

## Incidence of dry socket after third molar impaction removal in private dental college

- **Navya Khanna**

*Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences (SIMATS), Saveetha University, Chennai- 77, India.*

- **Kathiravan Selvarasu**

*Department of Oral and Maxillofacial surgery Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences [SIMATS], Saveetha University, Chennai 600077.*

- **Senthil Murugan Pandurangan**

Associate Professor, Department of Oral and maxillofacial surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences [SIMATS], Saveetha University Chennai - 600077, Tamil Nadu, India.

- **Vinod krishna**

Senior Lecturer, Department of Oral and maxillofacial surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences Saveetha University Chennai - 600077, Tamil Nadu, India.

### ABSTRACT:

**INTRODUCTION:** Dry socket (DS) is the most common post-surgical complication following extraction of impacted molar teeth. Various risk factors have been mentioned for this complication including gender, age, amount of trauma during extraction, difficulty of surgery, inappropriate irrigation, infection, smoking, and oral contraceptive use.

**AIM:** The aim of this study was to evaluate incidence of dry socket following extraction of impacted third molars.

**MATERIALS AND METHODS:** A total of 1040 patients with a total of 60 maxillary and 980 mandibular impacted third molar extraction surgeries entered this study. Surgeries to remove impacted third molar teeth between June 2019 to February 2021 were included in this study. Data was collected by studying case records imported to SPSS. Descriptive statistics and comparison with gender of patient using chi-square test was done.

**RESULTS AND DISCUSSION:** The incidence of dry socket in this study was 1.35%. Among 580 males, 8 were found to have dry socket in the following review appointment, whereas among 460 females, reported cases of dry socket were 6.

**CONCLUSION:** Our study shows that only 1.35% of patients undergoing extraction have got dry socket conditions at private colleges and hospitals. High incidence of dry socket is seen in mandibular molars than the maxillary molars. Reason for minimal dry socket complication in private college is due to Good Quality of treatment, proper oral health education, insisting the patients to follow up the post operative instructions promptly and most importantly best method of sterilisation technique. Dry socket was seen in patients after extraction of grossly decayed teeth as well as mandibular teeth due to multifactorial reasons.

**Key words:** dry socket, third molar impaction, incidence, innovative study

### INTRODUCTION:

The most common postoperative complication after tooth extraction (1) is dry socket, which develops 2 to 4 days after surgery (2–6). Crawford was the first to describe it in 1876(7). Alveolar osteitis, localised osteitis, alveolgia, alveolitis sicca dolorosa, septic socket, necrotic socket, localised osteomyelitis, fibrinolytic alveolitis, and other terms have been used to describe it(2). Dry socket has been recorded in 1% to 4% of extractions, with a high of 45 percent for mandibular third molars(2,8).

This happens as a blood clot dissolves and the alveolar bone is exposed. Pain, halitosis, reduced exercise, and extra visits to the surgeon are all expenses that the patient can bear(9). It is the most common complication when the mandibular third molar is surgically extracted. [28%] The prevalence of DS is increasing due to surgeons' inexperience,(10) the volume of pain during surgery,(9,10) smoking habits,(11,12) improper irrigation during surgery,(13) oral contraceptive use,(14,15) and preoperative infection(16,17). Dry socket was recorded to occur between 5% and 30% of the time when impacted mandibular third molars were surgically removed in various tests (18).

Patients between the ages of 40 and 45 are most likely to experience dry socket. (19,20) According to published reports, 1 percent to 4% of people had their teeth extracted, with lower teeth having a 10 times higher incidence than upper teeth (21) and mandibular third molars having a 45 percent incidence. (22,23) In addition to alveolitis sicca dolorosa and granulomatous alveolitis, Hansen (24) described alveolitis simplex in 1960, which is characterised by an unexpected loss of the clot and the absence of pain. This complication was divided into three forms by Hermes et al (25): superficial alveolitis marginal, suppurative alveolitis, and dry socket.

This complication was listed as true alveolitis and nonspecific alveolitis by Oikarinen (26) in 1989. True alveolitis causes the usual signs of dry socket which necessitates medical attention. Nonspecific alveolitis, on the other hand, occurs more often and, considering the unpleasant symptoms, does not necessitate medical attention. Researchers recently proposed

the following specification for dry socket: Pain around the alveolus that worsens with time between 1 and 3 days after extraction, followed by partial or complete clot failure in the interior of the alveolus, with or without halitosis. (27)

Dry socket is described by the presence of an inflammatory cellular infiltrate in the residual blood clot, including various phagocytes and giant cells, as well as the presence of bacteria and lamina dura necrosis.(28) Birn (17) stated in 1973 that the inflammatory process would spread to the medullary spaces and sometimes the periosteum, resulting in connective tissue inflammation of the adjacent mucosa with microscopic features similar to osteomyelitis. In histopathologic investigations of dry socket, degradation of the blood clot in combination with breakdown of erythrocytes and fibrinolysis, deposits of hemosiderin, and the absence of ordered granulation tissue have also been identified. (29)

Despite the fact that DS is a self-limiting complication, antibacterial, antiinflammatory, antifibrinolytic, and clot support agents have been suggested for care.[(8) a In the case of dry socket, however, avoidance is more successful. The prevalence of dry socket has decreased significantly as a result of the identification and elimination of risk factors, as well as pharmacological prophylaxis. (30) Local anaesthetic agents' vasoconstriction involvement, vitamin imbalances, contraceptive drugs, smoking, age and gender, and trauma are just a few of the causes. The goal was to figure out what proportion of male and female patients with maxillary and mandibular third molar extractions experienced dry sockets. The aim of this study was to evaluate incidence of dry socket following extraction of impacted third molars.

### MATERIALS AND METHODS:

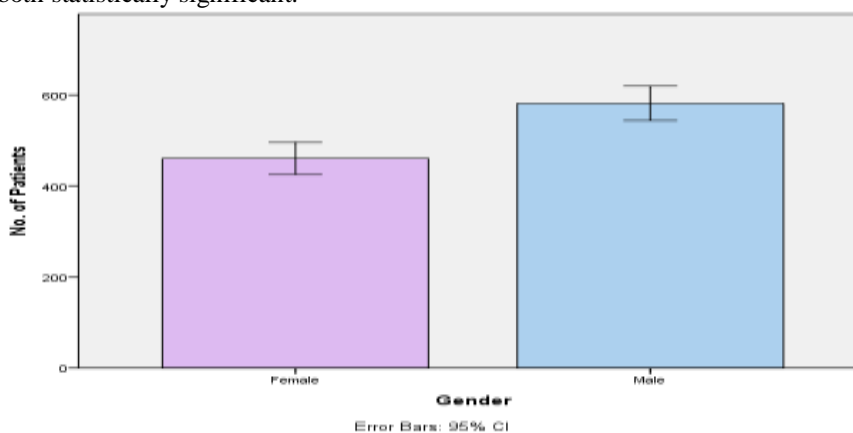
This study is a retrospective study conducted in a University setting under the outpatient department of Oral Surgery, Saveetha Dental College. The study setting had certain advantages like flexibility in data collection, less expenditure and maximum internal validity. However, the study also has certain limitations, that is unicentric with reduced sample size and minimum external validity. The ethical approval was obtained from the Institution Ethical Review Board Approval. The study involved two people.

The required data of patients procured by reviving patient records from June 2019 to February 2021 and reviewed. These patients were an output of the Oral Surgery department. A total number of 500000 cases were reviewed. The total sample size after review was 1040. Case sheet verification was done by 1 examiner. Sampling bias was minimised by doing simple random sampling. The internal validity is minimum and external validity is maximum. The necessary data such as age, gender, incidence of dry socket and its treatment, were recorded. The collected data was input in an Excel sheet. The data was verified by the cross examiner by photographs or data validation. There was no resolution of conflict. The censored data was discarded.

The tabulated data from the Excel was imported to SPSS for statistical analysis. The software used was SPSS version 22, IBM software, Chicago. Descriptive statistics and correlation statistics using chi-square test were tabulated and graphically represented.

### RESULTS AND DISCUSSION:

Dry socket is the most common post-surgical complication following extraction of impacted molar teeth. A total of 1040 patients were a part of this study. The gender distribution (figure 1) was found to be 580 males (55.77%) and 460 females (44.23%). Among the 1040 cases, 60 of them (5.77%) were maxillary third molars and 980 of them (94.23%) were mandibular third molars (figure 2). The prevalence of dry socket (figure 3) was found to be a minimal of 1.35% out of all 1040 patients, which is 14 cases out of 1040. Correlation was done between the incidence of dry socket with both gender (figure 4) and arch (figure 5) in which it was recorded and it was found to have a p value of 0.01 and 0.049 respectively ( $p < 0.05$ ), which are both statistically significant.



**Figure 1:** The pie graph represents the percentage of patients who underwent impacted third molar extraction. The light green represents the percentage of females (44.23%) while the dark green represents the percentage of males (55.77%)Koi

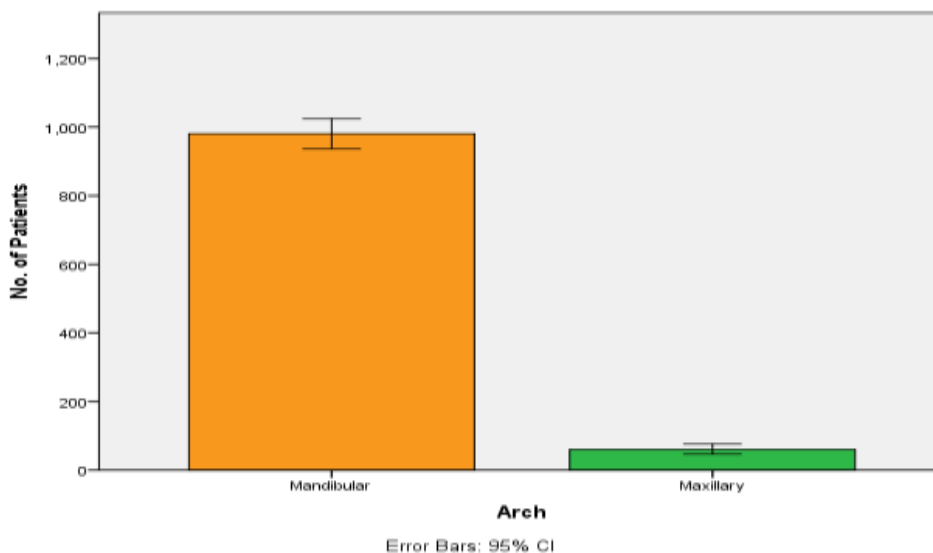


Figure 2: The pie graph represents the percentage of impacted third molar extraction belonging to the maxillary and mandibular arches. The light blue represents the percentage of impacted third molar extraction belonging to the maxillary arch (5.77%) while the dark blue represents the percentage of impacted third molar extraction belonging to the mandibular arch (94.23%)

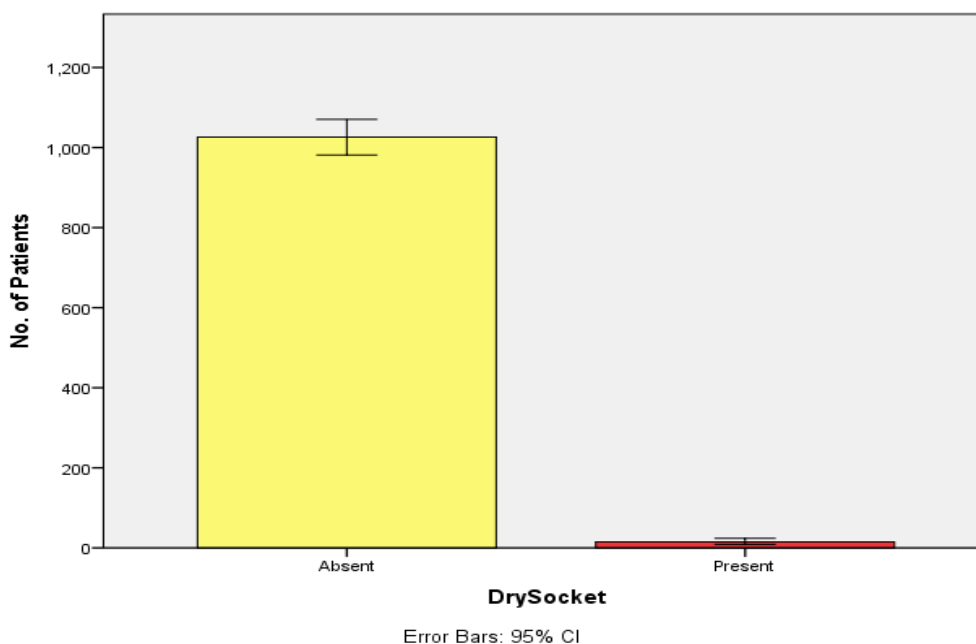
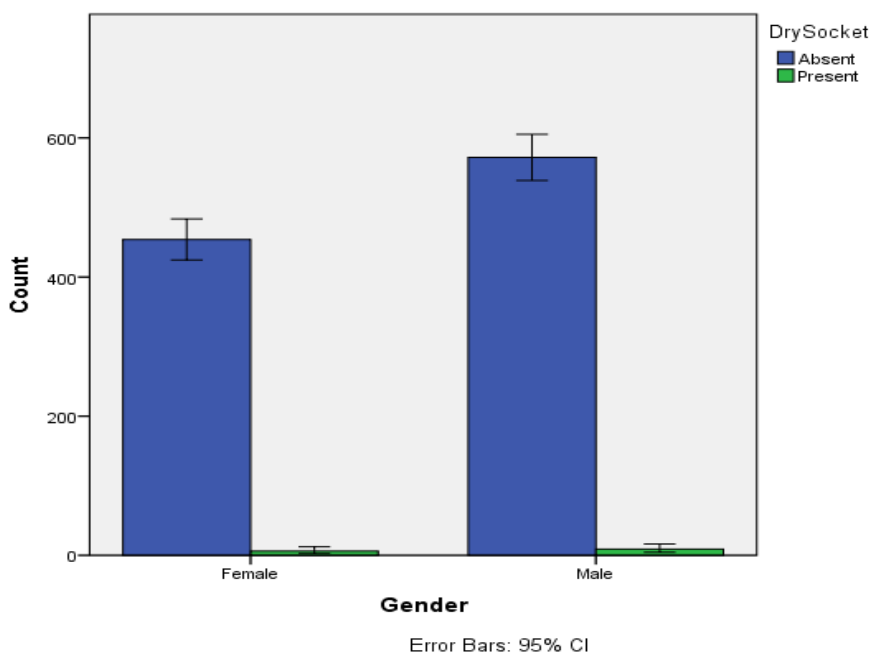
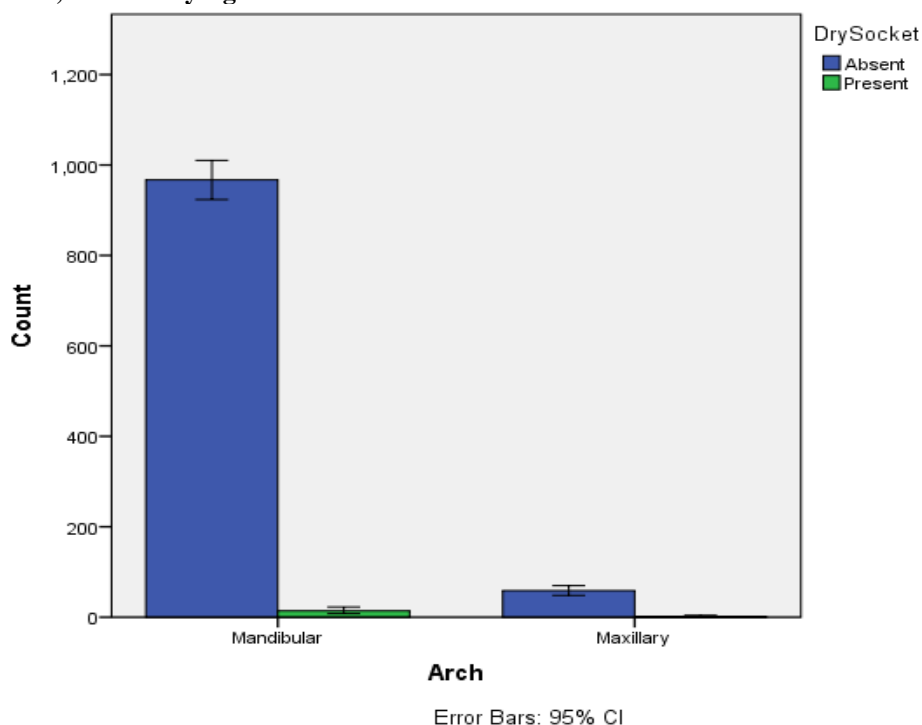


Figure 3: The pie graph represents the incidence of dry socket post extraction of impacted third molar. The light purple represents the absence of dry socket (98.65%) while the violet represents the presence of dry socket (1.35%)



**Figure 4:** Bar graph showing the association between the gender and incidence of dry socket among the patients who underwent impacted third molar extraction. The X-axis represents the gender while Y-axis represents the no. of patients. Chi-square test was done and the association was found to be statistically significant. P-value: 0.011 ( $p < 0.05$ ). Hence, statistically significant.



**Figure 5:** Bar graph showing the association between the arch and incidence of dry socket among the patients who underwent impacted third molar extraction. The X-axis represents the arch (maxillary or mandibular) while Y-axis represents the no. of patients. Chi-square test was done and the association was found to be statistically significant. P-value: 0.049 ( $p < 0.05$ ). Hence, statistically significant.

#### CONCLUSION:

Our study shows that only 1.35% of patients undergoing extraction have got dry socket conditions at private colleges and hospitals. High incidence of dry socket is seen in mandibular molars than the maxillary molars. Reason for minimal dry socket complication in private college is due to Good Quality of treatment, proper oral health education, insisting the patients to follow up the post operative instructions promptly and most importantly best method of sterilisation technique.

Dry socket was seen in patients after extraction of grossly decayed teeth as well as mandibular teeth due to multifactorial reasons.

**ACKNOWLEDGEMENT:**

I acknowledge the help offered by saveetha institute of Medical and Technical science for permitting me to use the facilities available to perform this study and I also thank my staffs.

**CONFLICT OF INTEREST:**

All the authors declare no conflict of interest in the study.

**SOURCE OF FUNDING:**

This study is funded by

- Saveetha Institute of Medical and Technical Sciences
- Deepak Bearing Industries, New Delhi.

**REFERENCES:**

1. ViewSpecialArticleDetail [Internet]. [cited 2021 May 26]. Available from: <http://www.ijpronline.com/ViewSpecialArticleDetail.aspx?ID=238>
2. Blum IR. Contemporary views on dry socket (alveolar osteitis): a clinical appraisal of standardization, aetiopathogenesis and management: a critical review. *Int J Oral Maxillofac Surg.* 2002 Jun;31(3):309–17.
3. Colby RC. The general practitioner’s perspective of the etiology, prevention, and treatment of dry socket. *Gen Dent.* 1997 Sep;45(5):461–7; quiz 471–2.
4. Al-Khateeb TL, El-Marsafi AI, Butler NP. The relationship between the indications for the surgical removal of impacted third molars and the incidence of alveolar osteitis. *J Oral Maxillofac Surg.* 1991 Feb 1;49(2):141–5.
5. Turner PS. A clinical study of “dry socket.” *Int J Oral Surg.* 1982 Aug 1;11(4):226–31.
6. Noroozi A-R, Philbert RF. Modern concepts in understanding and management of the “dry socket” syndrome: comprehensive review of the literature. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology.* 2009 Jan 1;107(1):30–5.
7. Crawford JY. Dry socket. *Dent Cosmos.* 1896;38:929.
8. Fazakerley M, Field EA. Dry socket: a painful post-extraction complication (a review). *Dent Update.* 1991 Jan;18(1):31–4.
9. Osborn TP, Frederickson G Jr, Small IA, Torgerson TS. A prospective study of complications related to mandibular third molar surgery. *J Oral Maxillofac Surg.* 1985 Oct;43(10):767–9.
10. Sisk AL, Hammer WB, Shelton DW, Joy ED Jr. Complications following removal of impacted third molars: the role of the experience of the surgeon. *J Oral Maxillofac Surg.* 1986 Nov;44(11):855–9.
11. Heasman PA, Jacobs DJ. A clinical investigation into the incidence of dry socket. *Br J Oral Maxillofac Surg.* 1984 Apr;22(2):115–22.
12. Sweet JB, Butler DP. The relationship of smoking to localized osteitis. *J Oral Surg.* 1979 Oct;37(10):732–5.
13. Meechan JG, Macgregor ID, Rogers SN, Hobson RS, Bate JP, Dennison M. The effect of smoking on immediate post-extraction socket filling with blood and on the incidence of painful socket. *Br J Oral Maxillofac Surg.* 1988 Oct;26(5):402–9.
14. Sweet JB, Butler DP. Predisposing and operative factors: effect on the incidence of localized osteitis in mandibular third-molar surgery. *Oral Surg Oral Med Oral Pathol.* 1978 Aug;46(2):206–15.
15. Catellani JE, Harvey S, Erickson SH, Cherkin D. Effect of oral contraceptive cycle on dry socket (localized alveolar osteitis). *J Am Dent Assoc.* 1980 Nov;101(5):777–80.
16. Gersel-Pedersen N. Blood fibrinolytic activity before and after oral surgery. *Int J Oral Surg.* 1977 Feb;6(1):42–7.
17. Birn H. Etiology and pathogenesis of fibrinolytic alveolitis (“dry socket”). *Int J Oral Surg.* 1973 Jan 1;2(5):211–63.
18. Babar A, Ibrahim MW, Baig NJ, Shah I, Amin E. Efficacy of intra-alveolar chlorhexidine gel in reducing frequency of alveolar osteitis in mandibular third molar surgery. *J Coll Physicians Surg Pak.* 2012 Feb;22(2):91–4.
19. Rud J. Removal of impacted lower third molars with acute pericoronitis and necrotising gingivitis. *Br J Oral Surg.* 1970 Mar;7(3):153–60.
20. Rood JP, Danford M. Metronidazole in the treatment of “dry socket.” *Int J Oral Surg.* 1981 Oct 1;10(5):345–7.
21. Alling CC, Helfrick JF, Alling RD. *Impacted teeth.* WB Saunders Company; 1993.
22. Trieger N, Schlagel GD. Preventing dry socket. A simple procedure that works. *J Am Dent Assoc.* 1991 Feb;122(2):67–8.
23. Buller DP, Sweet JB. Effect of lavage on the incidence of localized osteitis in mandibular third molar extraction sites. *Oral Surg Oral Med Oral Pathol.* 1977 Jul 1;44(1):14–20.
24. Hansen EH. Alveolitis sicca dolorosa (dry socket): frequency of occurrence and treatment with trypsin. *J Oral Surg Anesth Hosp Dent Serv.* 1960 Sep;18:409–16.
25. Hermes CB, Hilton TJ, Biesbrock AR, Baker RA, Cain-Hamlin J, McClanahan SF, et al. Perioperative use of

- 0.12% chlorhexidine gluconate for the prevention of alveolar osteitis: efficacy and risk factor analysis. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 1998 Apr;85(4):381–7.
26. Oikarinen K. True and nonspecific alveolitis sicca dolorosa related to operative removal of mandibular third molars. *Proc Finn Dent Soc.* 1989;85(6):435–40.
  27. Torres-Lagares D, Serrera-Figallo MA, Romero-Ruíz MM, Infante-Cossío P, García-Calderón M, Gutiérrez-Pérez JL. Update on dry socket: a review of the literature. *Med Oral Patol Oral Cir Bucal.* 2005 Jan;10(1):81–5; 77–81.
  28. Faillo PS. Proteolytic enzyme treatment for the necrotic alveolar socket (dry socket). *Oral Surg Oral Med Oral Pathol.* 1948 Jul;1(7):608–13.
  29. Amber MH. Pathogenesis of disturbed extraction wounds. *J Oral Surg.* 1973 Sep;31(9):666–74.
  30. Yengopal V, Mickenautsch S. Chlorhexidine for the prevention of alveolar osteitis. *Int J Oral Maxillofac Surg.* 2012 Oct;41(10):1253–64.
  31. Syahza, Almasdi, et al. "Potential development of leading commodities in efforts to accelerate rural economic development in coastal areas Riau, Indonesia." *Journal of Applied Sciences* 20.5 (2020): 173-181.
  32. Shinde, Tushar, Aditi Dhage, and Aishwarya Das. "Intentional Reimplantation: Salvaging Endeavour." *International Journal of Dental Research & Development (IJDRD)* 6.3 (2016).
  33. Jain, Kapil, et al. "Effect of Periodontal Treatment on Red Blood Cell Parameters in Patients with Chronic Periodontitis." *International Journal of Dental Research & Development (IJDRD)* 6.3 (2016).
  34. Chauhan, Ravish Kumar. "Structural Studies on Cu (II), Fe (III) and UO<sub>2</sub> (II) Complexes With Pyrazine-2-Carboxylic Acid Hydrazide and Its Derivatives." *International Journal of Medicine and Pharmaceutical Sciences (IJMPS)* 5.6: 21-28.
  35. Thakur, G. A. U. R. A. V., and G. U. R. P. R. E. E. T. Singh. "Experimental investigation of heat transfer characteristics in Al<sub>2</sub>O<sub>3</sub>-water based nanofluids operated shell and tube heat exchanger with air bubble injection." *International Journal of Mechanical and Production* 7 (2017): 263-273.
  36. Patil, Vathsala, et al. "A comparative study on the effect of stress in dental implant structure using finite element analysis." *Int J Mech Prod Eng Res Dev* 9 (2019): 709-17.