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## Awareness on the wound healing effects of curcumin therapy among dental students

Nithyanandham Masilamani\*, Dhanraj Ganapathy

Department of Prosthodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India

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### ABSTRACT

Turmeric also known as *Curcuma longa* is a rhizome used commonly in traditional medicines for decades to treat a number of inflammatory disorders and other ailments. Its therapeutic properties were primarily attributable to curcuminoids. The purpose of the study was for assessment of awareness of Curcumin's wound healing effects amongst dental students. A cross sectional study was done with a self-administered questionnaire comprising of 10 questions circulated among 100 dental students. The questionnaire assessed the awareness about wound healing effects Curcumin therapy, their effect on collagen expression, the effect on neovascularization, effect on reepithelization and effect on free radical scavenging. The responses were recorded and analysed. 78% of the respondents were not aware of the wound healing effects of curcumin therapy. 84% were not aware of the effect of curcumin in collagen expression. 88% were not aware of the effect of curcumin on neovascularization. 80% were not aware of the effect of curcumin on reepithelization. 94% were not aware of the effect of curcumin on free radical scavenging. The awareness about the use of Curcumin therapy in wound healing applications is very less among dental students. Increased awareness programs and sensitization and continuing dental education programs along with greater importance to the curricular modifications should be incorporated to improve the awareness levels.



### \*Corresponding Author

Name: Nithyanandham Masilamani  
Phone: 91 9840251312  
Email: [nithyanandam9677@gmail.com](mailto:nithyanandam9677@gmail.com)

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### INTRODUCTION

Turmeric also known as *Curcuma longa* is a rhizome used commonly in traditional medicines for decades to treat a number of inflammatory

disorders and other ailments. Its therapeutic properties were primarily attributable to curcuminoids (Saxena, 2013). Its rehabilitative effects are mainly attributed to curcuminoids, and the essential medicinal component present in the rhizome include curcumin (diferuloylmethane)—(1,7-bis(4-hydroxy3-methoxyphenyl)-1,6-heptadien-3,5-dione). Numerous studies have attempted to understand the pharmacokinetics of curcumin stored in the digestive system and dispersion into blood circulation to exert healing effects (Ravindranath and Chandrasekhara, 1981).

Curcumin plays a major role in enhancing healing mechanism in human body. Healing process and tissue repair are complex processes, including swelling, granulation and tissue reconstruction. Tissue damage starts a dynamic cascade that involves interactions with a variety of cells, several cytokines,

developmental factors, their accomplices and extra-cellular matrix proteins. Community use of turmeric is a very common treatment practice in India for several ailments, trauma, wound healing, ulcers, cutaneous diseases, insect bite and viral chicken-pox (Gribb, 1929).

In view of the antiquated utilization of turmeric in the wound healing process, prior examinations assessed the impact of curcumin on the improvement of wound healing (Aggarwal *et al.*, 2007). The purpose of the study was for assessment of awareness of Curcumin's wound healing effects amongst dental students.

### MATERIALS AND METHOD

A cross sectional survey was done with a self-administered questionnaire with 10 questions circulated among 100 dental students. The questionnaire assessed the awareness about wound healing effects Curcumin therapy, their effect on collagen expression, the effect on neovascularization, effect on reepithelization and effect on free radical scavenging. The responses were recorded and analysed.

### RESULTS

78% of the respondents were not aware of the wound healing effects of curcumin therapy Figure 1. 84% were not aware of the effect of curcumin in collagen expression Figure 2. 88% were not aware of the effect of curcumin on neovascularization Figure 3. 80% were not aware of the effect of curcumin on reepithelization Figure 4. 94% were not aware of the effect of curcumin on free radical scavenging Figure 5.

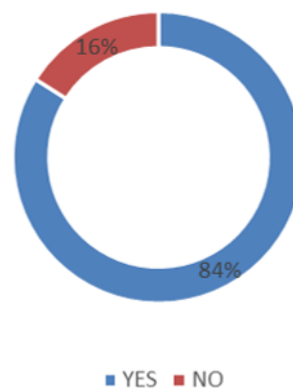


Figure 2: Awareness on effect of curcumin in collagen expression

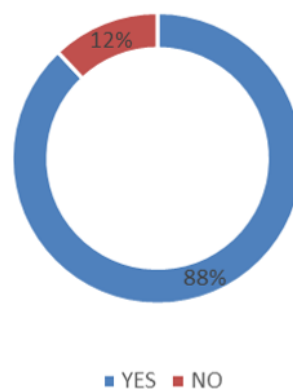


Figure 3: Awareness on effect of curcumin on neovascularization

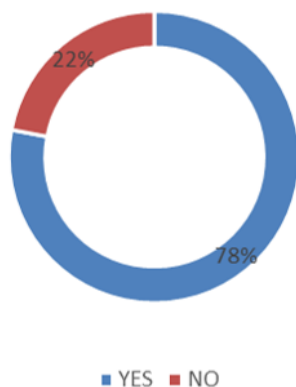


Figure 1: Awareness on wound healing effects of curcumin therapy

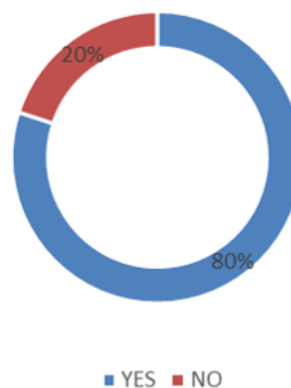
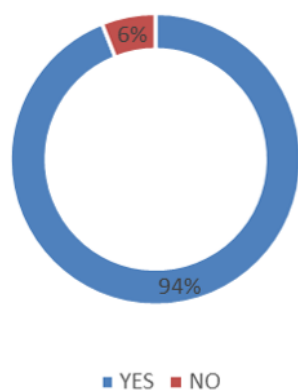


Figure 4: Awareness on effect of curcumin on reepithelization



**Figure 5: Awareness on effect of curcumin on free radical scavenging**

## DISCUSSION

Curcumin conditioned wound biopsies revealed an immense amount of cell migration of neutrophils, macrophages and the fibroblasts, relative to untreated wounds. The expression of myofibroblast in the curcumin administered wounds showed faster compression of wounds (Sidhu *et al.*, 1999). Metamorphosis of several cells is the anticipated source of growth factors required to regulate healthy mechanisms during wound healing. The Transforming growth factor (TGF- $\beta$ 1) is very important for wound healing because it enhances fibronectin (FN) and collagen synthesis by fibroblasts and enhances the amount of granulation tissue in vivo. Curcumin therapy culminated in increased fibronectin (FN) and collagen function (Marques *et al.*, 2017).

In addition, treatment with curcumin resulted in improved organization of granulation tissue, improved cell material, neo-vascularization and rapid re-epithelialization of wounds in diabetic and hydrocortisone-disrupted wounds, by controlling the expression of the TGF- $\beta$ 1, its receptors and nitric oxide synthase throughout wound healing (Mani *et al.*, 2002; Sidhu *et al.*, 1998). Several studies, including the fundamental entity of curcumin, have shown its useful impacts by enhancing muscle recovery after injuries in vivo through regulating NF- $\kappa$ B activity (Roach *et al.*, 2007).

Recent research has indicated curcumin prevents damage done due to hydrogen peroxide in mammalian keratinocytes and fibroblasts, suggesting cell reinforcement work in enhanced wound repairs (Krutmann and Humbert, 2010). Therefore, curcumin treatment exhibited enhanced wound reduction, better cell proliferation and sufficient free radical rummaging compared to control and

the collagen-treated rodents (Gomathi *et al.*, 2003; Gopinath *et al.*, 2004). Curcumin supplementation enhanced the combination of hexosamine, collagen, nitrite, DNA and histological examination of wound biopsy specimens illustrated elevated collagen assertion and an improvement in fibroblast and the vascular density indicating curcumin might be able to strengthen radiation-actuated deferral in wound healing (Jageti and Rajanikant, 2005).

Curcumin is noted for its antiulcer activity in an ulcer model in rodents by reducing glutathione exhaustion, lipid peroxidation and protein degradation. The denudation of the cell membrane during damage to the gastric lumen is overcome by curcumin by re-epithelialisation. In addition, both the oral and the intraperitoneal structure of curcumin inhibited the gastric ulceration in partly subjugated manner. It improved healing process and assured gastric ulcer healing by reducing the mobility of MMP-9 and enhancing the action of MMP-2. It is evident from these investigations that curcumin therapy has resulted in faster wound healing, far better control of the formation of granulation tissue and recognition of the growth factors (Aggarwal *et al.*, 2007). It suggests that the improvement of wound repairs be demonstrated at different stages. Further research is needed for evaluating curcumin as a potentially beneficial operator in the clinical domain of wound healing.

## CONCLUSION

The awareness about the use of Curcumin therapy in wound healing applications is very less among dental students. Increased awareness programs and sensitization and continuing dental education programs along with greater importance to the curricular modifications should be incorporated to improve the awareness levels.

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The authors declare that they have no funding support for this study.

## Conflict of Interest

The authors declare that they have no conflict of interest for this study.

## REFERENCES

- Aggarwal, B. B., Surh, Y. J., Shishodia, S. 2007. The Molecular Targets and Therapeutic Uses of Curcumin in Health and Disease. *Springer Science & Business Media*, 595. ISBN : 978-0-387-46400-8.
- Gomathi, K., Gopinath, D., Ahmed, M. R., Jayakumar, R. 2003. Quercetin incorporated collagen matrices

- for dermal wound healing processes in rat. *Biomaterials*, 24(16):2767-2772.
- Gopinath, D., Ahmed, M. R., Gomathi, K., Chitra, K., Sehgal, P. K., Jayakumar, R. 2004. Dermal wound healing processes with curcumin incorporated collagen films. *Biomaterials*, 25(10):1911-1917.
- Gribb, C. H. 1929. The Indian Materia Medica. Edited by K. M. Nadkarni. Pp. xviii + 1142. Appendices, pp. lxxxviii. Bombay: K. M. Nadkarni, 1927. Rs. 11, or Sh. 18s. *Journal of the Society of Chemical Industry*, 48(5):116-116.
- Jagetia, G. C., Rajanikant, G. K. 2005. Curcumin Treatment Enhances the Repair and Regeneration of Wounds in Mice Exposed to Hemibody ??-Irradiation. *Plastic and Reconstructive Surgery*, 115(2):515-528.
- Krutmann, J., Humbert, P. 2010. Nutrition for Healthy Skin: Strategies for Clinical and Cosmetic Practice. *Springer Science & Business Media*. ISBN: 978-3-642-12264-4.
- Mani, H., Sidhu, G. S., Kumari, R., Gaddipati, J. P., Seth, P., Maheshwari, R. K. 2002. Curcumin differentially regulates TGF- $\beta$ 1, its receptors and nitric oxide synthase during impaired wound healing. *BioFactors*, 16(1-2):29-43.
- Marques, A. P., Reis, R. L., Pirraco, R. P., Cerqueira, M. 2017. Skin Tissue Models. *Academic Press*, pages 441-451.
- Ravindranath, V., Chandrasekhara, N. 1981. Metabolism of curcumin-studies with [3H]curcumin. *Toxicology*, 22(4):337-344.
- Roach, R., Wagner, P. D., Hackett, P. 2007. Hypoxia and Exercise. *Springer Science & Business Media*.
- Saxena, P. K. 2013. Development of Plant-Based Medicines: Conservation, Efficacy and Safety. *Springer Science & Business Media*. ISBN : 978-90-481-5675-7.
- Sidhu, G. S., Mani, H., Gaddipati, J. P., Singh, A. K., Seth, P., Banaudha, K. K., Patnaik, G. K., Maheshwari, R. K. 1999. Curcumin enhances wound healing in streptozotocin induced diabetic rats and genetically diabetic mice. *Wound Repair and Regeneration*, 7(5):362-374.
- Sidhu, G. S., Singh, A. K., Thaloor, D., Banaudha, K. K., Patnaik, G. K., Srimal, R. C., Maheshwari, R. K. 1998. Enhancement of wound healing by curcumin in animals. Wound Repair and Regeneration: Official Publication of the Wound Healing Society. *European Tissue Repair Society*, 6(2):167-177.