrating with respect to  $\xi$  and hence with respect to  $\eta$ ). The limit integral of the polynomial function in the parametric formulation (square area), can be formulated by

$$\begin{aligned} I &= \int_{-1}^{+1} \int_{-1}^{+1} P(\xi, \eta) d\xi d\eta = \int_{-1}^{+1} \left[ \sum_i W_i P(\xi_i, \eta) + \overline{W}_i P'_{,\xi}(\xi_i, \eta) \right] d\eta \\ &= \sum_j \left[ W_j \left[ \sum_i W_i P(\xi_i, \eta_j) + \overline{W}_i P'(\xi_i, \eta_j) \right] + \overline{W}_j \left[ \sum_i W_i P'_{,\eta}(\xi_i, \eta_j) + \overline{W}_i P'_{,\xi\eta}(\xi_i, \eta_j) \right] \right] \end{aligned}$$

Or can be written as

$$I = \sum_i \sum_j \left[ W_i W_j P_{ij} + \overline{W}_i W_j P'_{ij,\xi} + W_i \overline{W}_j P'_{ij,\eta} + \overline{W}_i \overline{W}_j P'_{ij,\xi\eta} \right]$$

Furthermore, in three dimensions

$$I = \int_{-1}^{+1} \int_{-1}^{+1} \int_{-1}^{+1} P(\xi, \eta, \zeta) d\xi d\eta d\zeta$$

can be given by

$$I = \sum_i \sum_j \sum_k \left[ W_i W_j W_k P_{ijk} + \overline{W}_i W_j W_k P'_{ijk,\xi} + W_i \overline{W}_j W_k P'_{ijk,\eta} + W_i W_j \overline{W}_k P'_{ijk,\zeta} + \overline{W}_i \overline{W}_j W_k P'_{ij,\xi\eta} + W_i \overline{W}_j \overline{W}_k P'_{ijk,\eta\zeta} + \overline{W}_i W_j \overline{W}_k P'_{ijk,\xi\zeta} + \overline{W}_i \overline{W}_j W_k P'_{ij,\xi\eta\zeta} \right]$$

where,  $\Phi_{ij}$  and  $\Phi'_{ij,\xi}$  are respectively shows the ordinates of function  $\Phi$  at the point  $(\xi_i, \eta_j)$  and the first derivative with respect to variable  $\xi$ , and similarly for the second derivatives of the remaining ordinates.

## RESULTS AND DISCUSSION

The deformation-displacement vector [B] (For the element beam, with the inertia moment I, length L and elasticity modulus E) is defined as

$$[B] = \left[ -\frac{6}{L^2} + \frac{12}{L^3}x \quad -\frac{4}{L} + \frac{6}{L^2}x \quad \frac{6}{L^2} - \frac{12}{L^3}x \quad -\frac{2}{L} + \frac{6}{L^2}x \right]$$

while the value of stiffness matrix [k] can be determined as

$$[k] = \int_0^L [B]^T EI [B] dx = EI \int_0^L [B]^T [B] dx$$

Now, we can calculate the stiffness element k11 by the use of two integral points, we obtain

$$k_{11} = EI \frac{L}{2} \left[ 1 \times (\Phi_1 + \Phi_{-1}) - \frac{1}{3} \times \frac{L}{2} (\Phi'_1 - \Phi'_{-1}) \right]$$

The stiffness element k11, using the following expressions,

$$\Phi(x) = \left( -\frac{6}{L^2} + \frac{12}{L^3}x \right)^2, \text{ and } \Phi'(x) = \frac{24}{L^3} \left( -\frac{6}{L^2} + \frac{12}{L^3}x \right)$$

which give

$$\Phi_1 = \frac{36}{L^4}, \Phi_{-1} = \frac{36}{L^4}, \Phi'_1 = \frac{144}{L^5} \text{ and } \Phi'_{-1} = \frac{-144}{L^5}$$

reduces to

$$k_{11} = 12 \frac{EI}{L^3} = \text{exact solution}$$

In the similar way, the rest of the matrix's components may be verified with little effort and conclude that all that's left are the constitution elements of the stiffness matrix for the two-nod beam element, can be derived from integration.

$$[k] = \begin{bmatrix} 12 & 6L & -12 & 6L \\ & 4L^2 & -6L & 2L^2 \\ & & 12 & -6L \\ \text{Sym} & & & 4L^2 \end{bmatrix}$$

Exact results would be obtained for all the stiffness elements, and using also the Gauss quadrature, putting  $x = \frac{L}{2}(\xi + 1)$  and  $\xi = \pm\sqrt{3}$ , and the between difference that the vector [B] is actually computed at  $\xi = \pm 1$  instead of  $\xi = \pm\sqrt{3}$ , the fact which conducting to compute the stresses and strains at the same points which represents an inconvenience with Gauss quadrature and in this contributed quadrature is actually modified.

For the polynomial function (in cubic form)

$$\Phi(x) = A_0 + A_1x + A_2x^2 + A_3x^3$$

and the direct integral from 0 to L is given by

$$\int_0^L \Phi(x) dx = A_0L + \frac{1}{2}A_1L^2 + \frac{1}{3}A_2L^3 + \frac{1}{4}A_3L^4$$

Therefore, we get (By the above numerical formula)

$$I = \frac{L}{2} \left[ (\Phi(L) + \Phi(0)) - \frac{1}{3} \frac{L}{2} (\Phi'(L) - \Phi'(0)) \right]$$

Thus, we have

$$\Phi(L) + \Phi(0) = 2A_0 + A_1L + A_2L^2 + A_3L^3$$

$$\Phi'(L) - \Phi'(0) = 2A_2L + 3A_3L^2$$

On replacement this in the formula above, we obtain

$$I = A_0L + \frac{1}{2}A_1L^2 + \frac{1}{3}A_2L^3 + \frac{1}{4}A_3L^4$$



It should be noted that the idea of quadrature would also be applicable to this proposition with respect to the ordinates of the polynomial functions themselves, in which the derivatives terms, only represent contributions to meet the integration exact results. With this method, the exact results would be obtained thus for polynomial functions with degrees less than the odd degree of and approximately for every other mathematical function.

## CONCLUSION

For the stresses and strains, as well as the components of the deformation-displacement matrices in solid mechanics, the analysts must generally actually obtain the results at the nodal levels of the elements because extrapolation functions, particularly at the edge nodes, make it impossible to provide accurate results. Additionally, the suggested integration formulae for polynomials, which were intended specifically for the developers of finite elements, might be more advantageous for analysts who work with finite elements as well as for the integration of polynomials in general. The intervention of the first derivatives ordinates here simply means that the complete freedom of the choosing points positions, and their contributions in this effect to get exact numerical integration of polynomial functions and avoid actually the required points' positions in the class, are implied by the same numerical results obtained using the developed formulas and would otherwise be obtained using Gauss quadrature and exact direct integration ones.

## REFERENCES: -

- Mohanty, Sanjit& Dash, RajaniBallav. (2021). A quadrature rule of Lobatto-Gaussian for numerical integration of analytic functions. Numerical Algebra, Control & Optimization. 10.3934/naco.2021031.
- Hota, Manoj&Mohanty, Prasanta. (2014). Mixed Quadrature Rules for Numerical Integration of Real Definite Integrals. International Journal of Emerging Technologies in Computational and Applied Sciences. 521. 521-527.
- Acu, Ana & Sofonea, Florin. (2013). Some numerical integration methods based on interpolation polynomials. Carpathian Journal of Mathematics. 29. 1-8. 10.37193/CJM.2013.01.16.
- Beckmann, J. & Mhaskar, Hrushikesh&Prestin, Jürgen. (2012). Quadrature formulas for integration of multivariate trigonometric polynomials on spherical triangles. GEM - International Journal on Geomathematics. 3. 119-138. 10.1007/s13137-012-0035-4.
- Xiao H., Gimbutas Z. (2010) A numerical algorithm for the construction of efficient quadratures in two and higher dimensions. Comput Math Appl 59: 663–676.
- Mousavi S. E., Xiao H., Sukumar N. (2010) Generalized Gaussian quadrature rules on arbitrary polygons. Int J Numer Methods Eng 82 (1): 99–113.
- D. J. Holdych, D. R. Noble, and R. B. Secor. Quadrature rules for triangular and tetrahedral elements with generalized functions. International Journal for Numerical Methods in Engineering, 73:1310–1327, 2008.
- Mohanty, Sanjit& Dash, RajaniBallav. (2007). A Mixed Quadrature Rule for Numerical Integration of Analytic Functions. Bulletin of Pure & Applied Sciences E. Mathematics and Statistics. 26.
- G. Ventura. On the elimination of quadrature subcells for discontinuous functions in the eXtended Finite-Element Method. International Journal for Numerical Methods in Engineering, 66:761–795, 2006.

---

**EFFECT OF LEAD ACETATE TOXICITY ON MORPHOLOGICAL PARAMETER OF SEED GERMINATION OF RED HOT PEPPER (*CAPSICUM ANNUUM L.*)**

**Y. Chandrakala**

Jayoti Vidyapeeth Women's University, Vedant Gyan Valley, Jharna, Jaipur Rajasthan 303122,

\*Corresponding Author: chandrakala\_rie@rediffmail.com

**ABSTRACT**

A wide variety of contaminations enter into our environment due to extensive of industrial production, energy and fuel production and intensive agriculture. Among the heavy metals, lead is an element that easily accumulates in soils and sediments. Lead levels in the environment are currently a matter of great concern. Although lead is not an essential element for plants, it is absorbed and accumulates. In the present study the experiments were conducted to find out the effect of Lead acetate on the morphological parameter of germination of Red Hot Pepper (*Capsicum annuum L.*)(ie) germination (%), Seed vigour index, seedling tolerance index, percentage of phytotoxicity. In germination parameters, germination (%) and Seed vigour index has showed significant growth in 10 mg/l of lead acetate than control and then it decreased gradually with increase in concentration of lead acetate. The Percentage of phytotoxicity was minimum in 10 mg/l of lead acetate as compare to 200 mg/l of lead acetate.

The percent phytotoxicity and seedling length was affected by the lead acetate concentration in seedling.

Keywords: Germination (%), Seed vigour index, seedling tolerance index, percentage of phytotoxicity, *Capsicum annuum L.*

**INTRODUCTION**

Heavy metals are a group of non-biodegradable elements with a tendency to bioaccumulate in living systems. They are industrially and biologically important and include metals such as lead (Pb), cadmium (Cd), nickel (Ni), cobalt (Co), iron (Fe), zinc (Zn), chromium (Cr), iron (Fe), arsenic (As), silver (Ag) and the platinum group elements. Lead is known to cause a wide range of toxic effects in living organisms, including those of morphological, physiological and biochemical origin. Plants are the target of a wide range of pollutants that vary in concentration, specification and toxicity. Lead is known to induce a broad range of toxic effects to living organism which include the morphological, physiological, and biochemical. This metal impairs plant growth, root elongation, seed germination, seeding development, transpiration, chlorophyll production, lamellar organization in the chloroplast, and cell division. The extend of the intensity of plant stress, the stage of plant development, and the particular organs. The level of lead found in plants often correlates with the level present in the environment. Several studies shows the pesticides residues frequently occur on surface water and soil in agricultural areas (Y.Chandrakala and P.K. Mohapatra, 2012).



## MATERIAL AND METHODS

The present investigation entitled “Effect of lead acetate toxicity on the morphological parameter of seed germination of Red Hot Pepper (*Capsicum annuum L.*)” was carried out in the Department of Science and Technology, FEM, Jayoti Vidyapeeth Women’s University, Jaipur.

An experiment was conducted with Red Hot Pepper (*Capsicum annuum L.*) using a completely randomized design of five replications. The Red Hot Pepper (*Capsicum annuum L.*) seeds were superficially sterilized with 0.1% mercury chloride solution to prevent surface contamination, and then the seeds were rinse with distilled water. The seeds were tested for standard germination test in a seed germinator at at  $30\pm 2^{\circ}\text{C}$ . Using paper towel. Each set was uniformly treated with different treatments 10, 25, 50, 75, 100 and 200 mg/l of lead acetate. Control seeds were treated with distilled water. Each treatment, including the control, was repeated five times. Germination was recorded every 24 hours and on day 8<sup>th</sup> of each treatment, five seedlings were randomly selected to record seedling growth. Seed quality parameters viz; germination (%), Seedling length (cm), Seed vigour index- I (Abdul Baki and Anderson ., 1973), seedling tolerance index (Turner and Marshall (1972)), percentage of phytotoxicity of the effluent (Chou et al., (1978). And the data were subjected to analysis of variance (Gomez and Gomez , 1984).

## RESULTS AND DISCUSSION

The effect of different concentration of lead acetate on germination parameters are summarized in Table 1.

**Table 1:** The results regarding the effect of morphological parameter of seed germination of Red Hot Pepper (*Capsicum annuum L* at 8<sup>th</sup> DAS.

Treatment lead acetate (mg/l)	Germination Percentage (%)	Total Seedling Length (cm)	Seed Vigour Index - 1	Tolerance index	Percentage of phytotoxicity
0	92	5.5	368	0	0
10	98	6.8	392	1.03	3.44
25	76	5.7	304	0.93	6.89
50	66	5.3	264	0.86	13.79
75	54	4.5	216	0.69	31.03
100	42	3.5	168	0.52	48.27
200	36	2.5	144	0.34	65.51

The effect of lead in the polluted soil has an effect on germination. In germination parameters all above said values table 1 were showed higher except in 10 mg/l of lead acetate than control and then it decreased gradually. The similar trends was observed by Al-Yemini and Al-Hetal, (2001) in *Vigna ambacensis*. The lead treatment up to 10 mg/l of lead acetate was found to increase the germination percentage over control. Root and shoot length of Red Hot Pepper seedling increased 10 mg/l and then it decreased with an increase in lead acetate concentration. Root and shoot length were found to be higher at 10 mg/l of lead acetate at high levels may inhibit the root growth directly by inhibition of cell division or cell elongation or

combination of both, resulting in the limited exploration of the soil volume for uptake and translocation of nutrients and water and induced mineral deficiency (Foy *et al.*, 1978). Pb moves predominantly into root apoplast and thereby in the radial manner across the cortex and accumulates near the endodermis. The endodermis act as a barrier to the movement of Pb in the roots compared to shoots (Jones *et al.*, 1973; Verma and Dubey, 2003). It alters the mineral nutrition and water balance, modifies hormonal levels and affects the structure and permeability of the plasma membrane (Romerio *et al.*, 2006).

Seedling length of Red Hot Pepper seedling increased at 10 mg/l, increase in seedling length might be the result of higher embryo-cell wall extensibility. Increased seedling length and its growth may be due to increase in cell division within the apical meristem of seedling shoots and roots which was responsible for increase in overall seedling growth. But then it decreased with an increase gradually with concentration of lead acetate 200mg/l. These results showed that lead contamination has negatively affected root and shoot development. Seedling length is an important character as it decides the vigour of seed which is an important component in seed studies. By overproducing ROS, lead poisoning results in the suppression of ATP synthesis, lipid peroxidation, and DNA damage. Lead significantly reduces water and protein content, transpiration, chlorophyll production, seed germination, seedling development, and seedling growth.

A glance of the data showed that maximum vigour index-1 (392) was recorded in 10mg/l lead acetate. Seedling Vigour Index is a qualitative term about the sum of those properties of the seed which determine the potential level of activity and performance of the seed or lot during germination and seedling emergence.

Tolerance index was observed to show a decreasing trend from 10 mg to 200 mg/l lead acetate. Tolerance to lead acetate decreased when treatment reached to 200 mg amounting to 0.34.

**CONCLUSION** Lead acetate in soil certainly improve germination % and seedling vigour, establishment up to 10 mg/l beyond which it has adverse effect on the seed germination of Red Hot Pepper (*Capsicum annuum L.*). Hence it might be suggested that higher concentration of lead in the soil may not be suitable for crops growth. Proper care should be taken in disposal of lead contaminated effluent to avoid soil pollution.

#### REFERENCES

- Abdul-Baki, A.A and J.O. Anderson., (1973). Vigour determination in soybean application of dairy manure on germination manure on germination and emergence of some selected crops. *J. Environ. Qual.* 3:396-399.
- Al-Yemini, M.N. and Al-Hetal, (2001). Some metabolic changes in germinated *Acacia farnesiana L.* *Indian J. Plant. Physiol.*, 6(2):147-151.
- Ansari O., Azadi, M.S., Sharif, Z.F., Younesi, E., (2013). Effect of hormone priming on germination characteristics and enzyme activity of mountain rye seed under drought stress conditions. *Journal of plant physiology and Biochemistry* 9(3), 61-71.
- Chou, C.H., Y.C. Chiang and C.I. Khan. (1978). Impact of water pollution on crop growth Taiwan. *Bot Bull, Acad. Sincia.* 19:107-124.

- Foy, C.D., R.L. Chaney and M.C. White (1978). The physiology of metal toxicity in plants. *Annu. Rev. Plant physiol.*,29:511-566.
- Gomez, K.A., Gomez, A.A., (1984). *Statistical procedure for agricultural research*. John Wiley and Sons, NewYork 690.
- Joynes LHP,Clement CR,Hopper MJ(1973) Lead uptake from solution by perennial ryegrass and its transport from roots to shoots, *Plant soil* 38:403-414. Romerio., S.Lagoa AMMA, Furlani PR,de Abreu C,deAbreu,MF, Erismann, NM(2006). Lead uptake and tolerance of *Ricinus communis* L. para chumbo. *Braz .J. Plant Physiol.*18.(4): 1- 10.
- Turner, R.G. and C. Marshal, (1972). Accumulation of zinc by subcellular of root *Agrostis tannis* sibth in relation of zinc of zinc tolerance. *New Phytol.*71:671-676
- Turner, R.G. and C Marshal, 1972. Accumulation of zinc by subcellularof root of *Agrostis tannis* sibth in relation of zinc tolerance.*New Phytol.*,71: 671-676.
- Verma S, Dubey RS (2003) Lead toxicity induces lipid peroxidation and alters the activities of induce lipid peroxidation and alter the activities of antioxidant enzymes in growing rice plants. *Plant Sci.* 164:645-655.
- Y.Chandrakala and P.K. Mohapatra (2012). Tolerance of *Anbaena sp. PCC 7119* to cypermethrin measured though photosynthetic pigment fluorescence. *Plant Science Research* 34 (1&2) : 47-53, 201. ISSN 0972-8546.
- Zeid. I.M. 2001. Response of *Phaseolus vulgaris* to chromium and cobalt treatments *Biol Plant.* 44:111-115. Responses of *Phaseolous vulgaris* to chromium and cobalt treatments.*Biol Plant.*44:111-115.

## **A REVIEW ON ONYCHOPHAGIA & ITS MANAGEMENT BY HOMOEOPATHY**

### **Dr. Meenakshi Soni**

Associate Professor, Dept of Case taking & Homoeopathic Repertory. Faculty of Homoeopathic Science JVWU Jaipur, Rajasthan

### **Dr Rakesh Sharma**

HOD & Professor Dept. of Organon of Medicine, Faculty of Homoeopathic Science JVWU Jaipur, Rajasthan

### **Dr M P Sharma**

Dean & Director, Prof & HOD, Department of Physiology & Biochemistry, Faculty of Homoeopathic Science JVWU Jaipur, Rajasthan

### **Dr Ravi Jain**

Assistant Professor Dept. of Practice of Medicine, Faculty of Homoeopathic Science JVWU Jaipur, Rajasthan

### **Introduction:**

**Onychophagia is Body Focused Repetitive behaviours also called Nail biting. It is a non destructive behaviour of person.**

It is considered a pathological oral habit and grooming disorder, it's an uncontrollable mania that is destructive to fingernails and surrounding tissue.

Nail biting is a common and frustrating habit for many children, teenager especially girls, and patients those are suffering from any mental disorder like depression. Children are the main victim those who start growth age 2-8 year .Nail biting occurs most often during puberty in female because of hormonal misbalance. Even though some young adults, ages 1 to 22 years, bite their nails. Most people stop biting their nails on their own by age 30. Boys bite their nails more often than girls after age 10.



### **CAUSES OF NAIL BITING**

- Genetic link to nail biting behaviour.
- Anxiety, depression, over thinking etc, because this act relieves stress, tension, or boredom.

- It can be a habit usually in children and girls.
- Some people do not use nail cutter because of laziness and cut the nail by biting.
- Babies have also addiction of nail biting during growth period.
- Over thinking is another cause of nail biting.

#### **HOW WE OBSERVE:**

- Visually see the damages of nails with frizyness
- Patient mouth damage, abscess or ulceration found in inside the lips.
- The unattractive appearance of physical damage to skin and nails may cause feeling of shame, embarrassment, and guilt, leading to complicated family and social relationships.
- It can be associated with deficit hyperactivity disorder or ADHD, oppositional defiant disorder, separation anxiety, enuresis, tic disorder and other mental issues.
- Skin of fingers looking weak thin and sometimes bleeds easily.

#### **Some of the risks of nail biting include:**

- ✓ Soreness or infection in and on the skin around the nails.
- ✓ Damage to the tissue that makes the nails grow.
- ✓ Changes in how your nails look.
- ✓ Abnormal growth.
- ✓ More frequent colds and other illness from placing dirty fingers in mouth.
- ✓ Damage to teeth from chewing hard nails.

#### **Prevention:**

Some tips for preventing the habit of nail biting behaviour.

- Cut nails short—If there's not enough nail to grab with your teeth, it won't feel as satisfying when you give biting a try.
- Coat nails with a bad taste---There are special nail polishes available in market with a bitter flavour you can paint on your nails. The terrible taste will make you think twice before chewing
- Splurge on manicures—Spending money and time at a nail salon will give you both good looking nails and a reason to keep them that way.
- Wear gloves—wear gloves regularly for ignore the habit of nail biting.
- find out the reasons when your mood starts to cut the nail by bite so you can overcome on this problem.
- Keep your hands or mouth busy.—Find something to fiddle with – a stress ball, a worry stone, or even a pen to click. Chew gum so your mouth has a job. Give your nail-biting energy another place to go.

#### **Management by Homoeopathic Remedies:**

Homeopathy is a system of alternative medicine; it is totally based on the law of similia similibus curenter. On the basis of this first totality of symptoms is compulsory to take before selection of medicine. Traditional homeopathy is based on these philosophical foundations which is first Hahnemann established and have become refined over the two centuries that have passed since. Homeopaths believe treatment that obeys the laws of natural healing must lead to heal the disease in one way. Same as in onychophagia in this condition first we can see the root cause and then apply the rule of homeopathy on the basis of totality of symptoms. Homeopathy is a holistic science and considers the individuality of the person while treating in every disease such as his mental state, disposition, physical generals and his constitution.

### Homeopathic medicines:

**Argentum Nitricum:** Great Anxiety, Fear and Persistent Impulsive Thoughts. Fears and Anxieties, Hidden Irrational Motives For Actions. Dreads Ordeals. Fear of Impending Evil of Crowds, Passing a Certain Point of High Buildings of Dark. Fear of high buildings, Heights, Flying In Air-planes.

**Calcarea Carb:** They Are Easily Frightened Or Offended. Child Afraid Of Everything He Sees. Desire For Chalk, Pencil Etc.

**Medorrhinum:** Common Fears Are The Dark, Being Alone At Night Large Bodies Of Water, Closed In Spaces, Animals, Dogs, Slimy Animals Like Toads A Snakes, Of Being Observed, That Someone Is Behind Him, Cancer, Heart Disease, Death, Insanity. They Bite Their Nails

**Natrum Muriaticum:** Nail Biting In Children, With Nervousness. They Are Depressed And Introverted. They Are Irritable And Cannot Cry In Front Of Others. Children Learn To Talk Slowly. Awkward In Talking, Hasty, Drops Things. They Prefer For Salt And Salty Foods.

**Ammonium Bromate:** Irritability under the Nails Causing Nail Bite. Due to Nervous Irritation. Irritable Feeling in Fingernails, Better By Biting It

**Sanicula:** Nail Biting and Enuresis In Children.

**Dr. Boger In His Little Synoptic Key, Gives 3 Remedies For Nail Biting; Arsenicum, Sanicula, Hyocyamus.**

### REFERENCE:

- Boerick Materia Medica & Repertory By W.E. Boerick
- Boger-Boenninghausen Characteristic Repertory By C.M. Boger
- How to Stop Nail Biting
- Truth about Nail-Biting Book By Audrey Ciccarelli.
- Allen's Key Note.
- [http://www.homeowatch.org/books/crews\\_workbook.pdf](http://www.homeowatch.org/books/crews_workbook.pdf)
- [www.senseaboutscience.org/data/files/resources/54/Homeopathy.pdf](http://www.senseaboutscience.org/data/files/resources/54/Homeopathy.pdf)
- [www.nhmrc.gov.au/.../...opathy\\_overview\\_report\\_october\\_2013\\_140407.pdf](http://www.nhmrc.gov.au/.../...opathy_overview_report_october_2013_140407.pdf)
- [www.homeopathyzone.com/.../overview-of-classical-homeopathic-philosophy](http://www.homeopathyzone.com/.../overview-of-classical-homeopathic-philosophy)
- <http://homeopathy.inbaltimore.org/saine2.html>



**OPTIMISATION OF MOBILE APPS FOR USER ENGAGEMENT AND CONVERSION**

**Harsha Saini**

Assistant Professor, Department of Management & Commerce, Jayoti Vidyapeeth Women's  
University, Jaipur  
research@jvwu.ac.in

**Abstract**

As the number of mobile phone users exceeds that of PC users in many countries, how to optimize PC-based web sites for mobile phone users becomes an important issue. This article reviews several popular ways and introduces some methods that has been developed to help in conversion rate. Major advantages of this methods are that firms can use the mobile phone-based Web sites that can get the layout and content that best fit their devices. The paper presents examples to illustrate the features of the optimization process.

**Keywords:** Mobile optimisation , User interaction, Conversion

**Introduction**

Mobile optimisation for business firms are adjusting their app and online sites according to visitors convenience for better experience in their mobile devices. Day by day mobile commerce is increasing , and customer wants hassle free and user friendly shopping experience . As Generation Z and millennials are capturing major part of Mobile commerce it very necessary for business firms to design their site and marketing campaigns accordingly.

The role mobile plays in today's digital marketing world will likely keep growing as mobile usage continues to skyrocket. By implementing key mobile optimisation tactics and strategies, marketers can deliver exceptional experiences through every channel and every device.

Optimising for mobile includes the entire customer experience, and when done properly, it compliments every interaction a customer has with your brand. Mobile optimisation enhance user experience and they tend spend more time on website. It will also help in conversion.

There is high usage of social media on mobile, requires continuous improvement, which makes it simple for users to access social media apps on daily basis , irrespective of time and place.

Mobile optimisation is need of time if business firm are looking for reach out global audience. Business firms should optimise their e-commerce sites.

Sometimes mobile apps have bugs and glitches that can cause lower engagement on apps. It is to be designed to keep user engaged for longer duration.

**Review of literature**

Reetika Swaroop Srivastava, Arjun Manohar, 2020

The paper attempts to explore the need to optimize the web interface on the mobile platform. There has been previous research on the need for optimizing the websites to be user-friendly, however, there has not been adequate research on the need for optimization on mobile devices. With attention spans



narrowing it is important that websites are able to convey their value in few seconds else the user will bounce off to another website that represents information better. The problem goes deeper, most of the businesses

MeriKoponen, 2020

The objective of this study was to identify the best practices of how to create engaging mobile-optimised video ads for social media. Nowadays, an increasing number of people access their social media from mobile devices. Hence, it is valuable for brands to understand how they can leverage mobile-optimised video advertising on social media.

IntaKotane, DainaZnotina, SerhiiHushko, 2019

In recent years, the environment in which we live and work has changed radically. If the emergence of the Internet was revolutionary in the way we communicate and obtain information, currently the availability and mobility of technologies affects consumers' habits and promotes the transformation of classic business models. Aim of the study: to explore and learn about the development trends of digital marketing.

Satwinderjit Singh, IzzalAsniraZolkepli, Cheah Wen Kit, 2018

There is minimal study that investigates the importance of attitudes towards mobile commerce as antecedents mobile commerce adoption using Technology Acceptance Model (TAM), especially in the Malaysian market. These factors are crucial since the population of online users are massive and their influence is forming the untapped potential for marketers. By knowing the factors that drive the use of mobile commerce, this study seeks to facilitate marketers on how to use the findings and intensify the growth of online business in Malaysia.

JieRen, Ling Gao, Hai Wang, Zheng Wang , 2017

This paper has presented an automatic approach to optimise mobile web browsing on heterogeneous mobile platforms, providing a significant performance improvement over state-of-the-art. At the heart of our approach is a machine learning based model that provides an accurate prediction of the optimal processor configuration to use to run the web browser rendering process, taking into account the web workload characteristics and the optimisation goal.

Victoria Magrath, Helen McCormick, 2013

Whilst some may argue that e-commerce design literature can be applied to the designing of mobile commerce channels, it is an assumption that may come at the expense of the retailer. The purpose of this paper is to identify which marketing design elements could be integrated within a retailer's mobile strategy and suggest the importance of empirical testing. An academic or practitioner must primarily understand the abundance of marketing tools that can be integrated into a mobile strategy before they can begin to investigate the consumer effects.

Cindy Krum, 2010

Mobile Marketing Finding Your Customers No Matter Where They Are Use Mobile Marketing to Supercharge Brands, Sales, and Profits! Using brand-new mobile marketing techniques, you can craft campaigns that are more personal, targeted, immediate, measurable, actionable—and fun! Now, one of the field's leading pioneers shows exactly how to make mobile marketing work for your business.





**Objective of the study :**

- ) To study the concept of mobile phone optimisation
- ) To study the impact of mobile optimisation in conversion rate customers

**Concept of Mobile Optimisation**

Mobile optimisation means adjusting apps according to mobile devices for user friendly experience. Mobile optimisation is the process of adjusting and updating website content to ensure visitors are accessing up to date information from their mobile devices.

Mobile websites are users first interaction with business firm. If it is not optimally designed then user left it quickly without showing any interest in their site. User will be annoyed and stressed if sites take too much time to load and buffer .Even if your marketing strategies are strong but website is not mobile optimised then it will not convert visitor to buyer.

A mobile optimised site looks different from desktop sites . For example text are short and simple , images are lighter, content loads easily , minimum scrolling time, videos should be easily played on mobile devices. Mobile optimisation refers to the updating your website to deliver an ideal and engaging experience to users who are visiting the site from their mobile device. Truly optimised content offers amazing experiences across channels including both desktop and mobile devices.

**Significance of the Mobile optimisation**

It should be considered that mobile user behaviours are different from desktop. That means the strategies you will use for mobile should also be different than desktop.

The main benefit of a custom mobile app is that it serves to enhance the customer relationship in a great way. Each update on the products and services will reach the customer fast and directly. With the app, the business can receive feedback on the products and services from the customer through the app and take appropriate steps to improve customer satisfaction.

Image source :the next scoop.com

**Methodology of the study:**

In order to accomplish above objective, secondary sources, available literature, reports and data have been used. The data has been obtained from various journals, reports, magazines and websites.

**Factors affecting conversion rate**

) **The impact of page load speed on mobile conversion rates**

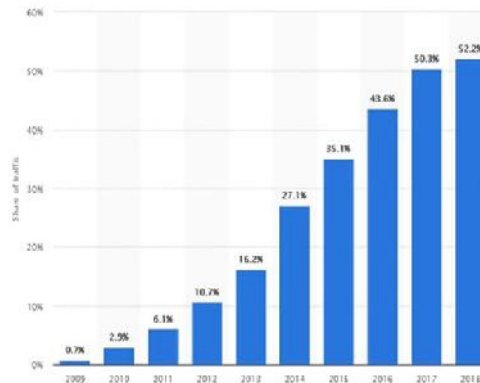
Page load speed is a critical factor that can have a significant impact on mobile conversion rates. In today's fast-paced world, users have little patience for slow-loading websites, and they are likely to abandon a site if it takes too long to load. This can result in decreased engagement and lower conversion rates.

In contrast, a fast-loading website provides a smooth and enjoyable user experience, which can help to improve engagement, increase customer satisfaction, and boost conversion rates. In addition, fast-loading websites are more likely to be ranked higher in search engines, which can help to drive more traffic to the site.



## ) Integrate On-Page Product Recommendations

Percentage of all global web pages served to mobile phones from 2009 to 2018



One of the best ways to go about on-page product recommendations is suggesting products similar to what a customer is viewing or has recently viewed.

## ) Provide E-wallet Payment Method

Due to payment method distrust, customer abandon their carts. With the abundance of financial information stored on smartphones, buyers want to be sure their financial details are secure.

The best way to address such concerns is to offer e-wallet payment methods such as Android Pay, Apple Pay, and PayPal.

## ) Poor product data

For international websites, it's especially vital that translations be accurate and tailored to the respective country. But that's not all: language-independent factors such as the thoroughness of technical information also play a role.

## ) Understand When Did Someone Use an App/Mobile Site

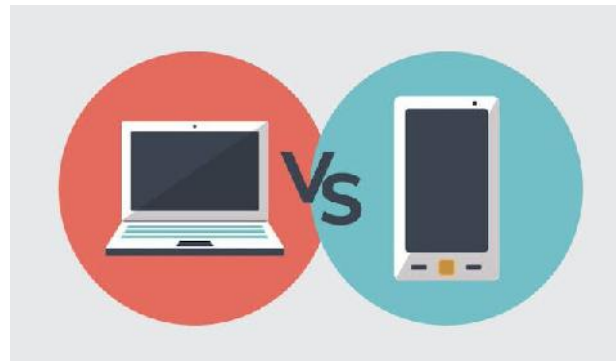
When considering mobile eCommerce conversion rate, it's also helpful to know when users interact with your site or app. For example, if you notice that customers who visit after 5 pm convert at higher rates than others, you can tailor your strategy to when it matters most.

### Some smartphone features that decrease conversions

#### ) Screen size isn't optimal for shopping

This is the obvious difference. Desktop displays generally have much more screen real estate for displaying information, and that extra space benefits ecommerce. It's much easier for desktop users to view side-by-side comparisons of products.

They can more easily see information that supports a purchase decision, such as background information, reviews, and multiple images of products. Tools that help users navigate choices, such as filter buttons, are usually easy to find.



) **Network speed makes for (uncomfortably) slow shopping experiences**

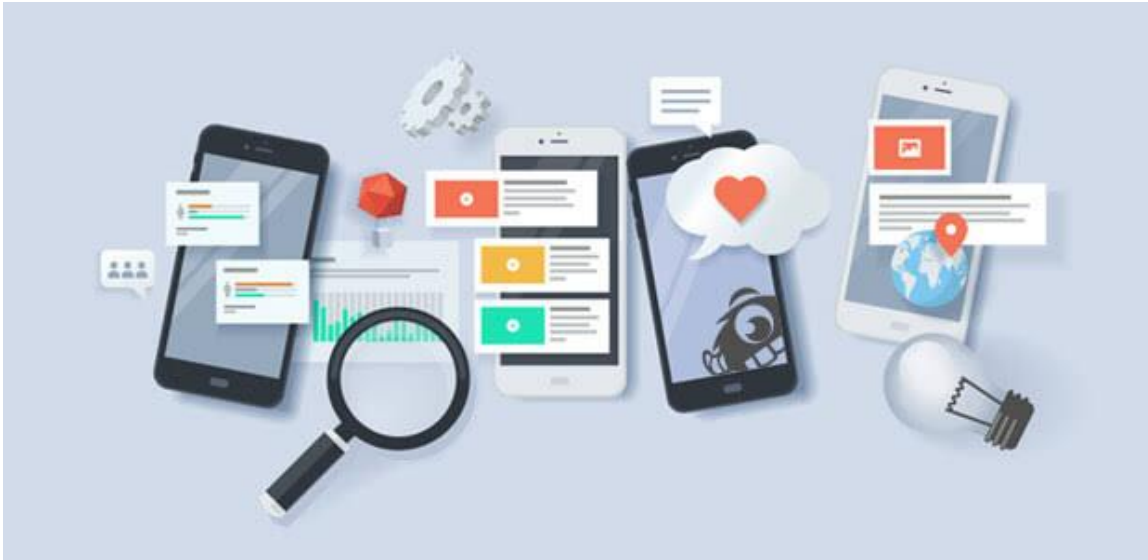
This is the other characteristic of mobile devices that limits conversion. Most desktop computers are connected through cables or WiFi to high-speed network connections. In contrast, most smartphones connect through the cellular data network.

Although cellular network speeds have increased substantially in recent years, they're still not as fast as most wired connections. And, as we've noted before, speed matters a great deal to conversion rate optimization.



**Tools for Mobile Optimisation**

A mobile optimised site helps in the conversion process easier and less stressful on the user. Some of the hallmark features include the following:



- ) Larger buttons
- ) Compressed images
- ) Auto-fill form fields
- ) Auto-detect location settings
- ) Guest checkout option
- ) Multiple screens instead of scrolling
- ) Reduce the number of pop ups
- ) Turn off auto correct on form filling

#### **Conclusion-**

As you can observe, the impact of the mobile app is huge and as a business owner, you can find visible profits in no time. If you wish to optimize your conversion rate, you'll need more than just attractive prices and enticing pictures. On the one hand, you'll have to put yourself in your customer's shoes, and make the user experience as smooth and dependable as possible. On the other hand, while doing the above, you'll want to keep an eye on how these same criteria are evaluated by the main search engines, and avoid corresponding SEO and conversion killers.

#### **References :**

1. By Sakshi Pandey, Community Contributor - January 23, 2023 <https://www.browserstack.com/guide/mobile-optimization>
2. By Kate , 2022 <https://www.magestore.com/blog/author/katemagestore/>
3. David Hoos, April 2023 <https://thegood.com/insights/mobile-conversion-optimization/>
4. Shineykoshy , Feb 2023 <https://www.linkedin.com/pulse/impact-mobile-optimization-digital-marketing-shiney-koshy>
5. Ben Jacobson, july 2017 <https://martech.org/author/ben-jacobson/> Ludivine Chatord , 2017 <https://www.textmaster.com/blog/7-factors-improving-conversion-rates/>



**A STUDY INTO THE RELATIONSHIP BETWEEN DIGITAL FINANCE, GREEN FINANCE, AND SOCIAL FINANCE**

**Khushboo Jangid**

Assistant Professor, Department of Management and Commerce , JayotiVidyapeeth Women's University, Jaipur

E-Mail : [khushboo@jvwu.ac.in](mailto:khushboo@jvwu.ac.in)

**Abstract**

Finding the point of convergence of digital finance, green finance, and social finance is critical to publicise long-term development on three levels: financial, social, and environmental. This research paper makes the case for a connection between digital finance, green finance, and social finance. I demonstrate with a theoretical framework, that digital finance facilitates a smooth, efficient, and effortless medium both for human beings and businesses to finance social programmes and initiatives that result in a societal dividend, and green initiatives that result in an environment that is long-lasting. As a result, digital finance acts as a tool and an instrument to ensure effective green and social financing.

**Keywords:** Green Finance, Social Finance, Digital Finance, Innovation

**Introduction:-**

This study investigates connection between green finance, digital finance, and social finance. Certain supporters of digital finance have recently argued that money should be transferred for every kind of expenditure through digital finance means and facilities, whereas supporters of social finance desire money should be channelled to every endeavours and initiatives that provide social payouts to society members.

Green finance promoters advocate green finance as a long-term solution to environmental sustainability. There are two major points of contention. The initial claim is that if policymakers enact policies restricting financial institutions as well as investors of financing organisations whose operations or endeavours endangers environment, these organizations will abandon damaging works and projects and go after actions and initiatives that safeguards the environment for the betterment of community. The second argument does not necessitate policy intervention by the government. In fact, it promotes investors to withdraw from companies whose operations compromise the environment and medium their capital to companies that have operations or initiatives safeguard the environment in a manner that is sustainable, allowing investors to demonstrate their appreciation for environmentally friendly investing and environmental sustainability.

On a daily basis, a variety of funds transfers are carried out via digital finance services and channels. However, the level that social finance and green finance might profit compared to the current explosion of digital finance has not been researched. Another unanswered question is the degree to that digital finance is able to maximize or minimize the amount of financing which goes to social and green projects. The financial literature has not yet investigated the relationship among digital finance, green finance, and social finance. This study aims to fill some of the voids in the literature.

Given the relatively large amount of literature on digital finance along with the comparatively small amount of research on the green finance and social finance, this is critical to understand the connection among digital finance, social finance, and green finance because it can provide some insights into synthesising the three studies into one, and it may assist us decide whether there are any mutually



beneficial advantages related to encouraging digital finance, social finance, and green finance are all at the same time.

This study contends that digital finance services, proxied through technological advances like banking applications, fundraising applications, internet banking, and various other advancements in finance, can serve as efficient intermediaries for the financial support of social or green projects via elective contributions or non public financial obligations.

The study provides two literary contributions. First, this study adds to existing research by suggesting a easy structure combining digital, green, and social finance for long-term advancement. Creating a structure that connects digital finance, social finance, and green finance, it adds to the theoretical comprehension of financial innovations. Two, this study annexes to the current body of information on sustainable finance by highlighting a further significant variable that promotes funding for green projects. In accordance with the conceptual framework, I argue in this paper which digital finance might be utilised to medium money to societal and green projects, resulting in higher societal dividends and sustainability for the environment.

### **Literature Review**

The review on digital finance, social finance, and green finance in connection with sustainable advancements is reviewed in this section. It begins with a definition of every term and then moves on to a review of the literature.

### **Digital Finance**

Financial facilities provided with the help of cell phones, computers, the internet, or cards with related to a dependable electronic payment methods are all examples of digital finance. The goal of digital finance is to improve financial intermediation, financial inclusion, poverty reduction, financial stability, and long-term development.

The advantages about digital finance are immense. They encompass increased financial inclusion, the broadening of official financial facilities to the non-financial industries, the availability of inexpensive, appropriate and safe financial services to poverty-stricken people in developing economies, growth in GDP, and more powerful macroeconomic security. Many studies show that poor communities and economies exist. Further studies concentrate on key victory variables of digital finance. They demonstrate that financial awareness, digital literacy, mobile phone access, and internet access are now key indicators of the utilisation of digital financial services and channels.

The literature has identified certain obstacles to digital finance. They are as follows: an overemphasis on transaction accounts, ineffective and untimely regulation, poor quality and unaffordable electronic communication or broadband access, an rise in financial risk, and unanticipated disruptions in the payment system.

### **Social Finance**

The calculated and intentional application of devices, tools, and techniques to channelize funds to projects that provide a social payment to community is referred to as social finance. Social finance may be defined as a method of money management which combines financial gains alongside a social benefit. The term "social financing" refers to lending to and investment in businesses that identify as Cooperatives, social enterprises, and charities, or NPO. Social finance refers to the phenomenon in



which companies profits are used to lend or invest in organizations that examine itself social enterprises or NPOs.

Cornée et al. (2018) demonstrate the way financial institutions' societal contributions are influenced by the return requirements of their funders. They demonstrate that investors will trade their monetary benefits for a significantly higher societal return, and that societal scrutinizing is required for attracting societal funders who will exchange their financial advantages for a much higher impact on society or outcomes. According to Cooper et al. (2016), funders with diverse degrees of curiosity in social dividends will modify their investment portfolios in ways that maximise their economic and social return expectations. Rexhepi (2016) contends that the most effective manner to cope dealing with poverty is through 'social finance,' which is intended to assist economies in creating circumstances where everyone benefits monetarily. Rexhepi goes on to say that Social finance can help to reduce joblessness, inequality in long-term earnings, more effectively handle poverty, encourage environmental stewardship, and reroute social attempt towards social advancements. Moore et al. (2012) demonstrate that important obstacles and obstacles are present within today's financial mainstream framework that restrict the channelling of investment in inventive social endeavours, merchandise, or procedures, whereas Myers and Conte (2013) declare that balancing societal and economic goals and effectively managing this trade-off is an important obstacle to social finance.

## Green Finance

Green finance is a money-management strategy that brings together economic profit with environmental protection. It places a premium on financing or committing to projects that provide economic benefits while simultaneously encouraging a sustainable environment. Green finance is motivated by either a financial incentive, a desire to preserve the environment, or some combination of the two (Wang & Zhi, 2016). Green finance has received considerable attention in recent policy literature while receiving little attention in mainstream finance journals (Zhang et al., 2019; Ehlers & Packer, 2017; Falcone & Sica, 2019).

Sachs et al. (2019) emphasise the need for increased investment in green project financing, particularly those that provide environmental benefits for sustainable development, which can be accomplished through the use of new financial instruments and regulations like green bonds, green banks, carbon market instruments, fiscal policy, green central banking, financial technologies, and community-based green funds, collectively known as green finance. Taghizadeh-Hesary and Yoshino (2019) propose that green loan guarantee schemes (GCGSs) and some form of tax rebate be provided to investors who participate in green investment in order to motivate wealthy individuals to participate in green financing.

The inability of green financing to draw in private investment from investors is a major challenge. Because of a poor rate of earnings for green investments, financiers have not been interested in green projects. According to Sachs et al. (2019), financial institutions are more interested in financing petroleum-based projects than green projects, owing to the numerous risks related to green projects and their low rate of return. The difficulty in drawing in private investors for green projects has prompted calls for the government and its agencies, like the Central Bank and other government-funded agencies, to become actively involved with encouraging green finance.

## Linking Digital, Social, and Green Finance Conceptual Framework:

'Mainstream finance' has been surpassed by 'digital finance' in recent years. Innovative financial technologies such as the use of AI in financing, internet-based fintech channels, smartphone channels,



block chain or distributed ledger technology, and the rise of the Internet of Things (IoT) all contribute to the existence of digital finance. Another emerging theme is 'sustainable finance,' which emphasises the utilisation of financing initiatives that promote environmental and social sustainability. Intuitively, digital finance can achieve social and environmental sustainability. However, in order for this to occur, the three major areas of finance must be linked: mainstream finance, digital finance, and sustainable finance.

### **Bringing Digital, Social, and Green Finance Together**

To summarise, the framework demonstrates that social and green finance are components of development finance, while digital finance advancements can aid in the funding of development initiatives such as green and social projects.

Let us now look more closely at the connection among digital finance, social finance, and green finance. Corporations, individuals, and the government have better options for channelling resources for business purposes. For operations involving commercial finance, business finance, public finance, and development finance, digital finance channels provide an efficient, seamless, and suitable alternative. In terms of development finance, the framework includes green finance and social finance as components because the goal of green and social financing is to enhance the results of development for the betterment of society and the environment. In simple terms, the theoretical framework suggests that digital finance serves as a facilitator of green and social finance.

### **Conclusion:**

The paper proposed a conceptual framework and a straightforward interaction between digital finance, green finance, and social finance. Digital finance, social finance, and green finance are all popular subjects in the international development community. The proposed conceptual framework has a clear implication: more research is needed to investigate the manner in which digital finance developments affect development outcomes. Such research can aid in the resolution of some more pressing research and policy issues.

Future research could provide more information regarding digital finance, social finance, and green finance through the perspectives of investors, corporations, and individuals. Future research can assess the disparities in expectations and eagerness of different stakeholders to participate and work together in green and social financing in order to generate higher returns and greater environmental and social dividends.

### **References:**

- ] Cooper, L., Evnine, J., Finkelman, J., Huntington, K., Lynch, D. (2016). Social Finance and the Postmodern Portfolio: Theory and Practice. *The Journal of Wealth Management*, 18(4), 9-21.
- ] Cornée, S., Jegers, M., Szafarz, A. (2018). *A Theory of Social Finance*. Working Papers CEB 18-010, ULB -- Université Libre de Bruxelles.
- ] Moore, M.L., Westley, F.R., Nicholls, A. (2012). The Social Finance and Social Innovation Nexus. *Journal of Social Entrepreneurship*, 3(2012), 115 - 132.
- ] Myers, K., Conte, N. (2013). *Can Social Finance Improve the outcomes of Employment and Training Programs?* The Social Research and Demonstration Corporation (SRDC) Working Paper. Retrieved from: <https://www.srdc.org/publications/Can-social-finance-improve-the-outcomes-of-employment-and-training-programs-details.aspx>
- ] Rexhepi, G. (2016). The Architecture of Social Finance. In Othmar M. Lehner (Ed.), *Routledge Handbook of Social and Sustainable Finance*. London: Routledge, 35-49.





- ) Sachs, J., Woo, W.T., Yoshino, N., Taghizadeh-Hesary, F. (2019). Importance of Green Finance for Achieving Sustainable Development Goals and Energy Security. In: *Handbook of Green Finance: Energy Security and Sustainable Development*, 3-12.
- ) Taghizadeh-Hesary, F., Yoshino, N. (2019). The Way to Induce Private Participation in Green Finance and Investment. *Finance Research Letters*, 31, 98-103.
- ) Wang, Y., Zhi, Q. (2016). The Role of Green Finance in Environmental Protection: Two Aspects of Market Mechanism and Policies. *Energy Procedia*, 104, 311-316.
- ) Zhang, D., Zhang, Z., Managi, S. (2019). A Bibliometric Analysis on Green Finance: Current Status, Development, and Future Directions. *Finance Research Letters*, 29, 425-430.



## The Importance of Forensic Accounting in Resolving Corporate Issues

**Khushboo Jangid**

(Assistant Professor , JVWU Jaipur)

### Abstract

The professional accounting bodies now have a new perspective that extends beyond statutory audit and, in some ways, even the trend of corporate governance as a result of numerous corporate scandals and failures in recent history.

The concept, necessity, and function of forensic accounting are discussed in this article in relation to the complex issue facing the corporate sector.

### Introduction

Regular auditing of corporate financial reports is required due to the expansion of public limited liability corporations, the significant rise in the number of investors holding shares, and the separation of ownership from control of companies.

According to AICPA (1992), the goals of the routine audit of financial statements by an independent auditor include the expression of an opinion on the fairness or otherwise in all materials regarding financial position, operational results, and cash flows in controlling with generally accepted accounting principles.

Modern organized corporate scams, on the other hand, are sophisticated and well-funded by managers, businesspeople, and politicians, to name a few. The demand for forensic accountants has arisen as a result of the necessity to respond to this evolving criminal danger and the need for non-traditional investigators with abilities like accountants and legal specialists to combat the corporate sick.

### Problem

There is demand on professional accountants and legal practitioners to discover a better approach of uncovering frames in the business world due to the inadequacy of statutory audit to prevent and limit misappropriation of company funds and an increase in corporate crime.

A forensic accountant is needed in 39 percent of firms, according to a national research

by Kessler International. The purpose of the study is to determine how forensic accounting knowledge might lessen corporate fraud and mismanagement.

### Methodology

In order to gather secondary sources of data for this theoretical investigation of the function of forensic accountants in resolving complex business problems, the study used existing literature on forensic accounting and its use in the contemporary corporate environment.

### Literature Review

#### Definition

The definition of forensic accounting in the Webster's Dictionary is "Being to, used in or suitable to court, of judicial authority or to public debates, debate and eventually dispute resolutions." It is also defined as just an accounting analysis that is appropriate to the court and will serve as the foundation for discussion, debate, and eventually dispute resolution.

Forensic accounting is the practice of applying specialized body of information to the evidence of economic transaction and reporting appropriate is the purpose of analyzing and implementing or valuation of administrative proceeding. It also includes the use of accounting auditing and investigatory skill to assist in legal matter. It can be referred to broadly as the honesty of accounting auditing and investigation skill to forgo a specific outcome.

The "Forensic Accountant" profession has gained popularity after being named as one of the "20 Not Job Tracks" of the Future by U.S. News & World Report. However, according to Kessler International specialists, the field's popularity has hurt many seasoned accountants who lack the expertise to perform investigations carefully and affordably.

However, forensic accounting differs from traditional debit or credit accounting in that it offers an accounting study tailored to the



organization that will assist in settling any disputes that might emerge.

When conducting an investigation, forensic accountants make use of their expertise in accounting, auditing, and investigations. These accountants have been taught to investigate the dispute in various ways. They frequently continue to examine, interpret, and present complex information in a way that is comprehensible and likely to be supported. Additionally, they frequently engage in a variety of activities, including investment, computerized analysis of financial evidence development, document exhibition, and presentation of the gathered evidence.

The two primary focuses of this innovative and novel accounting are The two primary focuses of this innovative and novel accounting are:-

- i) Litigation support and inquiry and
- ii) Dispute resolution.

In the former, economic issues connected to ongoing lawsuit are presented factually. In this role, the forensic accountant is supported by parties engaged in legal disputes and can help resolve disputes even before they enter the courtroom. On the other hand, the latter is the out of determining whether criminal matters like securities fraud, which includes financial settlement, identity theft, and insurance fraud, among other things, in such complex cases.

### **Requirement of Forensic Accounting**

The organization's internal and external audits were unable to identify specific flaws in the managerial system, leading to the requirement for a forensic accountant as a result of the audit system's failure.

Experts in the field noted that the severe economic pressure, with much more businesses at risk of bankruptcy, puts jobs and careers at risk, and employees are under pressure to retain and assist performance levels, leading many to engage in corruption. For whatever reason, an increasing number of forensic accountants are being hired to painstakingly search through documents, unearth new information, and assist in putting the erroneous pieces of a company's financial puzzle together.

The development of forensic accounting has the following significant causes.

- As a part of the management function, internal audit and the audit committee were unable to shed light on the many facts and other obscured components of corporate fraud.
- The statutory auditor's rotation touches on an issue, but it adversely necessitates a longer duration and rejects emphasis. The process for choosing the statutory auditors is not perfect because it allows for lobbying and collusion.
- The internal auditors could definitely notice what was happening, but they are rarely in a position to begin correct action in a timely manner.
- The certifications of the auditors are rarely checked properly, especially whenever the reports are filthy and qualified.

### **The Competencies of a Forensic Accountant**

The standard and expertise required for the performance of his duties result from the requirements for forensic accountants. According to Aderibigbe (2000), a forensic accountant needs to be highly competent, honest, and ethical in order to do his work. According to him, in order to join a recognized accountancy body, a forensic accountant should undergo extensive training and demonstrate his expertise by passing all pertinent exams.

He insisted that even a forensic accountant must always conduct himself with honesty, integrity, and probity and must retain a professional demeanor while carrying out his duties.

Numerous talents are needed, but many of them must be learned over the training years.

Wallace (2001) outlined the minimum requirements a forensic accountant must meet, including:

- The capacity to quickly identify the key issues from a large volume of documentation, including memos, correspondence, and other less evidently financial data, as well as the more common accounting documents and management information systems.



- A solid grasp of the unique characteristics of several business methodologies.
- A feeling of urgency and dedication that will ensure swift action when necessary, despite how lengthy civil litigation may seem to observers or even to those involved in a dispute.
- Following a precise schedule even when it means working longer hours to fulfill the deadline.
- The ability to convey complicated theoretical concepts in a way that is understandable by laypeople, supporting those communications with figures and facts when necessary without projecting a sense of superiority, and
- Most importantly, the capacity to appear objective as well as professional even when participating in the essentially partisan procedure of a court case

#### **What a Forensic Accountant Does**

It is common practice to hire a forensic accountant to analyze, interpret, summaries, and present complicated financial and commercial information in a way that is both clear and well-supported.

A forensic accountant frequently assists in the investigation and analysis of financial evidence, the creation of computerized tools to aid in the evaluation and presentation of financial evidence, the communication of their conclusions in the form of reports, exhibits, and document collections, as well as supporting legal proceedings by offering testimony as an expert witness and creating visual aids to bolster trial testimony.

As a result, a forensic accountant could help in a number of ways, such as:

The Function of Forensic Accounting in Resolving the Difficult Corporate World Problem 186.

- Offering early counsel as a preliminary evaluation of the pleadings and evidence provided at the beginning of proceedings.
- Identifying the important papers that need to be given access as proof. This is significant when the defense is represented by the

forensic accountant and attorneys are creating lists of papers to present in court.

- Creating a thorough, balanced report on the amount of evidence that addresses all issues, regardless of whether they are in the client's favor. The report should be written in language that is understandable to non-accountants.
- Reviewing and providing legal counsel on expert accounting reports that were presented by the opposing party and may have an impact on the amount of evidence.
- During pre-trial preparation, educating legal counsel here on financial and accounting components of the case.
- The introduction of environmental accounting can be started by the forensic accountant's other aircraft in order to highlight environmental harm and the potential for compensation or replacement of lost assets through ongoing environmental management.

Theft of assets, embezzlement, employee participation in kickback schemes, or transformation of company assets for personnel usages are the most common types of fraudulent activity committed by employees. To stop such behaviors, forensic accountants intervene and watch suspected asset examinations, invigilation's, document inspections, and interviews of those involved.

The forensic accountant can recommend internal control systems that owners could install to lessen the likelihood of fraud thanks to experience and this kind of interaction.

In addition, the forensic accountant would participate in criminal investigations on behalf of the police, and his report will be written with the goal of clearly and professionally presenting the evidence.

These presumptions frequently call for a thorough evaluation of accounting records spanning several years in order to quantify the difficulties at hand. He does need to be aware of business-related legal issues.

As a result, the forensic accountant could indeed help in a number of ways, such as investigation accounting, reviewing the section



entails and offering suggestions regarding potential courses of action, helping with professional and successful recovery of assets, and coordinating the efforts of other experts, such as private detectives, forensic document adjudicators, consulting engineers, etc.

### Summary and conclusion

Forensic accounting is the bests ever growing areas accounting that enables in enhancing the chances o success in day to day life of corporate firm by surmounting all the vexing and critical problems of corporate field as panacea.

Thus various agencies fighting corruption worldwide will need to engage the service of forensic accounting to compliment efforts of other professional in reducing fraudulent activities and installing fraud proof internal control system in corporate organization. So it is beyond doubt that the role of forensic accountant will become very major in corporate field; public accounting and in all awareness of government in the days to come.

### References

- [1] Aderibigbe, P. (1997): Auditors Independence and Corporate fraud Nigeria journal of Research and Development in Higher Education (NIJORDHED), Ile-Ife External Communication (Nig).
- [2] Aderibigbe, P. (2000): The Role of the Forensic Chartered Accountant. in Nigeria Accountant July, 2000.
- [3] Adhard, J. (1989): Beyond Statutory Audit. Prentice Hall.
- [4] Adewumi, B. and Toluyemi, T. (2000): Auditing and Corporate Transparency. Evans Publishers Nigeria.
- [5] Ahwood, F. A. and stein, N.D. (1986): De Paula Auditing 17th Edition. London Pitman Publishing Limited.
- [6] Adeniyi, A. (2002): Auditing and investigations. El-Toba Ventures Limited. Lagos: Nigeria.
- [7] Companies and Allie Matters Act (1990): Lagos Federal Government Press.
- [8] Carity, P. (1991): "Crime Wave: Who Can Stop the Tide?" Accounting September, 1991.

[9] Daunt, J. (2002): Modern Auditing Methods. [http://www articles Corporate findlaw.com](http://www.articlesCorporatefindlaw.com).

[10] Eagle, D. and Hawkins, J.: The English Illustrated Dictionary. London: Oxford University Press. [11] Gurpreet K., Arrawatia M.A., A Study on White-Collar Crimes and proposed updates of Forensic Accounting in India, Elementary Education Online, Vol 19, Issue 4, 2021

[12] Oremade, T. (1988): Auditing and Investigations. Lagos: West Africa Books Publishers Limited. [12] Sigieton Green, B. (1991): "The Biggest Fraud In History". Accounting, September 1991.

[13] Satyanarayan, T. (2005): Forensic Accounting and Corporate Ill. The Chartered Accountant Vol. 53, No. 8.

[14] Wallace, A. (1991): The Role of The Forensic Accountant. Accountant November 1991.

[15] Oduala, J. (2005): Forensic Accounting. Treasure Vol. 6, P.5

[16] Woolf, E. (1984): Legal Liabilities of Practicing Accountants. London: Butterworths and Co.

\*\*\*

## AYURVEDIC CaCO<sub>3</sub> NANOPARTICLES PREPARATION AS NANOMEDICINE USING PLANT EXTRACT

Nayan Mishra<sup>1</sup> Anushka Tyagi<sup>2</sup>

<sup>1</sup>Department of Physics, Jayoti Vidyapeeth Women's University, Jaipur, Rajasthan India, 303122

<sup>2</sup>Faculty of Ayurvedic Science, Jayoti Vidyapeeth Women's University, Jaipur, Rajasthan India, 303122

\*Corresponding author mail Id- nayanmishra2007@gmail.com

### ABSTRACT

#### Introduction

Bhasma are the incinerated metallic or mineral preparation which used for the treatment of various diseases with the combination of herbal extracts. Mukta –Shukti is an aquamarine calcium carbonate compound which has been indicated in the treatment of rajyakshma, kasa, visham jwar, netra vikar, pachan samsthan disorder, swasroga, hridayaroga, chardi, amlapita, trishna, kasta aartav, asthi vikar.

#### Aim

To prepare Muktashukti Bhasma with the extract of Guduchi and to structural and the final sample subject to various analytical studies:–XRD, SEM

#### Methodology

Mukta sukti bhasam synthesized according to classical method like Shodhana, Bhavana, Marana and the analysis of final herbo-mineral preparation was carried out using following analytical methods like: X-ray diffraction (XRD) and scanning electron microscopy (SEM).

#### Conclusion-

The synthesis of Herbo-mineral medicine-Mukta shukti with Guduchi extract carried out and final preparation was successfully investigated by various analytical techniques.

**Keywords:** Herbo-mineral medicine, Mukta shukti, Guduchi, X-ray diffraction (XRD) and Scanning electron microscopy (SEM).

### 1. INTRODUCTION

The application of nanoparticles has attracted considerable attention as targeted delivery systems. In today's decomposed era of human life, Nanotechnology is lifting out as a boon for delivering drugs to specific cells using nanoparticles.<sup>[1-2]</sup> The integration of Nanomedicine with biology is giving birth to development of diagnostic devices, contrast agents, analytical tools, and drug delivery vehicles. Traditional systems of medicines includes herbal medicines along with medicinal plants are continuing to play important role in providing healthy and disease free health care to large section of population, especially in developing countries. India is having a very unique distinction of six recognized systems of medicine in this category which are- Ayurveda, Siddha, Unani and Yoga, Naturopathy and Homoeopathy. Ayurveda is made of two words ayus (life) and veda (science) means the "Science of life". In India, Ayurveda is considered as most of the oldest system of Indian traditional medicine systems accepted worldwide. Ayurveda is a complete medical system that takes in to deliberation of physical, psychological, philosophical, ethical and spiritual well being of mankind. It plays great importance on living in harmony with the Universe and harmony of nature and science. This system focuses on the importance of maintenance of proper life style for keeping positive health and adopting all the healthy activities to enhance the quality of life. Ayurveda's drug formulation field known as 'Bhaishajya Kalpana', which gives great deal of information about methods of drug preparation, use of adjuvant,

collection and processing drugs in a particular manner. The junction of voluminous knowledge rich in herbal medicines from different traditional systems of medicines can lead to new heights in discovery process of universe of medicine. Extensively used in Ayurvedic medicine, Guduchi is often called the "root of immortality". The amrita herb has countless health benefits. It is also known as a powerhouse of antioxidants, which fights with free radicals and thus reducing the risk of deadly diseases like cancer. In Ancient history, its name is also mentioned as Amrita (Nectar of Life). It is said that during Samundra Manthan, when the pot full of Amrita, came out of sea; the demons took it and ran away. So while running few drops of Amrita fell on earth which took the form of a climbing herb known as Giloy. Thus for the betterment of human life, Giloy can be used in composition with other nectar in any form like bhasma of metals etc. for the scrapping of hazardous diseases from all over the world. It was used as internal medicine. The development of Aushadhiya Rasavigyan has brought a revolutionary step in Ayurvedic medicines by developing new techniques like shodhana, jarana, and marana for converting metals and minerals to very fine, absorbable, therapeutically most effective and least toxic medicinal form called bhasmas. Bhasma are defined as powder form of a substance obtained by Calcinations<sup>[3]</sup>. Natural products with medicinal value are gradually gaining importance in clinical research due to their well-known property of no side effects as compared to drugs. Mukta shukti nanoparticles are a calcium containing bhasma which is synthesized through special calcinations of the mother of pearls. It is commonly used as an acid neutralizer, rich source of calcium, anti- pyretic, asthma, dysmennorrhoea, cough, rheumatism, conjunctivitis, tuberculosis and other diseases.<sup>[4]</sup> Present study intended to synthesize the mukta shukti nanoparticles and evaluate the quality parameters including the structure and particle size for characterization of using X-ray diffraction (XRD), Scanning electron microscope (SEM).

## 2. MATERIALS AND METHODS

### 2.1 Material Synthesis and Experimental Methods

The raw material for the preparation of mineral-based was taken as raw material. The Bhasma nanoparticles is prepared for mukta sukta by special process which is providing heat in closed crucibles in pits with cow dung cakes (putpak vidhi).<sup>[5]</sup> and then Swedan of Mukta with jayanti patra swaras in dola yantra for 3 hr so that mukta is purified and wash it with clear water and store it . Marana is process of calcinations.<sup>[6]</sup> The purified mukta was kept into mortar pestle and mardana was done with rose water and shape was given to the paste in to tablet and dried them. After that, Heat was provided in closed crucibles in pits with cow dung cakes for three consecutive times and the final product is mukta shukti nanocrystal. For the preparation of Guduchi Satva, Guduchi sized of thumb are collected and then cut into small pieces, washed well and then crushed. Ratio of water to Guduchi is 4:1 and then macerated/rubbed manually in the water. Then the mixture is filtered through a clean cloth and the filtrate is kept aside for the whole night. Next day, with the help of siphon method, Satva settled at the bottom of the container is collected<sup>[7]</sup>.

#### 2.1.1 Ingredient specification-

Mukta sukta bhasma-It is calcium containing bhasma [8]. this bhasma is prepared from pearl oyster and is grounded and triturated with aloe vera and vinegar in adequate quantity to make a paste like texture.[9] In transmission electron microscopy study particles are appear irregular rod shaped and act like antacid antipyretic and as a source of calcium.[10] It is also beneficial in tuberculosis, cough ,asthma, arthritis, rheumatism and conjunctivitis. Recent studies have shown that better result in increased the bone mineral density of the lumbar spine through adding heated oyster shells to the diet of elderly patient [11].

Guduchi Satva-Ability to balance blood sugar, relieve fever and spasms, fight inflammation, carry out antioxidant functions, promote joint health, calm allergic reactions, reduce stress, protect the kidney,

support the immune system are the branches of Guduchi to act as a amrita in the field of diseased world.

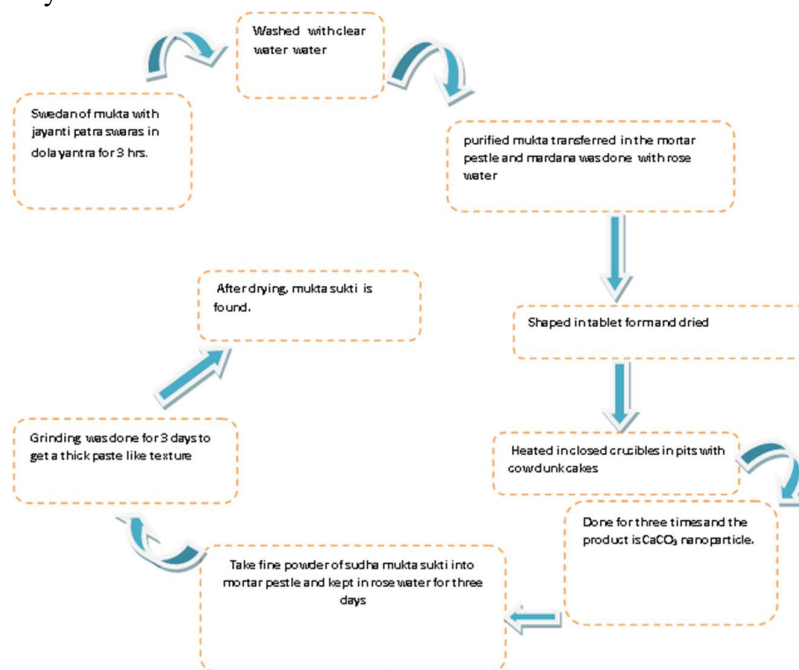
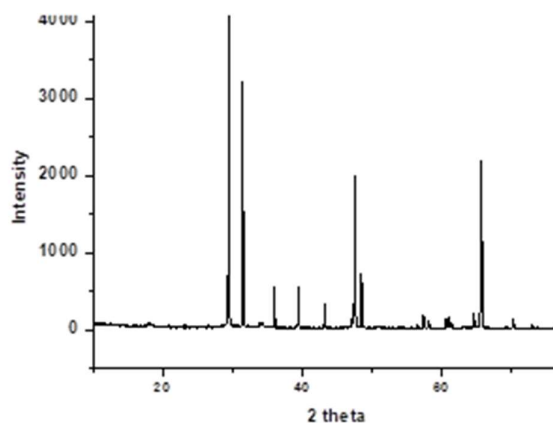


Figure 1 CaCO<sub>3</sub> nanoparticles using traditional Indian method.

## 2.2 X-ray Diffraction-

X-ray diffraction images of were recorded using powder x-ray diffraction analysis. The pattern of mukta shukti bhasma shows that the raw material of Muktashukti is in the aragonite form of calcium carbonate.



## 2.3 Morphological Examination by Scanning Electron Microscope

The morphological examination of the Ayurvedic Herbo- mineral drug was studied with the help of a scanning electron microscope JSM-5600. The drug Guduchi or Amrita consists of dried pieces of mature stem of *Tinospora cordifolia*. It is a large, deciduous extensively spreading climbing shrub with several elongated twinning branches.

## 3. RESULTS AND DISCUSSION

### 3.1 X-ray Diffraction-

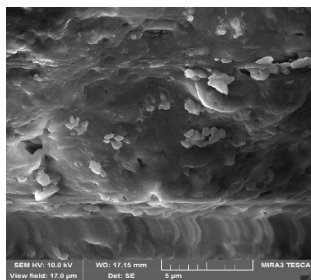
Nanoparticles were characterized by X-ray diffraction. The observed diffraction patterns of the drug sample have been shown in Fig. 1. The X- Ray diffraction spectra recorded for nanoparticles were



marked by most prominent peaks centered at 29.36 & 32.14.

Fig 2: X-ray Diffraction of CaCO<sub>3</sub> nanoparticles.

**3.2 Scanning Electron Microscope-**



**Fig: 3- SEM image of CaCO<sub>3</sub> nanoparticles.**

Figure no.3 is showing the Scanning Electron microscopy of CaCO<sub>3</sub> based nanocrystals. By different methods the SEM images are collected for Mukta-Shukti sample. In this figure the smallest size of the nanoparticle cluster of sample is 200 nm.

**Antimicrobial Activity**

**Test Micro-organisms**

The micro-organism used for the test was Escherichia coli and Candida albicans were procured from NCL (Pune, India).

**Preparation of Disc**

The sterile 8 mm discs were loaded with 20µl samples of 45% concentration and Streptomycin was used as positive control with concentration of 100µg/disc while for the negative control distilled water was used. The studies indicated that guduchi extract as well as synthesized nanoparticles lack anti-microbial activity. These will interesting if it is ingested as a drug as it will not harm microbial flora of the gut. Water extract and nanoparticles of CaCO<sub>3</sub> were analyzed for anti-microbial activity using different fungal and bacterial strains. However, no clear zone of inhibition was observed in either case. This suggests that extract lacks anti-microbial activity (Table a & b). Results obtained were in good agreement with MIC/MBC tests, where clear zone of inhibition was observed for nanoparticles up to 60 nm size but not for larger nanoparticles. Moreover, the release of Ca from large nanoparticles is stated to be lower in solid culture media [12]

Table a & b CaCO<sub>3</sub> nanoparticle activity for Escherichia coli and Candida albicans

a.

Microorganism	10	+ve	-ve	30	+ve	-ve	60	+ve	-ve	100	+ve	-ve
	mg/ml	(mm)	(mm)	mg/ml	(mm)	(mm)	mg/ml	(mm)	(mm)	mg/ml	(mm)	(mm)
<i>E.coli</i>	-ve	31.85	+ve	-ve	22.92	+ve	-ve	25.95	+ve	-ve	21.43	+ve
<i>C. albicans</i>	-ve	16.55	+ve	-ve	11.95	+ve	-ve	9.21	+ve	-ve	10.96	+ve

b.

Microorganism	10	+ve	-ve	30	+ve	-ve	60	+ve	-ve	100	+ve	-ve
	mg/ml	(nm)	(nm)	mg/ml	(nm)	(nm)	mg/ml	(nm)	(nm)	mg/ml	(nm)	(nm)
<i>E. coli</i>	-ve	39.51	+ve	-ve	35.03	+ve	-ve	36.97	+ve	-ve	38.45	+ve
<i>C. albicans</i>	-ve	9.54	+ve	-ve	11.45	+ve	-ve	8.87	+ve	-ve	8.87	+ve

#### 4. CONCLUSION

In this research work, the synthesis of CaCO<sub>3</sub> nanoparticles were successfully designed on ZnSe and PbSe core quantum dots using chemical deposition technique. The XRD patterns confirm the presence of CaCO<sub>3</sub> nanoparticles. The average crystalline size was calculated using Scherrer's formula and found to be 208 nm for CaCO<sub>3</sub> nanoparticles. It can be concluded that the CaCO<sub>3</sub> nanoparticles may be suitable for biological application in cancer, TB etc.

#### 5. ACKNOWLEDGEMENT

The authors gratefully acknowledge this research to Dr Panckaj Garg, Honorable Founder & Advisor, Jayoti Vidyapeeth Women's University, for providing ultimate guidance & support for progressive research. The authors are thankful to UGC\_DAE\_CSR for research experimental facilities (XRD, SEM, etc.)

#### REFERENCES

1. Ranganathan R, Madanmohan S, Kesavan A, Baskar G, Krishnamoorthy YR, Santosham R, Ponraju D, Rayala SK, Venkatraman G (2012). "Nanomedicine: towards development of patient-friendly drug-delivery systems for oncological applications". International Journal of Nanomedicine. 7: 1043–60. doi:10.2147/IJN.S25182. PMC 3292417. PMID 22403487.
2. Patra JK, Das G (September 2018). "Nano based drug delivery systems: recent developments and future prospects". Journal of Nanobiotechnology. 16 (71).
3. The Ayurvedic formulary of india part 1<sup>st</sup>-2<sup>nd</sup> revised English edition new delhi, the controller of publications, civil lines 2003 page no. 227.
4. Chaudhary A and singh N, Herbomineral formulation (rasaasadhies) of ayurveda an amazing inheritance of Ayurvedic pharmaceuticals, J Ancient Sci Life, 30 (1) (2010) 18-26.
5. Frawley D, Lad V. Delhi, India: Motilal Banarsidass Publishers Pvt. Ltd; 1994. The Yoga of Herbs; p. 560.
6. 4<sup>th</sup> ed. Mosby-Year Book Inc; 1994. Mosby's Medical, Nursing and Allied Health Dictionary; p. 243.
7. SS Vaidya, VA Dole (2013) Bhaishajya Kalpana Pratyakshik. Profishant Publishing House, Pune, India, pp. 177.
8. Chauhan O, Godhwani JL, Khanna NK, Pendse VK. Anti inflammatory activity of Muktaashukti Bhasma. Indian J Exp Biol. 1998;36:985–9.
9. Balmain J, Hannoyer B, Lopez E. Fourier transform infrared spectroscopy (FTIR) and X-ray diffraction analyses of mineral and organic matrix during heating of mother of pearl (nacre) from the shell of the mollusc Pinctada maxima. J Biomed Mater Res. 1999;48:749–54.
10. Bowen CE, Tang H. Conchiolin-Protein in Aragonite Shells of Mollusks. Comparative Biochemistry and Physiology A. 1996;115:269–76.
11. Brown CL, Bushell G, Whitehouse MW, Agrawal DS, Tupe SG, Paknikar KM, et al. Nano gold pharmaceuticals. Gold Bulletin. 2007;40:245–50.



**DIGITALIZATION IN INDIAN BANKING SECTOR: POSITIVE AND NEGATIVE ASPECT OF DIGITAL BANKING**

**Preeti Chahar**

Assistant Professor, Department of Commerce and Management, Jayoti Vidyapeeth

Women's University, Jaipur

E-mail: preetychahar@gmail.com

**Abstract**

Digitalization is the process of turning a physical firm to a digital one in order to increase chances for value creation and income generation. Because of this, the banking industry has placed a high priority on implementing digitization. By doing so, banks may improve their customer services. But several academics have noted that the usage of artificial intelligence in the banking industry has actually increased the unemployment rate. The goal of the current study is to discover this truth utilizing scheduled commercial banking data from India. In the case of Indian scheduled commercial banks, the contribution of staff to operational profitability of banks is estimated. Due to the increased use of digitalization, it is debated which employee type is more at risk than other employee types in the banking industry, taking into account officers, clerks, and sub-staffs of the banking sector. According to the analysis, even though officers and clerks both contribute positively to the operational profitability of banks today, and where clerks' contribution is greater than officers', only the number of officers is rising while the number of clerks is falling as a result of profit-making institutions' banks' realisation that, with fewer clerks due to use of digitalization, clerks' contribution to banks' profitability can increase. Thus, banks do not require a large number of clerks. It is also evident that fewer substaff members are employed today since they contribute negatively to the operational profitability of banks, making them obsolete as a result of the use of digitalization. If their numbers are not reduced, the bank will be forced to incur unproductive costs. The employment of workers in the banking business is thus impacted by the usage of digitalization in the Indian banking sector.

**Keywords:** Digitalization, employment, impact, and the banking sector in India.

**Introduction**

The term "digital banking" describes the process of converting conventional banking practices to digital ones to streamline banking transactions. To meet the needs of its digitalized consumers, digitalized banking, in contrast to traditional banking, attempts to create flexible computerized goods and services. Digital banking has completely changed how money is transferred, revolutionizing the banking industry. It has also made it easier for buyers to assist each other more quickly. The focus of the service sector nowadays is on deploying cutting-edge technical solutions to automate transactions. A crucial factor in a nation's economy developing is in particular banks. E-banking, often known as Internet banking, is one of the technical advancements that have changed the financial sector.

To eliminate the need for customers to visit a branch, digital banking entails digitizing all aspects of banking operations and replacing the bank's physical location with an ongoing online presence. Banking institutions can now use data analytic and artificial intelligence (AI) to improve business choices and provide individualized services to clients thanks to digitization. Banks can customize their services to match the unique demands of each customer by gathering and analyzing customer data. Digitization reduces human error, which boosts customer loyalty. Banking is accessible online around-the-clock. It has also become easier to manage large sums of money. Consumers have benefited from digitalization as well because it has made cashless transactions possible. When private



and international banks first joined the Indian market in 1991–1992, to digitalize the economy and enhance the services offered by general public sector banks to customers, the process of computerization accelerated alongside economic change in India. In India, internet banking and e-banking were first used between 1996 and 1998. The government of India then passed the Information Technology Act, 2000 to give electronic transactions and other forms of electronic commerce legal status. Since the introduction of ATMs, the banking industry has become increasingly digital in India. The banking industry frequently sees new advances like Telebanking, Electronic Compensation Services, Electronic Funds Transfer systems, MICR, RTGS (Real-Time Gross Settlement), Point of Sale Terminals, etc. E-banking has significantly reduced costs and assisted in generating income in a variety of ways. The RBI and National Payment Corporation of India had taken several actions and initiatives, such as the introduction of the United Payments Interface (UPI) and Bharat Interface for Money, to strengthen the Payment and Settlement Systems in banks. These programs and platforms have made it so that clients may now conduct transactions anytime, anyplace, and without having to store or carry currency with them.

### **The Status of India in the Digital World at the Moment**

Today's banks strive to give their consumers a quick, precise, and high-quality banking service. Digitization is currently the main priority for all Indian banks. Digital transactions are actively being encouraged by the Indian government. The two most important steps for innovation in the Indian payment systems industry were taken with the introduction of the United Payments Interface (UPI) and the Bharat Interface for Money (BHIM) by the National Payments Corporation of India (NPCI). With the use of the UPI Smartphone interface, users can instantly transfer money between accounts at virtual addresses that are supported by numerous banks.

There are 25,29,141 point of sale (POS) devices and 2,22,475 automated teller machines (ATMs), according to the RBI Report for 2016–17. Electronic payment systems such as NEFT (National Electronic Fund Transfer), ECS (Electronic Clearing Service), RTGS (Real Time Gross Settlement), Cheque Truncation System, Mobile Banking Industry, Debit cards, Credit Cards, and Prepaid cards have all been widely adopted by Indian banks. All of these are turning points in the banking industry's digital revolution. National Electronic Funds Transfer (NEFT) is the most ordinarily used electronic payment method for transferring money from any bank branch to a different bank in India. It operates in half-hourly batches, at the present, there are 23 settlements.

### **Litratue Review**

Brahmaiah et al (2008) Examine the factors affecting the profitability of Indian commercial banks to discover that it is influenced by both internal and external factors, with the strength of equity capital, operational efficiency, and the ratio of banking sector deposits to the gross domestic product (GDP) having a notably positive effect. Credit expansion, cost of funds, the ratio of non-performing assets (NPAs), and consumer price index (CPI) inflation have a significantly negative effect on the profitability of banks.

Chaturvedi et al (2012) Analyzed that, the ability of bank employees to provide timely and polite service to the clients makes it important to evaluate the profitability of banks in terms of their employee productivity. assessing the financial standing of Punjab National Bank and Central Bank of India in relation to their personnel According to Chaturvedi et al. (2012), the chosen banks made attempts to improve their viability over the course of the ten-year study period from 2002 to 2011.



Kumar (2016) estimated the employee productivity in public sector commercial banks in India and Nepal based on two key metrics: "Business per Employee" and "Profit per Employee." In order to uncover any hidden information, statistical tools like the average, compound annual growth rate, Anova, co-relation, and coefficient of determination were applied to tabulated data. The results show that employees are crucial to the banking industry's ability to achieve high productivity.

(Chakrabarty, 2013) According to a survey by the Reserve Bank of India, there were about 1,76,547 cases of financial fraud reported, totaling Rs. 31401.01 crores, of which 1,69,190 cases were reported in commercial banks and involved Rs. 29910.12 crores. 29653 incidents were reported by public sector banks, whereas 93331 cases were reported by private sector banks and 46206 cases were reported by foreign banks. Technology-related problems including credit card fraud, internet banking fraud, and other e-banking frauds contributed to 65% of fraud cases.

Raghavan and Parthiban,(2014) Numerous frauds are being committed in the e-banking industry, including those involving ATMs, credit cards, phishing attacks, identity theft, data theft, hacking, cracking, malware assaults, and many more. As a result, the nation as a whole is suffering significant financial losses.

Jagtap , (2014) According to a poll of informed participants, 38% of customers still do not utilise online banking due to its lack of security, vulnerability to fraud, and lack of operational instructions. It has been determined that despite being taught, customers are hesitant to use online banking since they believe it to be risky.

Chavda, (2014) One of the factors contributing to the rise in e-banking frauds is the lack of computer literacy among Indians, which prevents people from using the services themselves or from using them without assistance, which exposes the customer's confidential information to fraudsters who may use it for their own gain.

Komal and Rani, (2012) The main e-banking channels are the ATM, credit cards, internet, and mobile banking. According to 29% of respondents, mobile banking is unreliable, and 24% believe using credit cards is risky.

Siddique and Rehman, (2011) Computer is used as a tool for fraud since it has a large amount of data stored, including confidential data and information, and it is simple to access to steal data using covertly implanted key loggers and logic bombs. If there is no adequate backup, the data gathered is exploited and destroyed after usage, which can also lead to the loss of evidence and proof of facts. Mobile devices are also employed in fraud schemes.

Sharma et al, (2011) According to 64.83% of respondents, downloading certain applications gives customers access to their confidential data stored on their mobile devices, such as their messages, photo gallery, and various files and folders. As a result, there is a risk of data theft that could lead to the customers becoming victims of e-banking frauds.

### **Objectives**

) To know the impact of digitalization on employment in the Indian Banking Sector.



) To identify the quality gap for online banking.

### **Concept of quality gape**

In general, service businesses strive to meet or surpass their client's expectations to achieve customer satisfaction. Customers and service organizations have four key conceptual quality gaps, according to Parasuraman et al. (1985): (1) the discrepancy between customer expectations and management's perceptions of those expectations; (2) the discrepancy between management's conceptions of consumer expectations and the service quality requirements that the companies deliver from the customers' perspective; (3): the discrepancy between the agreed-upon level of service quality and the actual level of service provided to the client; and (4): the discrepancy between the real level of service provided and the perspective of the customer. Based in part on a survey of the literature and part on empirical analysis, these four quality gaps have prompted us to identify five service quality gaps for online banking.

**Technology Gap** There is a discrepancy between what clients anticipate the bank website to be able to do and how it works and is usable. **Service Reliability Gap** Difference between customers' expectations of bank reliability and bank website fulfillment. **Technical Knowledge Gap** Difference between customers' level of technical knowledge and the bank website's level of design complexity. **Security Assurance Gap** There is a discrepancy between the level of protection promised to customers and the privacy and security provided by the bank website.

### **Research Methodology:**

The study is purely descriptive in nature. The problem analysis makes use of secondary data. Sources for the secondary data come from a variety of places, including specialized Investigation team reports, news articles, Reserve Bank of India (RBI) websites, and famous researchers' research papers are all used.

### **3. Significance Of The Study**

The usage of digitalization in the banking sector and the contributions of bank personnel are identified to be the two key drivers of banks' profitability. However, jobs of employees are now in danger due to the banking sector's ongoing reliance on digitalization.

In the findings of numerous research papers, it is not adequately demonstrated which type of employee is more crucial to banks' operational profitability and which type of employee is more at risk than other types in the banking sector as a result of extensive use of digitalization. It is also not demonstrated which type of scheduled commercial employees are. **Impact of Digitalization on Employment of Personnel in Banking Sector: Indian Case Study**, The banks are the most at risk, according to <http://www.iaeme.com/IJM/index.asp> 985 editor@iaeme.com. The current study uses data from Indian scheduled commercial banking to discover these facts.

### **Findings**

From the analysis of the second objective, it is discovered that in scheduled commercial banks today, the number of both clerks and sub-staffs is decreasing, and the number of sub staffs is lowest when compared to the number of officers and clerks, as well as **Impact of Digitalization on Employment of Personnel In Banking Sector: A Case Study Of India**. The drop in the number of clerks and other



support workers is greatest for private sector banks among all categories of scheduled commercial banks, according to <http://www.iaeme.com/IJM/index.asp> 989 [editor@iaeme.com](mailto:editor@iaeme.com).

### **Threatened Jobs**

Digitalization has made it possible to conduct banking operations including money transfers, account opening, bill payment, account statement, ATM card, debit card, credit card, check book, loan information, etc. without going to a bank branch. The impact of digitization on the banking industry has the potential to diminish human intervention and eliminate the majority of jobs.

Due to the fact that routine banking tasks like updating passbooks, making cash deposits, checking client information, and uploading salaries can be completed without relying on branch staff, this makes the bank's personnel fearful for their future employment. The banking industry is moving towards cutting-edge technology advancements, and the increased usage of digitalization has put between 20–25% of banking sector jobs at risk. Data input, data verification, tellers, cashiers, and underwriters are among the key occupations affected by this, as they are routine, need less skill, and are in danger of disappearing.

### **Conclusion**

According to the analysis, officers and clerks both contribute positively to the operational profitability of banks today, and if the contribution of clerks is greater than that of officers, However, it is observed that today only the number of officers is growing while the number of clerks is declining. This is because profit-making institutions like banks have realised that by using digitization, a smaller workforce of clerks can contribute more to profitability. Thus, banks do not require a large number of clerks. As a result of their negative impact on banks' operational profitability, or because banks no longer need them as a result of using technology, the number of substaff is also on the decline today. If this trend continues, banks will incur unproductive costs. The employment of workers in the banking sector is thus impacted by the usage of digitalization in India. Although there will be new types of jobs in the event of scheduled commercial banks, even then the banking industry will not need as much staff and conventional types of jobs would disappear, which is not a good indication.

### **References**

- ] Gupta, S. and Yadav, A. The Impact of Electronic Banking and Information Technology on the Employees of Banking Sector. *Management and Labour Studies*, 42, 2017, pp. 379-387.
- ] Meena, R.M. and Ganesan, P. Impact of Digital Transformation on Employment in Banking Sector. *International Journal of Scientific & Technology Research*, 9, 2020, pp. 4912- 4916.
- ] Rao, J.V.K. and Kumar, A.K. Digitalization Impact on Banking Operational Profitability with Reference to Public and Private Sector Banks. *International Journal of Management, IT & Engineering*, 9, 2019, pp. 252-265.
- ] Patra, A. IBPS PO 2020 vacancies revised again; still lower than last year, 2020. <https://www.shiksha.com/sarkari-exams/banking/articles/ibps-po-2020-vacancies-revisedagain-still-lower-than-last-year-blogid-44023> [5] Brahmaiah, B. and Ranajee. Factors Influencing Profitability of Banks in India. *Theoretical Economics Letters*, 8, 2018, pp. 3046-3061.
- ] Yadav, S. and Garima. Employees Productivity in Indian Banks: A Comparative Analysis. *Pacific Business Review International*, 8, 2015, pp. 11-19. [7] Chaturvedi, A. and Sharma, D. Employees Productivity Analysis (A Comparative Study of Punjab National Bank and Central Bank of India). *IMS Manthan*, 7, 2012, pp. 55-57.



- ) Kumar, B. A Study of Productivity of Employees in Public Sector Commercial Banks of India and Nepal. Effulgence, 14, 2016, pp. 12-18.
- ) Pandit, V. These jobs may go missing from banks in the next few years, 2017. [https://www.google.com/amp/s/m.economictimes.com/industry/banking/finance/banking/these - jobs-may-go-missing-from-banks-in-the-next-few-years/amp\\_articleshow/60509828.cms](https://www.google.com/amp/s/m.economictimes.com/industry/banking/finance/banking/these-jobs-may-go-missing-from-banks-in-the-next-few-years/amp_articleshow/60509828.cms)
- ) Mali, P.G. PROS AND CONS OF ARTIFICIAL INTELLIGENCE (AI) IN BANKING, 2018. <https://www.smallbusinessbonfire.com/artificial-intelligence-banking/>
- ) Vaddepalli, S., Satish, D. and Jutar, S. Indian Banking Performance and Developments 2004-05, 2020. [https://www.researchgate.net/publication/341741446\\_Indian\\_Banking\\_Performance\\_and\\_Developments\\_2004-05](https://www.researchgate.net/publication/341741446_Indian_Banking_Performance_and_Developments_2004-05)
- ) Kumar, S. REPORT ON TREND AND PROGRESS OF BANKING IN INDIA 2016-2017. MUMBAI: Jayant Printery LLP., 2017, PP. 1-162



## STUDY OF INTERPERSONAL RELATIONS OF HI SECONDARY LEVEL STUDENT WITH TEACHERS

**Priyanka Karshania**

Asst. Professor Joyti Vidyapeeth Women's University Jaipur

### Summary

The purpose of the present study was to study the interpersonal relationship of high school students with teachers. Survey method was used for this study. 100 students from the Jaipur district was selected for this study. A self-made instrument was used for data collection. as a result, it was found that there is no significant difference in the interpersonal relationship of Higher Secondary students with teachers based on gender-based on reason.

### Preface

Interpersonal relationships play an important role in the lives of individuals the interpersonal. relationship of teachers is an essential factor in any school. if there is a good interpersonal relationship between students and teachers, teachers and other teachers, teachers and administration, School staff personnel, and parents and community members, develop a positive and good learning environment for all students. During teachers in the classroom, teachers and students are face to face and as a result of mutual interaction, the learning difficulties of students can be overcome quickly. There is no age bar in the relationship between teachers and students. the man keeps on learning something or the other directly or indirectly as a student throughout his life.

In school life, the good relationship between the teachers and the students is the basic base of his education. when a child comes to school for the first time, we find an atmosphere like his come there too. he has his eyes on the teachers who love him like his parents. if he does not get that environment, then he becomes a deranged mind. Disbelief hearted that fear for school and teachers arise in his mind. handling him in his situation only shows good relations between teachers and students. by the time he reaches adolescence, he is mature enough to form independence throughout schools and with teachers.

The environment of the school, the behavior of the teachers has established their supremacy in his mind. If a student, who came with the aim of getting education, becomes afraid of the behavior of the teacher, the way of imparting this education, then he can never succeed even if he wants to. Finds himself unable to do anything and alone, so the teacher should behave with his student in such a way that the students start accepting their good wishes and instead of fearing the teachers, try to get their company so that they can trust them.

### study of related literature

Baho and Ali (2020) conducted a study on the relationship between teacher-student interaction and student interpersonal skills, self-management skills, and academic behavior. The purpose of this study was to find out the interaction methods of secondary school teachers with students and students' interpersonal skills. Difference between self-management skills and academic behavior. The results found that teachers' uncertainty had a strong correlation with student's interpersonal skills, while teachers' salary and students' independence had a significant negative relationship with their risk self-management skills. All eight factors of student-teacher interaction remained positively correlated with student academic behavior.

Kasivu (2020) conducted a study on the role of teacher student interpersonal relationships in determining the discipline of students This study examined the role of teacher student interpersonal relationships in

determining the discipline of students in Kenya The study found that teacher student interpersonal relationships have a significant impact on students' discipline There was a significant positive correlation with the level of discipline. The study concluded that the role of teacher-student interpersonal relationships was important for the discipline of students. Teachers and pedagogy strive to encourage cordial teacher-student interpersonal relationships in their interactions at school.

Pascal (2020) NET conducted a study on teacher-student relationships and students' academic performance in public secondary schools in Tanzania. This study explored the impact of teacher-student relationships on students' academic performance in Tanzania. The results of this study suggest that that teacher student relations in Tanzanian public secondary schools is an important determinant and catalyst for academic performance teacher student relations help students feel cared for by their teachers help students have freedom of expression in the classroom and help teachers and students help to form an integral part of the class as they actively participate. On this basis it is recommended that teachers should establish a close relationship with the students as well as the study is recommended to achieve the performance of the students. Can be done when teacher student relationship will be maintained.

Result 2020 conducted a study on teacher student relationship and student learning outcomes in senior public secondary schools in Ghana The study found that teachers who are professionally close to their students made their students professionally dependent on them have increased their students' behavior and levels of instructional engagement. This study recommends that teachers develop a positive teacher-student relationship that will improve both the learning environment of schools and therapy, as well as student academic achievement.

#### **Research objective**

- 1 To study the interpersonal relations with the teachers of boys and girls of higher secondary level.
- 2 To study the interpersonal relations with teachers of rural and urban students of higher secondary level.

#### **Research hypothesis**

- 1 A significant difference will be found between the intra-personal relationships with the teachers of the students of higher secondary level.
- 2 A significant difference will be found between the unethical relations with the teachers of the students of rural and urban areas of higher secondary level.

#### **Research Method Used in the Study**

Survey method has been used by the researcher in this research work.

#### **Justice pain used in research**

For this research work, 100 students of higher secondary level of Jaipur district have been selected as judges by random method.

#### **Research equipment**

In the presented research work, its self-made has been used in the student-teacher inter-personal relationship.

#### **Statistics used in research**

Mean standard deviation Avanti test has been used in the presented research work.

#### **Data Analysis and Interpretation**

Hypothesis 1: A significant difference will be found between the interpersonal relationships with teachers of first secondary level boys and girls.

#### **Table 1**

Inter personal relationship with teachers of higher secondary level boys and girls.

Group	Number of students	Mean value	Standard deviation	t-value	Result
Boys	50	27.08	2.83	0.32	Denied
Girls	50	27.34	4.87	0.32	Denied

The above table shows the inter-personal relationship between male and female teachers of higher secondary level, it is clear from the observation of the table that the mean of boys is 27.08 and standard deviation is 2.83 and the mean of girls is 27.34 and standard deviation is 4.87. The obtained calculated bar value is 0.32 The obtained calculated team value is less than the table value at 0.505 level of significance hence the hypothesis is rejected.

### **Table 2**

Interpersonal relationships of rural and urban area students of higher secondary level.

Group	Number of student	Mean value	Standard deviation	t-value	Result
Rural area student	50	28.40	3.30	0.61	Denied
Urban area student	50	28.84	3.81	0.61	Denied

### **Interpretation and analysis**

The above table shows the interpersonal relationship of the students of rural and urban areas of higher secondary level, it is clear from the observation of the table that the mean of rural area students was 28.09, the trend was 3.30 and the mean of urban area students was 28.8 and standard deviation was 3.81. . Calculated strip value zero point 61 The calculated value is found to be less than the table value zero point of significance 0.0 5 so the hypothesis holds.

### **Reference list**

- Asthana Vipin (2009) Various and Evaluation of Psychology and Education Varanasi Vijay Prakashan
- Kalinga FM (1967) Foundation of Behavioral Research New Arch Halt Rain Hot and Wins
- Kaplan RM (1987) Basic Statistics for Behavioral Science London Allen & Bacon Printers
- Kapil SK (1995) Research Methods Meerut Bhargava Bhavan
- West Zone W (1963) Research in Education New Delhi Train Time Hall All India Pvt Ltd
- Bhargav Mahesh (2006) Modern Psychology Testing and Measurement Kachhari Ghat Agra Book Publications



## A CONTENT ANALYSIS ON ARTIFICIAL INTELLIGENCE AT THE SERVICE OF HUMAN RESOURCES MANAGEMENT

**Prof. Sanjay Chhabra**

(Dean, Faculty of Law & Governance, Jayoti Vidyapeeth Women's University, Jaipur Rajasthan

\*Corresponding Author Email ID - dean.flg@jvwu.ac.in)

### Abstract

The analysis of data pertaining to human resources has drawn the attention of all businesses in recent years, and the emphasis has been placed on human capital, which is regarded as the primary factor influencing the development of the business and all of its activities at all levels of human resource policies. Throughout the coming years, data analysis (HR analytics) will dramatically increase firm profitability. We began by conducting a thorough analysis of the various risks and issues related to human resources that HR specialists had reported. Next, we looked at the most recent research on computer science techniques that were suggested as solutions, before concentrating on potential artificial intelligence techniques. By describing the IT solutions already implemented in human resources for the years between 2008 and 2018, this review article will serve as an archive and a reference for computer scientists working on HR. It tries to clearly outline the problems that computer scientists are working to address for HR researchers. By emphasising those that use artificial intelligence, it simultaneously outlines the many and modern IT approaches, tools, and methodologies now in use.

**Keywords:** Human Resources Management, Artificial Intelligence, Motivation, Skill Management

### Introduction

As a result of the diversification of challenges pertaining to the HR function and the growth of its impact over corporate strategic decision-making processes, human resources management has experienced significant changes. The HR function is currently evolving more and more in the direction of individualised HR practises that take into consideration the unique characteristics of each target. The objective is to support managers in improving intergenerational collaboration. In order to

make the best decisions and enhance operational performance, businesses can use their "employee" databases effectively through the use of human resources analysis.

Artificial intelligence based on "machine learning" technology promises to revolutionise human resources departments at various levels, including recruitment, training, career management, mobility, compensation, and perks in an effort to draw in talent and high potential, treat and analyse nominations as quickly as possible, check the applicability of the profile and position, and more at a time when business leaders are trying to prepare for a digital world that is gaining momentum. Losing one or more of its successful employees to one of its rivals is one of the most challenging situations for any business that wishes to be modern and competitive. Artificial intelligence allows HRDs to create human capital performance indicators that are based on internal data analysis and cross-referenced with information from the external market, particularly competition. It will be feasible to map the current profiles in accordance with each employee's productivity and effectiveness using the findings of these investigations. This technology, which is undergoing a technical boom and is rapidly producing convincing results among the industry's titans, is inspired by how the human brain functions (Apple, Facebook, Google, Microsoft ...).

To get the most out of it, it is necessary to learn and analyse how data is treated. The HR function will be able to capitalise and elevate its function to a higher strategic and decisional level on the basis of this reflection and its intuition. Some people might believe that data and algorithms can take the place of their decision-making intellect, but in reality, they only allow for a more effective manifestation of that intelligence. It is crucial to comprehend that data is not autonomous if it becomes inevitable. The reading and



interpretation of this data by human intelligence is where all of its worth rests. Data is at HR's disposal; it does not substitute their wisdom and bravery. The data gives HR the foundation they need to construct their future. The difficulty that comes along with the taming of data by HR is challenging pre-made representations and preconceived assumptions to induce proposals based on these observations.

### Literature Review

Some scholars have successfully finished their work on human resources analytics over the past few years. We have decided to compile the many studies conducted on this topic between 2008 and 2018. Newspapers published the majority of their articles from 2015 to 2018, particularly between 2015 and 2017. These articles mostly dealt with issues pertaining to the fields of artificial intelligence and human resources. During the months of March and September and in the month of November of last year, there were more research projects involved.

A large number of articles have been published in computer science-related journals like Future Generation Computer Systems, International Journal of Interactive Multimedia and Artificial Intelligence, International Journal of Computing and Informatics, The Scientific World Journal, etc., while others have been published in journals that focus on human resources management, like Management: Journal of Contemporary Management Issues, Journal of Business Strategy, Business Hour From 2008 to 2018, the quantity of HR papers increased exponentially.

### Human Resources Risks

3.1. The Social Dialogue: A failure in the management of social dialogue due to poor communication or lack of clarity in managerial goals can lead to intense tensions inside the organisation, even a protracted strike (absenteeism, demotivation, lack of trust between managers and employees ...). Forecast: Additional Strikes/Absenteeism Rate.

3.2. Skills Management: A lack of follow-up on the company's skills and abilities results in a systematic exacerbated exodus of important workers, as well as increased staff

demotivation, a lack of training, and team stagnation. Attrition rate and assisted awareness rate to be predicted.

3.3. Well-Being and Motivation at Work: Certain managerial practises, such as the establishment of impossible goals and the lack of communication between managers and staff, can be thought of as stressors that lead to employee burnout, stress, or even suicide. Forecast: Employee Engagement/Staff Satisfaction.

3.4. Employee safety: If safety protocols are not formalised and there is no internal control in this area, the company could face legal and/or criminal consequences as a result of workplace injuries or even fatalities (degradation of his image). Operational hazards associated with the company's activity are anticipated.

3.5. "Horrorific" HR Procedures: An insensitive management system based on excessive pressure from management (pressure on targets) and a lack of internal control over managerial actions may result in a disastrous social climate (harassment of staff, unequal treatment of situations). Predict: Social climate assessment indicators.

3.6. HR Costs: Poor payroll management, expensive health insurance and provident insurance are just a few examples of how a lack of control over HR costs can result in additional expenses and a structural increase in management costs. Predict: HR management control improvements and cost-controlling indicators.

### It Solutions and Artificial Intelligence for Human Resources Problems

#### 4.1. The Different HR Issues Studied

Our research indicates that computer scientists have been tasked with solving a number of HR-related problems. The majority of the problems raised relate to: Employment, talent and skill management, candidate/staff selection and recruitment, attrition, turnover, future needs for human capital, HR performance and effectiveness, etc. The key HR concerns that have been brought up and for which computer scientists have suggested various IT solutions are displayed in the following graph.

4.2. IT Solutions for Human Resources Issues



Our quantitative analysis indicates that a number of IT solutions have been suggested to address the various human resources-related issues. Our thorough investigation revealed that the artificial intelligence algorithms (Machine Learning, Neural Network, and Data Mining) are the ones most frequently employed to address HR issues. They are used more frequently than the others (41%), with simple statistics or other analytical methods coming in second (29%), BI, Big Data, and data warehouse solutions coming in third (14%), and simple analysis utilising software, ERP, frameworks, or websites coming in fourth (16%).

#### 4.3. Artificial Intelligence Solutions for Human Resources Issues

The science that deals with the development of human knowledge and gives robots the ability to mimic human reasoning and intelligence is known by the abbreviation AI. It simulates the performance of tasks similar to those carried out by humans, including identification, forecasting, categorization, comprehension, discourse, adaptation, and learning. Artificial intelligence is currently a hot topic in the virtual world across all industries. Since its inception, it has undergone a renaissance in the form of Machine Learning and then the emergence of Deep Learning, which has boomed in recent years, giving Machine Learning a new type with more in-depth examples and algorithms. Furthermore, given their significance in all of the previously listed significant elements, we are unable to discuss these concepts without bringing up neural networks, which serve as the foundation of our research. It follows that the need for IT solutions for HR-related problems is growing. Several strategies have been put up by scientists to address these HR issues. The use of artificial intelligence is not unusual. It also provides many algorithms and techniques.

Our quantitative analysis indicates that a number of IT solutions have been suggested to address the various human resources-related issues. Many applications of artificial intelligence have been made, utilising various techniques and algorithms. The most popular artificial intelligence algorithms that have been applied are Decision Tree, Random Forest,

Support Vector Machine, Multi-Layer Perceptron, K-Nearest Neighbour (KNN), Gaussian Nave Baye, Logistic Regression, C4.5 method, and others. The most popular artificial intelligence algorithm is the decision tree, which is utilised 30% of the time, followed by SVM (17%), Random Forest (17%), 15% for Logistic Regression, 11% for KNN, 4% for MPL, and C 4.5 (4%), and 2% for Nave Bayes.

#### Conclusion

As a result of our research on the two axes of human resources and artificial intelligence, we were first able to identify the various concerns voiced by the experts and managers in the field and then focus on the most prevalent challenges. We have made an effort to compile all answers to problems that scientists and computer scientists have come up with, especially those that make use of artificial intelligence techniques between 2008 and 2018. Based on the number of papers we identified, we deduced that numerous HR Analytics were suggested, and the majority of them utilised artificial intelligence algorithms and approaches. This indicates the technology's quick development, observed growth, and growing interest and rivalry in the HR industry.

Recruiting, Skills Management, Human Resources Development (workers' abilities, effectiveness, productivity, and performance), attrition, and turnover were the HR questions that were asked the most regarding analysing and predicting. Some of the known software, frameworks, and ERP (SAP, SPSS, Oracle, SAS, CRM, SMA, SNW) and Artificially Intelligent algorithms (Machine Learning, Neural Network, Deep Learning...) were mentioned in the proposed solutions. Others used or suggested other analysis methods and simple statistical data combined with HR analysis and HR approaches. Decision Tree (DT), Random Forests (RF), the Support Vector Machine (SVM), Multi-Layer Perceptron (MLP), K-Nearest Neighbour (KNN), Gaussian Nave Bayes (GNB), Logistic Regression (LR), and C4.5 were the most widely utilised artificial intelligence techniques. The field of human resources is broad and expanding all the time. Each firm is concerned with managing its human resources



by viewing human capital as the foundation of success and the source of growth in order to boost productivity, draw in talent, and retain customers in order to successfully compete. On the reverse hand, the field of intelligence is constantly developing, and fresh ideas and techniques are constantly being put out.

#### Acknowledgement:

The authors gratefully acknowledge this research to the originator honorable advisor Mr. Vedant Garg Sir, Jayoti Vidyapeeth Women's University, Jaipur.

#### References:

- [1] Bernard Marr. "The 8 HR Analytics Every Manager Should Know About". Forbes. Mar 1, 2016.
- [2] Bernard Marr. "The 18 Best Analytics Tools Every Business Manager Should Know". Forbes. Feb 4, 2016.
- [3] Norhaslinda Kamaruddin, Abdul Wahab Abdul Rahman, Ramizah Amirah Mohd Lawi." Jobseeker-industry matching system using automated keyword selection and visualization approach". Indonesian Journal of Electrical Engineering and Computer Science (IJEECS). 2018.
- [4] John Bratton, "Jeff Gold. Human Resource Management", 6th Edition: Theory and Practice, 1 Mar. 2017.
- [5] Maxime Comptier." Les Ressources Humaines plus humaines grâce à l'Intelligence Artificielle". Octopeek. 2018.
- [6] Shoko Haneda & Keiko Ito." Organizational and human resource management and innovation: Which management practices are linked to product and/or process innovation? ", February 2018.
- [7] Ashok K. Gupta & Arvind Singhal" Managing Human Resources for Innovation and Creativity", 27 Jan 2016.
- [8] Romain Giry" Intelligence Artificielle : Quelles Applications Pour Les Rh ? ", Focus Rh. Erp/Sirh. May 2017.
- [9] Sabine Germain," Gestion Des Risques : Les Ressources Humaines Trop Peu Prises En Compte Par Les Risks Managers. Entreprise & Carrières". Novembre 2014.

- [10] Nicolas DUFOUR et abdel BENCHEIKH." Comprendre les risques ressources humaines", véritable enjeu et création de valeur pour l'entreprise. 2017.
- [11] Porter, Lyman W., Steers, Richard M." Organizational, work, and personal factors in employee turnover and absenteeism". Psychological Bulletin. 2016.
- [12] Rahul Yedida, Rahul Reddy, Rakshit Vahi, Rahul Jana, Abhilash GV, Deepti Kulkarni. "Employee Attrition Prediction". 02 November 2018.
- [13] Jessica Frierson, Dong SiEmai. "Who's Next: Evaluating Attrition with Machine Learning Algorithms and Survival Analysis?", International Conference on Big Data. 21 June 2018.
- [14].\Devesh Kumar Srivastava, Priyanka Nair. "Employee Attrition Analysis Using Predictive Techniques". ICTIS 2017: Information and Communication Technology for Intelligent Systems.
- [15] K. M. Suceendran, R. Saravanan, Divya Ananthram, Dr.S.Poonkuzhali, R.Kishore Kumar, Dr.K.Sarukesi. "Applying Classifier Algorithms to Organizational Memory to Build An Attrition Predictor Model". Advances In Information Science and Computer Engineering. 2015.
- [16] Alao D. & Adeyemo A. B. "Analyzing Employee Attrition Using Decision Tree Algorithms". Computing, Information Systems & Development Informatics Vol. 4 No. 1 March, 2013.
- [17] Emmanuel Nwahanye." Le rôle médiateur de la satisfaction au travail dans le lien entre l'intensité de la gestion des ressources humaines et le roulement du personnel", Septembre 2016.
- [18] Ismatilla T. Mardanov, Kenneth Heischmidt, Amy Henson." Leader-Member Exchange and Job Satisfaction Bond and Predicted Employee Turnover". Journal of Leadership & Organizational Studies. 2008.
- [19] Yafang Tsai and Shih-Wang Wu. "The Relationships Between Organisational Citizenship Behaviour, Job Satisfaction



- and Turnover Intention". Journal of Clinical Nursing. 2010.
- [20] JY Saulquin, G Schier. Responsabilité sociale des entreprises et performance." La Revue des Sciences de Gestion". 2007.
- [21] H Savall, V Zardet. "Maîtriser les coûts et les performances cachés: le contrat d'activité périodiquement négociable". Economica. 2010.
- [22] Bruno Silva, Marco A.S.Netto, Renato L.F.Cunha. JobPruner:" A machine learning assistant for exploring parameter spaces in HPC applications". Future Generation Computer Systems. June 2018.

\*\*\*



## IMPORTANCE OF MIASMS IN HOMEOPATHY

**Rakesh Sharma**

Faculty of Homoeopathic Science, Jayoti Vidyapeeth Women's University, Jaipur

The susceptibility of the individual is influenced by external factor (meturic and telluric) and results in derangement of the weaker parts of the human economy. This brings changes in the patho - physiological frame of the individual and produces diseases in the human body. In some of the chronic cases, even a well indicated remedy fails to give the desired result. So, miasmatic diagnosis is important in the treatment of chronic diseases for the purpose of removing any acute diseases & accelerating the mode of cure or removing any hindrances or suppression. The highest and ideal cure with the complete annihilation of disease is only possible through the employment of constitutional anti-miasmatic remedy.

**Keywords:** Miasm, psora, syphilis, sycosis, chronic diseases

### **Description:**

In aphorism 5 Dr. Hahnemann himself states that the fundamental causes of the chronic diseases, which is due to chronic miasms.<sup>1(i)</sup> In aphorism 72 Hahnemann divided the diseases into acute diseases and chronic diseases and states that “They (chronic diseases) are caused by dynamic infection with a chronic miasm.”<sup>1(ii)</sup>

The classification of diseases done by Dr. Hahnemann is based on the chronic miasms. Introducing this classification of diseases is one of the remarkable discoveries for the entire homoeopathic fraternity. When Hahnemann found this clinical classification of diseases it was considered most relevant for the purpose to draw the attention to the differential points in the clinical picture of the chronic type of diseases.<sup>2</sup>

Miasm is any noxious emanation or polluting factor which is inimical to life and is also dynamic in nature. The word “miasm” means the effect of the minute, invisible biological agents (microorganisms) on the vital force of the living organisms which is manifested through the symptoms and is also carried to the future generation. Dr. Hahnemann described three miasms and also classified them as venereal and non-venereal miasms on the basis of their origin.<sup>2</sup>

After many years of his practice, Dr. Hahnemann noted that some of the diseases got easily and naturally cured with the homoeopathic medicines. But at the same time he was disheartened to know that some of these patients used to come with their old symptoms or with the other new symptoms. So, he studied in depth and concluded that the obstacles in curing these diseases are due to the miasms which he named as psora, syphilis and sycosis.<sup>2</sup>

Psora- In aphorism 80 Dr. Hahnemann defines psora as “the psora, the only real fundamental cause and producer of all the other numerous, I may say innumerable, forms of diseases” It is the fundamental cause of all the diseases and creates abnormal functions of the body. For example, hysteria, mania, madness, epilepsy and convulsions, caries, gout, haemorrhoids, jaundice, cyanosis, dropsy, amenorrhoea. <sup>1(iii)</sup>

Sycosis- In aphorism 79 Dr. Hahnemann states that “Sycosis (the condylomatous diseases), equally ineradicable by the vital force without proper medicinal treatment” <sup>1(iv)</sup>

Syphilis- In aphorism 79 Dr. Hahnemann explains syphilis as “a chronic miasmatic diseases, which when uncured ceases only with the termination of life”<sup>1(iv)</sup>

### **Miasms and Pathology**

Dr. Hahnemann relates pathology with the miasms in aphorism 74 as “...the vital force is sometimes weakened to an unmerciful extent, sometimes, if it do not succumb, gradually abnormally deranged (by

each substance in a peculiar manner) in such a way that, in order to maintain life against these inimical and destructive attacks, it must produce a revolution in the organism, and either deprive some part of its irritability and sensibility, or exalt these to an excessive degree, cause dilatation or contraction, relaxation or induration or even total destruction of certain parts, and develop faulty organic alterations here and there in the interior or the exterior (cripple the body internally or externally), in order to preserve the organism from complete destruction of the life by the ever-renewed, hostile assaults of such destructive forces.”<sup>1(v)</sup>

**Miasmatic expression and its reaction**

Man has exposed himself to different type of stressors from the environment including physical, chemical, emotional, biological, spiritual, religious, socio-cultural, economic, political objects and sleep and dreams also. These environs may become the causative factors or the maintaining causes or the modifiers of the diseases which helps in its development from psora to syphilis.<sup>3</sup>

Whenever the constitution of the person gets affected to these stressors, the environmental scanner gets into the operation for sizing up the situation according to the tentative responses till the most suitable and appropriate one is selected and developed its reaction pattern. This phase is also identified as the phase of the diseases.<sup>3</sup>

**Miasmatic expression according to Dr. Samuel Hahnemann**

In aphorism 204 Dr. Hahnemann states- “in the case of psora the scabious eruption, in syphilis the chancre or the bubo, and in sycosis the condylomata.”<sup>1(vi)</sup>

**Miasmatic expression according to Dr. Herbert A Robert**

Dr. H. A. Robert compared metabolism and the tissue reaction of the body with the miasms relating them with the disturbed assimilation.

Miasm	Other name	Keyword	Accentuation	Characteristics of metabolism	Tissue reaction	Psychological state
Psora	Itch mite	Deficiency	Functional	Under assimilation, outward loss	Unimpaired structure	Anxiety neurosis
Sycosis	Fig-wart	Excess	Infiltration and deposits	Over assimilation, inward retentiveness	Overgrowth	Obsessive states
Syphilis		Disorganised	Ulcerative	Self-assimilation, inner and outer disruption	Deformity	Psychosis

4

**Miasmatic expression according to Dr. Subrata Kumar Banerjee**

Miasm	Keyword	Criteria
Psora	<div style="text-align: center;">                     Irritation                      /          \                      Physical      Mental                      e.g. itching    e.g. anxiety, fear,                      alertness                 </div>	Lack, scanty & absence e.g. atrophy, anaemia, ataxia, anorexia etc.

Sycosis	Incoordination		Hyper e.g. hypertrophy, hyperplasia, hypersexuality, excess working
	Physical Proliferation absentmindedness e.g. tumours, fibroids, warts & any growths.	Mental or excess e.g.	
Syphilis	Destruction & degeneration		'Dys' and irregular manifestations e.g. dystrophy, dysplasia, dysphagia
	Physical e.g. ulceration, pus formation & necrosis.	Mental e.g. suicidal tendencies	
Tubercular	Dissatisfaction		Alternating, periodic, one-sided and vague manifestations i) Alternation- e.g. constipation alternates with diarrhoea. ii) One sided diseases- e.g. insomnia, anorexia, migraine, etc
	Physical e.g. Person craves sugar but this makes him sick	Mental e.g. wants new clothes, changes occupation, studies	

5

**Miasmatic prescribing**

The skill of a homoeopathic physician is to recognize the surface miasm i.e. miasmatic diagnosis of the case through the surfacing of symptoms. The remedy they select should not only cover the symptomatic totality as manifested through the surfacing of symptoms but also the miasmatic totality. By such a prescription, which covers the miasmatic dyscrasia of the person, the chances of recurrence are eradicated and the axiom ‘rapid, gentle and permanent cure’ is encompassed. <sup>5</sup>

**Utility of miasmatic diagnosis**

Miasm in each case will help a homoeopathic prescriber in the following ways:

- (i) A deep acting anti-miasmatic medicine helps to open up a case, where there is a scarcity of symptoms due to various physical, emotional or iatrogenic suppressions
- (ii) Anti-miasmatic remedy covers the psychic essence, nature and character of the individual in absence of any recognisable totality and opens up the case.
- (iii) In prescribing one should include the surface miasm of the case in the consideration of the totality, as miasm, the dyscrasia of the person, constitutes a major part of that totality. The totality of symptoms cannot be said to be total until and unless the selected remedy covers the miasm.
- (iv) To evaluate the necessity of a change in the plan of treatment or a change of remedy.
- (v) To evaluate the homoeopathic prognosis of the case.
- (vi) To fulfil Hahnemann's instruction of cure as ‘rapid, gentle and permanent’.
- (vii) Anti-miasmatic medicines help to clear up the suppressions; clear up the presenting symptoms from their root and clear up the susceptibility to get infection and thereby strengthening the constitution.<sup>5</sup>

**Conclusion**

Thus the distinct notion on miasms described by the different stalwarts guide us to understand the concept of miasms from different point of view. The theory of miasms helps in understanding the future course of

the diseases and is also helpful in selecting the potency and repetition. This knowledge guide the physician to understand the block which prevent the well indicated remedy to act thoroughly. So, the miasmatic theory is a principle, which when applied correctly improves the quality of prescription and the quantity of better result especially in the chronic diseases.

**Reference**

1. Boericke W, Samuel H. Organon of Medicine, 6<sup>th</sup> edition, New Delhi, B. Jain Publishers Pvt. Ltd., Reprint edition 2003: (i)p. 94 (ii)p. 159 (iii)p. 167 (iv)p. 166-7 (v)p. 162 (vi)p. 243
2. Sarkar, BK. Hahnemann's Organon of Medicine, 9<sup>th</sup> revised edition, New Delhi, Birla Publications, 2011: p. 331-336
3. Dey SP, Essentials of principles and practice of homoeopathy, second edition, Calcutta: The Author, 1989: p. 94-116
4. Robert H. A., The Principles and Art of Cure by Homoeopathy, 3<sup>rd</sup> edition, New Delhi, B. Jain Publishers Pvt. Ltd., 9<sup>th</sup> impression 2013: p.182- 247
5. Banerjea S. K., Miasmatic Prescribing, 2<sup>nd</sup> edition, Noida, B. Jain Publishers Pvt. Ltd., 7<sup>th</sup> impression 2017: p. 3-8



**FINANCIAL AGILITY AND RETURN OPTIMIZATION: EVIDENCE FROM INDIA**

**Ritika Lata**

Assistant Professor, Department of Management and Commerce, Jayoti Vidyapeeth Women's  
University Jaipur  
[ritikalata@jvwu.ac.in](mailto:ritikalata@jvwu.ac.in)

**Abstract**

When internal and external conditions permit, an organization's agility is its capacity to effectively and efficiently divert its resources to value-creating, value-protecting, and higher yield activities. The objective of this paper is to find out the factors that affect the firms' profitability in market downfall. Methodology used to find the relationship between factors affecting company's profitability and growth of the firms is correlated. The firms are earning profit during downfall in the sensex and for that factor have been taken to show how those firms earned profit during downfall. It is concluded that the organizations are rising even in the down fall in the market and it shows that these organizations are adapting the changes with the market fluctuations and it is also showed that how firms make changes in the firms what are those factors which play an important role in earning profit for the firm even in the fluctuations in the sensex.

**Keywords:** Agility, organizational growth, market fluctuation, returns optimization

**Introduction**

The database of an organisation resides in the managers' and employees' heads rather than in the computer's memory (Mintzberg). Prior to the 1970s, several authors have concluded that a firm's primary competitive strategy was to maximise operational and financial efficiency (De Mayer et al., 1989; Ferdows and De Mayer, 1990; Vickery et al., 1997; Vokurka and Flidner, 1998). This tactic focuses on economies of scale, or reducing costs by mass producing specialised goods using specialised machinery. Other researchers began focusing more strategically on a firm's flexibility as market or customer demand became more diverse (Vokurka and Flidner, 1998). This refers to a firm achieving a superior competitive advantage by adjusting internal resources, processes, or products to deal with the anticipated change. According to Swink et al. (2005) and Ebben and Ohnson (2005), a firm's market-based performance benefits from its competitive strategy. However, according to Friedner and Vokurka (1997) and Goldman et al. (1995), these conventional competitive strategies that concentrate on the evolution of internal resources or potential might not be able to help firms survive and thrive as the business environment continues to experience unpredictable changes.

Today's businesses operate in a highly unpredictable, dynamic world that is always changing. In order to thrive in this environment, businesses must adapt or change. The speed with which technology and working conditions are changing puts organisational survival in danger. Few people possess the ability to alter their internal force and exert influence over powerful external forces. Despite the fact that the vast majority of organisations are aware of how important quick responses to unstable market conditions are, they have failed in their attempts to create their own new structures (HabibEbrahimpour, Mona Salarifar, and ArashAsiaei, 2012). To combat changes in the internal and external environment, all organisations should be built to adapt change.

By combining the appropriate resources, knowledge, and associations with speed and surprise, we can readily look for competitive market possibilities for trying something new when we keep an eye on



market changes (Goldman, S. L., R. N. Nagel, and K. Preiss, 1995). The term "agile" was originally used as a management concept in the early 1990s, primarily in reference to rapid manufacturing. After that, academics in many fields, including management, manufacturing, human resource management, and marketing, have become attracted by various elements of agility (Chang, Gong, Way and Jia, 2013; Eckstein, Goellner, Blome and Henke, 2015; Robert and Grover, 2012). In particular, marketing agility is recognised as a feature that enables businesses to detect opportunities, adapt to market changes, and effectively deal with volatile markets. According to HabibEbrahimpour, Mona Salarifar, and ArashAsiaei (2012), organisations are deemed agile if they are able to adjust and adapt to an unpredictable and changing marketplace while permanently meeting customer demands and achieving organisational goals. According to Seo and La Paz (2008), agility is a process that provides chances for a company to identify environmental change and choose how to respond to it quickly and affordably. According to Teece, Peteraf, and Leih (2016), agility is the ability of an organisation to effectively and efficiently shift its resources to value-creating, value-protecting, and higher yield activities when internal and external conditions dictate. As a result, survival in such a volatile environment depends on having the capacity to adjust to unanticipated changes in the global market (Ganguly et al., 2009). By utilising the collective resources of changes to quickly recognise and identify market shift, businesses can increase their competitive capability and hence increase their chances of surviving (Vokurka and Fliedner, 1998; Khan and Pillania, 2008). Enterprise agility permits organisations to handle with external adjustments adequately, making it one of the crucial factors to aid firm in surviving in upheaval contexts (Atuahene-Gima, 2003; overby et al., 2006). Agility is the ability to recognise times for innovation and adapt to such moments and to rapidly alter procedures to capitalize on marketplace circumstances (Kitchens, Dobolyi, Li and Abbasi 2018). This paper is examining the performance of the organization with the fluctuations in the market. Sensex is taken as a variable to measure the changes in the market and to measure the organizational performance we will take profit for the year 2004-2019 of the five Indian companies.

The rest of the paper is formulated as follow. Section 2 presents a literature review. Section 3 describes the research methodology. Section 4 includes findings and section 5 includes conclusion.

### **Literature Review**

A flexible and quick response exemplifies an aspect of agility, which was described as an organization's capacity to seize market opportunities and adapt to changing market conditions (Goldman et al., 1995).

(Sharifi and Zhang, 1999) defined agility as the ability to handle unforeseen problems, survive in a business climate with unprecedented threat, and seize opportunities presented by change. Businesses with high levels of adaptability adjust to market changes more effectively than rivals (Robert and Grover, 2012).

According to (Dubey, Altay et al., 2018), supply chain agility refers to a company's capacity to modify its supply chain's operations and strategies in response to environmental changes, opportunities, and threats. On this subject, there is a wealth of empirical literature.

According to research by Jing Zhou, Felix T. Mavondo, and Stephen Graham Saunders (2018), marketing agility affects financial performance both directly and indirectly. They discovered that when market upheaval is insufficient, financial performance has a greater capacity for innovation, and



that market turmoil weakens the indirect connection among marketing agility and financial success. According to (Chyan Yang and Hsian-Ming Liu, 2012), enterprise agility is crucial for modern businesses in the dynamic environment of today. Businesses could respond to unpredictable changes better by increasing enterprise agility.

(Mark Jacobs, Cornelia Droge, Shawnee K. Vickery, and Roger Calantone, 2011) investigated the connection between process and product modularity as well as the impact of each on business growth. They discovered that product modularity has a direct, positive impact on manufacturing agility, process modularity, and firm growth performance, and that neither process modularity nor manufacturing agility can predict firm growth performance. In order to increase agility and business performance in manufacturing organisations,

(S. K. Vickery, C. Droge, P. Setia, and V. Sambamurthy, 2010) explore the function of supply chain information technology and supply chain organisational initiative. They discovered that increased agility results in enhanced company performance. The impact of supply chain agility on client service, differentiation, and corporate performance is being studied by (Juneho Um, 2017). He discovered that while supply chain agility positively affects customer service and differentiation, it has no direct impact on business performance; rather, performance may be attained and intervened through enhanced customer service and differentiation.

According to (Amir Ashrafi, AhadZareRavasan, Peter Trkman, and Samira Afshari, 2018), business analyst competencies influence a firm's agility through the quality of its information and its capacity for innovation. They looked at how technical and market changes could be used to temper environmental turbulence. They discovered that business analyst capabilities have a significant impact on a firm's agility through an increase in data accuracy and innovative potential; nevertheless, the impact of firm agility on performance is moderated by both market and technology upheaval.

Confirmatory factor analysis technology is used by (Chyan Yang and Hsian-Ming Liu, 2012) to measure the model and test the theory. They collected data via surveys and looked at the causal impacts of hypothesis testing using structural equation modelling. The validity of the scale is being examined by (Jing Zhou, Felix T. Mavondo, and Stephen Graham Saunders, 2018) using exploratory factor analysis and confirmatory factor analysis. To assess the marketing agility and innovation capability, primary data has been gathered. Structural equation modelling and a t-test are being used by (Juneho Um, 2017) to assess how supply chain agility affects each of the three factors.

Data are gathered through surveys by (Amir Ashrafi, AhadZareRavasan, Peter Trkman, and Samira Afshari, 2018). They measured the effect of business analyst competencies on a firm's agility through data accuracy and inventive capability using partial least squares.

### **Research Methodology**

It is common to consider correlation analysis to evaluate the return optimization in an organization, and it is important to study the individual organization evidence at least at simple level. A good starting point is to look at the covariance between market return and firms return in each firm. Out of several indicators of measuring the growth of the organization we chose profits to determine the growth of the organizations in market fluctuations. Therefore, the coefficient of correlation between market SENSEX and firms profit is calculated from annual observations for each organization. The



data has been collected for the period 2004-2022. The resulting sample consists of 5 organizations. In all the companies, there are variations in the values of the variable over the sample period.

### **Findings**

Table 1 shows the coefficient correlation of all the 5 organizations. In all the firms, the correlations are positive. The mean of the 5 correlation coefficient is 0.903. The balance of probabilities thus suggests a strongly positive association between changes in market and organization return optimization.

In year 2009, market falls with 5935 points and TCS, Infosys and ITC were growing but in diminishing manner with 187.45, 1349 and 143.49 points. ONGC and Reliance were decreasing with the fall in the market with 575.33 and 4197.07 points. In the year 2012, market falls with 2041 points all the firms were still growing in diminishing rate except reliance which were falling with 246 points. And again in the year 2016 where market were falling with 2615 points all the firms were growing with diminishing rate except ONGC which was falling with 1593.02 points.

The result shows that all the companies were growing even in the down fall in the market but the growth rate of the firms was decreasing in comparison to other growing years. It means that companies are adapting the changes with the changes in the market. The changes adapting by the companies for return optimization in different years are:

- They have reduced the cost.
- The sales of the companies were increased.

And those companies which don't adapt the change faced loss during market downfall.

In the year 2009, 2012 and 2016, there was a downfall in sensex but TCS was growing still. The factors behind the growth of the company are:

- The raw material of the company was reduced in the year 2016, manufacturing expenses were also reduced in the same year and sales were increasing at that time period.
- In the year 2012, the company has reduced the raw material with 5.94 points and sales were increased as well in the same time period.
- In the year 2009, there was reduction in expenses of the company and increase in the sales and that's how the company earned profit even in the downfall in the sensex.

In ONGC, the company bear loss in the year 2016 and 2009 due to not changed with the changes in the market. It earned profit in the year 2012.

- In the year 2012, the company decreased the consumption of raw material and in the same year sales were increased and the company earned profit. Although the adapt changes in the year 2016 and 2009 but wasn't able to earn profit in both the years.

In Reliance, company earned profit only in the year 2016 among all the three years in which the sensex fell down.

- In year 2016, the company reduces cost to earn profit in the downfall in the sensex. In other years of the downfall company reduces costs and increased sales but there would be other factors so the company wasn't able to earned profit at that time period.

In Infosys, the company earned profit in all the three years of the fall in the sensex.





- In 2016, cost was reduced and sales were increased.
- In 2012 and in 2009 sales were increased even in the downfall in the sensex.

In ITC, the company earned profit during downfall in the sensex. Factors behind this are:

- In 2016, company reduced cost and the sales were increased.
- In 2012, sales were increased, no reduction in cost.
- In 2009, company's sales were increased and cost was reduced.

Table 2 is showing the correlation between the sensex and the factors which are responsible in making profit for the companies.

**Table 1**

Coefficient Of Correlation Between Sensex And Organisations Profit: Individual Company Data

FIRMS	COFFICIENT OF CORRELATION
TCS	0.955
Reliance	0.958
ONGC	0.697
INFOSYS	0.948
ITC	0.956

**Table 2**

Coefficient Of Correlation Between Sensex And The Factors Affecting The Profit Of The Organisation: Individual Company Data

FIRMS	COFFICIENT OF CORRELATION
TCS	sales-0.966
Reliance	Sales-1
ONGC	Sales-1
INFOSYS	Cost-0.982
ITC	Cost- 1, sales-0.999

### Conclusion

When internal and external conditions dictate, an organization's agility is its ability to effectively and efficiently shift its resources to value-creating, value-protecting, and higher-yield tasks. This essay's goal is to investigate the connection between firm expansion and market volatility.

It is concluded that the organizations are growing even in the down fall of the market and it shows that these organizations are adapting the changes with the market fluctuations. There is strongly positive relationship between all the companies taken as a sample in the paper. A very high positive correlation is found in TCS, Reliance, Infosys and ITC and moderate positive correlation is found in ONGC. Factors affecting the profit of the organization during downfall having positive correlation with sensex. In ONGC, Reliance and ITC the correlation between the sensex and the factors affecting the profit of the organization is perfectly correlated and in rest of the companies, there is strongly positive correlation between sensex and the factors.



It means the companies are adapting the changes during downfall in the sensex are earning profit and those companies which are not change themselves according the changes in the external environment are not able to earn the profit at that period of time.

### References

- J Amir Ashrafi, AhadZareRavasan, Peter Trkman and Samira Afshari. (2019). The role of business analytics capabilities in bolstering firms' agility and performance. *International journal of information management*. 47, 1-15
- J Atuahene-Gima, K. (2003), The effects of centrifugal and centripetal forces on productdevelopment speed and quality: how does problem solving matter?, *Academy ofManagement Journal*, Vol. 46 No. 3, pp. 359-73.
- J Chang S., Gong Y., Way S. A., Jia L. (2013). Flexibility oriented hrm system, absorptive capacity and market responsiveness. *Journal of Management*, 39(7), 1924-1951.
- J Chyan Yang and Hsian-Ming Liu. (2012). Boosting firm performance via enterprise agility and network structure. *Management decision*. 50(6), 1022-1044
- J De Meyer, A., Nakane, J., Miller, J.G. and Ferdows, K. (1989), Flexibility: the next competitivebattle, the manufacturing futures survey, *Strategic Management Journal*, Vol. 10 No. 2,pp. 135-44.
- J Dubey, R., Ali, S. S., Aital, P., &Venkatesh, V. (2014). Mechanics of humanitarian supplychain agility and resilience and its empirical validation. *International Journal ofServices and Operations Management*, 17(4), 367–384.
- J Ebben, J.J. and Ohnson, A.J. (2005), Efficiency, flexibility, or both?Evidence linking strategy toperformance in small firms, *Strategic Management Journal*, Vol. 26 No. 13, pp. 1249-59.
- J Eckstein D., Goellner M., Blome C. and Henke M. (2015). The performance impact of supply chain agility and supply chain adaptability: the moderating effect of product complexity. *International journal of production research*, 53(10), 3028-3046
- J Ferdows, K. and De Meyer, A. (1990), Lasting improvements in manufacturing performance: in search of new theory, *Journal of Operations Management*, Vol. 9 No. 2, pp. 168-84.
- J Flidner, G. and Vokurka, R. (1997), Agility: competitive weapon of the 1990s and beyond?,*Production and Inventory Management Journal*, Vol. 38 No. 3, pp. 19-24.
- J Ganguly, A., Nilchiani, R., & Farr, J. V. (2009).Evaluating agility in corporate enterprises.*International Journal of Production Economics*, 118(2), 410–423.
- J Goldman, S. L., R. N. Nagel and K. Preiss.(1995). Agile competitors and virtual organization: strategies for enriching the customers. New York: Van Nostrand Reinhold
- J HabibEbrahimpour, Mona Salarifar and ArashAsiaei. (2012). The relationship between agility capabilities and organizational performance: a case study among home appliance factories in Iran. *European journal of business management*.17(4). 186-195
- J Khan, A.K. and Pillania, R.K. (2008), Strategic sourcing for supply chain agility and firms'performance: a study of Indian manufacturing sector, *Management Decision*, Vol. 46No. 10, pp. 1508-30.
- J Kitchens, B., Dobolyi, D., Li, J., &Abbasi, A. (2018).Advanced customer analytics:Strategic value through integration of relationship-oriented big data.*Journal ofManagement Information Systems*, 35(2), 540–574.
- J Overby, E., Bharadwaj, A. and Sambamurthy, V. (2006), Enterprise agility and the enabling roleof information technology, *European Journal of Information Systems*, Vol. 15, pp. 120-31.



- J Roberts, N., & Grover, V. (2012). Investigating firm's customer agility and firm performance: The importance of aligning sense and respond capabilities. *Journal of Business Research*, 65(5), 579–585.
- J Seo, D., & La Paz, A. I. (2008). Exploring the dark side of IS in achieving organizational agility. *Communications of the ACM*, 51(11), 136–139.
- J Sharifi H, Zhang Z (1999) A methodology for achieving agility in manufacturing organisations: an introduction. *Int J Prod Econ* 62(2): 7-22
- J Swink, M., Narasimhan, R. and Kim, S.W. (2005), Manufacturing practices and strategy integration: effects on cost efficiency, flexibility, and market-based performance, *Decision Sciences*, Vol. 36 No. 3, pp. 427-57.
- J Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility. *California Management Review*, 58(4), 13–35.
- J Um Juneho. (2017), The impact of supply chain agility on business performance in a high level customization environment. *Operation management research*, 10(2), 10-19.
- J Vickery, S.K., Droge, C.L.M. and Markland, R.E. (1997), Dimensions of manufacturing strength in the furniture industry, *Journal of Operations Management*, Vol. 15 No. 4, pp. 317-30.
- J Vokurka, R.J. and Flidner, G. (1998). The journey toward agility, *Industrial Management & Data Systems*, Vol. 98 No. 4, pp. 165-71.
- J Zhou, J., *Industrial Marketing Management*, <https://doi.org/10.1016/j.indmarman.2018.11.008>



## PRACTICES OF ORGANIZATIONAL SUSTAINABILITY: A STUDY OF THE COMPANIES LISTED BY THE CORPORATE SUSTAINABILITY INDEX

Ritika Lata

(Assistant Professor, Jayoti Vidyapeeth Women's University, Jaipur)

### Abstract

Managers' decision-making has been guided by organisational sustainability (OS) in order to create competitive advantage. This essay seeks to discover the sustainable approaches used by big businesses to instal OS. Based on short, medium, and long-term sustainable goals, reports detailing actions taken by major organisations and their reach in the three pillars of sustainability—environmental, economic, and social dimensions—are reported to their key stakeholders. These reports frequently show how OS or efforts to achieve them are progressing. Few studies, however, examine the reproducibility of sustainable business practises. The reports from companies listed by the Corporate Sustainability Index (CSI) from 2012 to 2016 that were part of the Brazilian stock market's services sector and used the Global Reporting Initiative (GRI) methodology were searched. The findings demonstrated that the baseline for the application of the discovered techniques was the strategic planning involving infrastructure, environment, human resources, product innovation, organisational management, and deadline setting. Based on relevant and factual findings, the managers' decisions in developing their strategic planning will be guided by the facts.

**Keywords:** organizational sustainability; sustainability report; sustainability practices; corporate sustainability index

### Introduction

The purpose of this study is to identify the business practises of companies that have been adjudged to be sustainable in terms of their impact on the environment, the economy, and/or society. OS implementation is complicated and requires the involvement of all parties [1]. A survey of the primary approaches used to evaluate sustainability was done by Siew [2]. Amui et al[3] .s attention was drawn to the dynamic and requirements of sustainability, as well as [4] to the calibre of corporate sustainability reports. The analysis and evaluation of the primary sustainability categories in this paper, along with the observation of the recognised practises carried out by large, organisations that are regarded as being sustainable, supplement those works with a holistic view of the system. Managers will learn about the existing sustainable methods in use through this research, which will aid in their strategic planning decision-making. Gaining a competitive advantage requires discernment and the capacity to learn from the successful experiences of other businesses [5]. Numerous studies [6–8] simply conceptualise sustainability, its effects, and the potential benefits for firms, missing any real-world applicability in day-to-day operations and coming across as shallow to managers [9]. This essay aims to fill in the gaps between those ideas and fill them. Due to the several steps involved in its adoption and operationalization, OS has gained prominence in businesses' day-to-day operations [10].



Managers that need to balance profitability and competitiveness in the end result of their actions have found it difficult to adopt this methodology of working with sustainable strategies and practises [11,12]. The development of OS has been the focus of large companies' funding [8,13,14]. As a result, one strategy used by businesses to maintain their competitiveness is the search for sustainable practises in other markets or the innovation of ones that currently exist [15]. This can facilitate better resource utilisation and establish the prerequisites for gaining a competitive edge [14]. The fundamental tenet of OS is found in [16], which asserts that organisations' present needs must not come at the expense of those of future generations. Since then, numerous programmes have been launched to promote environmentally friendly industrial and consumer practises [17]. Incorporating the triple bottom line concept [18], an OS business strategy was created that took into account the environmental, economic, and social dimensions [19,20]. This strategy has been guiding managers' decisions as they work to operationalize these concepts in their day-to-day activities through standards, codes, or metrics [21]. As a result, the size, level of business maturity, organisational structure, and strategic planning of the firm all influence sustainable practises, and this variety makes it difficult to execute, evaluate, and discover potential improvements for sustainable practises [2].

As a result, businesses use OS [8], innovation, and tools to plan and operationalize their short-, medium-, and long-term actions in order to strengthen and ingrain sustainability into their operations [22]. In addition to economic performance, the stakeholders analysis—researchers,

investors, customers, governments, and civil society—also considers environmental and social issues [23]. Sustainability reports, which adhere to the rules established by the Global Reporting Initiative (GRI), which are the most widely used and acknowledged internationally [21,24], have become increasingly popular as a means of documenting those practises. These reports have developed into crucial resources for evaluating and illuminating how OS is applied in companies [25]. Given that many firms are cautioned about their responsibilities in terms of their affects on the environment and society, they provide the chance to evaluate the sustainable growth of organisations in relation to a particular set of standards and indexes [11]. These reports have been used by a number of enterprises to measure and manage their OS practises, which has allowed OS philosophy to gradually spread throughout them [26]. Companies that voluntarily submit and publicise their sustainability reports are expanding [24] and the key stakeholders penalise or reward the companies based on the actions taken and the effects they have [23]. Companies have the chance to enhance their market value, legitimacy, reputation, and transparency through the use of sustainability reports. They also encourage their colleagues and offer benchmarking against their rivals [25]. Additionally, they serve as a vital instrument for the growth and evolution of OS and serve to highlight the interdependencies between the social, economic, and environmental elements [27]. Due to competing interests among various departments and supervisors, it can be difficult to reconcile these disparate dimensions within a single organisation



[7,26]. Additionally, there are a number of management objections that claim the reports are merely surface-level indicators, missing in a practical component and frequently limited to huge firms, with no applicability in their day-to-day activities [28]. A change in behaviour, culture, and the alignment of interests and aims are all necessary to get rid of the aforementioned superficiality and develop useful activities [3].

The Global Reporting Initiative, the Dow Jones Sustainability Index, the Greenwashing Index, the Global 100 and Newsweek Green Rankings, the Greenhouse Gas Protocol Initiative (GHG Protocol), as well as regulation standards like Social Accountability 8000, ISO 14,000 and 26,000 [9,23,29], are just a few examples of international indices that rank and map businesses based on their sustainable activities. The IBOVESPA-maintained CSI (ISE—ndice de Sustentabilidade Empresarial in Portuguese language) identifies the companies in Brazil that adhere to the minimal OS criteria [30]. This essay seeks to address the superficiality problem by providing a response to the following: What are the steps that big businesses take to implement organisational sustainability? To accomplish this, a methodical data gathering process was used to look for businesses listed by the CSI from 2012 to 2016 who completed the GRI-G4 report. Brazil was selected for this study because to the country's recent economic downturn and economic volatility, which have resulted in rising unemployment [31,32]. The result of this circumstance is an increase in business owners operating in the service sector [33]. Given that the service industry and its subsectors accounted for

73.3% of Brazil's GDP in 2016 [34], only this sector and its subsectors were examined. This paper has the following structure: Section 2 presents a brief review on sustainability reports, the CSI and the service sector in Brazil, Section 3 explains the research method employed in the literature review and the data collection from the database, Section 4 displays the results and discussion, and Section 5 presents the conclusions.

### **Literature Review**

#### **Sustainability Reports**

A company needs its management to reinvent their perception of the effectiveness of its goods, services, and technologies used in its operations in order to apply OS standards [27]. Due to this necessity, businesses are becoming more and more interested in incorporating sustainability into their daily operations and informing their stakeholders about their efforts through sustainability reports [6,24]. Sustainability reports have developed into a crucial instrument for communicating the sustainable practises carried out by firms, whether as a result of market demands or special legal requirements [35]. With the use of this knowledge, businesses may move beyond theory and offer a practical perspective that can give them a competitive advantage [36]. This situation can be changed if the OS concept can be put into practise through effective initiatives [37]. In the recent years, businesses have become more involved in publishing their reports in accordance with GRI principles, which cover the triple bottom line's three components and are among the most widely used and respected globally [38]. Except for a few European Union nations where the release of the reports is required by law [40],



the preparation and release of these reports are voluntary [39]. To guarantee that the decision-makers have a sound foundation for their strategic planning, many industrialised countries use a standard system to examine the data regarding sustainability [41].

There is no explicit law in Brazil requiring companies to publish their reports. In this regard, there has been an increase in the number of Brazilian businesses who voluntarily compile and publish their reports in accordance with GRI standards. Companies that want to standardise their reports are willing to demonstrate to their stakeholders that they aim to implement and evaluate sustainable practises in accordance with international standards [27,42]. Despite the set of principles, it can still be challenging to monitor and gather the data for the reports because each business is different and because the reports do not explain how the firms evaluate the outcomes of their operations [26].

#### Corporate Sustainability Index

To give its clients new investing possibilities, the stock market offers a number of indices. These indexes show the operation of the capital markets as well as the price movement of the equities they list [31]. Investors look for companies that have open-source policies, transparency standards, and sound corporate governance [43]. The CSI indices satisfy this particular need by taking into account social, environmental, and corporate governance factors and emphasising the businesses that excel in the OS area [29,44]. The Dow Jones Sustainability Index, which accounts for 10% of the 2500 companies included by the Dow Jones index, is one of the most well-known examples [45]. In Brazil,

IBOVESPA, a 2005 creation, is in charge of upkeep and management of CSI. The mission of CSI is to examine corporate sustainability with a focus on its environmental, social, economic, and corporate governance dimensions. CSI is made up of 38 activities by 34 IBOVESPA-affiliated enterprises that represent 15 different industries [30]. Since more businesses are attempting to join the CSI, sustainability-related issues can be improved as a result of investors' demands for higher standards of performance [29]. Every year, CSI is evaluated and updated, and participation is optional [30].

The following minimum requirements must be met by businesses in order to be eligible to join the CSI: they must be listed among the 200 most actively traded stocks this year, engage in at least 50% of daily negotiations, have not filed for bankruptcy in any of their branches, are not defending themselves in internal lawsuits against the CSI management, and are not suspended from the stock market [46]. These requirements highlight the significance and seriousness of the subject, giving businesses another another incentive to invest in and set objectives for implementing OS [31]. According to Orsato et al. [43] even if joining a sustainability index is optional, doing so offers businesses benefits including access to resources, OS institutionalization, competitive advantage, information access, and excellent reputation.

#### Service Sector

The categorization of the nation's principal economic activity into three categories—primary sector (agricultural), secondary sector (industry), and tertiary sector (services)—is one of the existing approaches for calculating Brazil's GDP

[33]. In 2016, the service sector contributed 73.3% of Brazil's GDP, followed by the industrial sector (21.2%) and the agriculture sector (5.5%) [34]. Given that it employs more than 75% of the workforce and continues to grow despite the country's economic turmoil, the tertiary sector is crucial to the growth of the Brazilian economy [47]. The service sector is evaluated by a number of institutions due to its representativeness and size in the Brazilian economy. These institutions map the actions carried out to support the sector's continuous growth, offer management innovation, and use indices for better performances. Thus, it is a sector that employs people and generates value for everyone directly or indirectly involved, even during a time of economic upheaval [48].

### Materials and Methods

This paper followed the methodology proposed by [49] and the stages were followed:

- (1) Developing a review of GRI sustainability reports
- (2) Structuring a classification system for the areas approached by OS
- (3) Mapping the results found in the classification system
- (4) Identifying the results of the report analysis according to the classification
- (5) Analyzing the results and suggesting future works.

The actions carried out in each of the suggested stages are shown in Table 1. The primary OS report proponents in stage 1 include the social, environmental, and economic facets. GRI reports were chosen because they are the most widely used globally. In the review's planning, the following criteria were used to search and

select the reports from the GRI database: (1) service sector firms listed by the CSI between 2012 and 2016; (2) determining which of those firms published their reports in accordance with GRI standards; and (3) reports published in English. The second stage involves developing a classification scheme that arranges the findings and makes them easier to comprehend.

190 businesses were chosen from among those listed by the CSI during the period under study, and these were subsequently divided into groups according to their fields and the standards shown in Table 1. In phases 3 and 4, the categories were determined, and the reports showed their corresponding practises. For the purpose of charting and presenting the results, they were saved in an electronic spreadsheet. Stage 5 was the authoring of the article and the presentation of the findings, together with the appropriate recommendations for subsequent works. 190 companies participated in the CSI between 2012 and 2016, and 71 reports were examined after the companies that operate in the service sector were chosen.

**Table 1. Methodology stages.**

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
a. OS and GRI literature review. b. Developing a review of	Structuring a classification system of the areas approached by OS; economic practices;	Mapping the results found in the classification system.	Identifying the results of the report analysis according to the classification. Cross	Analyzing the results and suggesting future work. Ranking the results and propo





GRI sustainability report . c. Criteria for selecting reports: Companies listed in the CSI from 2012-2016; GRI guidelines; reports in English.	environmental practices; social practices. Classification of the segment of the companies: primary, secondary, tertiary.		tabulation of results .	sals for future work.
---	---	--	-------------------------	-----------------------

Because sustainability calls for a series of medium- to long-term measures, this time frame was chosen [10,26,35]. These actions necessitate ongoing evaluations, updates, and modifications as needed. As a result, it was feasible to determine the market's existing sustainable practises and the companies that maintain them.

Any businesses participated in the CSI for the entire time period, and their reports were examined to see if their strategies changed at some point. All of the businesses adhered to the GRI requirements, choosing to complete either the comprehensive or the streamlined report model.

## Results and Discussion

### Sustainability Practices—Environmental Category

The methods used by organisations to implement sustainability in the environmental area are shown in Table 2. Combating corruption, supplier management, a focus on sustainability, risk management, capital and possibilities, employee satisfaction, and customer satisfaction were among the practises discovered. These outcomes support the findings of [50], which unmistakably show that businesses are always being watched over by their shareholders and the public sector in order to satisfy stakeholders and other interested parties. According to Bellantuono et al. [51], the involvement of the stakeholders is essential for the creation of an environmental plan with specific goals.

They pay particular attention to the environmental policies that organisations implement in order to take action that goes beyond the financial element [31, 52, 53]. As a result of competitive behaviours and practises, meeting international criteria, and pursuing the level of excellence expected in industrialised countries, environmental performance is crucial for preserving competitiveness [54]. Neglecting environmental policies and other sustainability tenets severely limits the ability of businesses to operate and grow, resulting in the loss of worthwhile long-term investment prospects [55]. The actions taken in the category of input (water and energy) and residues included internal and external public awareness campaigns, a gradual investment in infrastructure (such as energy management software, effective air



conditioners, and rainwater harvesting), and routine maintenance of the facilities.

Those actions support the findings of [54, 56], which showed that the use of renewable resources is increasing and the environmental performance is measured by actions to reduce the consumption of natural resources, and they are in contrast to the findings of [57], which highlight that in many organisations the investment in environmental practises may be given low priority, to the detriment of the long-term economic returns that they may offer and the resulting attraction of capital.

**Table 2. Environmental practices.**

Category	Practices
Materials	<ol style="list-style-type: none"> <li>1. Anti-corruption program</li> <li>2. Supplier management</li> <li>3. Sustainability</li> <li>4. Risk management strategy</li> <li>5. Client and worker satisfaction</li> </ol>
Energy/water	<ol style="list-style-type: none"> <li>1. Investments in new technologies and infrastructure update</li> <li>2. Awareness measures</li> <li>3. Infrastructure maintenance</li> </ol>
Effluents and waste	<ol style="list-style-type: none"> <li>1. Selective collection and the proper disposal</li> <li>2. Awareness measures</li> <li>3. Reverse logistics</li> </ol>
Biodiversity	<ol style="list-style-type: none"> <li>1. Monitoring and control system, if applicable</li> </ol>
Transportation	<ol style="list-style-type: none"> <li>1. Carbon emissions of the vehicles awarded and its promotions</li> <li>2. Awareness measures for virtual meetings</li> </ol>
Emissions	<ol style="list-style-type: none"> <li>1. Working toward</li> </ol>

	GHG Protocol and international certifications
Environmental grievance mechanisms	<ol style="list-style-type: none"> <li>1. Inspection visits and action plans</li> <li>2. Audits</li> <li>3. Comply with corporate social responsibility</li> <li>4. Procurement professional code of ethical conduct</li> </ol>

In the other categories, the activities were directed through the use of particular contracts, cost-cutting measures, and certifications. Only one industry (telecommunications) acknowledged doing ongoing monitoring in accordance with the relevant environmental laws, which falls under the biodiversity category. The results support [52]'s point of view, which limits environmental activities to the use and preservation of natural resources (such as water use, gas emissions, etc.), and they concur with [58] that businesses are accountable for creating market- and environmental-friendly solutions. The procedures created by businesses cover every link in the production chain.

#### Sustainability Practices—Economic Category

The creation of strategic planning, investments in IT, human resources, and digital security all shone out in the field of economic performance practises. According to the reports, the indirect economic effects included the creation of new markets, opportunities for the creation of new jobs, increased accessibility measures, and adaptability to the new economic environment. The ethics code that was gradually implemented with the suppliers and the encouragement of environmentally



friendly operations were the procurement practises. According to [57], the economic performance of businesses who implement OS is well-defined and structured, to the detriment of the other sectors. Table 3 illustrates these practises. Without giving any category a higher priority than another, organisations with a clearly defined sustainable strategy are able to enhance their financial standing and satisfy their stakeholders, claims [52]. Priorities for sustainability categories must be consistent, in line with internal and external public opinion, and not just focused on money [59]. The medium- and long-term achievement of the practises' goals depends on the integration between the business plan and the sustainable strategies [60], enhancing the viewpoint put forward by [54]. The lack of incentives for sustainable activities is justified by Santis et al[31] .s demonstration that there is no clear correlation between financial performance and sustainable initiatives.

According to the authors, sustainable practises have long-term implications, which causes some managers to pay less attention to them. However, companies won't be able to deliver the outcomes expected from sustainability until the medium and long term, which necessitates careful planning that touches both society and the organisation [13]. For this planning to have the desired effect at the organisational and systemic levels, the time factor and the acting dynamic are crucial [61]. Short-term results-focused organisations and managers have poor outcomes [55]. Results in line with the values of sustainability and innovation are also necessary in the current global economic environment [62].

The discovered practises back up the theories put forth by [62], according to which developing and sustainable nations should follow rules that encourage demand creation and job development. Applying a new business model and integrating all essential parties in the execution of a new, sustainable paradigm is necessary to change the current business logic (profit).

**Table 3. Economic practices**

Category	Practices
Economic performance	<ol style="list-style-type: none"> <li>1. Strategic planning</li> <li>2. Investment in information security, IT solutions and human resource</li> <li>3. Financial indicators</li> <li>4. Use of incentive laws</li> </ol>
Indirect economic impacts	<ol style="list-style-type: none"> <li>1. Activities in strategic new markets</li> <li>2. Possibility of generating jobs</li> <li>3. Accessibility actions</li> <li>4. Adaptation to new economical context</li> <li>5. Driving local economies</li> </ol>
Procurement practices	<ol style="list-style-type: none"> <li>1. Procurement Professional Code of Ethical Conduct</li> <li>2. Comply with corporate social responsibility</li> <li>3. Focus on local suppliers</li> </ol>

Businesses that don't take risks invest some of their funds in sustainable activities based on profitability, and when those practises don't produce the anticipated returns, those practises are discontinued [55]. It is important to note that, despite the pressure from society for sustainable actions that satisfy the needs of the current market, it is the manager's duty to keep the



organisation within a minimum level of profitability in which the activities are both sustainable and profitable; otherwise, the firm will be vulnerable to failure [63]. The firm, able to provide the anticipated profit without affecting the outside environment, is responsible for creating a sustainable environment inside its supply chain and productive processes [41].

#### Sustainable Practices—Social Category

The social category comprises subcategories that cover a variety of topics, such as how employees are treated and the environment in which the company operates. Businesses have a real impact on the areas in which they operate [64]. In order to strike a balance between the moral standards required by the market and social obligations, managers must address the social issue [65]. Our results support the work of [55], demonstrating organisations' interest in generating value for their companies through the recognition and upkeep of their talent (benefit packages, career plans, salaries, quality of working life, and incentive to corporate education). Companies must strike a balance between income planning, social fairness, and environmental preservation [1].

The procedures and results shown in Table 4 point to a meritocracy in hiring and promotions, but they do not clearly describe how this situation is assessed and revealed to their collaborators, challenging businesses to offer rewards depending on how well employees support OS. To boost the process' dependability, productivity, and efficiency, meritocracy needs to be defined and recorded [66].

**Table 4. Social practices.**

<b>Subcategory: Labor Practices and Decent Work</b>	<b>Practices</b>
Employment	<ol style="list-style-type: none"> <li>1. Benefits package (e.g., health insurance, postgraduate studies, etc.)</li> <li>2. Career development policy and salary</li> <li>3. Trainee program</li> <li>4. Attraction and retention of talent</li> <li>5. Internal recruitment</li> </ol>
Health and safety at work	<ol style="list-style-type: none"> <li>1. Quality of working life</li> <li>2. Ergonomic conditions</li> <li>3. Educational campaigns (e.g., smoking, sedentary, etc.)</li> </ol>
Training and education	<ol style="list-style-type: none"> <li>1. Corporate University</li> <li>2. Learning paths</li> <li>3. Financial in graduation and postgraduate</li> <li>4. Retirement plans for the employees</li> <li>5. Internal career development: e.g., leadership, goals orientation</li> </ol>
Diversity and equality of opportunity	<ol style="list-style-type: none"> <li>1. Meritocracy in hiring and promotions</li> </ol>
Equal remuneration for women and men	<ol style="list-style-type: none"> <li>1. Career plan and salary</li> </ol>
Supplier assessment for labor practices	<ol style="list-style-type: none"> <li>1. Code of Ethical Conduct</li> <li>2. Compliance with labor, fiscal and the pertinent laws and regulations</li> <li>3. Compliance with preventing and combating corruption;</li> <li>4. Compliance with environmental</li> </ol>



	preservation measures and social questions;
<b>Subcategory: Society</b>	<b>Practices</b>
Local communities	<ol style="list-style-type: none"> <li>1. Sponsorship: educational, cultural and sporting projects</li> <li>2. Financial education for young people up to 17 years and retirees</li> <li>3. Volunteer work program</li> <li>4. Financial donations for charity institutions</li> <li>5. Initiatives funded by incentives laws</li> </ol>
Anti-corruption	<ol style="list-style-type: none"> <li>1. Corporate anti-corruption policy and standard</li> <li>2. Ethical code</li> <li>3. Communication channel for complaints about corruption and bullying</li> <li>4. Online and face-to-face anti-corruption training</li> </ol>
Child labor/forced or compulsory labor	<ol style="list-style-type: none"> <li>1. Supplier audit</li> <li>2. Contracts</li> </ol>
Response to disasters/emergencies	<ol style="list-style-type: none"> <li>1. Contingency plan if applicable</li> </ol>
<b>Subcategory: Product Responsibility</b>	<b>Practices</b>
Client health and safety	<ol style="list-style-type: none"> <li>1. Digital security</li> <li>2. Privacy and responsibility in internet</li> <li>3. Post sale program</li> <li>4. Security internet for children</li> </ol>
Product and service labeling	<ol style="list-style-type: none"> <li>1. Customer Relationship Management</li> <li>2. Networks</li> <li>3. Digital channels</li> </ol>

Contracts that specify their obligations and responsibilities with regard to the suppliers outline the legal requirements and

company-specific elements. Suppliers must participate in organisational processes and take ownership of them [40]. Businesses must collaborate on environmental and humanitarian issues while attempting to adopt sustainability as a whole by engaging in more social activities [26]. The findings support the development of volunteer programmes in which staff members are encouraged to take part voluntarily in charitable activities carried out by the company as well as the promotion of sports and cultural sponsorship campaigns using financial advantages. In order to address ethical and moral issues, businesses have been considering both internal and external social factors [64].

Additionally, as the state no longer has the infrastructure to oversee all of those operations by itself, the attributions must be distributed among the major players in society [5]. Organizations must act preventively rather than reactively because they are a component of a system, turning their social investments into tools that aid in the system's long-term sustainability [26]. It is evident that business sustainability creates a knowledge set capable of integrating several organisational sectors, contributing to the establishment of objectives and goals toward the gradual and practical implementation of sustainable practises in firms [67]. This is true even though some market segments downplay the social responsibility of organisations, penalising society and spawning new businesses [55]. Which steps are required for the organisation to be able to implement its sustainable measures depends on its business model and segment [67]. Due to the instability of their market segments, earnings, and adaptation to market



conditions, businesses are still unable to follow a sustainable action pattern even when they engage in a variety of activities [9,31].

When firms are aware of the risks associated with achieving their economic, social, and environmental goals, they are better prepared to take advantage of new possibilities and assume new sustainable and innovative responsibilities [68]. Businesses that uphold superior financial management standards without ignoring social issues can create a strong foundation for upholding the sustainability presumptions [64]. Our findings support the findings of [68], who emphasise that businesses should continue to evaluate and report on their sustainability targets.

### Conclusions

The sustainability reports of companies listed by the CSI from 2012 to 2016 that use the GRI methodology to communicate their sustainable practises to their stakeholders were examined in this article. For every person and stage involved in this process, the information in those reports is essential. We discovered that all of the CSI participants are sizable businesses, which means they all have more resources to devote to sustainability. Additionally, we discovered that organisations with longer histories of sustainability report publication provide more in-depth data, a sign of organisational maturity. Although firms willingly submit these reports, we can still see their dedication to reaching the optimal plateau, juggling investments, outcomes, and deadlines, as well as their need to innovate in their processes and output.

Based on the realisation of a strategic strategy that establishes deadlines, implements these procedures, and evaluates

the outcomes, our conclusions are useful and relevant in every firm. We emphasise, however, that due to factors such as size, location, public vs. private, commodities vs. services, time and effort put into achieving sustainability, level of employee engagement in sustainability, and others, what works for one business may not produce the same outcomes for another. The entire supply chain was involved in the environmental practises, which were based on environmental contracts with suppliers and other parties, special environmental legislation, and the utilisation of natural resources. The social practises are centred on the human resources and the communities engaged, while the economic practises are based on strategic planning and the creation of new markets.

We point out that there are still some incredibly arbitrary questions that need to be documented, and that we were unable to find any criterion for the application of meritocracy. Therefore, in order to put the findings into practise, managers should instead develop a plan that takes into account the unique characteristics, culture, and resources of their firm before defining their long-term goals. This article might offer a fresh perspective on sustainability by replacing its superficiality with practical and objective activities that managers can oversee or update in accordance with their priorities for sustainable investments while also being aware that the same activities are employed by businesses that have received third-party certification as sustainable.

The first step in starting an OS objective may be to analyse one's own procedures, substitute the use of natural resources when possible, and look for upgrades to the existing structure (such as



new technologies). This study acknowledges the drawback of only looking at companies operating in the service sector of the Brazilian market. Future works should examine additional economic sectors including industry and agriculture in addition to expanding the breadth of firms and looking at patterns in other nations and economic blocs. Additionally, it provides a chance to see how different approaches besides GRI are used, allowing for the comparison of outcomes and the analysis of the structures used.

### References

1. Rodríguez-Olalla, A.; Avilés-Palacios, C. Integrating sustainability in organisations: An activity-based sustainability model. *Sustainability* 2017, 9, 1072. [CrossRef]
2. Siew, R.Y.J. A review of corporate sustainability reporting tools (SRTs). *J. Environ. Manag.* 2015, 164, 180–195. [CrossRef] [PubMed]
3. Amui, L.B.L.; Jabbour, C.J.C.; de Sousa Jabbour, A.B.L.; Kannan, D. Sustainability as a dynamic organizational capability: A systematic review and a future agenda toward a sustainable transition. *J. Clean. Prod.* 2017, 142, 308–322. [CrossRef]
4. Baviera-Puig, A.; Gómez-Navarro, T.; García-Melón, M.; García-Martínez, G. Assessing the communication quality of CSR reports. A case study on four Spanish food companies. *Sustainability* 2015, 7, 11010–11031. [CrossRef]
5. Antal, A.B.; Oppen, M.; Sobczak, A. (Re)discovering the social responsibility of business in Germany. *J. Bus. Ethics* 2009, 89, 285–301. [CrossRef]
6. Del Mar Alonso-Almeida, M.; Llach, J.; Marimon, F. A closer look at the “Global Reporting Initiative” sustainability reporting as a tool to implement environmental and social policies: A worldwide sector analysis. *Corp. Soc. Responsib. Environ. Manag.* 2014, 21, 318–335. [CrossRef]
7. Hahn, T.; Pinkse, J.; Preuss, L.; Figge, F. Tensions in Corporate Sustainability: Towards an Integrative Framework. *J. Bus. Ethics* 2015, 127, 297–316. [CrossRef]
8. Lozano, R. A holistic perspective on corporate sustainability drivers. *Corp. Soc. Responsib. Environ. Manag.* 2015, 22, 32–44. [CrossRef]
9. Morioka, S.N.; Carvalho, M.M. Measuring sustainability in practice: Exploring the inclusion of sustainability into corporate performance systems in Brazilian case studies. *J. Clean. Prod.* 2016, 136, 123–133. [CrossRef]
10. Pavláková Dočekalová, M.; Doubravský, K.; Dohnal, M.; Kocmanová, A. Evaluations of corporate sustainability indicators based on fuzzy similarity graphs. *Ecol. Indic.* 2017, 78, 108–114. [CrossRef]
11. Deng, H. Multicriteria analysis for benchmarking sustainability development. *Benchmarking Int. J.* 2015, 22, 791–807. [CrossRef]
12. Sukitsch, M.; Engert, S.; Baumgartner, R.J. The implementation of corporate sustainability in the European automotive industry: An analysis of sustainability reports. *Sustainability* 2015, 7, 11504–11531. [CrossRef]
13. Longoni, A.; Cagliano, R. Sustainable Innovativeness and the Triple Bottom Line: The Role of Organizational Time Perspective. *J. Bus. Ethics* 2016. [CrossRef]
14. Falle, S.; Rauter, R.; Engert, S.; Baumgartner, R.J. Sustainability management with the Sustainability Balanced Scorecard in SMEs: Findings from an Austrian case study. *Sustainability* 2016, 8, 545. [CrossRef]
15. Klewitz, J.; Hansen, E.G. Sustainability-oriented innovation of SMEs: A systematic review. *J. Clean. Prod.* 2014, 65, 57–75. [CrossRef]
16. Brundtland, G.H. Our Common Future: Report of the World Commission on



- Environment and Development. *Med. Confl. Surviv.* 1987, 4, 300.
17. Keskin, D.; Diehl, J.C.; Molenaar, N. Innovation process of new ventures driven by sustainability. *J. Clean. Prod.* 2013, 45, 50–60. [CrossRef]
  18. Elkington, J. *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*; Capstone: Oxford, UK, 1997.
  19. Clarke-Sather, A.R.; Hutchins, M.J.; Zhang, Q.; Gershenson, J.K.; Sutherland, J.W. Development of social, environmental, and economic indicators for a small/medium enterprise. *Int. J. Account. Inf. Manag.* 2011, 19, 247–266. [CrossRef]
  20. Hannouf, M.; Assefa, G. Subcategory assessment method for social life cycle assessment: A case study of high-density polyethylene production in Alberta, Canada. *Int. J. Life Cycle Assess.* 2018, 23, 116–132. [CrossRef]
  21. Garcia, S.; Cintra, Y.; de Cássia, S.R.; Torres, R.; Lima, F.G. Corporate sustainability management: A proposed multi-criteria model to support balanced decision-making. *J. Clean. Prod.* 2016, 136, 181–196. [CrossRef]
  22. Luz, L.M.; De Francisco, A.C.; Piekarski, C.M. Proposed model for assessing the contribution of the indicators obtained from the analysis of life-cycle inventory to the generation of industry innovation. *J. Clean. Prod.* 2015, 96, 339–348. [CrossRef]
  23. Antolín-López, R.; Delgado-Ceballos, J.; Montiel, I. Deconstructing corporate sustainability: A comparison of different stakeholder metrics. *J. Clean. Prod.* 2016, 136, 5–17. [CrossRef]
  24. Thijssens, T.; Bollen, L.; Hassink, H. Managing sustainability reporting: Many ways to publish exemplary reports. *J. Clean. Prod.* 2016, 136, 86–101. [CrossRef]
  25. Hahn, R.; Kühnen, M. Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding field of research. *J. Clean. Prod.* 2013, 59, 5–21. [CrossRef]
  26. Isaksson, R.B.; Garvare, R.; Johnson, M. The crippled bottom line—Measuring and managing sustainability. *Int. J. Product. Perform. Manag.* 2015, 43, 432–447. [CrossRef]
  27. Lozano, R. Sustainability inter-linkages in reporting vindicated: A study of European companies. *J. Clean. Prod.* 2013, 51, 57–65. [CrossRef]
  28. Morioka, S.N.; de Carvalho, M.M. A systematic literature review towards a conceptual framework for integrating sustainability performance into business. *J. Clean. Prod.* 2016, 136, 134–146. [CrossRef]
  29. Cunha, F.A.F.S.; Samanez, C.P. Performance Analysis of Sustainable Investments in the Brazilian Stock Market: A Study about the Corporate Sustainability Index (ISE). *J. Bus. Ethics* 2012, 117, 19–36.
  30. BM&FBOVESPA Índice de Sustentabilidade Empresarial (ISE). Available online: <http://isebvmf.com.br/oque-e-ose?locale=pt-br> (accessed on 8 May 2017).
  31. Santis, P.; Albuquerque, A.; Lizarelli, F. Do sustainable companies have a better financial performance? A study on Brazilian public companies. *J. Clean. Prod.* 2016, 133, 735–745. [CrossRef]
  32. Organization, I.L. ILOSTAT Country Profiles. Available online: <https://www.ilo.org/ilostatcp/CPDesktop/?list=true&lang=en&country=BRA> (accessed on 13 January 2018).
  33. IBGE. Contas Nacionais Trimestrais: Indicadores de Volumes e Valores Correntes; Instituto Brasileiro de Geografia e Estatística: Rio de Janeiro, Brasil, 2017.
  34. Bank, W. World Development Indicators. Available online: [http://databank.worldbank.org/data/Views/Reports/ReportWidgetCustom.aspx?Report\\_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=](http://databank.worldbank.org/data/Views/Reports/ReportWidgetCustom.aspx?Report_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=)





- n&zm=n&country=BRA (accessed on 25 July 2017).
35. Lozano, R.; Ceulemans, K.; Scarff Seatter, C. Teaching organisational change management for sustainability: Designing and delivering a course at the University of Leeds to better prepare future sustainability change agents. *J. Clean. Prod.* 2015, 106, 205–215. [CrossRef]
  36. Lloret, A. Modeling corporate sustainability strategy. *J. Bus. Res.* 2015, 69, 418–425. [CrossRef]
  37. Engert, S.; Baumgartner, R.J. Corporate sustainability strategy—Bridging the gap between formulation and implementation. *J. Clean. Prod.* 2016, 113, 822–834. [CrossRef]
  38. Toppinen, A.; Korhonen-Kurki, K. Global Reporting Initiative and social impact in managing corporate responsibility: A case study of three multinationals in the forest industry. *Bus. Ethics* 2013, 22, 202–217. [CrossRef]
  39. Ceulemans, K.; Lozano, R.; del Mar Alonso-Almeida, M. Sustainability reporting in higher education: Interconnecting the reporting process and organisational change management for sustainability. *Sustainability* 2015, 7, 8881–8903. [CrossRef]
  40. Lozano, R.; Nummert, B.; Ceulemans, K. Elucidating the relationship between Sustainability Reporting and Organisational Change Management for Sustainability. *J. Clean. Prod.* 2016, 125, 168–188. [CrossRef]
  41. Foran, B.; Lenzen, M.; Dey, C.; Bilek, M. Integrating sustainable chain management with triple bottom line accounting. *Ecol. Econ.* 2005, 52, 143–157. [CrossRef]
  42. Salvioni, D.M.; Franzoni, S.; Cassano, R. Sustainability in the Higher Education System: An Opportunity to Improve Quality and Image. *Sustainability* 2017, 9, 914. [CrossRef]
  43. Orsato, R.J.; Garcia, A.; Mendes-Da-Silva, W.; Simonetti, R.; Monzoni, M. Sustainability indexes: Why join in? A study of the “corporate sustainability index (ISE)” in Brazil. *J. Clean. Prod.* 2015, 96, 161–170. [CrossRef]
  44. Lourenço, I.C.; Branco, M.C. Determinants of corporate sustainability performance in emerging markets: The Brazilian case. *J. Clean. Prod.* 2013, 57, 134–141. [CrossRef]
  45. Yu, M.; Zhao, R. Sustainability and firm valuation: An international investigation. *Int. J. Account. Inf. Manag.* 2015, 23, 289–307. [CrossRef]
  46. Marcondes, A.W.; Bacarji, C.D. ISE: Sustentabilidade No Mercado de Capitais; Report. São Paulo, Brazil, 2010. Available online: <http://hdl.handle.net/10438/15424> (accessed on 17 January 2018).
  47. Mdic, M. Da Industria Comercio Exterior e Serviços A Importância do Setor Terciário. Available online: <http://www.mdic.gov.br/index.php/comercio-servicos/a-secretaria-de-comercio-e-servicos-scs/402-a-importancia-do-setor-terciario> (accessed on 27 July 2017).
  48. Ministério do Desenvolvimento, Indústria e Comércio Exterior (MDIC); Instituto Brasileiro de Geografia e Estatística (IBGE); Instituto de Pesquisa Econômica Aplicada (IPEA); Serviço Brasileiro de Apoio às Micro e Pequenas Empresa (SEBRAE). Atlas Nacional de Comércio e Serviços, 1st ed.; ABDI: Brasília, Brazil, 2013.
  49. Lage Junior, M.; Godinho Filho, M. Variations of the kanban system: Literature review and classification. *Int. J. Prod. Econ.* 2010, 125, 13–21. [CrossRef]
  50. Fifka, M.S.; Drabble, M. Focus and Standardization of Sustainability Reporting—A Comparative Study of the United Kingdom and Finland. *Bus. Strategy Environ.* 2012, 21, 455–474. [CrossRef]
  51. Bellantuono, N.; Pontrandolfo, P.; Scozzi, B. Capturing the stakeholders’ view in sustainability reporting: A novel approach. *Sustainability* 2016, 8, 379. [CrossRef]



52. Moneva, J.M.; Ortas, E. Corporate environmental and financial performance: A multivariate approach. *Ind. Manag. Data Syst.* 2010, 110, 193–210. [CrossRef]
53. Ortas, E.; Gallego-Alvarez, I.; Álvarez Etxeberria, I. Financial Factors Influencing the Quality of Corporate Social Responsibility and Environmental Management Disclosure: A Quantile Regression Approach. *Corp. Soc. Responsib. Environ. Manag.* 2015, 22, 362–380. [CrossRef]
54. De Abreu, M.C.S. How to define an environmental policy to improve corporate sustainability in developing countries. *Bus. Strategy Environ.* 2009, 18, 542–556. [CrossRef]
55. Perrini, F.; Russo, A.; Tencati, A.; Vurro, C. Deconstructing the Relationship between Corporate Social and Financial Performance. *J. Bus. Ethics* 2011, 102, 59–76. [CrossRef]
56. De Fátima de Oliveira Miranda Santos, S.; Piekarski, C.M.; Ugaya, C.M.L.; Donato, D.B.; Braghini, A.; de Francisco, A.C.; Carvalho, A.M.M.L. Life cycle analysis of charcoal production in masonry kilns with and without carbonization process generated gas combustion. *Sustainability* 2017, 9, 1558. [CrossRef]
57. Delmas, M.; Blass, V.D. Measuring Corporate Environmental Performance: The Trade-Offs of Sustainability Ratings. *Bus. Strategy Environ.* 2010, 19, 245–260. [CrossRef]
58. Yang, Z.; Liu, W.; Sun, J.; Zhang, Y. Corporate environmental responsibility and environmental non-governmental organizations in China. *Sustainability* 2017, 9, 1756. [CrossRef]
59. Hardjono, T.; De Klein, P. Introduction on the European Corporate Sustainability Framework (ECSF). *J. Bus. Ethics* 2004, 55, 99–113. [CrossRef]
60. Osagie, E.R.; Wesselink, R.; Blok, V.; Lans, T.; Mulder, M. Individual Competencies for Corporate Social Responsibility: A Literature and Practice Perspective. *J. Bus. Ethics* 2014, 135, 233–252. [CrossRef]
61. Vildåsen, S.S.; Keitsch, M.; Fet, A.M. Clarifying the Epistemology of Corporate Sustainability. *Ecol. Econ.* 2017, 138, 40–46. [CrossRef]
62. Boons, F.; Montalvo, C.; Quist, J.; Wagner, M. Sustainable innovation, business models and economic performance: An overview. *J. Clean. Prod.* 2013, 45, 1–8. [CrossRef]
63. Weyzig, F. Political and economic arguments for corporate social responsibility: Analysis and a proposition regarding the CSR agenda. *J. Bus. Ethics* 2009, 86, 417–428. [CrossRef]
64. Cornelius, N.; Todres, M.; Janjuha-Jivraj, S.; Woods, A.; Wallace, J. Corporate social responsibility and the social enterprise. *J. Bus. Ethics* 2008, 81, 355–370. [CrossRef]
65. Morimoto, R.; Ash, J.; Hope, C. Corporate social responsibility audit: From theory to practice. *J. Bus. Ethics* 2005, 62, 315–325. [CrossRef]
66. Rhaïem, M. Measurement and determinants of academic research efficiency: A systematic review of the evidence. *Scientometrics* 2017, 110, 581–615. [CrossRef]
67. Pojasek, R.B. A framework for business sustainability. *Environ. Qual. Manag.* 2007, 17, 81–88. [CrossRef]
68. Chakrabarty, S.; Wang, L. The Long-Term Sustainance of Sustainability Practices in MNCs: A Dynamic Capabilities Perspective of the Role of R&D and Internationalization. *J. Bus. Ethics* 2012, 110, 205–217

\*\*\*



**A STUDY OF THE LITERATURE AND THEIR CLASSIFICATION FROM MARKETING MIX TO E-MARKETING MIX**

**Prof. (Dr.) Sanjay Chhabra**

Dean, Faculty of Law and Governance, Jayoti Vidyapeeth Women's University

**Abstract**

The marketing mix paradigm, in its well-known iteration of the four Ps, has been a topic of debate throughout the development of marketing theory and is relevant to both academic research and management application. The 4 Ps marketing mix is a milestone in marketing theory, but it is also true that as corporate circumstances have changed, it has become necessary to revisit the "controllable factors" that make up the marketing mix. The more recent and in need of a greater degree of mix differentiation among the business contexts is the digital business. In the research community throughout this evolutionary process, the "conservatives," who assert that the 4 Ps paradigm can adapt to environmental changes by incorporating new elements inside each "P," and the "revisionists," who contend that the 4 Ps paradigm is out of date and suggest new paradigms, have always been at odds with one another. This research aims to clarify these two different views of the evolution of the marketing mix using a review of the important e-marketing mix literature and a focus on the development of the theory for the digital context.

**Keywords:** E-marketing, Marketing mix, E-marketing mix

**Introduction**

Understanding the dichotomy between "conservatives" and "revisionists" that this study suggests is essential to comprehending the historical origins of the conventional marketing mix.

**1.1 Theoretical framework**

The marketing mix, according to McCarthy, consists of the following components: product, pricing, place, and promotion. Borden (1964) listed twelve managerial policies, and each of these Ps contains numerous sub-mixes. The marketing mix, according to Kalyanam & McIntyre (2002), consists of hundreds of little components that are combined to help with managerial duties. The traditional mix will either be included or excluded in the digital context depending on whether and how it is conceivable and practicable to add more parts to it, remove some, and build a new one. Borden (1964) noted that in the formulation of his twelve components, Two lists must be created: one listing the crucial components or ingredients that go into marketing plans, and the other listing the forces that have an impact on a company's marketing strategy and to which the marketing manager must adjust in order to find a mix or programme that will work.

McCarthy's marketing has gained widespread acceptance among managers and academics throughout time, becoming an essential part of marketing theory and practise. The fact that it is simple to use and understand, making it a useful tool for both teaching and commercial decision-making, may account for this widespread use. (Jobber, 2001; Grönroos, 1994; Yudelso, 1999).

Client interaction and internet-based communication options were unimaginable in the 1960s. The 4 Ps were developed with manufacturers in mind. However, because of their versatility, the 4Ps can be used in competitive circumstances that are substantially dissimilar from those for which they were



originally intended. The focus of this study is on the question, "Can a new list of elements be created that can adequately modify the traditional mix to fit in new digital contexts?"

Researchers have experimented with two different approaches to modifying the traditional marketing mix. In digital situations, the 4 Ps may continue to dominate the marketing mix paradigm, according to some researchers (whom we refer to as "conservatives"). This is because it is necessary to alter the sub-mixes inside each P by adding and/or removing specific components in order to accommodate the new situation. Other authors—those we refer to as "revisionists"—claim that the 4 Ps framework is now out-of-date and advocate changing the components of the mix or suggesting the addition of new ones. Both strategies provide compelling justifications for their conclusions. Through an analysis of the relevant primary literature, this paper seeks to clarify these motivations.

### **1.2 The purpose and scope of the research**

To provide readers a sense of the current level of the discussion over whether it is practical to use the classic marketing mix in digital environments, this study presents a literature scan and classification. Instead of providing a response to this question, the paper wants to draw attention to a crucial point that should be discussed during the debate. The most significant drawback of this research is that it solely examines academic viewpoints found in academic textbooks and research papers, without any examination of actual fieldwork. The publication emphasises the necessity for additional study on the subject.

### **2. The revisionists' perspective on a new marketing strategy for the digital business environment**

Numerous studies and pieces of research have been carried out to build a new operational marketing paradigm that goes beyond the 4 Ps and can more clearly identify the marketing levers. According to this body of study, which we refer to as "revisionist," a considerable reconceptualization is required. The four Ps are commonly criticised for preventing organisations from being externally focused and giving their interactions with customers adequate attention (Möller, 2006; Popovic, 2006; Constantinides, 2002a, b). The four Ps are primarily criticised for this. According to Schultz (2001), the marketplaces of today require a new externally oriented paradigm that embraces a network system perspective. It's noteworthy to note that, with very few exceptions, the bulk of the "revisionists" authors examined concur that the 4 Ps should be included in marketing mix models despite these concerns.

The additional two Ps, people and packaging, which have been debatable in the marketing mix literature for many years, are suggested to be included to the traditional 4 Ps mix by Lawrence et al. (2000). The 5 Ps of marketing, which also comprise paradox, standpoint, paradigm, persuasion, and passion, are then added to this combination. Prandelli and Verona (2006) propose a three-part model for the Italian literature known as the three Cs. These three Cs include material (website and platform), community (relational capabilities and interaction system), and commerce (which includes the four Ps: product, price, place, and promotion). The 3 C + I (interface) paradigm put forth by Pastore and Vernuccio incorporates and reframes the 4 Ps for use in the online environment.

The 4 Ps are included in Kalyanam & McIntyre's (2002) 4P+ P2+C2+S3 model as part of a more thorough operational framework.

The 8 Ps model entails:



- J Precision is the improved level of target segment selection accuracy and market placement in digital contexts, primarily due to database management systems;
- J Customers must be able to easily utilise and trust payment methods;
- J Personalization refers to the ability to design a flexible interface that may change to meet the needs and preferences of users;
- J Push and Pull refers to the choice between user-requested communication (pull) and active communication regulations (push).
- J While the core components of these models are the conventional 4 Ps, other authors suggest completely different mixtures. The Internet, according to Chaffey et al. (2000), necessitates a modification of the conventional marketing mix. When creating a marketing plan at the strategic level, they point out eight important considerations: the target audience, brand integration, marketing assistance, strategic alliances, organisational structure, and financial constraints.
- J Strategic goals, market analysis and potential, e-commerce maturity level, and the strategic significance of e-commerce for the organisation are all included in the scope of strategic relevance. site, which is operationally valuable and has interface problems;
- J Synergy, which has organisational significance, includes the integration of the company's business model's bricks-and-clicks components.
- J System, which handles the data warehouse, security systems, and Web platform management.

### **3. Conservatives' attitude on upholding the 4 Ps in digital contexts**

The 4 Ps model is perfectly capable of adapting and continuing to be the dominant paradigm in these new circumstances, according to a less significant but conceptually coherent portion of the literature on the subject. It is imperative to modify the marketing mix to account for sociological and market changes brought on by the widespread use of digital technologies, particularly the Internet.

The "internal orientation" critique of the 4 Ps, as per Möller (2006), is founded on an inaccurate understanding of the connection among marketing mix and the marketing concept. As per Möller, the 4 Ps paradigm accurately embodies the marketing maxim that "marketing activities should be based on identification of customer needs and wants." This implies that clear customer information must be decided upon in order to satisfy consumers' demands through segmentation, product differentiation, and positioning.

The virtual value chain, according to Bhatt & Emdad (2001), is internally modifying each P by supplying new dimensions—personalized information in the Product, transparency and personalization of Price, direct delivery for Place, and more flexibility for Promotion. As a result, each P is being internally transformed. Given as traditional marketing mix paradigm has to be adjusted, O'Connor & Galvin argue that digital technologies may be employed to enhance the functioning of the mix while maintaining the 4 Ps as the primary component of Internet marketing. The most significant changes that digital technology has made to each of the four Ps are as follows:

#### **Product**

The "virtual product" is a new product concept that has emerged as a result of the Internet's potential to be interactive and connected, according to O'Connor and Galvin (1997) (Valdani, 2000). According to von Hippel (2005) and Dominici (2008)b, the virtual product is viewed as a combination of material and immaterial elements that is customised and altered in line with the variety and variability of people's tastes. A product's development can take place in the context of the digital era when it can



be transferred digitally from the producer to the consumer (for instance, as an mp3 file for music, an avi file for movies, a pdf file for books and magazines, etc.) (Pastore & Vagnani, 2000). From the demand side, the capacity to obtain information is crucial (Smith & Chaffey, 2001). Due to the ease and low cost of online information retrieval, the growing amount of information, and the interactivity of Web 2.0, which has significantly aided the purchasing process for "search" products, experience products can now be converted into search products.

### **Price**

Yudelson (1999) asserts that the price need to be redefined as the buyer's time, money, and effort expended to obtain the good. Additionally, comparing features and pricing automatically and specifically can be done while saving time and effort thanks to the usage of Artificial Intelligent Agents (Dominici, 2008a). Real-time price changes made possible by the Internet could, in the producer's view, lead to risky pricing competitions and a corresponding loss in profit margins (Allen & Fjermestad, 2001). To avoid this, online marketing campaigns must emphasise the product's distinguishing attributes and qualitative traits.

### **Place**

It is now best described as everything necessary and done to support exchange (Yudelson 1999). The incorporation of the purchase process as a key component of location is necessitated by the term's use in a digital context. The process must be clear-cut and easy to follow while simultaneously encouraging positive client encounters. The transaction's intangible components are now present at the physical site, which is now virtual. Bhatt & Emdad (2001) claim that building connectivity with customers rather than just doing online transactions is the Internet's main contribution to business. A more effective and efficient e-CRM (digital customer relationship management) solution can be created thanks to the interactive elements of the Internet.

### **Promotion**

It could be broadened to cover all interparty communication (Yudelson, 1999). Additionally, the interactive components of digital communication are included in this idea. Internet communication is distinct from earlier forms of mass media (Morris & Ogan, 1996). Although it may undoubtedly reach a large and dispersed audience, this medium actually sets itself apart from others in terms of its interactive and multimedia features. The more modern many-to-many paradigm has supplanted the older one-to-many paradigm in the context of the Web. With other media, it is impossible to transmit messages in a flexible manner that are targeted for a specific person (Bhatt & Emdad).. Due to the multimodal capabilities of Web communication, it is also possible to hit the target when he or she is in a condition similar to that of television, but with a greater capacity for knowledge (described by Krugman in 1965 as one of "low involvement"). Instead of just advertising a product, the objective of online communication is to develop a buying relationship with the customer and cultivate a sense of trust in them. The P of promotion should include relationships, engagement, and multimedia.4. Conclusions and further research.

The various and powerful possibilities of digital contexts have created a brand-new corporate environment that is increasingly challenging the marketing mix paradigm. Many authors believe the mix is inadequate for the 21st century despite its capacity to absorb a large variety of factors and adapt to a wide range of business environment mutations. A new dominant paradigm for operational decisions in digital contexts is still being looked after. We are still a long way from creating a brand-



new, widely accepted standard that will completely displace the 4 Ps combinations. Lack of knowledge of the full commercial potential of new digital technologies and underappreciation of case study research on marketing operations are probably to blame for the lack of a novel, broadly accepted model. When McCarthy developed the 4 Ps, online enterprises had not yet reached the same degree of maturity as industrial corporations. The essential structure of the 4 Ps is still applicable and, with some expansion and adjustment, still serves as the foundation for practical decisions, despite the fact that there have been differences between "conservatives" and "revisionists" for almost fifty years. The conservatives' point of view is supported by the flexibility to alter the components of each P in the conventional blend. There is a need for research on this subject now, much as Borden (1964) formulated twelve aspects using information from practical practices and case studies in the 1960s. The traditional 4 Ps will undoubtedly be replaced by a new, more broadly acknowledged paradigm for marketing operations once e-marketing research and practices reaches a deeper level of understanding and maturity in the digital environment.

### References

- J Andreini D. (2006). The Evolution of the Theory and Practice of Marketing in Light of Information Technology, in Krishnamurthy S. Contemporary Research in E-Marketing, Vol. 2, pp. 168-215.
- J Borden N.H. (1964). The Concept of the Marketing Mix. Journal of Advertising Research, 24 (4): 7-12.
- J Bruner G. C. (1988). The marketing mix: A retrospective and evaluation. Journal of Marketing Education, 10: 29-33.
- J Chaffey D., Mayer R., Johnston K., Ellis-Chadwick F. (2000). Internet Marketing, Strategy, Implementation and Practice, FT/Prentice Hall.
- J Chen C-Y. (2006). The comparison of structure differences between internet marketing and traditional marketing. International Journal of Management and Enterprise Development, 3 (4): 397-417.
- J Constantinides E. (2006). The Marketing Mix Revisited: Towards the 21st Century Marketing. Journal of Marketing Management, 22 (3): 407-438.
- J Constantinides E. (2002a). The 4S Web-Marketing Mix model. Electronic Commerce Research and Applications, 1: 57-76.
- J Constantinides E. (2002b). From Physical Marketing to Web Marketing: The Web-Marketing Mix. Attidella 35th Hawaii International Conference on System Sciences.
- J Culliton J. W. (1948). The Management of Marketing Costs, Boston: Division of Research. Graduate School of Business Administration, Harvard University.
- J Dixon D. F., Blois K. J. (1983). Some Limitations of the 4 Ps as a Paradigm of Marketing, in Blois K. J. (a cura di). Proceedings of the Marketing Education Group, pp. 92-107.
- J Dominici G. (2008a). Holonic Production System to Obtain Flexibility for Customer Satisfaction. Journal of Service Science and Management, 1 (3): 251-254.
- J Dominici G. (2008b). Demand Driven Supply Chain ed innovazione: il sistemalogistico-produttivo per la soddisfazione dei bisogni del cliente in Purpura A. & Fazio G. (ed.), Economia e gestione dell'innovazione nelle PMI. Percorsi tematici ed esperienze formative del Master EGI, pp. 100-114, FrancoAngeli.
- J Dominici G. (2009). E-marketing cosa cambia? Dai modelli di business al mix operativo, Milan: FrancoAngeli.



- J E-center of National Taiwan University of Science and Technology. (1999). The Electronic Commerce, TsangHai Book Co., pp.2–150.
- J Fjermestad J., & Romano N. C. J. (2003). An Integrative Implementation Framework for Electronic Customer Relationship Management: Revisiting the General Principles of Usability and Resistance, proceedings of the 36th Hawaii International Conference on Systems Sciences.
- J Goi C.L. (2005). Marketing Mix: a Review of 'Ps'. Journal of Internet Banking and Commerce, 10 (2). [Online] Available: [www.arraydev.com/commerce/JIBC/2005-08/goi.htm](http://www.arraydev.com/commerce/JIBC/2005-08/goi.htm)
- J Goi C. L. (2009). A review of Marketing Mix: 4Ps or More? International Journal of Marketing Studies, 1 (1): 2-14.
- J Goldsmith R. E. (1999). The Personalized Marketplace: Beyond the 4Ps. Marketing Intelligence & Planning, 17 (4): 178-185.
- J Goldsmith R. E. (2002). Explaining and Predicting Consumer Intention to Purchase over the Internet: An Exploratory Study. Journal of Marketing Theory and Practice, 10 (2): 22-28.
- J Grönroos C. (1994). Quo vadis marketing? Toward a relationship marketing paradigm. Journal of Marketing Management, 10 (5): 347- 360.
- J Grönroos C. (1994b). From Marketing Mix to Relationship Marketing: Towards a Paradigm Shift in Marketing. Asia-Australia Marketing Journal, 2 (1): 9-30.
- J Grönroos C. (2000). Relationship Marketing: The Nordic School Perspective'', in Sheth J. N., Parvatiyar A. (a cura di), Handbook of Relationship Marketing, Sage.
- J Grönroos C. (2005). On defining marketing: finding a new roadmap for marketing. Marketing Theory, 6 (4): 395-417.
- J Grönroos C. (2008). In Search of a New Logic for Marketing: Foundations of Contemporary Theory, Wiley.
- J Hoffman, D.L., & Novak, T.P. (1997). A New Marketing Paradigm for Electronic Commerce. The Information Society: An International Journal, 13: 43-54.
- J Jobber D. (2001). Principles and Practices of Marketing 3rd edition, McGraw Hill.
- J Kalyanam K., & McIntyre S. (2002). The E-marketing Mix: a Contribution of the E-Tailing Wars. Academy of Marketing Science Journal, 30 (4): 487-499.
- J Klein L. R. (1998). Evaluating the potential of interactive media through a new lens: Search versus experience goods. Journal of Business Research, 41: 195-203.
- J Lambin J. J. (1972). A Computer On-Line Marketing Mix Model. Journal of Marketing Research, 9: 119-126.
- J Lasswell H. D. (1948). The Structure and Function of Communication in Society, in Bryson L. (a cura di), The Communication of Ideas, Harper & Bro.
- J Lawrence E., Corbitt B., Fisher J. A., Lawrence J., & Tidwell A. (2000). Internet Commerce: Digital Models for Business (2nd ed.), Wiley & Sons.
- J Lauterborn R. (1990). New Marketing Litany: 4Ps Passes; C-Words Take Over, Advertising Age, ottobre, pp.26-28.
- J McCharty E.J. (1960). Basic Marketing: A Managerial Approach, Irwin. M
- J cCharty E.J. (1964). Basic Marketing: A Managerial Approach, 2nd ed., Irwin.
- J McCarthy E. J., & Perreault W.D. Jr. (1987). Basic Marketing: A Global Managerial Approach, Irwin.





- J Möller K. E. (1994). Interorganizational Marketing Exchange: Metatheoretical Analysis of Current Research Approaches, in Laurent G. Lilien G, Pras B. (a cura di), *Research Traditions in Marketing*, pp. 348-382,
- J Kluwer. Möller K. E., & Halinen A. (2000). Relationship Marketing Theory: Its roots and directions. *Journal of Marketing Management*, 16 (1): 29-54.
- J Möller K. E. (2006). Comment on: The Marketing Mix Revisited: Towards the 21st Century Marketing? by E. Constantinides. *Journal of Marketing Management*, 22 (3): 439-450.
- J Morris M., & Ogan C. (1996). The Internet as Mass Medium. *Journal of Computer Mediated Communication*, 1 (4), [Online] Available: <http://jcmc.indiana.edu/vol1/issue4/morris.html>
- J Mosley-Matchett J. D. (1997). Include the Internet in marketing mix. *Marketing News*, 31 (25).
- J Nelson P. (1974). Advertising Information. *Journal of Political Economy*, 83: 729-754.
- J O'Learly C., Rao S., & Perry, C. (2004). Improving Customer Relationship Management through Database/Internet Marketing. A Theory-building Action Research Project. *European Journal of Marketing*, 38 (3/4): 238-254.
- J Pastore A., & Vagnani G. (2000). Il ruolo dell'e-commerce nell'evoluzione dei sistemi distributivi. *Industria e Distribuzione*, 1: 33-46.
- J Pastore A., & Vernuccio M. (2004). *Marketing, Innovazione e Tecnologie Digitali. Una lettura in ottica sistemica*, Padua (IT): Cedam.
- J Pastore A., & Vernuccio M. (2008). *Impresa e comunicazione. Principi e strumenti per il management*. 2a ed., Milan: Apogeo.
- J Popovic D. (2006). Modelling the marketing of high-tech start-ups. *Journal of Targeting, Measurement and Analysis for Marketing*, 14 (3): 260-276.
- J Prandelli E., & Verona G. (2006). *Marketing in Rete*, Milan: McGraw-Hill. Robins F. (2000). The E-marketing mix. *The Marketing Review*, 1: 249-274.
- J Schultz D. E. (2001). Marketers: Bid Farewell to Strategy Based on Old 4Ps. *Marketing News*, 35 (2): 7.
- J Vignali C., & Bavies B. J. (1994). The Marketing Mix Redefined and Mapped: Introducing the MIXMAP Model. *Management Decision*, 32 (8): 11-16.
- J Von Hippel E. (2005). *Democratizing innovation*, MIT Press. Wang K.L., Wang Y., & Yao J.T. (2005). A Comparative Study on Marketing Mix Models for Digital Products. *Internet and Network Economics Proceedings of First International Workshop, WINE 2005*, Hong Kong, China, 15-17 december, pp.660-669, Springer.
- J Yudelson J. (1999). Adapting McCarthy's Four P's for the Twenty-First Century. *Journal of Marketing Education*, 21 (1): 60-67.



**CAUSE RELATED MARKETING – IT'S AWARENESS AND PERCEPTION TOWARDS  
THE PRODUCT (A CASE STUDY OF JAIPUR, RAJASTHAN)**

**JV'n Seema Modi**

Assistant Professor, Department of Management & Commerce, Jayoti Vidyapeeth Women's  
University

**Abstract**

CRM first gained traction as a marketing tactic in the United States in the early 1980s, but more recently it has been utilised by a wide spectrum of businesses throughout the world. The aim of the paper is to measure EFA of CRM towards Consumer Perception and also to study the consumer awareness level towards CRM campaigns with respect to demographic variables. Primary and Secondary data was collected. 190 respondents were used for analysis. T-test was applied with the help of SPSS.

Result revealed that For the dimension Consumer Perception, two latent variables have been extracted also there is a significant difference in the average scores of the male and female respondents regarding awareness for the *Lets put India first and Swach Adat and Swach Bharat* CRM campaign.

**Keywords:** CRM campaign, Consumer Awareness, Consumer Perception

**Introduction**

CRM stands for "Cause Related Marketing" and refers to a business arrangement that benefits both parties—the corporation and the social causes it supports—while placing less emphasis on the interests of the consumer. However, consumer involvement is essential for a marketing effort to be effective and is best fostered by emphasising the long-term advantages for customers through appropriate positioning and audience targeting.

CRM first gained traction as a marketing tactic in the United States in the early 1980s, but more recently it has been utilised by a wide spectrum of businesses throughout the world. One explanation is that businesses are approaching their community involvement more strategically and looking for methods to help local organisations while also advancing their own corporate objectives. CRM is expanding for a second reason: public opinion research has demonstrated that successful cause marketing initiatives can improve a company's reputation, brand image, and marketing campaign credibility while providing customers with an easy way to support nonprofits through their purchasing decisions.

Seventy-eight percent of consumers had a more favourable opinion of a corporation that donates to or sponsors a cause they believe in, according to Skory and Repka's study from 2004. Cause A fascinating idea in marketing is related marketing, which can help both companies and charities or other deserving organisations. Additionally, it draws in new funding, resource, and support sources. CRM initiatives satisfy the obligations of both businesses and customers. In response to a customer's purchase, CRM finds programmes in which businesses take part in social and ethical activities by donating a portion of their income to a certain cause. CRM presupposes the involvement of both economic system actors: businesses that must execute social and ethical activities, and consumers who must buy items linked to these initiatives. They are conducted on a certain item for a set amount of time, frequently in collaboration with other organisations (such charities).



## Examples-

Companies like Tata, Reliance, HUL, and P&G have all implemented CRM techniques favourably in India. For instance, Tata Tea collaborated with Janaagraha on a voter registration drive under the "Jaago re!!" campaign moniker. (Get up!) The corporation then expanded the campaign to include fighting corruption. Discussions on these and other social topics are encouraged on the Jaago Re website. 'Jaago Re Corruption Index' will also be released by Tata Tea. By promoting December 9, which is designated as "Anti-Corruption Day" internationally, and measuring public perception of corruption, this will measure public perception of corruption and turn it into a national activity..

With P&G's launch of SHIKSHA'08, you can now make simple brand choices to educate more underprivileged children. P&G pledges Rs. 1 crore to its partner CRY, which will be used for initiatives that support children's right to an education. Education of Children via Shiksha is the top priority in India as part of P&G's global charity programme P&G Live, Learn, and Thrive, which focuses on the development of children in need around the world. With a gift of more than Rs. 4 crore, Shiksha has put 67,000 children in 435 villages on the path to their right to an education. With the motto "Padhega India, Badhega India," the programme aspires to provide education to all for a better India. In addition to Sushmita Sen, Rahul Bose, Konkona Sen, Tabu, Soha Ali Khan, Lara Dutta, Preity Zinta, Kiran Bedi, Sanjana Kapoor, Jatin Das, Shaan, and others, Shiksha has the support of these public figures. Bollywood stars Kajol and Sharmila Tagore introduced the programme.

## Review of Literature

Hina Yaqub Bhatti, M. Mercedes Galan-Ladero, and Clementina Galera-Casquet's article from 2021 gives a thorough assessment of the literature on CRM based on the terms "Cause-Related Marketing" and "Cause Marketing," with a 1988–2020 time frame. In this work, 344 English articles are synthesised using a strict process using e-journal database searches. The development of these publications over time, across countries, in terms of methodology, cross-cultural analysis, and the function of journals, were all categorised. The Bibliometric Analyses were also conducted as part of this study. The assessment emphasises how the idea of CRM has changed from being seen as a tool for the marketing mix (a tool for promotion) to being seen as a CSR endeavour with a more strategic nature. Only a few journals published articles on CRM, according to our research. Geographically speaking, the CRM study began in North America, then moved on to Europe, Oceania, Asia, and Sub-Saharan Africa. Beginning in the third decade, cross-cultural studies saw an increase in collaboration and the use of mixed-method (qualitative and quantitative research) approaches. Finally, this analysis identifies the most obvious research gaps in CRM, providing a new direction for investigation.

Simranjit Kaur Bedi, Dr Amardeep Kaur Ahluwalia (2020), shares that the organization has realized the benefits of the social alliances and hence coming forward in order to collaborate with non-profit organizations for the achievement of the social objectives. The main aim of the research was to study unaided awareness towards CRM by youth. It has been seen that very few respondents had basic understanding about the CRM. Unaided awareness has been found to be high among the respondents. Vivek Aggarwal, Vinod Kumar Singh (2019), conducted in India's National Capital Region (NCR) aims to determine whether a consumer's decision to buy a product connected to a cause was deliberate or impulsive. Gender's impact has also been studied. Descriptive and regression analyses were used to evaluate hypotheses about the relationship between CrM campaigns and customers' purchase intentions. The study's findings indicate that customers are aware of CrM and view it as a useful communication tool. They discover that the length of a CrM campaign and the company's dedication



to one are significant. The results imply that CrM campaigns affected consumers' purchase intentions. These findings can be used to pinpoint the components of CRM campaigns and to inform marketing advice for businesses looking to use CRM campaigns to successfully target various customer categories.

Dr. T.Bina, P.Shanmugha Priya (2015), has become a top management priority in the past ten years as a result of the rising understanding that it is one of the most important intangible assets that businesses have to improve their company image among both internal and external customers. CRM has grown to be an absolute necessity for today's corporate environment as it consistently offers many benefits like goodwill growth, competitive advantage, survival, and competitive advantage (Collins 1993). This essay highlights definitions, meanings, and earlier research in the field of CRM to identify some of the most significant works in the domain.

Francisca Farache, Keith John Perks, Lilian Soares Outtes Wanderley, Jose Milton de Sousa Filho (2008), attempt to understand the perception of the consumer towards CRM which were based on 200 consumers. Consumers, when it comes to supporting a good cause, they would like to support which is related to Children. It has also seen that consumers have a better perception of who supports the cause rather than who does not. They also believe that the collaboration between NGO and corporation would impact society for this good cause.

### **1. Need for the Study**

Nowadays, CRM is becoming one of the most effective marketing tool which creates a win-win situation for the companies as well as for non-profit organization. In the current pandemic, many companies and brand has come forward for the cause which might help the consumer indirectly in terms of health, education, food or in other way. So this study will give us the answer to the impact of CRM on consumer attitude and their perception and does covid19 has affected consumers towards the CRM and has increased the level of awareness.

### **2. Research Methodology**

#### **Research Objectives-**

- i. To measure EFA of CRM towards Consumer Perception
- ii. To study the consumer awareness level towards CRM campaigns with respect to demographic variables.

#### **Research Design-**

The study is based on Empirical Analysis of Customer Awareness and perception of CRM. This study is based on descriptive research. The research design are adopted in such a way that it suit the analysis of the empirical which would be based on the primary data collected through self-structured questionnaire

#### **Universe of the study-**

Universe is the customer of the Jaipur City

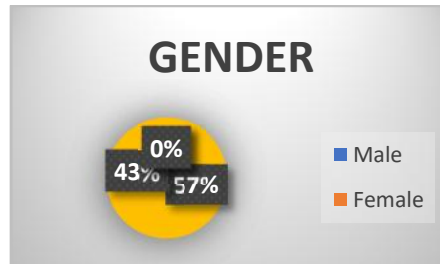
#### **Sample size-**

For present study, same size has been calculated as per Morgans Formula i.e. 384



**Sampling**

The sample take a look at was the customer of the Jaipur who were involved in the CRM campaign. 250 questionnaire were given to the customer randomly. 24% respondents were unusable as not filled completely, 190 usable questionnaires have been accumulated finally (response rate=seventy six%). In our survey, Fig 3.1 shows that 61% of the participants were male and the remaining 39% are female



**3. Analysis and Discussion**

**Objective 1- To measure EFA of CRM towards Consumer Perception**

An Exploratory Factor Analysis (EFA) of the component construction of the Consumer Perception scale utilized embraced with SPSS to inspect the element design of factors. The EFA technique utilized is "standard parts strategy" for extraction with "varimax revolution" and elements with eigen values more prominent than one were separated from everyone else held (Hair, Anderson, Tatham and Black, 1998). Factor analysis is the stage of multi - variate measurable techniques principally used to recognize the basic design in information. Factor examination alludes to the bunch of bury - reliance procedures while it sums up the data from countless factors into factors, contingent upon their relationship (Hair et al., 1998). As verified by Hair et al., (1998), moderate variable loadings of more prominent than 0.50 were to be viewed as huge at 0.05 degrees of importance.

**Result of KMO and Bartlett’s Test and Communalities Score**

To gauge the appropriateness of the information for factor investigation the amplexness of the information was assessed based on the consequences of Kaiser-Meyer-Olkin (KMO) proportions of examining sufficiency and Bartlett’s Test of Sphericity (Homogeneity of Variance). The outcomes demonstrated that the KMO proportion of inspecting sufficiency was 0.659 so the information was fit for directing the figure examination every one of the cases. Additionally, Bartlett’s Test of Sphericity (0.00) was huge ( $p < .05$ ) which too uncovered that adequate relationship existed between the criteria to continue with the utilization of exploratory factor investigation.

Table CONSUMER PERCEPTION KMO and Barlett’s Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		<b>.659</b>
Bartlett’s Test of Sphericity	Approx. Chi-Square	1522.808
	df	36
	Sig.	.000



**Results of Total Variance Explained for the Consumer Perception**

The aggregate difference of Consumer Perception, the initial three parts (factor) in the underlying arrangement have an Eigen esteems more than 1, and it represented around **85.360** percent of the watched varieties considering the feeling on resolve measurement for recognizing the criteria of the Consumer Perception.

Total Variance Explained CP									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
1	3.339	55.653	55.653	3.339	55.653	55.653	3.339	55.649	55.649
2	1.782	29.707	85.360	1.782	29.707	85.360	1.783	29.711	<b>85.360</b>

**Results of Rotated Component Matrix of Consumer Perception**

It became clear that in the factor of Consumer Perception where the four measured variables viz., CRM good way to raise, NGO feels responsible, firm acting socially and product good way were found as more correlated with component 1. Similarly, two measured variables viz., looking at advertisement and firm is interested in supporting were found as more correlated with component 2.

Rotated Component Matrix CP		
	1	2
CRM is a good way to raise funds for the cause	.945	
The Non-Governmental Organisation (NGO) feels responsible for using the CRM funds.	.859	
The firm is acting in a socially responsible manner with their CRM campaign.	.876	
The product is a way to promote and encourage the NGO	.970	
After looking at the advt., I have an urge to support the NGO		.941
The firm is interested in supporting rather than exploiting the NGO		.941

**Conclusion of Exploratory Factor Analysis**

In the present study, dimensions namely Consumer Perception are evaluated and two different models have been derived by applying Exploratory Factor Analysis (EFA). For the dimension Consumer Perception, two latent variables have been extracted.

**OBJECTIVE 2- To study the consumer awareness level towards CRM campaigns with respect to demographic variables.**



Group Statistics

Group Statistics						
	Gender	N	Mean	Std. Deviation	t-value	Sig.
Development of Remote Villages	Male	62	3.79	1.332	.169	
	Female	47	3.62	1.360	.198	
Lets put India first	Male	62	3.39	1.335	.170	
	Female	47	4.26	.896	.131	
Padhega India tabhi to Bhadega India	Male	62	4.31	.759	.096	
	Female	47	4.17	.842	.123	
Swach Adat, Swach Bharat	Male	62	3.35	1.392	.177	
	Female	47	3.74	1.093	.159	
Chotte Kadam Pragati ki aur	Male	62	3.82	1.312	.167	
	Female	47	4.13	.992	.145	
700se7kadam	Male	62	3.21	1.307	.166	
	Female	47	2.38	1.407	.205	

The above table 5.16 of descriptive Statistics provides information about the sample size (n), mean, standard deviation, and standard error for of group for the purpose of comparison of the group. In present study, there are 62 respondents were male and 47 respondents were female.

Above table also suggest better awareness level on the basis of mean. With **Development of Remote Villages-Male** (3.79) is better, in **Lets puts India first-Female** (4.26) is better, in **Padhega India tabhi to Bhadega India-Male** (4.31) is better, in **Swach Adat Swach Bharat-Female** (3.74) is better, in **Chotte Kadam Pragati ki aur-Female** (4.13) is better and in **700se7kadam-Male** (3.21) is better.

Based on the Mean, we can say that,



**Independent Sample T test**

Independent Sample T test								
		Levene's Test for -Equality of Variances		t-test for -Equality of Means				
		F	Sig.	T	Df	Sig. (2 tailed)	Mean difference	Std. Error Difference
Development of remote villages	Equal variances assumed	.161	.689	.667	107	.507	.173	.260
	Equal variances not assumed			.665	98.108	.508	.173	.261
Lets Put India first	Equal variances assumed	13.667	<b>.000</b>	-3.848	107	.000	-.868	.226
	Equal variances not assumed			-4.056	105.594	.000	-.868	.214
Pdhega India tabhi to bhadega India	Equal variances assumed	.033	.856	.885	107	.378	.136	.154
	Equal variances not assumed			.872	93.407	.385	.136	.156
Swachh Adat, Swachh Bharat	Equal variances assumed	8.528	<b>.004</b>	-1.585	107	.116	-.390	.246
	Equal variances not assumed			-1.638	106.850	.104	-.390	.238
Chotte Kadam Pragati ki aur	Equal variances assumed	3.265	.074	-1.331	107	.186	-.305	.229
	Equal variances not assumed			-1.382	107.000	.170	-.305	.221
700se7kadam	Equal variances assumed	.767	.383	3.163	107	.002	.827	.261
	Equal variances not			3.131	95.165	.002	.827	.264x





assumed							
---------	--	--	--	--	--	--	--

In order to study the level of awareness of respondents with respect to gender, Independent samples t-test was used. The CRM campaigns were taken as testing variables and gender was taken as grouping variables. Levene’s test for equality of variance was used to check whether the variances are equal for both the groups of gender i.e. males and females or not. The set of CRM campaigns displayed different levels of awareness based on the gender of the respondents. Out of six campaigns presented, only two were found to be statistically significant with respect to gender. The detailed results are presented in above Table. For **ITC Classmate- Lets put India first**, the significant value is .000 and f value is 13.667 which is statistically significant, **Similarly for Swach Adat, Swach Bharat**, the significant value is .004 and f value is 8.528 which is statistically significant. It is therefore concluded that there is a significant difference in the average scores of the male and female respondents regarding awareness for the above two stated CRM campaign.

The remaining campaigns were not found to be statistically significant for CRM awareness with respect to gender. For all the three campaign named as “Lets put India first”, “Swach Adat and Swach Bharat” and “Chote Kadam Pragati ki aur” found to be statistically significant, the mean scores of females (4.26, 3.74, 4.13) are more than the mean score of males (3.39, 3.35, 3.82), which can be observed from....reflecting a significant difference in gender wise awareness regarding CRM. Based on the means, we can say that females and males have equal level of awareness for CRM campaign.

#### 4. Findings

S.No	Objective	Statistical Tools	Result
1	To measure EFA of CRM towards Consumer Perception	EFA	For the dimension Consumer Perception, two latent variables have been extracted.
2	To study the consumer awareness level towards CRM campaigns with respect to demographic variables.	T-test	Findings reveal that females have high level of awareness for CRM campaign than males in CRM campaign named as “ <b>Lets put India first</b> ”, “ <b>Swach Adat and Swach Bharat</b> ” and “ <b>Chote Kadam Pragati ki aur</b> ”. Also there is a significant difference in the average scores of the male and female respondents regarding awareness for the <b>Lets put India first and Swach Adat and Swach Bharat</b> CRM campaign.

#### 5. CONCLUSION

The result being on the study being depicted as

- As depicted by primary objective of the study “To find study the consumer awareness level towards CRM campaigns with respect to demographic variables” and for its attainment T-test has been applied and it has been revealed that female has high level of awareness in the CRM campaign named as “Let’s put India first”, “Swach Adat and Swach Bharat” and “Chote Kadam Pragati ki aur”



- The second objective of the study is 'To measure EFA of CRM towards Consumer Perception' and for its attainment EFA has been applied on Consumer Perception and in present study, two latent variables have been extracted.

### References

- ) Agarwal, vivek. (2016). Influence of Cause related marketing campaigns on consumers' purchase intention: An empirical study in India Vivek. *International Journal in Management and Social Science*, 4(8).
- ) Bedi, S. K., & Ahluwalia, A. K. (2020). Marketing of Social Causes through Cause-Related Marketing – An Awareness Study of Young Consumers. *ENVISION – International Journal of Commerce and Management*, 14.
- ) Bina, T., & Priya, P. S. (2015). A Study on Social Cause Related Marketing and Its Impact on Customer Brand Preference. *IJISET - International Journal of Innovative Science, Engineering & Technology*, 2(9).
- ) Chaabouni, A., Jridi, K., & Bakini, F. (2021). Cause-related marketing: scepticism and warm glow as impacts of donation size on purchase intention. *International Review on Public and Nonprofit Marketing*. <https://doi.org/https://doi.org/10.1007/s12208-020-00262-3>
- ) Cone Communication (2015). 2015 Cone communication/Ebiquity global CSR study. Retrieved February 18, 2016 from <http://www.conecomm.com/2015-global-csr-study>.
- ) Irid, S. D., & Dropuljid, M. (2015). Consumers' attitudes towards cause-related marketing. *Annals of the Alexandru Ioan Cuza University-Economics*, 62(3), 343-356.
- ) Farache, F., Perks, K. J., Wanderley, L. S. O., & Sousa Filho, J. M. de. (2008). Cause Related Marketing: Consumers' Cause Related Marketing: Consumers' Perceptions and Benefits for Profit and Non- Benefits for Profit and Non-Profits Organisations. *BAR-Brazilian Administration Review*, 5(3).
- ) Hou, J., Du, L., & Li, J. (2008). Cause's attributes influencing consumer's purchasing intention: Empirical evidence from China. *Asia Pacific Journal of Marketing and Logistics*, 20(4), 363-380.
- ) La Ferle, C., Kuber, G., & Edwards, S. M. (2013). Factors impacting responses to cause-related marketing in India and the United States: Novelty, altruistic motives, and company origin. *Journal of Business Research*, 66(3), 364-373.
- ) Moharam, O. M., Elsamadicy, A. M., & Negm, E. M. (2020). Cause-Related Marketing: A Conceptual and Theoretical Review. *IOSR Journal of Business and Management*, 22(10).
- ) Parmar, B. P. (2014). Cause Related Marketing and its impact on brand preferences & brand attachment among customers at Bhavnagar city with special reference to P&G FMCG products. *International Journal of Research in Commerce, IT & Management*, 4(6).
- ) Pawlak, M., & Zasuwa, G. (2011). Influence of a company's social initiatives on the consumer attitude towards it: Results of experimental research. *Contemporary Economics*, 5(2), 80-89.
- ) Pelozo, J., & Shang, J. (2011). How can corporate social responsibility activities create value for stakeholders? A systematic review. *Journal of the Academy of Marketing Science*, 39(1), 117-135.
- ) Qamar, N. (2013). Impact of Cause Related Marketing on Consumer Purchase Intention: Mediating Role of Corporate Image, Consumers' Attitude and Brand Attractiveness. *Middle-East Journal of Scientific Research*, 16(5).



- ) Rathod, K. L., Gadhavi, D. D., & Shukla, Y. S. (2014). Effect of cause-related marketing on corporate image and purchase intention: evidence from India . *International Journal of Business and Emerging Markets*, 6(3).
- ) Shabbir, S., Kaufmann, H.R., Ahmad, I., & Qureshi, I. M. (2010). Cause related marketing campaigns and consumer purchase intentions: The mediating role of brand awareness and corporate image. *African Journal of Business Management*, 4(6), 1229-1235.
- ) Soni, S., & Soni, A. (2013). Cause related marketing: A strategy to communicate corporate social responsibility. *PRIMA Publishing India Group* 4(1), 9-15.
- ) Sung, M., & Lee, W. (2016). What makes an effective CSR program? An analysis of the constructs of a cause-related participant sport sponsorship event. *International Journal of Sports Marketing and Sponsorship*, 17(1), 56–77.

## EFFECT OF SYNCHRONOUS AND ASYNCHRONOUS METHODS OF INSTRUCTION ON 21<sup>ST</sup>CENTURY SKILLS AMONGST PROSPECTIVE TEACHERS

**Shalvi Kumari**

Faculty of Education & Methodology, Jayoti Vidyapeeth Women's University, Jaipur,  
Rajasthan

### 1.0.0. INTRODUCTION

The education systems of the world have for long moved in a linear path and although there have been progresses there have few significant technological advancements in the methods of imparting education, theoretical or practical. Education in its traditional sense had always been a process of transfer of knowledge in a formal setting. Alismail, H.A. and Patrick McGuire. (2015) observed that with the advancements in technology, the world saw in the late 20th century and the early 21st century drastically change in the nature of education itself which opened up opportunities to modernize the education system. The process of it all started with the advancements in the computer technology. With the advent of personal computers, the computer no longer stayed an advanced tool of calculation or limited use for research and data storage facilities, rather became a tool of academic convenience. 'The advent of Internet changed communication with instantaneous data transmission around the world leading to practically unlimited educational resources at the disposal of learners' (Tikam, M.V.2013). The advent of this technology led to a change in the skill set required for the professionals of the 21st century. With access to information becoming easier the emphasis on textbook knowledge has taken a backseat with other skills which determine the ethics and approach of the professional task at hand. This implies that 21st century skills are the skills which are essential for a successful and fulfilling professional and personal life in the modern world.

### 1.1.0. 21<sup>ST</sup> CENTURY SKILLS

Twenty first century skills include a few skills and qualities that an individual needs to cultivate in a professional life. These skills are a synchronism of ethics, communication skills, technological capability and personal development. In broad terms, the 21st century skills can be defined as a combination of three dimensions of skills, such as: (i) Cognitive Skill (ii) Interpersonal Skill and (iii) Intra Personal Skills. These skills do not function consecutively however their function is parallel to one another.

There are many categories in each of the dimensions of skills of 21st century skills. The categories of the first dimension Cognitive Skills are: (i) Critical thinking: It's the capacity of an individual to analyze and interpret information with an impartial and open mind to reach a fair conclusion. (Salameh, E. S. 2019). (ii) Problem Solving: Rahman, M.M (2019) defining the Concept "Problem Solving" says 'Problem Solving is a part of Critical Thinking and it helps identifying the useful pieces of information from a large data pool and use that data and previous experiences to rectify problems.' (iii) Creativity: Creativity is the ability of an individual to innovate their thinking and create new ways of approach and thought. It also encompasses the concepts of adaptability, flexibility and the ability to elaborate and expand existing ideas.

The second dimension of the 21st century skills is the Inter-Personal Skill which includes some categories. The categories of Inter-Personal skills are; (i) Communication: Defining communication skill, Chirugure, S. (2020) states that it's the ability to express the needs, opinions, perspectives, and issues that an individual faces in an effective manner, appropriately through a variety of means both verbally and non-verbally. (ii) Social Skills: these are the skills that enable a person to interact and work more efficiently in a diverse social setting and help them function better in an environment with a multitude of cultural

elements. (iii) Teamwork: which is an effort made by different individuals within the team to achieve a common goal. (iv) Cultural Sensitivity: which is understanding of cultural differences and similarities among individuals without placing a value on them. (v) Dealing with problem: is the ability to make a decision in order to improve the current situation. Together these Inter-Personal Skills enable an individual to gain information through a variety of means and help them with their learning skills. It helps them evaluate and critique the content made available to them through different platforms and enables them to communicate effectively.

The third dimension comprise of the Intrapersonal Skills. These skills themselves have several categories such as, (i) Self- Management: which is the ability to control ones action, thoughts, feelings and behavior in a way that benefits oneself. (ii) Self-Regulation: which is the capacity to comprehend and manage one's own actions and reactions. (iii) Time Management: which is the practice of managing and planning how to split the time between various activities (iv) Self Development: which is the process of acquiring new knowledge and abilities. (v) Adaptability: it means quickly changing of ones behavior in response to new situations. Thereby, it is implicit that there are genres of the skills in the 21st century that a person needs to enhance their professionalism.

#### **1.2.0. 21<sup>ST</sup> CENTURY SKILL IN TEACHER EDUCATION**

The education of teachers is crucial to be kept updated with the changes in times as this education is what later serves as the foundations of the schooling of several students under the tutelage of those teachers. Thus the skills learnt by the educators do eventually trickle down to their pupils. In research titled "Fostering 21st century skills for future teachers," Cretu D. (2017) mentions the student teachers studying in teacher education program reflected their views in the survey. Many such student teachers responded that the inclusion of 21st century skills, helps the educators to understand the methods through which such skills can be taught to the students and thus is an essential in teacher's education. In this research it was also been discovered that the process of learning of the 21st century skills essential for the student educators is not the same for every individual candidate and the ease of learning the components of the 21st century skills can vary from person to person based on their individual capabilities and experiences. As the education structure of the student teachers is centered on the methods of instruction to be used for education of students, it is crucial that the student teachers learn the methods of instructions for fostering the 21st century skills. And this is where the skills of understanding the methods of learning of the 21st century skills give them an edge towards becoming better teachers. The aforementioned study indicated that the learning of the 21st century skills during their education as prospective teachers could potentially improve their teaching skills.

Collis, B.A. (1996) in 'Technology in Teacher Education', points out the challenges being faced in teacher education. First issue is regarding the effective use of technology in Teacher Education delivery and the other is about the use of technology as Course Content. Talking about the delivery of content in teacher education program technology enhancement can be considered. A suitable channel to deliver course at a distance is by the help of computer assisted telecommunications. It was reflected in the study, 'the methods of teaching used for the instruction plays a significant impact on their capability at developing an understanding and fostering the 21st century skills'.

#### **1.3.0. SYNCHRONOUS AND ASYNCHRONOUS METHOD OF INSTRUCTION**

Teaching is a dynamic process and cannot be restricted to a singular process however there are two broad methods of instruction which encompass the various methods involved in the teaching process. These two methods are the synchronous and the asynchronous instruction. In simple terms synchronous method of instruction is when the teaching and learning happens at same time and place. It happens face to face

in a traditional classroom environment or in virtual classroom using platforms such as Google Meet, Zoom meeting application, Google Classroom, Live YouTube Sessions etc. While the asynchronous is when the times of teaching and learning are not in synchronization. It is flexible in terms of place and time wherein students can learn at their own pace using offline study materials such as pre-recorded lectures, books, articles, DVD, pen drive etc.

In online mode of Instruction several types of technical system and support can be included which make the process of instruction take place in virtual platform. Internet connectivity is a pre-requisite of carrying out online instruction which includes both synchronous and asynchronous method of Instruction.

Raj, Rita. (2009) in 'Encyclopedia of Educational technology' defines synchronous and asynchronous delivery in terms of Distance Education wherein Synchronous Delivery is the exchange of Information without delay. The traditional classroom teaching is completely Synchronous in nature. The example of Synchronous Delivery in distance education would be live audio or video transmitted among instructors and students where a certain level of real time communication is expected. The book of Encyclopedia also mentions of advantages of Synchronous Delivery as of developing motivation, tele-presence, feedback & pacing. Asynchronous Delivery on the other hand refers to all pre stored material consisting of web pages, DVDs, CDs, E-mail, pre- recorded videos, pen drives etc. Both the methods are used to deliver the content to the students.

There are several components to the Synchronous method of teaching such as the interactions between the teacher and the student that occur in real time. This form of teaching mostly occurs in a team setting and it is categorized by active interactions between the members of the team or the group. Synchronous teaching methods are further characterized by a fixed schedule of teaching which all members need to adhere to. It also results in real time problem solving and feedback for both the students and the educator. On the other hand, asynchronous teaching, the teaching and learning processes do not occur simultaneously. There are no real time interactions between the student and the teacher. Instead, the teacher records their lessons at a time and the lessons are learnt by the students at very different times. This method of teaching is characterized by, an absence of a team setting as the real time classrooms. Even video conferences are not utilized. There is an absence of real time interactions between the teachers and the students as well as absence of interactions among the students themselves. This method of teaching is also characterized by the lack of a fixed schedule as the teachers can record the lessons at their time of convenience and the student can learn those lessons at a very different time which suits them. This method of teaching also reduces repetitive work as the recorded lessons can be used multiple times. In the opinion of Islam, M.N.(2021) Synchronous and Asynchronous instruction has revolutionized the process of imparting education. The computer mediated instruction help those students whose feasibility to have access to the traditional classroom is not achievable.

Thus both synchronous and asynchronous instructional methods present the necessary means for an effective system of teaching. But how far can these methods develop learning in conventional classroom having prescribed syllabus and that too for the development of 21st Century Skills requires an investigation.

#### **1.4.0 FACTORS AFFECTING 21ST CENTURY SKILLS**

Other than the methods of instruction the previous studies indicate multiple factors which affect the proficiency of students' development of 21st Century Skills. Few of these skills are;

(1) Motivation: In a research study conducted by Talmi, Iris. et. al. (2018) on Undergraduate Engineering Project found that students who were intrinsically motivated performed well in the assigned project. Motivation is found as an important factor that has an impact on acquiring 21st Century skills.

(2) Classroom Environment: Ball, Annahita. et.al. (2016) mentioned in their study that the learning environments are useful in the development of 21st century skills amongst students, providing learning opportunities and higher perception of skills thereby enhancing their proficiency at utilizing these skills in varied settings. The learning environment incorporates factors such as, involvement, cooperation, satisfaction, role fulfilment, newness and personalization.

(3) Digital Adaptability: The evolution of technology presents a challenge to the digital skills of a learner. The ability to adapt to evolution in the technologic sphere is crucial to the digital competence serving as an integral aspect of 21st Century Skills. (Puckett, C., 2022)

(4) Digital Literacy: Proficiency in 21st century skills requires technological progression in a learning setting. Skill and support of technological ability ensures that 21st century skills are engrained in the education. (Lewin, Cathy & Sarah, McNicol., 2015)

## **2.0.0. RELATED LITERATURE**

The related literature includes previous research studies related to 21st Century Skills and Computer Mediated Instruction.

### **2.1.0. 21ST CENTURY SKILLS**

The earlier literature related to 21st century skills includes few of the studies as such;

Purohit, A.R. (2016) focused on “A study of coping skills for 21st century at secondary school level.” The objectives of the study were (i) to range over the coping skills for 21st century anticipated in students of secondary level. (ii) to create such educational activities that would help exploring the coping skills for 21st century. (iii) to prepare a tracker on the coping skills for 21st century. Ankur Vidhyalaya, Dasrath was chosen for taking out sample of the study. 40 students of IX std, six teachers and a principal were the sample of the study. Parents of selected students (Sample), adolescents of Pratap Gunj, Vadodara, Research scholars and teacher educators of Centre of Advanced Study in Education were selected. The data of the study was collected through semi-structured interviews & interview schedule, Brainstorming Sessions, 6 Focused Group Discussions, Battery of Tests, Socio metric, Moodle, Observation, Observation Schedule, Field Notes & Field Diaries and student profile. The design of this research was exploratory cum intervention study, which was qualitative in nature. The findings of the study presented the mixed scenario of the students on different coping 21st century skills. No student was found good at all the skills. Ball, Annahita. et.al.(2016) study on the topic “Exploring 21st Century Skills and Learning Environments for Middle School Youth.”, aimed to specify the characteristics and skill set required by the youth to excel after secondary education. It was an Exploratory Research. Data from 262 middle school was collected through Survey Method. Instruments of study were 21C-LCS and 21C-CE. Factor Analysis was used to interpret the data. The result of the study suggested that both cognitive and non-cognitive skills are important for the overall development of the students. It also reflected about the scales that could measure 21st Century Skills.

Boholano, Helen. (2017) conducted a research study on the topic “Smart Social Networking : 21st Century Teaching and Learning Skills.” The study utilized Mixed Method Research Design. 250 Pre-Service Teachers were selected as sample of the study. Survey Questionnaire and interview were the tools used for the purpose of data collection. The study showed that Facebook was being frequently used by pre-service teachers followed by YouTube which was being used by the pre-service teacher in the process of teaching. Pre-service teachers were also familiar with Blogging, LinkedIn and Tumblr. Pinterest was the least utilized social networking site.

Sümen, O. O., & Hamza Çalisici. (2017) in their study focused on “Examining the 21st Century Skills of Secondary School Students: A Mixed Method Study.” Two hundred and twenty two students were

selected from a secondary school in Turkey belonging from middle class socio-economic background as sample for the research. 20 students out of selected sample participated in Semi structured interview. 32 5-point Likert Rating Scale was also used to collect data from the sample. 14 female and 6 male consisted of every five students from various grade level. Mixed Method Research Design has been used as research design. The result showed that students are good at 21st century skills. Students of 8th grade were well versed in 21st century skills. The 21st century skills in female are higher than their male counterpart.

Chalkiadaki, Areti. (2018) study on the topic “A systematic Literature Review of 21st century Skills and Competencies in Primary Education.” Includes systematic literature review taken up to answer the research questions. The searching of different literatures was done using ERIC and Google scholar. The number of total texts selected for analysis were 40. The findings of the study state that the categorization of several 21st century skills are not tangible and are falling into different sections of the broader classifications.

Ganayem, Asmaa., & Wafa, Zidan. (2018) conducted a study on “21st Century Skills: Student Perception of Online Instruction Role.” The aim of the study was to inquire about the perception of the students towards the role of technology education and diversity of culture instructors in improvising their 21st century skills. The study also highlights student preference of learning style. Sample of 99 students were taken up who took participation in TEC model. The data was collected through questionnaire. The students selected from eight various teacher education colleges and different cultural backgrounds. The result of the study suggested that students preferred face to face style for learning communication followed by blended method over complete online.

Talmi, Iris et al. (2018) studied “Intrinsic Motivation and 21st-Century Skills in an Undergraduate Engineering Project: The Formula Student Project.” The aim of the study was to find out the relationship between intrinsic motivation & 21st century skills expression. 54 students participated from different departments in this study. Research tools such as in-depth interviews, questionnaires, observations were used to collect the data for this study. The findings of the study suggested that the 21st century skill expression of the students participating in Technion formula project enhanced their motivation to take part because these skills made them attain the basic needs such as autonomy, competence etc. which are the supporter of intrinsic motivation.

Cigerci, F.M. (2020) conducted a research study on the topic “Primary School Teacher Candidates and 21st century skills” The purpose of the study was to find the effects of digital story telling on the enhancement of 21st century skill among teacher candidates. Explanatory Sequential research design has been used in this research study. A sample of 42 teacher candidates, 29 females and 13 males have been selected for the study. 21st century skills and competences scale directed at teaching candidates and structured interviews were the tools used for data collection. The result of the study suggested that the score of post-test was higher than that of the pre-test on 21st century skills analysis.

Gratani, Francesca & Lorella, Giannandrea. (2022) research titled, “Towards 2030. Enhancing 21st Century Skills through educational robotics.” The aim of the study was to incorporate robotics in education into the primary & junior secondary curriculum in school. The project was created through longitudinal approach & multidisciplinary approach and the methodology taken up was Design-based Implementation Research. Size of the sample was fifty 4th & 5th Students from Italy till the following years at school. The comparative findings of the study showed progress in leadership & interpersonal skills as compared to results in the 1st phase.

### **2.2.0. SYNCHRONOUS AND ASYNCHRONOUS METHOD OF INSTRUCTION**

The preceding studies related to computer mediated instruction comprise some of the following titles



which are;

Carroll, Noel. (2011) whose research topic “Evaluating online Asynchronous support in the institutes of technology Ireland.” aimed to find about the perception of the students using asynchronous way of learning in an e-learning course. Survey method has been used in this research study, the data was collected using online questionnaire. The research got right response from 448 pupils across the Irish IoTs. The result of the study showed that synchronous assisted tools are considerably underused in the IoTs and are not that useful in meeting the learning needs of the students. Email proved to be an important means of communication.

Karal, H., et al. (2011) studied the “perceptions of Students who take Synchronous Course through Video Conferencing about Distance Education.” The objective of the study is to know the perception about distance learning course from the students taking synchronous distance education classes through video conferencing. The study used a qualitative research approach. Total 9 students from two different undergraduate levels at Karadeniz Technical University were selected as sample of the research through focused sampling. The data collection tools used to collect data from the sample was Semi-structured interviews and observations. Descriptive data analysis technique was taken up to analyze the data. The findings of the study suggest that the process of communication between students and teacher in the synchronous teaching was weak in the first week that gradually improved from the next week. Students felt satisfied by the technical equipments that were being used in the synchronous class. Some students also asserted that they felt more comfortable and could concentrate in a better way in the synchronous class through video conferencing.

Jacob, S.M. (2012) conducted a research study on “Mathematical achievement and Critical thinking skills in asynchronous discussion forums.” A relation between critical thinking and maths marks of engineering students had been checked among two groups of students. 43 students in group A and 60 students in group B were sample of the study. Data was collected using different ways being ODF postings, internal Maths scores and final exam scores. The result suggested that improved Critical thinking skill would help in achieving great results in Maths.

LeShea, A. V. (2013) carried out a research on the topic “The Effects of Synchronous Class Sessions on Students’ Academic Achievement and Levels of Satisfaction in an online Introduction to Computer Course.” The purpose of the study was to test the effect of live, synchronous class in online computer class. The size of the sample was 61. Quasi-experimental research design has been used to carry out the research. T-test was used to analyse the data. Data was presented using Histograms. The findings of the study showed that students who studied non-synchronously scored higher in their exam than the synchronous group students.

Woodcock, Stuart et al. (2015) studied “The Learning Experience: Training Teachers Using Online Synchronous Environments.” The research studied the efficacy of synchronous platform being used to train pre service teachers. A blended learning approach was executed. Total number of participants in the course were 53. Both qualitative and quantitative approach have been used in the study. Data was collected through interview and survey. Statistical and thematic content analysis were used to analyze the data. The result of the study proved synchronous way to be an effective tool in training pre service teachers.

Kannan, Kalpana., & K, Narayanan. (2015) studied “Synchronous Teacher Training in India : A study of perception and satisfaction of the participants.” The study showed the results of survey of 14 workshops carried out through distance synchronous mode from 2009 to 2013. The objective of the study was to know whether the training program was accessible to the target group and to get the perception

and level of satisfaction of the participants. Size of the sample was 450 initially and later exceeded by 3700. Online survey was used to collect data. Questionnaire was the tool to collect the data. The result showed that the workshop could not reach the target group. The female teachers and the teachers in colleges based in rural areas had less opportunity.

Kuo, Ping-Hong. (2016) conducted a research study on the topic “Effects of synchronous web-based instruction on students’ Thinking styles and creativity.” The sample of the study consisted of teachers and students of public as well as private universities in Kaohsiung city. Total 600 questionnaire copies were distributed out of which 428 well founded copies are collected. The findings suggested that thinking styles were affected by synchronous web-based instruction. Creativity too was influenced by synchronous web-based instruction in a positive way.

Berry, Sharon. (2017) conducted a research study on “Educational Outcomes of Synchronous and Asynchronous High School Students: A Quantitative Casual-Comparative Study of Online Algebra 1.” The research design chosen to carry out the research study was ex post facto design. Students who enrolled into online courses in the United States were the target population of the study. The sample of the study were the 499 Algebra I pupils at the Cyber Charter school. The data for the study was collected through final course grade, grades retrieved from school database and questionnaire. The data was analyzed using SPSS. Chi-square and t-test statistical techniques were used to analyze data. The findings of the study showed that students scored good marks through asynchronous learning unlike synchronous learning.

Deepa, F & R, Muthaiyan.(2017) in their book “E-Learning” entitled ‘Concept of E-Learning’ have defined e-learning as an innovative application of teaching-learning process allowing learning to take place in a flexible space and time and is highly superior to traditional ways of imparting knowledge. It introduces the students to a rich learning environment which supersedes the learning experiences in the crowded classrooms. It takes individual differences into consideration. Synchronous and Asynchronous training are two important categories of E-Learning. In Synchronous Mode of Training the teaching takes place in real time. Contrary to this Asynchronous Mode of Training is not time or location dependent. This mode is quite effective when massive discussion between students and teachers are not required.

Francescucci, Anthony., & Laila, Rohani. (2019) conducted a research study on the topic “Exclusively Synchronous Online (VIRI) Learning: The Impact on Student Performance and Engagement Outcomes.” This research study was conducted at a large University of North America situated in the urban area. A sample of 698 participants was taken up. The level of student engagement and performance was compared using quasi-experimental research design. Exams were conducted to know the level of performance and engagement. The findings of the study stated that mixed results could be seen at both the levels.

Corfman, Timothy., & Dennis, Beck. (2019) carried a research study on the topic “Case study of creativity in asynchronous online discussions.” The aim of the study was to find out the effectiveness of online courses in developing creativity by the use of asynchronous online content, materials developed by teachers etc. Case study approach had been used in this study. Data was collected through individual interviews from students opted for the course and the teacher taking up the course. Two staged data analysis method has been used in the study. The result of the study suggested that project based, problem based and heuristic prompts taken up in asynchronous online teaching helps in promoting creativity.

Ogbonna, C. G.et.al. (2019) conducted a research study on the topic “Synchronous versus asynchronous e-learning in teaching word processing: An experimental approach.” The aim of the study was to investigate the impact of synchronous and asynchronous e-learning on achievement of cognitive academic and practical skills attainment in processing of words. Quasi-experimental design was used to carry the research. 70 junior secondary school students of ages 10–12 were taken up as the sample consisting of

two intact classes from the two schools. WPSAT and WPCAT consisting of 40 questions each were the two instruments taken up for the study. The results of this study show that teaching word processing through synchronous and asynchronous e-learning modes enhanced the cognitive academic achievement of students in word processing. The data also reflects that students taught through asynchronous e-learning showed greater cognitive achievement than those taught through synchronous e-learning.

Nejad, N. M.et.al. (2021) conducted a research study on the topic “ The effect of synchronous and asynchronous computer-mediated communication (CMC) on learner’s pronunciation achievement.” The purpose of the study was to examine the efficacy of one to one synchronous and asynchronous voice computer mediated communication on EFL Learner’s achievement in pronunciation. Experimental Design was used to carry out the research. Size of the sample was 45 of which 15 participants were in control group and 30 were in experimental group. Lexical stress test and phonemic discrimination test were used in the research. The result of the study suggested positive effect of CMC based instruction as compared to F-F oriented instruction. Also there was no significant difference witnessed between two CMC modes of instruction. Synchronous mode of instruction proved to be very effective than other modes of instruction in terms of learning pronunciation. The role of technology has a great importance in learning pronunciation.

Mukhopadhyay, Marmar.(2022) in his book “Educational Technology for Teachers.” entitled ‘Online Education’ has provided a wide range of information about Online Education. Online Education is a way through which knowledge is imparted using online means of instruction, internet. In this mode of education all the teaching activities are conducted online like teaching, discussion, assignment submission, feedback and so on. Basically, there are 3 ways through which online education takes place, they are Synchronous, Asynchronous & Hybrid. In Synchronous Mode both teachers & learners interact simultaneously with each other. The interaction can take place through audio or video chat (e.g., Google Meet, Google Classroom, Zoom, etc.). On the other hand Asynchronous Mode of instruction no interaction takes place in real-time. Learners get the content materials and assignments. They can work at their own pace in a given time period. The Hybrid mode also known as Blended mode. It is the combination of both Synchronous as well as Asynchronous mode of Analysis.

## CONCLUSION

The metrics of previous study on the impacts of the methods of instruction are categorized into the hierarchy of variables in order to create productive research. The literature of the earlier studies available is carried out to study these variables to attain the understanding of the research process and findings. Among the length of literature studied many reflect a pattern of positive as well as adverse outcomes. Of the 22 literature perused through the course 9 studies were conducted in 21st Century Skills wherein different techniques and research methods have a exhibited significant impact on understanding and learning of 21st Century skills. However, some studies related to 21st Century such as of Sümen, Ö.Ö., & Hamza ÇALIŞICI. (2017) & Chalkiadaki, Areti. (2018) did not observe any significant impact on the learning of the 21st century skills among the students.

The studies conducted to find the impacts of different strategies reflects that the students have a tangible preference for one or the other teaching techniques and this preference reflects in the learning outcomes that these teaching techniques have on the students. But there are 4 studies as that of Francescucci, Anthony., & Laila, Rohani.(2019). Thomas, J.(2013) ,Mulcahy, K.F, Burns, Sharon., et.al. (2014) & Cunningham, J.(2014), Jacob, M.S. (2012) who neither found any significant preference of the students from the two different teaching techniques and nor were there any significant differences in the academic

outcomes. A few studies were observed on 21st Century Skills in respect to motivation, and learning environment as those mentioned by Talmi, I. et al. (2018) & Ball, Annahita. et al. (2016).

Among the other 13 studies conducted on Computer Mediated Instruction reveals the findings of 4 studies carried out by Nejad, N.M. et al. (2021), Woodcock, Stuart. et al. (2015), Kuo, Ping-Hong. (2016) & Karal, H., et al. (2011), that Synchronous mode of Instruction has positively impact on learning. Whereas, the 5 studies conducted by Ogbonna, C. G. et al. (2019), Corfman, Timothy & Dennis, Beck (2019), Berry, Sharon (2017) LeShea, A. V. (2013) & Carroll, Noel. (2011) exhibit that students showed a positive outlook towards Asynchronous mode of Instruction. This exhibits that computer mediated instruction is a powerful method of instruction to be opted for teaching learning process.

Several researches on Computer Mediate Instruction had been carried out in discipline of English, Mathematics, Computer science and Robotics, but rarely any study has been carried out on Teacher Education or on undergraduate teacher trainees. Only 1 study carried out by Ball, Annahita. et al. (2016) included the modelling factors affecting 21st Century Skills of Indonesian student teachers.

Moreover, from the earlier mentioned studies it is apparent that most of the studies have been done in foreign countries and only a few are in the Indian context. Only 1 Indian study mentions development of 21st Century Skills and 3 studies explored the area of CMI. One study that focused on technology enhanced learning, limited itself to creativity & motivation, whereas 21st Century Skills encompasses several other academic skills. The other observation was the inconsistency in the researches towards attainment of 21st Century skills. Where some studies agreed to attainment of 21st century skill two studies denied its attainment. (Sümen, Ö.Ö., & Hamza ÇALIŞICI, 2017 & Chalkiadaki, Areti. 2018)

The preceding study does focus the importance of instructional method for effective system of teaching but this study was conducted in respect to distance education. And the studies were either related to synchronous mode of instruction or asynchronous mode of instruction. None of the studies opted the hybrid mode CMI of instruction. So how far can Computer Mediated Instruction (CMI) develop 21st Century skills needs investigation? Moreover when a prescribed syllabus is transacted through CMI what will be the effect requires examination. These observation instigated the investigator towards some of the queries which are; (1). Can methods of teaching be used for instruction in developing 21st century skills among prospective teachers? (2). How far can CMI develop 21st century skills when following the prescribed syllabus of teacher training program? (3) Which of the aspects such as the subject background, motivation, classroom atmosphere, digital literacy, or digital adaptability respectively would have an interactive effect on 21st century skills? (4) What shall be the reaction of the participants when units of syllabus will be taught through Computer Mediated Instruction? These afore mentioned aspects paved the way to explore the impact of computer mediated instruction on attainment of 21st Century Skills.

## 12.0.0. BIBLIOGRAPHY

- Alismail, H. A., & Patrick, McGuire. (2015). 21st century standards and curriculum: Current research and practice. *Journal of Education and Practice*, 6(6), 150-154. <https://files.eric.ed.gov/fulltext/EJ1083656.pdf>
- Ball, Annahita. et al. (2016). "Exploring 21st century skills and learning environments for middle school youth." *International Journal of School Social Work*, 1(1), 1-17. <https://doi.org/10.4148/2161-4148.1012>
- Berry, Sharon. (2017). *Educational Outcomes of Synchronous and Asynchronous High School Students: A Quantitative Causal-Comparative Study of Online Algebra 1* (Doctoral dissertation, College of Professional Studies, Northeastern University, Boston, USA., Massachusetts. <https://repository.library.northeastern.edu/files/neu:cj82qm059/fulltext.pdf>
- Boholano, Helen. (2017). *Smart social networking: 21st century teaching and learning skills*. Research in

Pedagogy, 7(1), 21-29. DOI:10.17810/2015.45

Burns, Sharon., et.al. (2014). Asynchronous online instruction: Creative collaboration for virtual student support. *CEA Critic*, 76(1), 114-131. DOI:10.1353/cea.2014.0007

Carroll, Noel. (2011). Evaluating online asynchronous support in the institutes of technology Ireland. *The All Ireland Journal of Teaching and Learning in Higher Education*, 3(2), 50-70. [https://www.researchgate.net/publication/259609775\\_Evaluating\\_Online\\_Asynchronous\\_Support\\_in\\_the\\_Institutes\\_of\\_Technology\\_Ireland](https://www.researchgate.net/publication/259609775_Evaluating_Online_Asynchronous_Support_in_the_Institutes_of_Technology_Ireland)

Chalkiadaki, Areti. (2018). A systematic literature review of 21st century skills and competencies in primary education. *International Journal of Instruction*, 11(3), 1-16. [https://www.e-iji.net/dosyalar/iji\\_2018\\_3\\_1.pdf](https://www.e-iji.net/dosyalar/iji_2018_3_1.pdf)

Chandra, Ramesh. (2003). *Universal Education and Technology in 21st Century. Impact of Media and Technology in Education*, vol.3, 72-81. Kalpaz Publications.

Chiruguru, S.B. (2020). The essential skills of 21st century classroom (4Cs). *Shingania University* [https://www.researchgate.net/publication/340066140\\_The\\_Essential\\_Skills\\_of\\_21st\\_Century\\_Classroom\\_4Cs](https://www.researchgate.net/publication/340066140_The_Essential_Skills_of_21st_Century_Classroom_4Cs), 1-13. [https://www.researchgate.net/profile/Suresh-Chiruguru/publication/340066140\\_The\\_Essential\\_Skills\\_of\\_21st\\_Century\\_Classroom\\_4Cs/links/5e75277d4585157b9a4d9964/The-Essential-Skills-of-21st-Century-Classroom-4Cs.pdf](https://www.researchgate.net/profile/Suresh-Chiruguru/publication/340066140_The_Essential_Skills_of_21st_Century_Classroom_4Cs/links/5e75277d4585157b9a4d9964/The-Essential-Skills-of-21st-Century-Classroom-4Cs.pdf)

Cigerci, F.M. (2020). Primary School Teacher Candidates and 21st Century Skills. *International Journal of Progressive Education*, 16(2), 157-174. DOI: <https://doi.org/10.29329/ijpe.2020.241.11>

Collis, B.A. (1996). *International Encyclopedia of Educational Technology*. In Tjeerd, Plomp & Donald, P.E. (Eds.), *Technology in Teacher Education*, 534-538. Pergamon.

Corfman, Timothy., & Dennis, Beck. (2019). Case study of creativity in asynchronous online discussions. *International Journal of Educational Technology in Higher Education*, 16(1), 1-20. <https://educationaltechnologyjournal.springeropen.com/articles/10.1186/s41239-019-0150-5>

Cretu, D. (2017). Fostering 21st century skills for future teachers. *The European Proceedings of Social & Behavioural Sciences*, 23, 672-681.

Deepa, F. & R., Muthaiyan. (2017). *E-Learning. Concept of E-Learning*. 1-9, A.P.H. Publishing Corporation.

Fraser, Barry J. (2014). *Classroom Environment, Instrument for assessing Classroom Environment*. 14-71 Routledge Publication, London, UK. <https://doi.org/10.4324/9780203125885>

Francescucci, Anthony., & Laila, Rohani. (2019). Exclusively synchronous online (VIRI) learning: The impact on student performance and engagement outcomes. *Journal of Marketing Education*, 41(1), 60-69. <https://doi.org/10.1177/0273475318818864>

Ganayem, Asmaa., & Wafa, Zidan. (2018). 21st Century Skills: Student Perception of Online Instructor Role. *Interdisciplinary Journal of E-Learning & Learning Objects*, 14, 117-141. <https://doi.org/10.28945/4090>

Gratani, Francesca & Lorella, Giannandrea. (2022). Towards 2030. Enhancing 21st Century Skills through educational robotics. *Frontiers in Education*. 7:955285. doi: 10.3389/feduc.2022.955285

Guay, Fedric. et.al (2000). On the assessment of situational intrinsic and extrinsic motivation: The Situational Motivational Scale. *Motivation & Emotion*, 24(3), 175-213. [https://scholar.google.com/scholar?](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=onassessment+of+situation+intrinsic+and+extrinsic+motivation+&btnG=Islam,M.N(2021).OnlineTeaching-Learning:AToolforcontinuingEducation.AWeeklyJournalofHigherEducation,59(43),26-31.)

[hl=en&as\\_sdt=0%2C5&q=onassessment+of+situation+intrinsic+and+extrinsic+motivation+&btnG=](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=onassessment+of+situation+intrinsic+and+extrinsic+motivation+&btnG=Islam,M.N(2021).OnlineTeaching-Learning:AToolforcontinuingEducation.AWeeklyJournalofHigherEducation,59(43),26-31.)

Islam, M.N. (2021). Online Teaching-Learning: A Tool for continuing Education. *A Weekly Journal of Higher Education*, 59(43), 26-31.

Jacob, S. M. (2012). Mathematical achievement and critical thinking skills in asynchronous discussion

- forums. *Procedia-Social and Behavioral Sciences*, 31, 800-804. <https://doi.org/10.1016/j.sbspro.2011.12.144>
- Joynes, Chris. et al. (2019). 21st Century Skills: Evidence of Issues in Definition, Demand and Delivery for Development of Contexts (K4D Helpdesk Report). [https://assets.publishing.service.gov.uk/media/5d71187ce5274a097c07b985/21st\\_century.pdf](https://assets.publishing.service.gov.uk/media/5d71187ce5274a097c07b985/21st_century.pdf)
- Kannan, Kalpana., & K. Narayanan. (2015). Synchronous teacher training in India: A study of perceptions and satisfaction of the participants. *International Journal of Information and Education Technology*, 5(3), 200-207. DOI:10.7763/IJiet.2015.V5.502
- Karal, H., et al. (2011). Perceptions of students who take synchronous courses through video conferencing about distance education. *Turkish Online Journal of Educational Technology*, TOJET, 10(4), 276- 293. [https://www.researchgate.net/publication/285676885\\_Perceptions\\_of\\_students\\_who\\_take\\_synchronous\\_courses\\_through\\_video\\_conferencing\\_about\\_distance\\_education](https://www.researchgate.net/publication/285676885_Perceptions_of_students_who_take_synchronous_courses_through_video_conferencing_about_distance_education)
- Koutsabasis, Panayiotis., et al. (2011). Perceived impact of asynchronous e-learning after long-term use: Implications for design and development. *Intl. Journal of Human-Computer Interaction*, 27(2), 191-213. DOI:10.1080/10447318.2011.537206
- Kuo, Ping-Hong. (2016). Effects of synchronous web-based instruction on students' thinking styles and creativity. *EURASIA Journal of Mathematics, Science and Technology Education*, 12(3), 609-619. <https://doi.org/10.12973/eurasia.2016.1234a>
- LeShea, A. V. (2013). The effects of synchronous class sessions on students' academic achievement and levels of satisfaction in an online introduction to computers course. Doctoral dissertation, Liberty University, Lynchburg, VA. <https://digitalcommons.liberty.edu/doctoral/769/>
- Lewin, Cathy., & Sarah, McNicol. (2015). Supporting the development of 21st century skills through ICT. *KEYCIT 2014-Key Competencies in Informatics and ICT*, (7), 181-198. [https://publishup.uni-potsdam.de/opus4-ubp/frontdoor/deliver/index/docId/8267/file/cid07\\_S181-198.pdf](https://publishup.uni-potsdam.de/opus4-ubp/frontdoor/deliver/index/docId/8267/file/cid07_S181-198.pdf)
- Majumdar, Sonia., & Sangeeta, Chauhan. (2021). Effectiveness of Online Teaching-Learning in Indian Classroom. *A Weekly Journal of Higher Education*, 59(35), 12-21.
- Mukhopadhyay, Marmar. (2022). *Educational Technology for Teachers*. Online Education. 340-360. Shipra Publications.
- Nadda, J. B. et al. (2021). Remote Teaching: Methods, Tools and Technologies. *A Weekly Journal of Higher Education*, 59(36), 3-11.
- Nejad, N. M. et al. (2021). The effect of synchronous and asynchronous computer-mediated communication (CMC) on learners' pronunciation achievement. *Cogent Psychology*, 8(1), 1872908. <https://doi.org/10.1080/23311908.2021.1872908>
- Ogbonna, C. G. et al. (2019). Synchronous versus asynchronous e-learning in teaching word processing: An experimental approach. *South African Journal of Education*, 39(2), 1-15. <https://eric.ed.gov/?id=EJ1220064>
- Puckett, C. (2019). CS4Some? Differences in Technology Readiness. *Harvard Educational Review* 89 (4):554-87
- Puckett, C. (2022). Digital Adaptability: A new measure for digital inequality research. *Social Science Computer Review*, 40(3), 641-662. <https://journals.sagepub.com/doi/10.1177/0894439320926087>
- Purohit, A. R. (2016). A Study of Coping Skills for 21st Century at Secondary School Level (Doctoral dissertation, Maharaja Sayajirao University of Baroda (India)). [http://www.educationindiajournal.org/home\\_art\\_avi.php?path=&id=289](http://www.educationindiajournal.org/home_art_avi.php?path=&id=289)
- Rahman, M. M. (2019). 21st Century Skill "Problem Solving": Defining the Concept. *Asian Journal of*

- Interdisciplinary Research, 2(1), 64-74. <https://doi.org/10.34256/ajir1917>
- Raj, Rita. (2009). Global Encyclopedia of Educational Technology. Synchronous/Asynchronous Delivery. 334-335. Global Vision Publishing House.
- Salameh, E.S. (2019). Critical thinking as a 21st century skill: conceptions, implementation and challenges in the EFL classroom. *European Journal of Foreign Language Teaching*, 4(1), 1-16. DOI: 10.5281/zenodo.2542838.
- Saxena, Karunesh., & Sandeep, Soni. (2021). Blended Learning Models. *A Weekly Journal of Higher Education*, 59(43), 13-19.
- Sümen, Ö. Ö., & Hamza ÇALIŞICI. (2017). Examining the 21st century skills of secondary school students: A mixed method study. *Journal of Education and Social Policy*, 4(4), 92-100. DOI: 10.30845/jesp
- Talmi, Iris. et.al. (2018). Intrinsic Motivation and 21st-Century Skills in an Undergraduate Engineering Project: The Formula Student Project. *Higher Education Studies*, 8(4), 46-58. DOI: 10.5539/hes.v8n4p46
- Tikam, M.V. (2013). Impact of ICT on Education. *International Journal of Information Communication Technologies and Human Development (IJICTHD)*, 5(4), 1-9. <https://dl.acm.org/doi/abs/10.4018/ijicthd.2013100101>
- Vikas, Om., & G, Gopalkrishnan. (2022). Views on Online Teaching and Learning Processes and National Education Policy-2022. *A Weekly Journal of Higher Education*, 60(18), 3-7.
- Woodcock, Stuart. et.al. (2015). The learning experience: Training teachers using online synchronous environments. *Journal of Educational Research and Practice* 5(1), 21-34. DOI: 10.5590/JERAP.2015.05.1.02

## Formulation Development and Evaluation of Herbal Cream for Candidiasis

Shilpa Thakur<sup>1</sup> and Sharav Desai<sup>2\*</sup>

<sup>1</sup>Department of Pharmaceutics,

Jayoti Vidyapeeth Women's University, Jaipur (Rajasthan), India.

<sup>2</sup>Department of Pharmaceutics,

Sanjivani College of Pharmaceutical Education and Research, Kopergaon (Maharashtra), India.

(Corresponding author: Sharav Desai\*)

(Received: 16 December 2022; Revised: 22 January 2023; Accepted: 26 January 2023; Published: 01 February 2023)

(Published by Research Trend)

**ABSTRACT:** The present work describes the formulation and evaluation of topical herbal cream prepared from the leaf extract of *Camellia sinensis* effective against the yeast *Candida albicans*. The physicochemical and phytochemical screening was performed for the extract along with antifungal activity and minimum inhibitory concentration. The herbal cream was optimized using different concentrations of white petrolatum and lanolin as independent variables; Spreadability, viscosity, zone of inhibition, and % drug release as dependent variables using 3<sup>2</sup> factorial designs. The optimized formula was evaluated by different parameters like anticandidal activity, pH, Spread ability, viscosity, homogeneity, consistency, acid value, saponification value, thixotropy study, *in vitro* drug release study, comparison with marketed formulation, skin irritation study, and stability study. FTIR study showed compatibility of excipients with the extract. The optimized formulation was found brown, having a characteristic odor, pH 6.7, zone of inhibition was 14.96 ± 0.11 mm, Spreadability 15.13 gm.cm/sec, viscosity 1556 cps, homogenous, consistency 5.5 mm, acid value 0.66 and saponification value 185. The drug release was found to be 84.41 % over 180 minutes. Further, an animal study showed no skin irritation, and the prepared formulation was found to be stable. *Camellia sinensis* extract showed good antifungal activity against the yeast *Candida albicans*.

**Keywords:** *Camellia sinensis*, *Candida albicans*, Candidiasis, herbal cream, herbal formulation.

### INTRODUCTION

Fungal infections of the skin, hair, or nails affect 25 % of the world's population (~1.5 billion) (Havlickova *et al.*, 2008). Candidiasis is a fungal infection caused by yeast that belongs to the genus *Candida*. There are over 20 species of *Candida* yeast that can cause infection in humans, the most common of which is *Candida albicans* (Fallis *et al.*, 2013). *Candida* yeast normally lives on the skin and mucous membranes without causing infection, however, overgrowth of these organisms can cause symptoms to develop. It affects 5 - 7 % of newborns, 9 - 13 % of AIDS patients, and 20 % of cancer patients (Havlickova *et al.*, 2008). The common cause of Candidiasis may be the frequent use of antibiotics that destroy harmful and disease-causing microorganisms in the body, but may also destroy the beneficial microorganisms which help keep the growth of fungi (yeast) in check. It is also recorded that untreated candidiasis infections resulted in systemic infection with the involvement of other internal organs. Furthermore, this infection is common to occur in immunocompromised individuals like in patients with leukemia, or lymphoma as they consumed corticosteroids or cytotoxic drugs which compromised their immunity. Antibiotic usage, diabetes, pregnancy,

use of oral contraceptives, HIV, TB, and hypoparathyroidism are other conditions where candidiasis is found infect commonly. Patients with Xerostomia in which they are in absence of antifungal proteins like histatin and calprotectin are liable to get candidiasis more commonly than other individuals. The most common antifungal agents recommended for candidiasis are derivatives of azoles, Echinocandins, polyenes, nucleoside analogs like flucytosine and allylamines, and thiocarbamates are also known to have antifungal activities (Vanani *et al.*, 2019). The destruction of these microorganisms may lead to uncontrolled multiplication resulting in yeast infection. Other causes may be metabolic disturbances like diabetes, weakened or undeveloped immune systems, people working in wet conditions, etc (Armayanti *et al.*, 2021; Lawton, 2018). The clinical manifestations include rashes (area of reddening, usually itchy), red or purple patches (area with an altered surface), white substance over the affected area, scaling (shedding of the skin with flakes), cracking (cracks in the skin), soreness, erythema (area of redness), maceration (appearance of soft white skin) and creamy satellite pustules at margins of affected areas (pimples filled with pus) (Armayanti *et al.*, 2021; Lawton, 2018).



Herbal drugs are defined as a branch of science where plant-based formulations are used to treat diseases. It is also known as phytomedicine or botanical medicine. In the earlier times, when analgesics and antibiotics were not yet discovered herbal medicines were used as the primary healthcare system. Recently a shift has been observed in the universal trend from synthetic back to herbal medicine, which can be said "Return to Nature". The search for eternal health, longevity, and remedies to relieve pain and discomfort made man explore his surrounding and found the use of many plants, minerals, and animal products, etc. for the development of various therapeutic agents (Diorio *et al.*, 2020; Sharma *et al.*, 2008). *Camellia sinensis* L. (Green tea) is an important commercial plant that is produced in over 30 countries and has been consumed worldwide primarily as a beverage made from processed leaf (Rha *et al.*, 2019). It contains a broad spectrum of active ingredients like polyphenols, methylxanthines, flavanols, amino acids, glycosides, etc. The amount of catechins is higher in green tea as compared to other varieties which are rich dietary source. These compounds in green tea are well known for their broad spectrum of biological activities such as antidiabetic, anti-carcinogenic, antioxidant, anti-inflammatory, anti-hypertensive, and antitumor functions. Recent research has shown *Camellia sinensis* to have a wide range of antimicrobial activity (Liczbi ski and Bukowska 2022; Mabe *et al.*, 1999; Sakanaka *et al.*, 2000).

## MATERIALS AND METHODS

**Materials:** *Candida albicans* (MTCC, Chandigarh), *Camellia sinensis* (Hindustan Biosynth Ltd.), White petrolatum, Liquid paraffin (AaturInstru Chem), Lanolin, Triethanolamine (Chemdyes), Stearic acid (Suvidhinath laboratory), Propylene glycol (Qualikems), Tween 60 (Krishna-Chem), Methylparaben (Oxford laboratory), Propylparaben (Chiti-Chem Corporation), Potato Dextrose Agar medium, Sabouraud Dextrose Agar medium (HIMEDIA).

**Physicochemical characteristics** (Natekar *et al.*, 2022; Xue-Feng *et al.*, 2011)

The percentage of moisture content, ash value, acid insoluble ash, water soluble ash, alcohol extractive value, and water extractive value of *Camellia sinensis* extract was determined according to WHO guidelines on quality control methods for medicinal plant materials (Table 3).

**Phytochemical screening** (Natekar *et al.*, 2022; Xue-Feng *et al.*, 2011)

The extract was tested for phytochemicals present in the extract as per the textbook of Practical Pharmacognosy for the detection of alkaloids, carbohydrates, glycosides, tannins and phenolic compounds, steroids, flavonoids, and saponins (Table 4).

**FTIR Study.** The FTIR study of *Camellia sinensis* was carried out using a pressed pellet technique in which KBr was dried in a hot air oven and this dried KBr was used for the preparation of pellets of extract. The prepared pellet was placed in a sample holder and the scanning range used was 4000 to 400  $\text{cm}^{-1}$  to obtain the spectra (Table 5 and Fig. 1).

**Determination of antifungal activity (Satpathy *et al.*, 2011)**

**Standard:** -Amphotericin B

(500  $\mu\text{g/ml}$ , 1000  $\mu\text{g/ml}$ , 1500  $\mu\text{g/ml}$ )

**Test solution:** -*Camellia sinensis* leaf extract

(500  $\mu\text{g/ml}$ , 1000  $\mu\text{g/ml}$ , 1500  $\mu\text{g/ml}$ )

Sabouraud dextrose agar acquired from HIMEDIA was used as a medium. It was filled in tubes and sterilized by autoclave. These tubes were stabilized at 45°C and seeded with 0.1 ml of a broth culture of *Candida albicans*. After complete mixing, these tubes were poured into sterile petri-plates and allowed to be set at room temperature. Wells were bored using a sterile borer size 5 and an internal diameter of 10 mm. Each well was filled with different concentrations of *Camellia sinensis* leaf extract aqueous solution. These plates were incubated overnight at 25°C and observed for the zone of inhibition after 24 hrs, 48 hrs, and 72 hrs (Table 6 and Fig. 2).

The same procedure was carried out for the standard solution of Amphotericin B prepared in methanol.

**Determination of MIC (P. Sharma *et al.*, 2021).**

Different concentrations of *Camellia sinensis* extract were prepared. Potato Dextrose Agar (PDA) medium was taken in test tubes and 200, 400, 600, and 800  $\mu\text{g/ml}$  concentrations of *Camellia sinensis* extract were added to it. The control test tube was used having only PDA (without extract). In each of these test tubes,  $10^3$  cells of *Candida albicans* in 0.02 ml volume were added. These test tubes were poured into sterile petri-plates and incubated at 28°C for 72 hrs. The number of colonies was then counted and the concentration that showed zero colonies was considered MIC.

**Standard calibration curve.** 100 mg *Camellia sinensis* extract was diluted upto 100 ml with phosphate buffer pH 7.4 (1000  $\mu\text{g/ml}$ ). Different aliquots of 0.5, 1.0, 1.5, 2.0, 2.5, and 3.0 ml were transferred to a volumetric flask and diluted upto 10 ml with phosphate buffer pH 7.4 (50 - 300  $\mu\text{g/ml}$  respectively). The absorbance was measured at 274 nm using phosphate buffer pH 7.4 as a blank solution using a UV spectrophotometer (Table 7 and Fig. 3).

**Preparation of cream formulation:** The oil phase was prepared by dissolving oil-soluble components (White petrolatum, liquid paraffin, lanolin, stearic acid) at 75°C. The aqueous phase containing extract was also prepared by dissolving water-soluble components (Propylene glycol, triethanolamine, tween 60, methyl paraben, propyl paraben) and heated at 75°C. After the oil phase and aqueous phase reached the same

temperature, the oil phase was added to the aqueous phase with continuous stirring until the mixture cooled. 3<sup>2</sup> factorial design was used and the parameters

Spreadability, viscosity, zone of inhibition, and % drug release were evaluated for optimization of the batch using Design Expert software 10.0.0.

**Table 1: Composition of cream formulations based on factorial design.**

	White Petrolatum	Liquid Paraffin	Lanolin	Stearic acid	Propylene glycol	Triethanolamine	Tween 60	Methyl Paraben	Propyl Paraben	Water (upto 100ml)
F1	0.6	8.3	0.6	16.7	3.5	1.0	5.0	0.18	0.02	q.s
F2	0.6	8.3	0.8	16.7	3.5	1.0	5.0	0.18	0.02	q.s
F3	0.6	8.3	1.0	16.7	3.5	1.0	5.0	0.18	0.02	q.s
F4	0.8	8.3	0.6	16.7	3.5	1.0	5.0	0.18	0.02	q.s
F5	0.8	8.3	0.8	16.7	3.5	1.0	5.0	0.18	0.02	q.s
F6	0.8	8.3	1.0	16.7	3.5	1.0	5.0	0.18	0.02	q.s
F7	1.0	8.3	0.6	16.7	3.5	1.0	5.0	0.18	0.02	q.s
F8	1.0	8.3	0.8	16.7	3.5	1.0	5.0	0.18	0.02	q.s
F9	1.0	8.3	1.0	16.7	3.5	1.0	5.0	0.18	0.02	q.s

**Evaluation test:**

**Anticandidal activity**

Same as described above.

**pH (Giradkar and Rode 2021).** One gram cream formulation containing *Camellia sinensis* extract was weighed and added to 50 ml water and shaken well. This solution was filtered and used for pH determination using a pH meter that had been previously calibrated.

**Spreadability (Abd El Aziz et al., 2019).** The spreadability of formulations was determined by an apparatus, which consisted of a wooden block, with a fixed glass slide and a movable glass slide with one end tied to the weight pan rolled on the pulley, which was at a horizontal level with a fixed slide.

$$\text{Spreadability (S)} = M \times L / T$$

Where,

M = weight tied to upper slide

L = length of glass slide

T = time taken to separate the slide from each other

**Viscosity (Kolesnikov et al., 2020; Richtering, 2019).** The viscosity of the formulated creams was determined using a Brookfield viscometer using spindle no. S64 at 100 rpm. About 100 gms of cream was taken for measurement and the temperature was maintained at around 20°C.

**Homogeneity (Abd El Aziz et al., 2019).** The formulation was tested by pressing a small quantity of cream between the thumb and index finger. The consistency of the formulation and the appearance of coarse particles on the fingers were used to evaluate the homogeneity of the formulations.

**Consistency (Abd El Aziz et al., 2019).** The measurement of the consistency of prepared cream formulations was done by dropping a cone attached to a holding rod from a fixed distance of 10 cm in such a way that it falls on the center of the glass cup filled with the cream. The penetration by the cone was measured from the surface of the cream to the tip of the cone inside the cream. The distance traveled by the cone was noted down after 10 seconds.

**Acid value.** 10 grams cream formulation was dissolved in a 50 ml mixture of an equal volume of alcohol and solvent ether, the flask was collected to a reflux condenser and heated slowly until the sample was completely dissolved. To this solution, 1 ml of phenolphthalein was added and titrated with 0.1 N KOH until the appearance of faint pink color.

$$\text{Acid value} = n \times 5.61 / w$$

Where,

n = the number of ml of KOH required

w = the weight of the substance

**Saponification value.** 2 grams of the cream formulation was refluxed with 25 ml of 0.5 N alcoholic KOH for 30 minutes. To this, 1 ml of phenolphthalein was added and immediately titrated with 0.5 N HCl.

$$\text{Saponification value} = (b - a) \times 28.05 / w$$

Where,

a = volume of titrant in ml

b = volume of titrate in ml

w = weight of the substance in gm

**Thixotropy study (Vinod et al., 2011).** A fixed quantity of 10 gms cream was taken in a 10 ml beaker and kept intact for 1 hour. The beaker was inclined to one side and observed whether the cream was liquefied or not. After that, the beaker was shaken to and fro for continuous 5 minutes and again the beaker was tilted and checked for consistency and pourability.

**In-vitro drug release study (Ansari, 2021; Baudonnet et al., 2004).** A glass cylinder with both ends open, 7 cm height, 2.1 cm outer diameter, and 1.7 cm inner diameter was used as a permeation cell. A cellophane membrane prehydrated with distilled water (24 hrs before use) was fixed to one end of the cylinder with the help of thread to form a permeation cell.

One gram of cream formulation was taken in the cell (donor compartment) and the cell was immersed in a beaker containing 80 ml of phosphate buffer pH7.4 as receptor compartment. The cell was immersed to a depth of 1 cm below the surface of receptor fluid. The medium in the receptor compartment was agitated using

a magnetic stirrer and  $37^{\circ}\text{C} \pm 17^{\circ}\text{C}$  temperature was maintained.

The required amount of sample (5 ml) was withdrawn at a predetermined time interval and the sample volume was replaced by a fresh solution in the receptor compartment. The withdrawn sample was analyzed by UV spectrophotometer at 274 nm along with required dilutions.

**Skin irritation study (More *et al.*, 2013; Premkumar *et al.*, 2015).** A skin irritation study was performed (proposal number-OGECT/PPDC/IAEC/2016/12/4) on an Albino rabbit weighing 1.5 – 2.5 kg. A single rabbit was used for the study.

The hair from the back of the rabbit was shaved off and the region was divided into three different areas, first as control, second for *Camellia sinensis* extract containing cream, and third area for the blank cream base (without extract).

The observations for erythema and edema were made after 0, 24, 48, and 72 hours and recorded according to the scoring. (Fig. 4 and 5)

**Table 2: Classification system for skin reaction.**

Reaction	Score
Erythema	
No erythema	0
Very slight erythema	1
Well defined erythema	2
Moderate to severe erythema	3
Severe erythema (beet redness) to scar formation	4
Edema	
No edema	0
Very slight edema	1
Well defined edema	2
Moderate edema	3
Severe edema	4
The total possible score for primary irritation	<b>8</b>

**Stability study.** The formulation of cream was monitored for up to 1 month for short-term stability conditions of temperature and relative humidity ( $40 \pm 2^{\circ}\text{C} / 75\% \pm 5\% \text{RH}$ ). The cream formulation was packed in an aluminum tube and kept in a humidity chamber. Samples were withdrawn at intervals of 15 days and the parameters observed were phase separation, pH, Consistency, Viscosity, and % Drug release (Table 10).

## RESULTS AND DISCUSSION

**Physicochemical Characteristics.** The color of the *Camellia sinensis* leaf extract was found to be brown, and the odor was characteristic. The pH was found to be 6.7.

**Table 3: Results of physicochemical parameters.**

Parameters	Observed values (% w/w)
Moisture content (% w/w)	5.50
Ash value (% w/w)	5.16
Acid Insoluble ash (% w/w)	0.53
Water soluble ash (% w/w)	3.04
Alcohol extractive value (% w/w)	43
Water extractive value (% w/w)	21

**Phytochemical Screening.** The tests for the identification of constituents present in the *Camellia sinensis* leaf extract were performed and the results obtained are listed in the Table.

**Table 4: Results of phytochemical screening.**

Sr. No.	Chemical test	Observed value
1.	<b>Alkaloids</b>	
	Dragendorff's test	-ve
	Mayer's test	-ve
	Hager's test	-ve
2.	<b>Carbohydrates</b>	
	Molisch's test	-ve
	Benedict's test	-ve
3.	<b>Glycosides</b>	
	Legal's test	-ve
4.	<b>Tannins and phenolic compounds</b>	
	Lead acetate solution	+ve
	5% $\text{FeCl}_3$ solution	+ve
5.	<b>Steroids</b>	
	Salkowski reaction	-ve
6.	<b>Flavonoids</b>	
	Shinoda test	+ve
7.	<b>Saponins</b>	
	Foam test	-ve

**FTIR Study.** Identification of green tea extract was studied by scanning the sample in the wave number range  $400\text{-}4000\text{ cm}^{-1}$  using FTIR spectroscopy by the KBr pellet method.

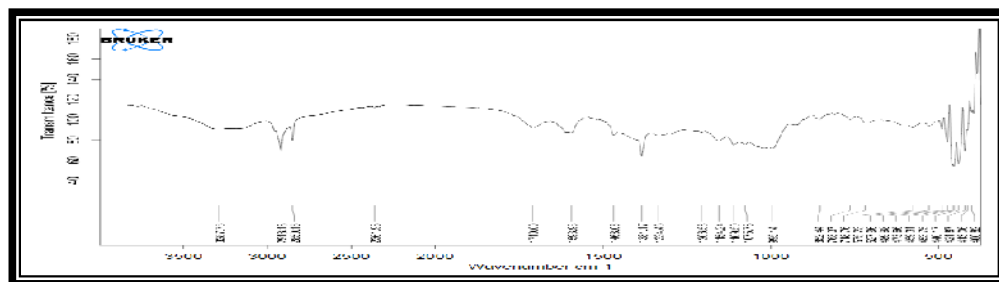


Fig. 1. FTIR spectra of *Camellia sinensis* extract.

Table 5: Interpretation of FTIR spectra of *Camellia sinensis* leaf extract.

Sr. No.	Functional Group	Wave No. (cm <sup>-1</sup> ) <i>Camellia sinensis</i> extract
1.	OH	3287.76
2.	CH Aromatic	2918.18
3.	C=O	1710
4.	C-O-C	1384.17

**Determination of Antifungal activity.** The antifungal assay was performed using the agar well diffusion method for *Camellia sinensis* leaf extract and standard Amphotericin B solutions. The effect of *Camellia*

*sinensis* extract against *Candida albicans* was observed at 1000 µg/ml and increased at 1500 µg/ml. The test and standard solutions showed nearby same results on the concentration of 1000 µg/ml.

Table 6: Results of antifungal assay of *Camellia sinensis* leaf extract and standard Amphotericin B solution.

	Concentration (µg/ml)	Zone of inhibition (mean ± Standard Deviation)		
		After 24 hr	After 48 hr	After 72 hr
<i>Camellia sinensis</i> extract	500	-	-	-
	1000	-	8.13 ± 0.30	14.26 ± 0.12
	1500	-	9.26 ± 0.11	16.46 ± 0.31
Amphotericin B	500	-	4.13 ± 0.11	8.26 ± 0.05
	1000	-	7.90 ± 0.20	15.30 ± 0.10
	1500	-	12.16 ± 0.11	23.93 ± 0.23

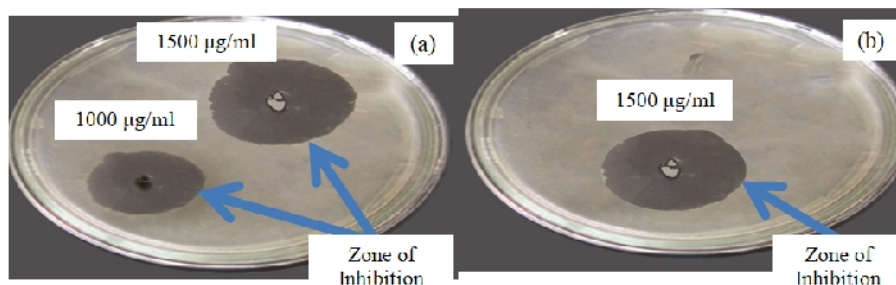


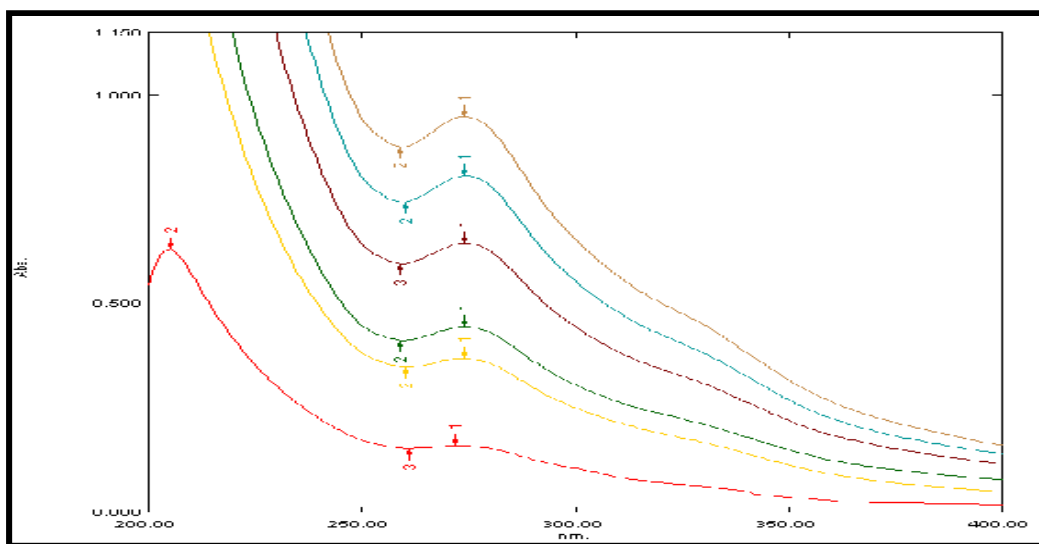
Fig. 2. Images of the zone of inhibition of (a) *Camellia sinensis* leaf extract (b) Amphotericin B.

**Determination of Minimum Inhibitory Concentration.** The different concentrations of *Camellia sinensis* extract 200, 400, 600, and 800 µg/ml were tested by tube dilution method for MIC. The results showed less number of colonies in 600 µg/ml solution whereas no growth was observed in 800 µg/ml concentration.

**Standard Calibration curve.** The standard calibration curve was found to be linear with an R<sup>2</sup> value of 0.997.

Table 7: Standard Calibration curve of *Camellia sinensis* leaf extract.

Concentration (µg/ml)	Absorbance (mean ± S.D*)
50	0.159 ± 0.0015
100	0.321 ± 0.0005
150	0.444 ± 0.0011
200	0.646 ± 0.0020
250	0.808 ± 0.0017
300	0.949 ± 0.0005
N* = 3	



**Fig. 3.** Spectra of calibration curve of *Camellia sinensis* in phosphate buffer pH 7.4.

**Composition and evaluation of the final optimized batch.** The final optimized batch was selected based on Design Expert software (10.0.0). Further evaluation tests were performed on the final batch (Table 8).

**Table 8: Composition of Final optimized formulation.**

<i>Camellia sinensis</i> extract	5 % w/w
White petrolatum	0.823 % w/w
Lanolin	0.835 % w/w
Liquid paraffin	8.3 % v/v
Stearic acid	16.7 % w/w
Propylene glycol	3.5 % v/v
Triethanolamine	1.0 % v/v
Tween 60	5.0 % v/v
Methyl paraben	0.18 % w/w
Propyl paraben	0.02 % w/w
Purified water (upto)	100 %

**Table 9: Evaluation of cream formulation.**

Evaluation parameters	Observed values
Zone of Inhibition	9.23 ± 0.05 (After 48 hr)
	14.96 ± 0.11 (After 72 hr)
pH	6.7
Spreadability	15.13
Viscosity	1556
Homogeneity	Homogenous
Consistency	5.5 mm
Acid value	0.66
Saponification value	185
Thixotropy	No
<i>In vitro</i> drug release	84.41 %
Skin irritation	No

**Skin irritation study.** The observations of the skin irritation study are shown in Fig. 5.

The result of skin irritation studies indicated that the formulation was non-irritant to the skin. No signs of erythema or edema were observed.

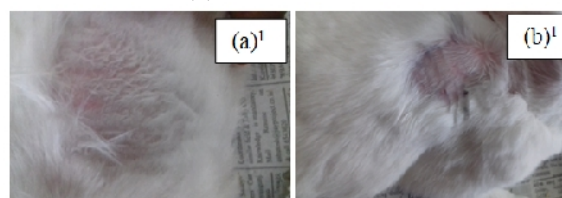


**Fig. 4.** Skin irritation study of optimized batch: (a) Normal controlled area, (b) Applied *Camellia sinensis* extract cream formulation, (c) Applied cream base (without extract)

**(1) After 24 hours**



**(2) After 48 hours**



**(3) After 72 hours**



**Fig. 5.** Observations for skin irritation study: (a), (a<sup>1</sup>) and (a<sup>11</sup>) show the images of *Camellia sinensis* extract formulation applied area: (b), (b<sup>1</sup>) and (b<sup>11</sup>) show the images of the cream base (without extract) applied area.

**Stability study.** From the results, it has been observed that no phase separation was observed for the formulation. It showed no significant change in pH,

Consistency, Viscosity, and % drug release. So the prepared formulation was found to be stable at accelerated conditions.

**Table 10: Stability data for optimized formulation.**

Days	Stability study at the accelerated condition $40 \pm 2^\circ\text{C} / 75\% \pm 5\% \text{RH}$				
	Phase separation	pH	Consistency (mm)	Viscosity (cps)	% Drug release
Initial	No	6.7	5.5	1556	84.41
15	No	6.7	5.5	1554	84.30
30	No	6.7	5.4	1554	84.06

*Camellia sinensis* L. being an important commercial plant is consumed worldwide as a beverage made from the processed leaf. The secondary metabolites catechin, caffeine, theanine, and saponin have a broad spectrum of biological activities like antibacterial, antifungal, antitumor, and antioxidant. This work aimed to formulate and evaluate topical herbal cream for improving therapeutic efficiency to treat Candidiasis. The optimization of polymers and preparation of formulation was carried out using design expert software. The optimized formulation was then evaluated for various parameters like homogeneity, % drug release, release kinetics, and consistency. Skin irritation study on rabbits showed no irritancy explaining that the formulation shows no sensitivity to skin tissues. A short-term accelerated study for 1 month showed no changes at  $4^\circ\text{C} \pm 1^\circ\text{C}$  RH for physicochemical properties.

## CONCLUSION

A herbal formulation was prepared using *Camellia sinensis* L. for the treatment of Candidiasis. A reformulation study of physicochemical and phytochemical screening was carried out and the results obtained were satisfactory. The standard calibration curve was taken in water and phosphate buffer pH 7.4 at  $\lambda_{\text{max}}$  274 nm. The optimized formulation has pH 6.7, a Spreadability of 15.13 gm.cm/sec, a viscosity of 1556 cps,  $14.96 \pm 0.11$  mm zone of inhibition, and 84.41 % drug release. Skin irritation study on rabbits showed no irritancy explaining that the formulation shows no sensitivity to skin tissues. The short-term stability study showed no changes in the physicochemical properties of formulation during 1 month.

## FUTURE SCOPE

The prepared and evaluated cream can become a good alternative for patients having drug resistance towards commercial and conventional creams. The authors recommend this formulation for further detailed animal and clinical trial studies.

**Conflict of Interest.** None.

## REFERENCES

Abd El Aziz, M. A., Sharifipour, F., Abedi, P., Jahanfar, S. and Judge, H. M. (2019). Secnidazole for treatment of

bacterial vaginosis: a systematic review. *BMC women's health*, 19(1), 1-12.

Ansari, S. A. (2021). New Formulation and Characterization of Topical Films of Tioconazole and Evaluation of Their Antifungal Therapy. *Journal of Pharmaceutical Research International*, 400-408.

Armuyanti, I., Wardani, M. K. and Nasution, L. H. (2021). The effect of cutaneous candidiasis toward skin moisture in Haji Adam Malik Central Hospital in Medan. *Bali Medical Journal*, 10(2), 802-806.

Baudonnet, L., Grossiord, J. L. and Rodriguez, F. (2004). Physicochemical characterization and in vitro release of salicylic acid from o/w emulsions prepared with Montanov 68®: effect of formulation parameters. *Drug development and industrial pharmacy*, 30(9), 975-984.

Diorio, C., Kelly, K. M., Afungchwí, G. M., Ladas, E. J. and Marjerrison, S. (2020). Nutritional traditional and complementary medicine strategies in pediatric cancer: A narrative review. *Pediatric Blood & Cancer*, 67, e28324.

Fallis, A.G; Kumar, V. and Abbas, A. K. (2013). Pathologic Basis of Disease 8th Ed. In *Journal of Chemical Information and Modeling* (Vol. 53, Issue 9).

Giradkar, P. and Rode, V. (2021). Formulation and evaluation of polyherbal anti-aging face creams. *Journal of Medical Pharmaceutical and Allied Sciences*, 10(3), 2920-2923.

Havlickova, B., Czaika, V. A. and Friedrich, M. (2008). Epidemiological trends in skin mycoses worldwide. *Mycoses*, 51, 2-15.

Kolesnikov, S. I., Khokhlov, A. L., Miroshnikov, A. E. and Pozdnyakov, N. O. (2020). Industrial Pharmacy: The Way to Create a Product (Monograph Review). *Pharmaceutical Chemistry Journal*, 54(5), 544-546.

Lawton, S. (2018). Managing and treating skin infections and infestations. *Nursing and Residential Care*, 20(8), 382-387.

LIczbi ski, P. and Bukowska, B. (2022). Tea and coffee polyphenols and their biological properties based on the latest in vitro investigations. *Industrial Crops and Products*, 175, 114265.

Mabe, K., Yamada, M., Oguni, I. and Takahashi, T. (1999). In vitro and in vivo activities of tea catechins against *Helicobacter pylori*. *Antimicrobial agents and chemotherapy*, 43(7), 1788-1791.

More, B. H., Sakharwade, S. N., Temburne, S. V. and Sakarkar, D. M. (2013). Evaluation for skin irritancy testing of developed formulations containing extract of *Butea monosperma* for its topical

- application. *International Journal of Toxicology and Applied Pharmacology*, 3(1), 10-13.
- Natekar, P., Deshmukh, C., Limaye, D., Ramanathan, V. and Pawar, A. (2022). A micro review of a nutritional public health challenge: iron deficiency anemia in India. *Clinical Epidemiology and Global Health*, 100992.
- Premkumar, A., Muthukumaran, T., Ganesan, V., Shanmugam, R. and Priyanka, D. L. (2015). Formulation and evaluation of cream containing antifungal agents, antibacterial agents and corticosteroids. *Journal for Drugs and Medicines*, 6(2), 5-16.
- Rha, C. S., Jeong, H. W., Park, S., Lee, S., Jung, Y. S. and Kim, D. O. (2019). Antioxidative, anti-inflammatory, and anticancer effects of purified flavonol glycosides and aglycones in green tea. *Antioxidants*, 8(8), 278.
- Richtering, W. (2019). Understanding rheology. *Applied Rheology*, 12(5), 233-233.
- Sakanaka, S., Juneja, L. R. and Taniguchi, M. (2000). Antimicrobial effects of green tea polyphenols on thermophilic spore-forming bacteria. *Journal of bioscience and bioengineering*, 90(1), 81-85.
- Satpathy, B., Sahoo, M., Sahoo, P. and Patra, S. R. (2011). Formulation and evaluation of herbal gel containing essential oils of piper betle against skin infecting pathogens. *Int. J. Res. Pharm. Sci.*, 2(3), 373-378.
- Sharma, A., Shanker, C., Tyagi, L. K., Singh, M. and Rao, C. V. (2008). Herbal medicine for market potential in India: an overview. *Academic Journal of Plant*, 1(2), 26-36.
- Sharma, P., Verma, K. K., Raj, H., & Thakur, N. (2021). A review on ethnobotany, phytochemistry and pharmacology on *Terminalia bellerica* (Bibhitaki). *Journal of Drug Delivery and Therapeutics*, 11(1-s), 173-181.
- Vanani, A. R., Mahdavinia, M., Kalantari, H., Khoshnood, S. and Shirani, M. (2019). Antifungal effect of the effect of *Securigera securidaca* L. vaginal gel on *Candida* species. *Current medical mycology*, 5(3), 31-35.
- Vinod, K. R., Santhosha, D. and Anbazhagan, S. (2011). Formulation and evaluation of piperine creama new herbal dimensional approach for vitiligo patients. *International Journal of Pharmacy and Pharmaceutical Sciences*, 3(2), 29-33.
- Xue-Feng, X., Hu, J., Xu, H. Y., Wen-Yuan, G., Zhang, T. J. and Liu, C. X. (2011). Key Techniques and Application Progress of Molecular Pharmacognosy. *Chinese Herbal Medicines*, 3(2), 106-116.

**How to cite this article:** Shilpa Thakur and Sharav Desai (2023). Formulation Development and Evaluation of Herbal Cream for Candidiasis. *Biological Forum – An International Journal*, 15(2): 01-08.



## MEDIATION ON INSOMNIA

**Tannu Gour**

Assistant Professor, Faculty of Ayurvedic science, Jayoti Vidhyapeeth women's University,  
Rajasthan

Corresponding [author-tannugourtannu@gmail.com](mailto:author-tannugourtannu@gmail.com)

### ABSTRACT

Today, for quick travel, the material world presents in the railway steamers, and so on. and that's why people are not able to concentrate on themselves because of being too engaged in their life, they are not taking care of themselves, the stress of day to day life has been increasing faster and faster that causes depression anxiety and some other psychological disorders which in turn leads to various diseases such as –Insomnia.

Insomnia is a prevalent and weaken condition that majorly affects sleep quality and daily other activities and slowly the entire system to be disturbed. So, Meditation has been suggested as a effective/Integrated therapy to medical treatment for Insomnia, that slow down racing thoughts ,let go og negativity and calm both mind and body.

**Keywords-** Psychological disorders and insomnia.

### INTRODUCTION

Meditation is nothing just is paying attention to the present moment on purpose with kindness and curiosity in order to just maintain the feelings of stress, anxiety.

The practice of any meditation is just to bring our attention to the current moment. Today's growing race, our mind have not been under our control. So, to control over mind we have to focus on our physical body what the body is doing internally through meditation that regularly fights our day to day stress and anxiety and ease the disorder like Insomnia.

The link between meditation and better sleep is due to the relaxation response influenced by Meditation the people who mediate regularly and properly will has become more alert and aware Insomnia is characterized by disturbed sleep patterns ,it may be acute or chronic people with insomnia often have anxiety depression. Treatment for insomnia has evolved for many years but it is not their own side effects and also not for longer duration so a safer and non side effective treatment includes Mindfulness meditation which have been shown to be effective for improving insomnia. The regular practice of meditation would result in improvement of Insomnia symptoms.

The goal of meditation is just to faster awareness of how to work with mental and physical states associated with insomnia and by the activation of alpha, delta and theta waves and these brain waves are responsible for inducing quality sleep and deep relaxation.

### METHDOLOGY

Meditation in vedic –Dhyan and its practice originated in the sramanic movement of ancient india, before the 6<sup>th</sup> century BCE and the practice has been influential within the diverse





traditions of Hinduism. Meditation a part of a self directed awareness and unifying yoga process by which the yoga process by which the yogi relieves self, one's relationship with other or ultimate reality.

### **CONCLUSION**

Meditation is highly effective stress relief technique ever invented with many surprising benefits. It can be done anywhere, or at anytime, or even it not required silence, or special area. It only simply requires a complete presence of mind. Meditation can be useful in detaching from constant stream of thoughts judgments concerns, rumination, cluster of mind and getting to a place of inner peace. The world that we perceive and experience is reflected in by our own minds. If that mirror is covered with dust or dirt wrong values in form of vasana and samaskaras the reflection from it is distorted.

So, moving on this path, we get some benefits like good physical health, calm mind, balance body. Meditation has been described as a practice in awareness which produces definite changes in perception, attention and cognition. Some techniques by which our body aware itself.

1. walking meditation-when we walk with intention and deep attention bringing awareness to your steps and your surroundings returns you to the now
2. Mindful-movement-paying attention on our own body and its sensation as it moves
3. Breathing meditation-we have to pay attention on bringing out or in that calms us down.

### **REFERENCES-**

1. <https://www.innerpeacefellowship.org>
2. <https://www.zzzquill.in>
3. <https://www.health.harvard.edu>
4. <https://www.sleepfoundation.org>
5. <https://www.floridedicalclinic.com>.



## IMPACT OF DIGITAL FINANCE ON FINANCIAL INCLUSION: AN EVIDENCE FROM INDIA

**Urvashi Sharma**

Assistant Professor, Department of Management and Commerce

Jayoti Vidyapeeth Women's University, Jaipur, Rajasthan, India

Email I'd: [jvnurvashi@jvwu.ac.in](mailto:jvnurvashi@jvwu.ac.in)

### Abstract

In order to better understand how digital finance affects financial inclusion, this study focuses on two independent variables: the population's internet usage rate and the number of ATMs per 100,000 persons. The overall value of internet transactions expressed in lakh crores is the dependent variable under analysis. In order to investigate the connection between digital finance and financial inclusion, a dataset spanning from time period of 2010 to 2020 is gathered. The collection includes data from secondary sources. Various tests like augmented dickey filler test, co-integration test, vector error correlation model are used to create correlations and spot patterns between the variables that are both independent and dependent. The study's findings offer insightful information on how digital finance affects financial inclusion. Results show that the total value of online payments is positively correlated with a larger proportion of the population utilising internet access and a higher density of ATMs per 100,000 adults. These findings imply that increased accessibility to digital banking services, which has been made possible by internet use and ATM accessibility, greatly increases the amount of digital transactions. The proportion of people who use the internet and ATMs as independent factors and the total amount of digital payments as the dependent variable, respectively, are used in this research paper to illuminate how digital finance affects financial inclusion. This study emphasises the significance of digital technologies in promoting financial inclusion and identifies potential paths for expanding financial accessibility and engagement in the digital era by examining the links between these factors.

**Keywords:** Digital Finance, Financial Inclusion, Augmented Dickey Filler Test, Co-integration test, Vector Error Model

### Introduction

The term "**digital finance**" is used to describe how new technologies have affected the financial services sector. The old method of offering financial services as well as banking has been revolutionised by a number of new products, applications, procedures. The development of new technology has accelerated along with an economy's overall growth. These technological breakthroughs have also contributed to improvements in the banking, investment, and finance sectors. Old and conventional methods of communication with banks are gradually giving way to innovative methods of communication. The trend towards digitalization in the financial service industry has experienced a fast acceleration. With the aid of recent technology improvements, making payments, investments, money transfers, and other transactions related to banking and finances have become significantly faster.

Another key idea on which this study will concentrate is **financial inclusion** which refers to all of the initiatives aimed at ensuring that all members of society have access to all financial

services. It strives to eliminate all the obstacles that prevent various segments of society from taking advantage of these financial services and their advantages. Financial inclusion is becoming simpler to attain because of the developments in financial technology like digital transactions. Digital financial inclusion entails the use of cost-effective digital means to provide populations that are currently underserved and financially excluded with a variety of official financial products and services that are with integrity delivered at a cost that is affordable to beneficiaries and feasible for providers. There is still a sizable segment of the global populace that lacks access to financial services. Due to these developments, it is now simpler and more effective for a larger percentage of the public to obtain financial services. The idea of "digital financial inclusion" appears to provide the excluded group a lot of prospects and advantages which includes affordable access to a range of financial services. There are several objectives of financial inclusion which includes increasing financial knowledge and awareness and giving the impoverished people specialised services based on their circumstances, requirements, and income level. Additionally, it plans to introduce smartphone banking or the worlds of finance in order to connect with the country's poorest residents who live in exceedingly remote regions. The transition from cash to digital payments is being facilitated by financial inclusion. Customers have access to a system for electronic payments that allows them to quickly and inexpensively send money to friends, family, and business partners.

The present paper seeks to investigate how digital finance affects financial inclusion. It contributes to the scant and still-growing amount of knowledge about how financial innovation affects the financial inclusion in India.

### **Review of Literature**

With the help of his research, **Mohammad O. Al-Smadi (2022)** has looked at the relationship between digital banking and financial inclusion in the Middle East and North Africa (MENA) area. A study demonstrates how digital finance might improve financial inclusion. The study's conclusions demonstrate how digital finance has improved the region's access to, availability of, and use of financial offerings.

In their study, **Banna, H., and Alam, MR. (2021)** looked into how electronic financial inclusion may help to sustain the stability of banking in ASEAN nations and whether there would be any implications for the post-Covid-19 period of pandemics. The complete implementation of digital financial inclusion, according to the study, accelerates ASEAN banking stability, reducing banks' default risk while simultaneously boosting the region's financial mobility. The findings also imply that ASEAN lenders are likely to maintain the stability of the financial system by minimising liquidity crises during and after COVID 19. Greater adoption by electronic payments is positively correlated with ASEAN banking stability.

In their study, **Achugamonu BedeUzoma, Alexander E. Omankhanlen, et al. (2020)** looked at the dynamic causality between financial inclusion and digital finance. The findings indicate a long-term relationship between financial inclusion and digital finance that is favourable. The study comes to the conclusion that the effects of digital money on inclusive finance behave in various ways in the short- and long-term. In the near term, financial enclosure is negatively impacted by digital financial technology; but, in the long term, financial enclosure is positively impacted by digital finance. The study comes to the conclusion that financial inclusion is positively impacted by digital finance over the long term. .

**Md. Morshadul Hasan, Shajib Khan, and others (2020)** have made an effort to research how digital financial services contribute to China's inclusive finance and the influence of these services' instruments on changing the financial industry. The study's finding suggests that Chinese should go above and beyond to give better financing options to everyone who is financially disadvantaged. Another crucial aspect is that they have been showcasing how to advance inclusive finance through the use of digital financial services as a world leader in the digital financial transformation. These inclusive finance digital transformation strategies will in particular promote the growth of inclusive finance globally.

A further research by **David Mhlanga (2020)** to look at the effect of AI on financial inclusion through digital means has found that AI has a significant influence in areas linked to risk detection, measurement, and management.

The goal of **Tabitha Durai and G. Stella's(2019)** study is to determine how digital finance—including credit and debit cards, mobile wallets (Apps), internet banking, and mobile banking—affects financial inclusion. According to the study's findings, ease of use, accessibility, accurate execution, and easy interbank trade account facilities have positive effects on mobile banking. Low service fees, accurate timing, and convenience also have a big positive impact on mobile wallets (apps). Although there are many drawbacks to digital marriage, including costs, security, adaptability, etc.

**Peterson K. Ozili (2018)** has made another effort to research the effects of internet-based finance on monetary inclusion and stability. Results of the study have demonstrated how digital finance has a favourable impact on financial integration in emerging nations. It also demonstrates how much more significant to them is the ease that digital money offers to people in low-income groups.

According to **Vinay Kandpal and Rajat Mehrotra's** research on the impact of fintech and internet-based financial services in India, clients are less inclined to adopt new technologies if they have faith and trust in the existing banking system. New technologies won't be successful until users are happy with security and privacy concerns.

**Pengpeng Yue et al** has investigated how households are affected by digital money. The study's findings indicate that the usage of digital banking has expanded the involvement in the loan market. The increased availability of credit has changed consumers' marginal propensities to consume, which has raised household consumption. However, the increased ease of access to the credit market also raises the possibility of household debt trapping.

## **Data and Methodology**

### **1.1.Data description**

This study looks at the connection between financial inclusion and digital finance in India from 2010 to 2020. The goal of this study is accomplished through the utilisation of secondary data. The World Bank database was used to get the information. ATMs per 100,000 individuals, internet use rates, and the total dollar worth of all digital transactions are used as indicators of digital finance and financial inclusion, respectively.

## **Methodology**

### ***1.2.1. Stationarity test***

Investigating the stationarity of the data's qualities in time series data is crucial. This is crucial since the majority of time series data are non-stationary and analysis of such data may result in inaccurate conclusions. Finding the variables' stationarity qualities aids in determining the sequence of integration and the best econometric technique to use when analysing the data. In order to investigate stationarity qualities, this research applies the Augmented Dickey Fuller test.

### ***1.2.2 Augmented Dickey Fuller Test***

A statistical test called the Augmented Dickey-Fuller (ADF) test is used to assess if a time series dataset contains a unit root, which denotes that the dataset is non-stationary. A time series is said to be stationary if statistical characteristics like mean and variance don't change over the course of the data. The Dickey-Fuller test, which looks for a unit root in a time series, is extended by the ADF test. The ADF test incorporates lagged variations of the variable of interest in the formula for regression as well as the potential of serial correlation. The unit root existence in the time series is tested using the ADF test as the null hypothesis. The null hypothesis is dismissed and the time series is considered stationary if the p-value for the ADF test is less than a preset level of significance (typically 0.05). The null hypothesis cannot be disproved, however, if the p-value is above the significance level, which indicates the existence of a unit root and non-stationarity in the data. To evaluate the stationarity of economic and financial data, the ADF test is often used in econometrics and time series analysis. Researchers can use suitable statistical methods and models that presume stationarity, including the autoregressive integrated moving average (ARIMA) models, by establishing whether a time series is stationary or not.

### ***1.2.3. Co-integration Test***

A statistical concept known as cointegration describes a long-term association between more than one non-stationary time series variables. In other words, two variables are considered to be cointegrated if they display short-term variations but tend to move jointly over time. In the study of econometrics, cointegration is frequently employed, particularly when examining connections between economic indicators. Even if the variables may individually display random or non-stationary behaviour, it aids in determining whether or not there is an established equilibrium or long-term link between them. Numerous statistical methods are used by econometricians to check for cointegration. We employed the Johansen test in this investigation. By analysing the behaviour of the indicators' residuals (i.e., the discrepancies between what is actually happening and the values expected by the model), this test determines if there is a cointegrating connection. If the test results show that cointegration exists, it implies that the variables have a long-term link and that changes in one variable result in predictable long-term changes in the other(s). Macroeconomics, financial modelling, and other disciplines where it is critical to comprehend the long-range balance between variables can all benefit from cointegration analysis.

### ***1.2.4. Vector Error Correction Model***

A statistical model called a VECM, which stands for vector error correction model, is used to examine the short-term dynamics and long-term relationships between various time series data.

It incorporates a set of variables into the error correction model, also known as the ECM idea. In VECM, the concepts of cointegration (the long-term connection) and error correction (the short-term dynamics) are combined. When factors are non-stationary and show a long-run equilibrium connection, it is very helpful. The study of long-term stability adjustments and immediate dynamics may be done concurrently using VECM, which calculates the variables of both the integration connection and the short-term dynamics. The model is useful in econometrics and time series analysis because it sheds light on both the equilibrium state over the long run and the short-term relationships among the variables.

**Empirical findings**

**1.1. Unit root test**

To examine the stationarity characteristics of the parameters in the data set, the enhanced Dickey Fuller test is used. The findings (table 1) demonstrate that every variable is stationary at the first difference but non-stationary at the level.

**Table 1: Augmented dickey Fuller Test**

Variables	P-value at level	P-value at first difference
Total digital transactions	0.8769	0.0021
ATM per 100000 adults	0.2750	0.0002
internet use rates	0.2475	0.0403

**Co-integration test**

Variables that are steady at the initial difference could be related by co-integration. All of the study's variables, including the percentage of internet users and the number of ATMs per 100,000 adults, are constant from the outset. Total digital transactions are the dependent variable in this case, whereas the independent variables are the proportion of people who use the internet and the number of ATMs per 100,000 adults. The co-integration test result is displayed in Table

**Table 2: Co-integration test  
Unrestricted Co-integration Rank Test (Trace)**

Hypothesized	Trace	0.05		
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.891869	42.01561	29.79707	0.0002
At most 1	0.604093	13.09826	15.49471	0.1182
At most 2	0.077789	1.052757	3.841466	0.5649

Trace test indicates 1 co integrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Unrestricted Co integration Rank Test (Maximum Eigen value)**

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.891869	28.91735	21.13162	0.0003
At most 1	0.604093	12.04550	14.26460	0.1769
At most 2	0.077789	1.052757	3.841466	0.3659

Max-eigen value test indicates 1 co integrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Vector Error Correction Model**

The underlying long- and short-run connection between the variables is examined using a vector error correction model after co-integration testing. The output of the vector error correction model is displayed in Table 3.

**Table 3: Result of vector correction model**

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.698911	0.514025	-1.359683	0.2110
C(2)	0.023663	0.462532	0.051159	0.9605
C(3)	3.876334	10.54686	0.367534	0.7228
C(4)	-2.026815	2.234048	-0.907239	0.3908
C(5)	-1.043704	1.294726	-0.806120	0.4435
R-squared	0.261091	Mean dependent var		-0.837953
Adjusted R-squared	-0.108363	S.D. dependent var		4.355992
S.E. of regression	4.585937	Akaike info criterion		6.167589
Sum squared resid	168.2466	Schwarz criterion		6.384877
Log likelihood	-35.08933	Hannan-Quinn criter.		6.122926
F-statistic	0.706695	Durbin-Watson stat		1.954090
Prob(F-statistic)	0.609427			

The outcome of the vector error correction model indicates that there is neither a long-term nor a short-term causal link between the proportion of internet users, the number of ATMs per 100,000 adults, and the total value of digital transactions. In both the long- and short-term, the impact of ATMs per 100,000 individuals and the percentage of the population that uses the internet is negligible.



## Conclusion

This research looked at the link between the effects of being financially included on India's economic development from 2015 to 2020. In order to first study the long-term link between digital finance and inclusion in the economy, a co-integration test was employed. The outcome demonstrates that there is a long-term association between the total value for digital transactions, the number of ATMs per 100,000 adults, and the percentage of people who use the internet. Using a vector error correction model, we later looked at the long- and short-term causal relationships between online banking and financial inclusion. The results showed that neither the number of ATMs per 100,000 adults nor the percentage of people who use the internet has any effect on the overall worth of digital transactions over the long- or short-term.

## References

- [https://finance.ec.europa.eu/digital-finance/what-digital-finance\\_en](https://finance.ec.europa.eu/digital-finance/what-digital-finance_en)
- <https://www.worldbank.org/en/topic/financialinclusion/publication/digital-financial-inclusion>
- <https://www.bankbazaar.com/personal-loan/financial-inclusion.html>
- Yue, P., Korkmaz, A. G., Yin, Z., & Zhou, H. (2022). The rise of digital finance: Financial inclusion or debt trap?. *Finance Research Letters*, 47, 102604.
- Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review*, 18(4), 329-340.
- Al-Smadi, M. O. (2023). Examining the relationship between digital finance and financial inclusion: evidence from MENA Countries. *Borsa Istanbul Review*, 23(2), 464-472.
- Bede Uzoma, A., Omankhanlen, A. E., Obindah, G., Arewa, A., & Okoye, L. U. (2020). Digital finance as a mechanism for extending the boundaries of financial inclusion in sub-Saharan Africa: A general methods of moments approach. *Cogent Arts & Humanities*, 7(1), 1788293.
- Durai, T., & Stella, G. (2019). Digital finance and its impact on financial inclusion. *Journal of Emerging Technologies and Innovative Research*, 6(1), 122-127.
- Mhlanga, D. (2020). Industry 4.0 in finance: the impact of artificial intelligence (ai) on digital financial inclusion. *International Journal of Financial Studies*, 8(3), 45.
- Banna, H., & Alam, M. R. (2021). Impact of digital financial inclusion on ASEAN banking stability: implications for the post-Covid-19 era. *Studies in Economics and Finance*, 38(2), 504-523.
- Hasan, M. M., Yajuan, L., & Khan, S. (2022). Promoting China's inclusive finance through digital financial services. *Global Business Review*, 23(4), 984-1006.
- Kandpal, V., & Mehrotra, R. (2019). Financial inclusion: The role of fintech and digital financial services in India. *Indian Journal of Economics & Business*, 19(1), 85-93.



## STUDY ON INHERITANCE IN JAVA

**Yamini Bhardwaj**

Assistant professor, Department of Computer Science, Jayoti Vidyapeeth Women's University,  
yaminibhardwaj23@gmail.com

### **Abstract:**

Object-oriented programming languages are distinguished by inheritance, but its practical use is still not well understood. Programmers utilize inheritance for a variety of reasons, including sub typing, code reuse, enabling subclasses to modify the behavior of super classes, and simply classifying things.

The review article starts with an examination of JAVA OOP's ideas, such as inheritance, programming, and language technical notions using appropriate examples to give the reader a sense of the language. A general-purpose programming language called Java, which has a system programming influence, offers efficient low-level computations, data abstraction, object-oriented programming, and generic programming. Reusability of code is greatly influenced by inheritance.

**Keywords:** JAVA, OOP's, Inheritance, reusability, Base class, Derived class, super class.

### **Introduction:**

The concept of "inheritance" has been the subject of a lot of writing since the advent of the object-oriented paradigm. It is always preferable to reuse something that already exists as opposed to repeatedly making the same thing. This idea is supported by Java. Java classes can be utilized in a variety of ways. The simplest method for doing this is by reusing the properties of already existing classes while constructing new ones. Inheritance is the process through which a new class is derived from an existing one. The term "base class," "super class," or "parent class" is used to describe the old class. The term derived class, subclass, or child class is used to describe the new class. When an object inherits from a parent object, it takes on all of the parent object's properties and behaviors. The concept behind inheritance is that new classes can be built on top of older ones. You can reuse parent class fields and methods when you inherit from them, and you can also add new properties and methods. The parent-child relationship, also known as the IS-A relationship, is represented by inheritance.

### **Advantages to inheritance:**

1. Reduce the amount of redundant code in a program.
2. If there is redundant code (variables and methods) in two related classes, the hierarchy can be refactored by shifting the redundant code up to the shared super class.
3. Better coding structure.
4. An improvement in code organization arises from moving common code to a super class.
5. Flexible changes to the code.

### **Syntax of java Inheritance:**

```
Class Baseclass_Name{
//declaring methods and fields
}
class Derivedclass_Name extends Baseclass_Name
{
//declaring methods and fields
}
```

When you create a new class that derives from an existing class, you use the extends keyword.

### **Types of Inheritance in JAVA:**

There are following types of Inheritance supported by JAVA:

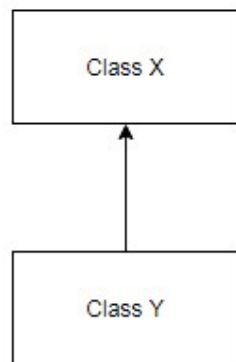
1. Single Inheritance
2. Multilevel Inheritance
3. Multiple Inheritance
4. Hybrid Inheritance
5. Hierarchical Inheritance

#### Super Keyword:

- To refer to an immediate parent class instance variable, use the super keyword.
- You can call the immediate parent class method with the super keyword.
- Constructor of the immediate parent class may be called using super ().

#### 1. Single Inheritance:

It's incredibly simple to understand single inheritance. Single inheritance is the term used when a class only extends one other class. Class Y just extends class X, as can be seen in the flowchart below. In this instance, X is the parent class of Y, and Y would be X's child class.



Structure of Single Inheritance

Syntax:

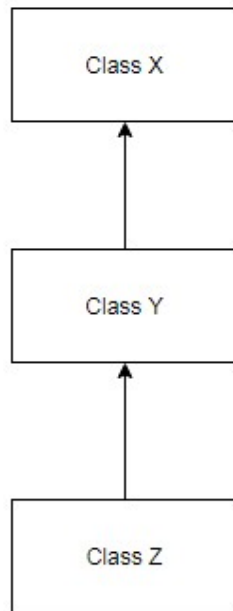
```

Class X
{
//code
}
Class Y extends X
{
//code
}
  
```

Example 1:

#### 2. Multilevel Inheritance:

Multilevel inheritance is an OO technology feature that allows one to inherit from a derived class, making that derived class the base class for the new object. As you can see in below flow diagram Z is subclass or child class of Y and Y is a child class of X. For more details and example refer – Multilevel inheritance in Java.



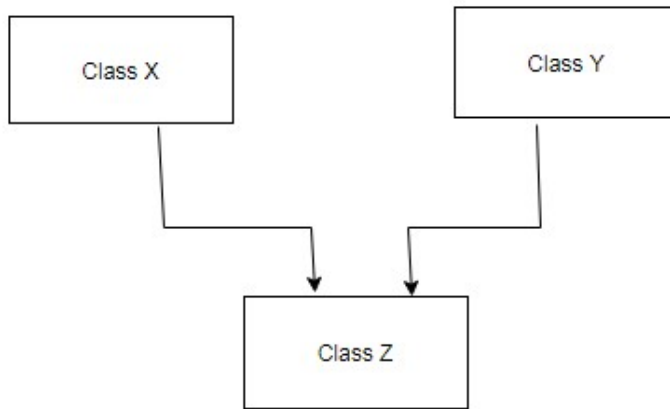
Structure of Multilevel Inheritance

Syntax:

```
class X
{
//code
}
class Y extends X {
//code
}
class Z extends Y {
//code
}
```

### 3. Multiple Inheritance:

A class extending (or inheriting) from more than one base class is referred to as having "multiple inheritance". One base class or parent was a concept in the earlier lessons on inheritance. Multiple inheritance has the drawback of requiring the derived class to handle its dependencies on two base classes.



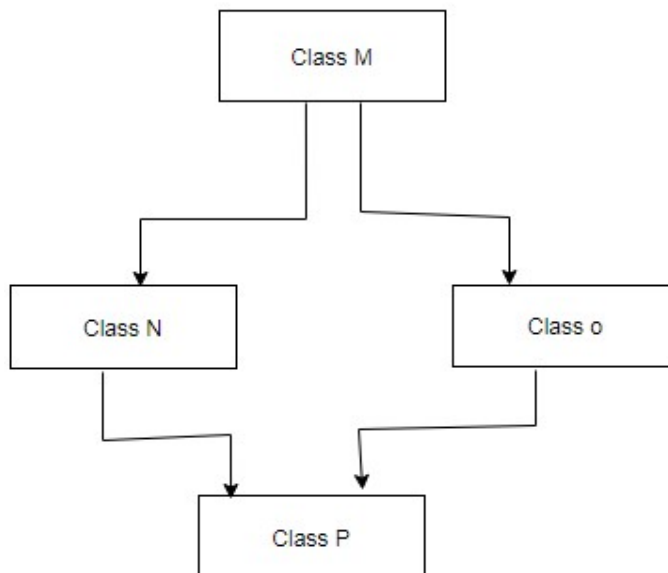
Structure of Multiple Inheritance

Note: 1. Software projects hardly ever use multiple inheritances. Multiple inheritance frequently causes issues in the hierarchy. When the class is extended further, this leads to unneeded complexity.

2. Multiple inheritance is not supported by the majority of the new OO languages, including Small Talk, Java, and C#. C++ supports multiple inheritances.

#### 4. Hybrid Inheritance:

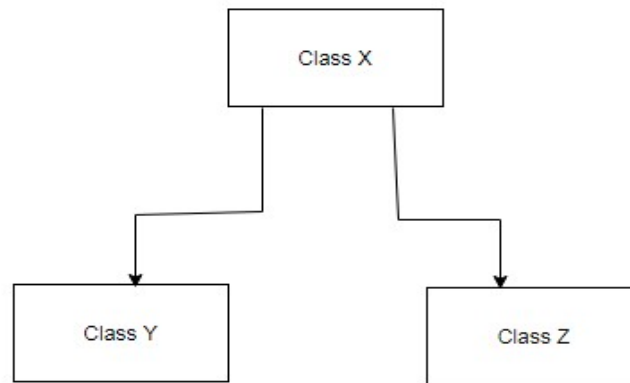
Hybrid inheritance can be defined as a blend of single inheritance and multiple inheritance in simple terms. The flowchart shown below is typical. The same manner that multiple inheritance can be performed in Java, so can a hybrid inheritance! employing interfaces Yes, you heard correctly. Java supports multiple and hybrid inheritance by using interfaces.



Structure of Hybrid Inheritance

#### 5. Hierarchical Inheritance:

When multiple classes inherit from a single class, this is also known as hierarchical inheritance.



Structure of Hierarchical Inheritance

Syntax:

```

class A
{
  //code
}
class B extends A
{
  //code
}
class c extends A{
  //code
}
  
```

### Implementation of multiple inheritance in Java:

The primary advantages of inheritance, parent class reuse, and protocol conformance, as well as how they may be accomplished in Java, have been discussed in the section above. Multiple parent class reuse and simultaneous adherence to all of their protocols are two of multiple inheritance's primary advantages. Because multiple inheritance is not supported in Java, these advantages cannot be directly obtained.

### Limitations of the interface delegation method:

Both of the main advantages of multiple inheritance can be achieved with the interface-delegation technique. There are several elements that we have left out, and sometimes workarounds are required for the technique to be used in practice. A scaffolding class could be required because, for instance, the delegation object's protected fields and methods can only be accessed by extending classes. However, the interface-delegation method generally has practical advantages.

### Conclusion:

In this paper, inheritance as it relates to software is extensively discussed, but there seems to be little on how it is actually employed. According to the numerous websites, blogs, and stories in the trade press, there appears to be a great deal of confusion about what it is and how to utilize it.

At the same time, criticisms of inheritance are made fairly openly in articles with provocative headings like "Why inheritance is wicked" or "Inheritance is evil, and must be eradicated."

Although Java does not support multiple inheritance, it does introduce an interface feature that does. This may be employed to accomplish the advantageous outcomes of multiple inheritance, according to certain theories. In this study, we investigated how this may be done. We started off by demonstrating the usage of delegation to reuse classes. Then, we identified the effects that could be accomplished solely through interfaces.

**Reference:**

1. <https://beginnersbook.com>
2. <https://www.javatpoint.com>
3. Arnold, K., Gosling, J., 1998. The Java Programming Language, The Java Series, second ed. Addison-Wesley, Reading,...

राजस्थानी भाषा के उन्नयन व विकास में कन्हैया लाल सेठिया का योगदान

**चंदा कुमावत**

ज्योति विद्यापीठ महिला विश्वविद्यालय, जयपुर, शिक्षा विभाग

[kumawatchanchal1990@gmail.com](mailto:kumawatchanchal1990@gmail.com)

## सारांश

राजस्थानी भाषा में कन्हैयालाल सेठिया का विशेष योगदान रहा है कन्हैयालाल सेठिया राजस्थानी भाषा के महान रचनाकार होने के साथ साथ वो एक सफल स्वतंत्रता सेनानी भी थे और एक गीतकार भी इसलिये इन्होंने 'धरती धोरा री' गीत की रचना की श्री कन्हैयालाल सेठिया उल्लेखनीय कृतियाँ है रमणियां रा सोरठा -; गळगचिया , मींझर , कूंकऊ , लीलटांस , धर कूंचा धर मंजळां , मायड़ रो हेलो , सबद , सतवाणी , अघरीकाळ , दीठ , क क्को कोड रो , । आपको 2004 में पद्मश्री, साहित्य अकादमी पुरस्कार तथा 1988 में ज्ञानपीठ के मूर्तिदेवी साहित्य पुरास्कार से भी सम्मानित किया गया है।

सेठिया जी द्वारा रचित राजस्थानी गीत 'धरती धोरां री !' राजस्थान का वंदना गीत बन चुका है। राजस्थान का सरस, गौरवशाली वर्णन करने वाले इस गीत के बोल हर राजस्थानी के मन में प्रदेश के गौरव एवं स्वाभिमान को जगाते हैं। गीत में प्रयुक्त अलंकारिक भाषा, भाव, कल्पना, रस -- इन सब में गौरव छलकता है। राजस्थान की समृद्ध सांस्कृतिक पहचान को देश-विदेश में पहुंचाने में इस गीत की खास भूमिका रही है।

- राजस्थानी भाषा में रचे इस अमर काव्य की पंक्तियां जब भी कानों को सुनाई देती है, राजस्थानी काव्य के भीष्म पितामह, स्व. कन्हैया लाल सेठिया का स्मरण हो आता है। सेठिया जी की यह कविता राजस्थान में सर्वाधिक बार पढ़ी व गायी जाने वाली रचनाओं में से एक है। ये शब्द सेठिया जी की देशप्रेम व स्वाभिमान से ओतप्रोत वीररस की कविता "पीथल व पाथल" से है। इस कविता को पढ़ने के बाद पाषण हृदय वाला कायर भी मातृभूमि की आन बचाने के लिए मचल उठता है।
- उक्त दोनों रचनाएं, दशकों से राजस्थान के विविध शैक्षणिक पाठ्यक्रमों का अनिवार्य हिस्सा है।
- यद्यपि सेठिया जी ने साहित्य की कई विधाओं में अनेक रचनाएं रची है, तथापि अगर वे उक्त दो कविताएं मात्र रचते, तो भी उनका नाम राजस्थानी के अमर साहित्यकारों में शामिल होता।

सेठिया जी द्वारा रचित राजस्थानी गीत 'धरती धोरां री !' राजस्थान का वंदना गीत बन चुका है। राजस्थान का सरस, गौरवशाली वर्णन करने वाले इस गीत के बोल हर राजस्थानी के मन में प्रदेश के गौरव एवं स्वाभिमान को जगाते हैं। गीत में प्रयुक्त अलंकारिक भाषा, भाव, कल्पना, रस -- इन सब में गौरव छलकता है। राजस्थान की समृद्ध सांस्कृतिक पहचान को देश-विदेश में पहुंचाने में इस गीत की खास भूमिका रही है।

## प्रस्तावना

राजस्थानी भाषा के विकास में राजस्थान के गौरव के उत्थान में कन्हैयालाल सेठिया के समग्र साहित्य में मूल्य बोध है उनका व्यक्तिगत चिन्तन यथार्थवादी था। सत्य को वे करीब से महसूस करते थे कवि को कन्हैयालाल सेठिया अनुभूति का माध्यम मात्र मानते थे। उनके रोम-रोम में विराजमान था तो कविवर सेठिया ने कवियों को उद्देश्य युक्त रचनाओं के सर्जन की ओर

प्रेरित किया है। कन्हैया जी रचनाओं में ऐसा ही मानव बसता है जिसमें सिन्धु में बिंदु की तरह समाहित है। संत कबीर को, जो उनके इष्ट है वह निरक्षर होते हुए भी चिन्तन अक्षर है, नीर-क्षीर का विवेकी है।

जन्म : 11 सितम्बर 1919 ई० को सुजानगढ़ (राजस्थान) में

पिता-माता : स्वर्गीय छगनमलजी सेठिया एवं मनोहरी देवी

विवाह : 1937 ई० में श्रीमती धापू देवी के साथ सन्तान : दो पुत्र - जयप्रकाश एवं विनयप्रकाश  
पुत्री श्रीमती सम्पत देवी दूगड़

अध्ययन : बी०ए०

निधन : 11 नवम्बर 2008

कन्हैयालाल सेठिया का जन्म राजस्थानके चूरु जिले के सुजानगढ़ शहर में हुआ। प्रसिद्ध राजस्थानी गीत आ तो सुरगा नै सरमावै इन्हीं की रचना है। 11 नवम्बर 2008 को निधन हो गया।

मुख्य शब्द -: मायड, सुरागा, रमणीय, राजस्थान, पीथल व पाथल, डिंगल

**राजस्थानी भाषा के उत्थान में योगदान-** राजस्थान भाषा की विकास यात्रा कन्हैयालाल सेठिया के से समय से ही नहीं प्रारम्भ हुई बल्कि सीताराम लालस राजस्थानी भाषा के आधुनिक काल के प्रसिद्ध विद्वान रहे हैं। राजस्थानी साहित्य में सीताराम लालस की सर्वाधिक महत्वपूर्ण उपलब्धि राजस्थानी शब्दकोश का निर्माण है। डिंगल कोई भाषा नहीं है बल्कि मारवाड़ी की ही साहित्यिक शैली है। डिंगल भाषा की प्रमुख विशेषता है कि इसमें जो शब्द जिस तरह बोला जाता है उसी तरह लिखा जाता है। डिंगल भाषा का सर्वप्रथम प्रयोग कुशललाभ द्वारा रचित पिंगलशिरोमणि नामक ग्रंथ में किया गया। राजस्थान में चारण कवि बांकीदास और सूर्यमल्ल मिश्रण ने अपनी रचनाओं में डिंगल भाषा का प्रयोग ठिया जी ने देश की स्वतंत्रता आंदोलन में भी बढ़चढ़ कर भाग लिया। सेठिया जी, बीकानेर में आजादी की भावना लोगों में जागृत करने व राजशाही के अत्याचारों के विरुद्ध आवाज उठाने वाले संगठन “बीकानेर प्रजामंडल” के सदस्य भी रहे। आप महात्मा गांधी जी व उनकी विचारधारा से प्रभावित थे। गांधी जी प्रेरणा से आपने खादी के प्रचार व दलित उद्धार की दिशा में भी कार्य किया। सेठिया जी ने राजस्थानी के अलावा हिन्दी में अठारह व उर्दु भाषा में दो पुस्तकों की रचनाएं की लीलटांस, रमणिया रां सोरठा, धर कूंचा धर मंजला, सतवाणी, गळगचिया, मायड रो हेलो, मींझर, कूंकऊ, हेमाण राजस्थानी भाषा में लिखी रचनाएं हैं। हिन्दी भाषा में लिखी कृतियों में शामिल हैं- मेरा युग, आज हिमालय बोला, प्रणाम, वनफूल, दीप किरण, अग्निवीणा, खुली खिड़कियां चौड़े रास्ते, प्रतिबिम्ब, अनाम, मर्म, वामन, श्रेयस, स्वागत, देह-विदेह, त्रयी, निष्पति व निर्ग्रन्थ। गुलची व ताजमहल शीर्षक से उर्दु भाषा में रचनाएं रची। सेठिया जी की रचनाओं का अंग्रेजी, बंगाली, मराठी व हिन्दी भाषाओं में अनुवाद भी हुआ है।



सेठिया जी की प्रसिद्ध कविता धरती धोरा पर अन्तरराष्ट्रीय ख्याती प्राप्त फिल्म निर्माता गौतम घोष द्वारा “Land of the sand dunes” शीर्षक से वृत्तचित्र का निर्माण किया गया जिसको भारत सरकार द्वारा स्वर्णकमल पुरस्कार से सम्मानित किया गया।

कन्हैया लाल सेठिया को अनेक राज्य व राष्ट्रीय स्तर के पुरस्कारों से सम्मानित किया गया। इनमें से प्रमुख है. पद्मश्री पुरस्कार- वर्ष 2004 वर्ष 1976 में साहित्य अकादमी, नई दिल्ली द्वारा उनकी राजस्थानी काव्यकृति “लीलटांस” को सर्वश्रेष्ठ राजस्थानी कृति के रूप में पुरस्कृत किया गया। वर्ष 1980 में भारतीय ज्ञानपीठ द्वारा हिन्दी काव्यकृति “निर्ग्रन्थ” को मूर्तिदेवी साहित्य पुरस्कार प्रदान किया गया। 1983 में हिन्दी साहित्य सम्मेलन, प्रयाग द्वारा साहित्यवाचस्पति उपाधि से अलंकृत किया गया। 1992 में राजस्थान सरकार द्वारा स्वतंत्रता सेनानी का तामपत्र प्रदान किया गया। मार्च, 2013 को मृत्यु उपरान्त राजस्थान रत्न सम्मान प्रदान किया गया। श्री कन्हैया लाल सेठिया ने राजस्थानी भाषा में रचे बसे मिठास से न केवल राजस्थान अपितु पूरे भारतवर्ष को परिचित करवाया। समाज सुधारक, स्वतंत्रता सेनानी व राजस्थानी भाषा के इस सपूत का 11 नवम्बर, 2008 को निधन हुआ।

राजस्थानी भाषा के उद्देश्य -

- राजस्थानी भाषा साहित्य एवं संस्कृति के उन्नयन, संवर्द्धन एवं संरक्षण के लिए प्रयत्न करना।
- राजस्थानी भाषा के साहित्यकारों और लेखकों में आपसी सहयोग की अभिवृद्धि के लिए प्रयत्न करना।
- उच्च स्तरीय ग्रंथों, पत्र-पत्रिकाओं, कोश, विश्वकोश, आधारभूत शब्दावली, ग्रंथ व सूचीकरण आदि के सृजन में सहायक।
- विश्व भाषाओं के उत्कृष्ट का राजस्थानी भाषा में तथा राजस्थानी के उत्कृष्ट साहित्य का विश्वभाषाओं में अनुवाद करना तथा ऐसे अनुवाद कार्यों को प्रोत्साहित करना।
- साहित्यिक सम्मेलन, विचार संगोष्ठियां, परिसंवाद एवं साहित्य, भाषा और संस्कृति के प्रचार-प्रसार की अन्य योजनाएं आदि की व्यवस्था करना।
- राजस्थानी भाषा, साहित्य के साहित्यकारों को उनकी उत्कृष्ट रचनाओं के लिए पुरस्कृत करना एवं श्रेष्ठ साहित्यकारों को उनकी साहित्यिक सेवाओं के लिए सम्मानित करना।
- सृजन, अनुवाद, साहित्यिक शोध व आलोचनात्मक अध्ययन संबंधी प्रोजेक्ट, भाषा वैज्ञानिक एवं साहित्यिक करवाना।
- भाषा साहित्य एवं संस्कृति के क्षेत्र में कार्यरत साहित्यकारों को वित्तीय सहायता, शोधवृत्तियां आदि देना।
- अनुसंधान शाखा सहित साहित्यिक पुस्तकालय तथा अध्ययन केन्द्र स्थापित करना और इस प्रवृत्ति के विकास के लिए वित्तीय सहयोग देना।
- जनता, व्यक्तियों और संस्थाओं से वस्तु और मुद्रा के रूप में आर्थिक सहयोग प्राप्त करना तथा सरकारी या अर्द्धसरकारी निकायों से अनुदान एवं अन्य सहयोग प्राप्त करना।

संदर्भ ग्रंथ सूची –

---

आचार्य रामचंद्र शुक्ल का हिंदी साहित्य का इतिहास

<https://www.google.co.in>

[https://hi.wikipedia.org/wiki/कन्हैयालाल\\_सेठ](https://hi.wikipedia.org/wiki/कन्हैयालाल_सेठ)

'लीलटांस' के लिए राजस्थानी में साहित्य अकादमी, 'सबद' काव्य-संग्रह के लिए

<https://www.drishtias.com> राजस्थान, भारत एवं विश्व का इतिहास

राजस्थानी भाषा साहित्य और संस्कृति – आशीर्वाद पब्लिकेशन

प्राचीन लिपिमाला, राजपुताने का इतिहास (पं. गौरीशंकर हीराचंद ओझा) :

<https://pdfdownload.in>

<http://assests.voou.ac.in> राजस्थानी भाषा अर साहित्य रो इतिहास