
Age and Gender Wise Prevalence Of Dental Caries Among Children - A Retrospective Analysis

HENA MARIAM FATHIMA¹, MAHESH RAMAKRISHNAN^{2*}

¹Saveetha Dental College and Hospitals ,Saveetha Institute of Medical and Technical Sciences,Saveetha University, Chennai

²Reader,Department of Pedodontics and Preventive Dentistry,Saveetha Dental College and Hospitals
Saveetha Institute of Medical and Technical Sciences,Saveetha University, Chennai

*Corresponding author

Email: mahesh@saveetha.com

Abstract: Dental caries is a chronic disease with multifactorial etiology, with variable pathogenesis and is the most prevalent unmet health care need in children. The aim of the study is to evaluate the age and gender wise prevalence of dental caries among children. A retrospective study was carried out among children reported to a private Dental University from June 2019-March 2020. Patient records were collected and evaluated independently by calibrated examiners. Patients in the age group of 6-16 years were selected for the study. A total of 217 patients met the inclusion criteria and were eligible for the study. The mean DMFT/dmft score was found to be 3.78. Chi square analysis showed no statistically significant result between gender and DMFT/dmft score, since p value >0.05. Males were more affected than females. It can be concluded that caries prevalence and mean DMFT/dmft was found to be higher in males and in the age group of 6-8 years specifically.

Keywords: Age; Caries; Children; DMFT/dmft; Gender

INTRODUCTION

Dental caries is a significant yet preventable public health problem. It is the most common chronic disease of childhood. It affects children all over the globe. Although it is a marked increase in dental caries in developing nations. The dental caries being one of the most common chronic diseases of childhood (6-12 years). (Govindaraju, Jeevanandan and Subramanian, 2017b; Jeevanandan, 2017) This increase in dental caries signals a pending public health crisis (Sohi et al., 2012). Oral hygiene is the most effective measure to prevent caries and periodontal disease (Campus et al., 2007). Oral health is more than healthy teeth; it is an integral part of general health and is essential to the general well being of an individual. (Somasundaram et al., 2015; Govindaraju, Jeevanandan and Subramanian, 2017c; Jeevanandan and Govindaraju, 2018) Dental caries or tooth decay is an acquired chronic infective disease process caused by the acidic by-products of bacteria inhabiting organized dental plaque or oral biofilm that, if left undisturbed, can dissolve or demineralize the enamel surfaces of the teeth (Choo, Delac and Messer, 2001). Dental caries is a multifactorial disease (Behal et al., 2016). It is believed that an environment with its typical culture, socioeconomic status, lifestyle and dietary pattern can have a greater impact on caries resistance or development than the so-called inherent racial attributes (Brian, Stephen and Donald, 1999).

Among various stages of life, the school going period is the crucial one where the children are facing multi-dimensional challenges in terms of educational and health perspective risks which leads to various conditions like oral diseases. (Govindaraju, Jeevanandan and Subramanian, 2017a; Ravikumar, Jeevanandan and Subramanian, 2017; Panchal et al., 2019) The major oral health problems around the world are generally considered to be dental caries and periodontal disease. (Christabel and Linda Christabel, 2015; Gurunathan and Shanmugaavel, 2016; Packiri, Gurunathan and Selvarasu, 2017) The main cause of dental caries are dental plaque associated with bacteria including *Streptococcus Mutans* and *Lactobacillus*. The prevalence and severity of caries in a population is influenced by several risk factors like age, gender, dietary patterns, oral hygiene habits as well as social class. Caries is the outcome of a highly complex process reflecting biological and genetic susceptibility as well as many related individual, social, environmental and cultural factors. (Harris et al., 2004) Diet affects the development and integrity of the oral cavity as well as progression of diseases of the oral cavity, and are major multifactorial environmental factors in the etiology and pathogenesis of oro-facial diseases and disorders. Age is an important factor to be regarded in order to better understand oral health. Children suffer from many infectious diseases during the first three years of life around the time of eruption of deciduous teeth. The problem is more critical in children due to lack of proper brushing, high carbohydrate consumption and

most of poor patient awareness. Childhood is an important period for instituting preventive programs because as primary teeth erupt, bacteria colonize the tooth surfaces and dental behavior starts to develop during this time. In 1940, the prevalence of dental caries in 5 and 12-year-old schoolchildren in India were 55.5% and it jumped to 68% in 1960 (Damle and Patel, 1994; Murray, Nunn and Steele, 2003) and climbed to 89% in subsequent years (Dash et al., 2002). A very extensive and comprehensive National Health Survey was conducted in 2004 by the Dental Council of India, throughout the entire country in order to ascertain the oral health status and prevalence of dental disease in representative age groups. The following percent prevalence of dental caries was reported for the various age groups examined, for both coronal and root surfaces as 51.9% in 5 year-old children, 53.8% in 12 year-old children, 63.1% in 15 year-old teenagers, 80.2% in adults aged 35-44 years-old, and 85.0% in adults aged 65-74 years-old (Joshi, Rajesh and Sunitha, 2005). The report concluded to provide preventive dentistry programs, such as water fluoridation, dental health education, early diagnosis and treatment. Age is an important factor to be regarded in order to better understand oral health. Children within this age group are in the mixed dentition period and have both their permanent and deciduous teeth present. ('Fluoride, Fluoridated Toothpaste Efficacy And Its Safety In Children - Review', 2018; Lakshmanan et al., 2020) The establishment of good oral health practices in this period could lead to a healthier mouth lifetime. (GovinDaraju and Gurunathan, 2017; Subramanyam et al., 2018) Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J et al., 2018; Menon et al., 2018; Prabakar et al., 2018; Rajeshkumar et al., 2018, 2019; Vishnu Prasad et al., 2018; Wahab et al., 2018; Dua et al., 2019; Duraisamy et al., 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu et al., 2019; Mehta et al., 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran et al., 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma et al., 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi et al., 2020; Samuel, Acharya and Rao, 2020) The present study was done to assess the age wise and gender wise prevalence of dental caries in children aged 6-16 years of age.

MATERIALS AND METHODS

The present cross sectional study was carried out in the Pedodontics and Preventive Dentistry of Saveetha Dental College and Hospital, Chennai, Tamil Nadu. The study was of university setting, the records of a total of 86000 patients who reported to the Dental hospital between June 2019-March 2020 were evaluated. The patients who met the inclusion criteria were taken into detailed examination. The advantage of using a university setting is that data is readily available and children are of similar ethnicity. The disadvantage of this type of setting is that it covers a specific geographic area and trends in other locations are not assessed. Ethical approval was obtained from the institution. The data was reviewed by 2 reviewers. Case verification was done by 2 reviewers. Random sampling of the available data was done. The sample size consisted of 217 samples of children from the ages of 6-16 years of age. Inclusion criteria included children within the ages of 6-16 years diagnosed with dental caries. Children having orthodontic and prosthetic appliances were excluded from the study. Special health care needs children were also eliminated since they have difficulty in maintaining proper oral hygiene. Data was tabulated using Microsoft Excel. Censored or incomplete data was excluded from the study. The data was imported to SPSS software developed by IBM and results were tabulated. Chi square test was done to compare the gender of the participants with their DMFT/dmft status.

RESULTS AND DISCUSSION

A total of 217 children between the ages of 6-16 years were assessed. Out of which 122 (54%) were male and 95 (43.8%) were female. Children aged 6 yrs (54) in number, 7yrs (45), 8yrs (36), 9yrs (30), 10yrs (22), 11yrs (11), 12yrs (6), 13 yrs (5), 14yrs (2), 15yrs (3) and 16yrs(3). The mean DMFT/dmft was found to be 3.78 ± 2.4 . Males seem to have higher values of DMFT/dmft when compared to females.

Figure 1 depicts the descriptive distribution of DMFT/dmft compared to the number of children. X axis represents the DMFT/dmft of children participating in the study and Y axis represents the number of children participating in the study. The maximum children (n=42) had a DMFT/dmft score of 1 and 2, the maximum DMFT/dmft score of 14 was seen only in one child.

Figure 2 depicts the descriptive distribution of gender of the children participating in the study. X axis represents the gender of children participating in the study and Y axis represents the number of children participating in the study. Majority of our study population consisted of males (n=122) as compared to females (n=95).

Figure 3 depicts the descriptive distribution of age of the children participating in the study. X axis represents the age of children participating in the study and Y axis represents the number of children participating in the study. The minimum age group was 6 years (n=54), 7 years (n=45), 8 years (n=36), 9 years (n=30), 10 years (n=22), 11 years (n=11), 12 years (n=6), 13 years (n=5), 14 years (n=2), 15 years (n=3) and 16 years (n=3).

Figure 4 depicts the descriptive distribution of DMFT/dmft of the children participating in the study with respect to their age. X axis represents the DMFT/dmft of children participating in the study and Y axis represents the number of children participating in the study. Chi square analysis showed no statistical significant result, p value >0.05.

Figure 5 depicts the descriptive distribution of DMFT/dmft of the children participating in the study with respect to their gender. X axis represents the DMFT/dmft of children participating in the study and Y axis represents the number of children participating in the study. Chi square analysis was done, p value was 0.910 which was >0.05 and hence not statistically significant.

The present study revealed that caries prevalence was higher in primary dentition than permanent dentition and males had much high caries prevalence than females. The children between the ages of 6-8 were most affected. Chi square analysis shows p value of 0.465 for DMFT/dmft and sex of the participants which is statistically not significant.

Previously, Rajendran et al (Rajendran and Singh, 2016) reported that prevalence of dental problems among the school children (8 – 13 years) rural Tamil Nadu is 48.2%. In a study by Jose et al (Aa and Mr, 2003) out of 1068 children examined, 580 (54.3%) showed evidence of dental caries, of which only 34 (3.18%) received treatment. As the age advances there was a rise in proportion affected by caries. Both males and females are almost equally affected by caries with slightly higher prevalence among males. Among 580 children having caries only 3.18% had dental fillings. In other words the proportion of children getting medical attention for caries is very minimum. It is interesting to note that among all those having caries more boys have dental filling than girls. 65% of those with fillings are boys.

In a study by Vinay et al (Bhardwaj, 2014) out of the 1,200 children examined in the present study, 594 were boys and 606 were girls. Among male students, 172, 184, and 238 belonged to the 6-7, 8-9, and 10-12 years age-group, respectively, whereas 190, 206, and 210 female students belonged to 6-7, 8-9, and 10-12 years, respectively. Both the arches had deciduous first molars most affected with dental caries, 46.56% and 51.3%, respectively, irrespective of age and gender. Mandibular central incisor and maxillary lateral incisor were the teeth least affected with dental caries. Maxillary permanent first molar was the most affected tooth with dental caries (77.38%), followed by central incisor (6.18%). Canine was the least affected tooth (1.8%). Mandibular first molar was the most affected tooth (80%), followed by the first premolar (4.93%). Lateral incisor (0.31%) was the least affected tooth. A study conducted by Malvania et al (Malvania et al., 2014) shows that the percentage of individuals affected with dental caries was found to be 17.15%. Females (20.26%) compared with males (15.02%) and government school children (23.78%) compared with private school children (13.84%) were found to be significantly more affected with dental caries.

In a study by Mohammadi et al (Mohammadi et al., 2015) out of 1140 students, with 462 girls (40.52%) and 678 boys (59.40%) The prevalence of dental caries in boys was 45.08%, and girls was 28.42%. In permanent dentition, the mean DMFT in boys was found to be slightly higher than the mean DMFT of girls (P = 0.55). In deciduous dentition, the mean dmft scores for boys and girls were 0.50 ± 1.04 and 0.66 ± 1.12 , respectively and the difference was statistically significant (P = 0.014). In permanent dentition, the caries prevalence and severity was highest in children of 12–14 years age and least in the children of 6–8 years age. The difference between groups was statistically highly significant (P = 0.001). In a study by Shingare et al (Shingare et al., 2012) in Maharashtra, reported the prevalence of dental caries among 3-14 years old children to be 80.92%. In Kenya, Ng'ang'a and Valderhaug (Ng'ang'a and Valderhaug, 1992) reported a prevalence of 40-50% among children aged 13-15 years. Another study was conducted by Kassim et al. (Kassim, Noor and Chindia, 2006) in Nairobi in 2006 which revealed that the prevalence to be 43% among rural children.

Dixit et al. (Prasai Dixit et al., 2013) conducted a study among school children in Nepal and they found that the prevalence of dental caries among the school children aged 12-13 years was 41% and also reported a higher prevalence among girls (48.4%) than in boys (32%). Bali, et al. reported that caries prevalence of 5 year old children was 50% and caries prevalence of 5 years old children in Jammu and Kashmir State was 50.9%. The caries prevalence for boys was found to be more in comparison to the girls for 6 years as well as for age group 7-11 years. The mean recorded dmft of subjects ≤ 6 years of age was 1.34 ± 1.61 . (Bali et al., 2004). Dhar and Bhatnagar and de-Almeida, et al. have reported caries prevalence of 51.53% and 46.9% for similar age in Udaipur and Portuguese children respectively (De Almeida et al., 2003; Dhar and Bhatnagar, 2009; Prasai Dixit et al., 2013).

Higher mean caries experience in primary dentition of 7-10 years old children has been reported as 2.43 ± 2.57 in rural areas of Tamil Nadu, (Saravanan et al., 2008) 2.87 ± 2.31 in 8 to 12 year schoolchildren of Rohtak (Rai et al., 2007) and in many other previous studies (Subrata, 1996). In previous studies done by Srinivas, et al. (Srinivas et al., 2012). These findings suggest high prevalence of disease and lack of dental care in boys within these age groups.

The present study also reported a decrease in caries prevalence in primary dentition with increasing age, i.e., from 6-16 years, a trend also seen within the same gender. The exfoliation of deciduous teeth in the older age group might explain the cause (Sweeney, Nugent and Pitts, 1998). Another reason can be attributed to increase

in the level of manual dexterity and increase in the awareness and knowledge of the subjects (Babu, Nirmala and Sivakumar, 2011). Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh et al., 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai et al., 2019; Sridharan et al., 2019; Vijayashree Priyadharsini, 2019; Mathew et al., 2020)

CONCLUSION

Although not statistically significant the study concluded that caries prevalence and mean DMFT/dmft was found to be higher in males and the age group of 6-8 years specifically.

REFERENCES

1. Aa, J. and Mr, J. (2003) 'Prevalence of dental health problems among school going children in rural Kerala', *Journal of the Indian Society of Pedodontics and Preventive Dentistry*, 21(4), pp. 147–151.
2. Babu, M. S. M., Nirmala, S. and Sivakumar, N. (2011) 'Oral hygiene status of 7-12 year old school children in rural and urban population of Nellore district', *Journal of the Indian Association of Public Health Dentistry*. Available at: https://www.researchgate.net/profile/Sivakumar_Nuvvula/publication/220000442_Oral_Hygiene_Status_of_7-12_year_old_School_Children_in_Rural_and_Urban_population_of_Nellore_District/links/02bfe50e5581970307000000/Oral-Hygiene-Status-of-7-12-year-old-School-Children-in-Rural-and-Urban-population-of-Nellore-District.pdf.
3. Bali, R. K. et al. (2004) 'National oral health survey and fluoride mapping 2002-2003, India'. Available at: <https://www.scienceopen.com/document?vid=15faaccb-cbe2-43d8-b8f6-48da7a311b5d>.
4. Behal, R. et al. (2016) 'Oral health status of 6-12-year-old children attending a Government Hospital in Kashmir', *IAIM*, 3(3), pp. 139–146.
5. Bhardwaj, V. K. (2014) 'Dental caries prevalence in individual tooth in primary and permanent dentition among 6-12-year-old school children in Shimla, Himachal Pradesh', *International Journal of Health & Allied Sciences*, 3(2), p. 125.
6. Brian, A. B., Stephen, A. E. and Donald, W. L. (1999) 'Dentistry', *Dental Practice and the Community*, pp. 217–224.
7. Campus, G. et al. (2007) 'Changing trend of caries from 1989 to 2004 among 12-year old Sardinian children', *BMC public health*, 7(1), p. 28.
8. Choo, A., Delac, D. M. and Messer, L. B. (2001) 'Oral Hygiene Measures and Promotion: Review and Considerations', *Australian dental journal*, 46(3), pp. 166–173.
9. Christabel, S. L. and Linda Christabel, S. (2015) 'Prevalence of Type of Frenal Attachment and Morphology of Frenum in Children, Chennai, Tamil Nadu', *World Journal of Dentistry*, pp. 203–207. doi: 10.5005/jp-journals-10015-1343.
10. Damle, S. C. and Patel, A. R. (1994) 'Caries prevalence and treatment need amongst children of Dharavi Bombay, India', *Community dentistry and oral epidemiology*, 22(1), pp. 62–63.
11. Dash, J. K. et al. (2002) 'Prevalence of dental caries and treatment needs among children of Cuttack (Orissa)', *Journal-Indian society of Pedodontics and preventive dentistry*, 20(4), pp. 139–143.
12. De Almeida, C. M. et al. (2003) 'Changing oral health status of 6-and 12-year-old schoolchildren in Portugal', *Community dental health*, 20(4), pp. 211–216.
13. Deogade, S., Gupta, P. and Ariga, P. (2018) 'Effect of monopoly-coating agent on the surface roughness of a tissue conditioner subjected to cleansing and disinfection: A Contact Profilometric In vitro study', *Contemporary Clinical Dentistry*, p. 122. doi: 10.4103/ccd.ccd_112_18.
14. Dhar, V. and Bhatnagar, M. (2009) 'Dental caries and treatment needs of children (6-10 years) in rural Udaipur, Rajasthan', *Indian journal of dental research: official publication of Indian Society for Dental Research*, 20(3), p. 256.
15. Dua, K. et al. (2019) 'The potential of siRNA based drug delivery in respiratory disorders: Recent advances and progress', *Drug development research*, 80(6), pp. 714–730.
16. Duraisamy, R. et al. (2019) 'Compatibility of Nonoriginal Abutments With Implants: Evaluation of Microgap at the Implant-Abutment Interface, With Original and Nonoriginal Abutments', *Implant dentistry*, 28(3), pp. 289–295.
17. Ezhilarasan, D. (2018) 'Oxidative stress is bane in chronic liver diseases: Clinical and experimental perspective', *Arab journal of gastroenterology: the official publication of the Pan-Arab Association of Gastroenterology*, 19(2), pp. 56–64.
18. Ezhilarasan, D., Apoorva, V. S. and Ashok Vardhan, N. (2019) 'Syzygium cumini extract induced reactive oxygen species-mediated apoptosis in human oral squamous carcinoma cells', *Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American*

- Academy of Oral Pathology, 48(2), pp. 115–121.
19. Ezhilarasan, D., Sokal, E. and Najimi, M. (2018) 'Hepatic fibrosis: It is time to go with hepatic stellate cell-specific therapeutic targets', *Hepatobiliary & pancreatic diseases international: HBPD INT*, 17(3), pp. 192–197.
 20. 'Fluoride, Fluoridated Toothpaste Efficacy And Its Safety In Children - Review' (2018) *International Journal of Pharmaceutical Research*, 10(04). doi: 10.31838/ijpr/2018.10.04.017.
 21. Gheena, S. and Ezhilarasan, D. (2019) 'Syringic acid triggers reactive oxygen species-mediated cytotoxicity in HepG2 cells', *Human & experimental toxicology*, 38(6), pp. 694–702.
 22. Gomathi, A. C. et al. (2020) 'Anticancer activity of silver nanoparticles synthesized using aqueous fruit shell extract of Tamarindus indica on MCF-7 human breast cancer cell line', *Journal of Drug Delivery Science and Technology*, p. 101376. doi: 10.1016/j.jddst.2019.101376.
 23. GovinDaraju, L. and Gurunathan, D. (2017) 'Effectiveness of Chewable Tooth Brush in Children-A Prospective Clinical Study', *Journal of clinical and diagnostic research: JCDR*, 11(3), p. ZC31.
 24. Govindaraju, L., Jeevanandan, G. and Subramanian, E. M. G. (2017a) 'Clinical evaluation of quality of obturation and instrumentation time using two modified rotary file systems with manual instrumentation in primary teeth', *Journal of clinical and diagnostic research: JCDR*, 11(9), p. ZC55.
 25. Govindaraju, L., Jeevanandan, G. and Subramanian, E. M. G. (2017b) 'Comparison of quality of obturation and instrumentation time using hand files and two rotary file systems in primary molars: A single-blinded randomized controlled trial', *European Journal of Dentistry*, pp. 376–379. doi: 10.4103/ejd.ejd_345_16.
 26. Govindaraju, L., Jeevanandan, G. and Subramanian, E. M. G. (2017c) 'Knowledge and practice of rotary instrumentation in primary teeth among indian dentists: A questionnaire survey', *Journal of International Oral Health*, 9(2), p. 45.
 27. Gurunathan, D. and Shanmugaavel, A. K. (2016) 'Dental neglect among children in Chennai', *Journal of the Indian Society of Pedodontics and Preventive Dentistry*, 34(4), p. 364.
 28. Harris, R. et al. (2004) 'Risk factors for dental caries in young children: a systematic review of the literature', *Community dental health*, 21(1), pp. 71–85.
 29. Jeevanandan, G. (2017) 'Kedo-S Paediatric Rotary Files for Root Canal Preparation in Primary Teeth – Case Report', *JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH*. doi: 10.7860/jcdr/2017/25856.9508.
 30. Jeevanandan, G. and Govindaraju, L. (2018) 'Clinical comparison of Kedo-S paediatric rotary files vs manual instrumentation for root canal preparation in primary molars: a double blinded randomised clinical trial', *European archives of paediatric dentistry: official journal of the European Academy of Paediatric Dentistry*, 19(4), pp. 273–278.
 31. Joshi, N., Rajesh, R. and Sunitha, M. (2005) 'Prevalence of dental caries among school children in Kulasekharam village: A correlated prevalence survey', *Journal of the Indian Society of Pedodontics and Preventive Dentistry*, 23(3), p. 138.
 32. J, P. C. et al. (2018) 'Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study', *Clinical implant dentistry and related research*, 20(4), pp. 531–534.
 33. Kassim, B. A., Noor, M. A. and Chindia, M. L. (2006) 'Oral health status among Kenyans in a rural arid setting: dental caries experience and knowledge on its causes', *East African medical journal*, 83(2), pp. 100–105.
 34. Lakshmanan, L. et al. (2020) 'Assessing the quality of root canal filling and instrumentation time using kedo-s files, reciprocating files and k-files', 23(1), p. 7.
 35. Malli Sureshbabu, N. et al. (2019) 'Concentrated Growth Factors as an Ingenious Biomaterial in Regeneration of Bony Defects after Periapical Surgery: A Report of Two Cases', *Case reports in dentistry*, 2019, p. 7046203.
 36. Malvania, E. et al. (2014) 'Prevalence of dental caries and treatment needs among 12-year-old school going children in Vadodara City, Gujarat, India: A cross-sectional study', *Indian Journal of Oral Sciences*, p. 3. doi: 10.4103/0976-6944.129938.
 37. Mathew, M. G. et al. (2020) 'Evaluation of adhesion of Streptococcus mutans, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary ...', *Clinical oral investigations*. Available at: <https://link.springer.com/article/10.1007/s00784-020-03204-9>.
 38. Mehta, M. et al. (2019) 'Oligonucleotide therapy: An emerging focus area for drug delivery in chronic inflammatory respiratory diseases', *Chemico-biological interactions*, 308, pp. 206–215.
 39. Menon, S. et al. (2018) 'Selenium nanoparticles: A potent chemotherapeutic agent and an elucidation of its mechanism', *Colloids and Surfaces B: Biointerfaces*, pp. 280–292. doi: 10.1016/j.colsurfb.2018.06.006.
 40. Mohammadi, S. N. et al. (2015) 'Dental caries status in 6–14-year-old schoolchildren of rural Channagiri, Davangere: A cross-sectional survey', *Journal of Indian Association of Public Health Dentistry*, 13(4), p. 389.
 41. Murray, J. J., Nunn, J. H. and Steele, J. G. (2003) *The Prevention of Oral Disease*. OUP Oxford.

42. Ng'ang'a, P. M. and Valderhaug, J. (1992) 'Dental caries in primary school children in Nairobi, Kenya', *Acta odontologica Scandinavica*, 50(5), pp. 269–272.
43. Packiri, S., Gurunathan, D. and Selvarasu, K. (2017) 'Management of paediatric oral ranula: a systematic review', *Journal of clinical and diagnostic research: JCDR*, 11(9), p. ZE06.
44. Panchal, V. et al. (2019) 'Comparison of instrumentation time and obturation quality between hand K-file, H-files, and rotary Kedo-S in root canal treatment of primary teeth: A randomized controlled trial', *Journal of the Indian Society of Pedodontics and Preventive Dentistry*, 37(1), p. 75.
45. Panchal, V., Jeevanandan, G. and Subramanian, E. M. G. (2019) 'Comparison of post-operative pain after root canal instrumentation with hand K-files, H-files and rotary Kedo-S files in primary teeth: a randomised clinical trial', *European archives of paediatric dentistry: official journal of the European Academy of Paediatric Dentistry*, 20(5), pp. 467–472.
46. Pc, J., Marimuthu, T. and Devadoss, P. (2018) 'Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study', *Clinical implant dentistry and related research*. Available at: <https://europepmc.org/article/med/29624863>.
47. Prabakar, J. et al. (2018) 'Comparative Evaluation of Retention, Cariostatic Effect and Discoloration of Conventional and Hydrophilic Sealants - A Single Blinded Randomized Split Mouth Clinical Trial', *Contemporary clinical dentistry*, 9(Suppl 2), pp. S233–S239.
48. Prasai Dixit, L. et al. (2013) 'Dental caries prevalence, oral health knowledge and practice among indigenous Chepang school children of Nepal', *BMC oral health*, 13(1), p. 20.
49. Rai, B. et al. (2007) 'Dental caries and oral hygiene status of 8 to 12 year school children of Rohtak: a brief report', *Internet J Dent Sci*, 5(1). doi: 10.5580/2a1.
50. Rajendran, A. K. and Singh, K. (2016) 'Dental Caries prevalence am school children of Tamil Nad screening and camp approac'. Available at: http://www.academia.edu/download/48695450/Published_copy_of_Dental_caries..pdf.
51. Rajendran, R. et al. (2019) 'Comparative Evaluation of Remineralizing Potential of a Paste Containing Bioactive Glass and a Topical Cream Containing Casein Phosphopeptide-Amorphous Calcium Phosphate: An in Vitro Study', *Pesquisa Brasileira em Odontopediatria e Clínica Integrada*, pp. 1–10. doi: 10.4034/pboci.2019.191.61.
52. Rajeshkumar, S. et al. (2018) 'Biosynthesis of zinc oxide nanoparticles using *Mangifera indica* leaves and evaluation of their antioxidant and cytotoxic properties in lung cancer (A549) cells', *Enzyme and microbial technology*, 117, pp. 91–95.
53. Rajeshkumar, S. et al. (2019) 'Antibacterial and antioxidant potential of biosynthesized copper nanoparticles mediated through *Cissus arnotiana* plant extract', *Journal of photochemistry and photobiology. B, Biology*, 197, p. 111531.
54. Ramadurai, N. et al. (2019) 'Effectiveness of 2% Articaine as an anesthetic agent in children: randomized controlled trial', *Clinical oral investigations*, 23(9), pp. 3543–3550.
55. Ramakrishnan, M., Dhanalakshmi, R. and Subramanian, E. M. G. (2019) 'Survival rate of different fixed posterior space maintainers used in Paediatric Dentistry - A systematic review', *The Saudi dental journal*, 31(2), pp. 165–172.
56. Ramesh, A. et al. (2018) 'Comparative estimation of sulfiredoxin levels between chronic periodontitis and healthy patients - A case-control study', *Journal of periodontology*, 89(10), pp. 1241–1248.
57. Ravikumar, D., Jeevanandan, G. and Subramanian, E. M. G. (2017) 'Evaluation of knowledge among general dentists in treatment of traumatic injuries in primary teeth: A cross-sectional questionnaire study', *European journal of dentistry*, 11(02), pp. 232–237.
58. Samuel, S. R., Acharya, S. and Rao, J. C. (2020) 'School Interventions-based Prevention of Early-Childhood Caries among 3-5-year-old children from very low socioeconomic status: Two-year randomized trial', *Journal of public health dentistry*, 80(1), pp. 51–60.
59. Saravanan, S. et al. (2008) 'Caries prevalence and treatment needs of rural school children in Chidambaram Taluk, Tamil Nadu, South India', *Indian journal of dental research: official publication of Indian Society for Dental Research*, 19(3), p. 186.
60. Sharma, P. et al. (2019) 'Emerging trends in the novel drug delivery approaches for the treatment of lung cancer', *Chemico-biological interactions*, 309, p. 108720.
61. Shingare, P. et al. (2012) 'Dental caries prevalence among 3-to 14-year-old school children, Uran, Raigad District, Maharashtra', *The journal of contemporary dental practice*, 2(2), pp. 11–14.
62. Sohi, R. K. et al. (2012) 'Assessment of prevalence of dental caries among 5 and 12-year-old schoolchildren in Chandigarh (UT), India', *Archives of Oral Research*, 8(1). Available at: <https://periodicos.pucpr.br/index.php/oralresearch/article/view/23076>.
63. Somasundaram, S. et al. (2015) 'Fluoride content of bottled drinking water in Chennai, Tamilnadu', *Journal of clinical and diagnostic research: JCDR*, 9(10), p. ZC32.
64. Sridharan, G. et al. (2019) 'Evaluation of salivary metabolomics in oral leukoplakia and oral squamous cell

- carcinoma', *Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology*, 48(4), pp. 299–306.
65. Srinivas, R. et al. (2012) 'Oral health status of institutionalized street children aged 5--15 years In Guntur City Andhra Pradesh India', *International Journal of Scientific & Technology Research*, 1(11), pp. 19–23.
 66. Subramanyam, D. et al. (2018) 'Comparative evaluation of salivary malondialdehyde levels as a marker of lipid peroxidation in early childhood caries', *European Journal of Dentistry*, pp. 067–070. doi: 10.4103/ejd.ejd_266_17.
 67. Subrata, S. (1996) 'Prevalence and severity of dental caries and oral hygiene status in rural and urban areas of Calcutta', *Journal of the Indian Society of Pedodontics and Preventive Dentistry*, 14(1), pp. 17–20.
 68. Sweeney, P. C., Nugent, Z. and Pitts, N. B. (1998) 'Deprivation and dental caries status of 5-year-old children in Scotland', *Community Dentistry and Oral Epidemiology*, pp. 152–159. doi: 10.1111/j.1600-0528.1998.tb02005.x.
 69. Varghese, S. S., Ramesh, A. and Veeraiyan, D. N. (2019) 'Blended Module-Based Teaching in Biostatistics and Research Methodology: A Retrospective Study with Postgraduate Dental Students', *Journal of dental education*, 83(4), pp. 445–450.
 70. Vijayashree Priyadharsini, J. (2019) 'In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens', *Journal of periodontology*, 90(12), pp. 1441–1448.
 71. Vishnu Prasad, S. et al. (2018) 'Report on oral health status and treatment needs of 5-15 years old children with sensory deficits in Chennai, India', *Special care in dentistry: official publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 38(1), pp. 58–59.
 72. Wahab, P. U. A. et al. (2018) 'Scalpel Versus Diathermy in Wound Healing After Mucosal Incisions: A Split-Mouth Study', *Journal of oral and maxillofacial surgery: official journal of the American Association of Oral and Maxillofacial Surgeons*, 76(6), pp. 1160–1164.

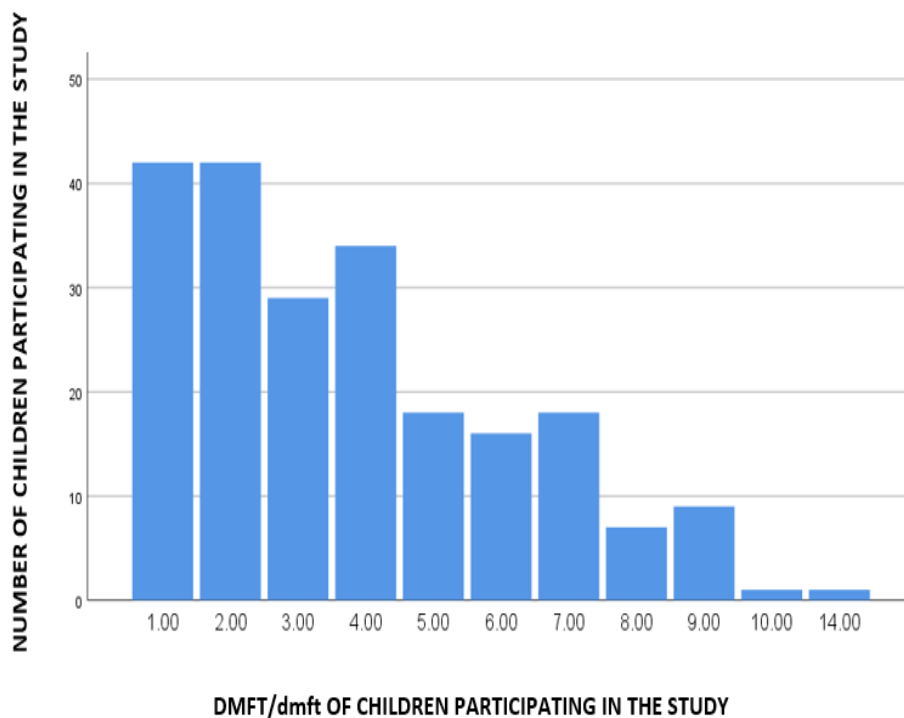


Fig.1: This bar graph represents the descriptive distribution of DMFT/dmft compared to the number of children. X axis represents the DMFT/dmft score of children participating in the study and Y axis represents the number of children. Maximum number of children (n=42) had a DMFT/dmft score of 1 or 2 , the highest DMFT/dmft score of 14 was seen only in one child (n=1).

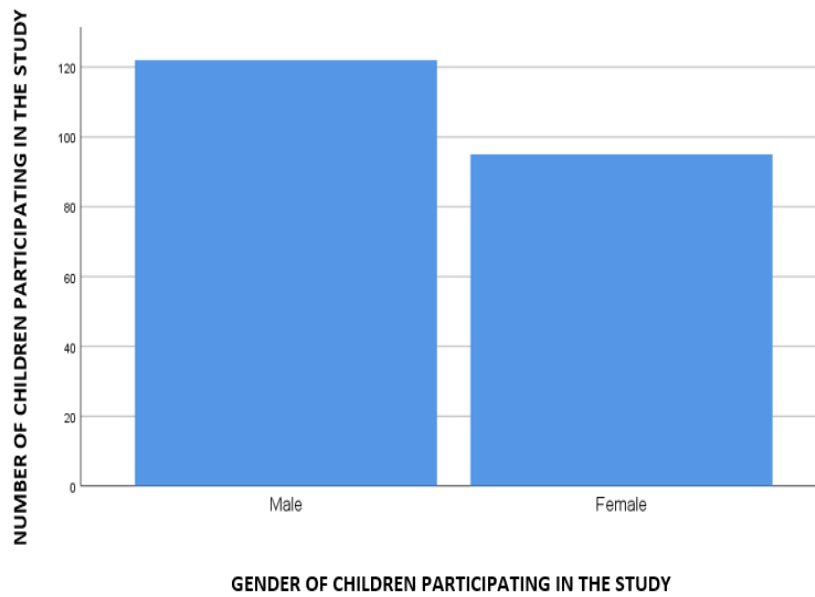


Fig.2: This bar graph represents the descriptive distribution of gender of the children participating in the study. X axis represents the gender of children participating in the study and Y axis represents the number of children participating in the study. Majority of our study population consisted of males (n=122) as compared to females (n=95).

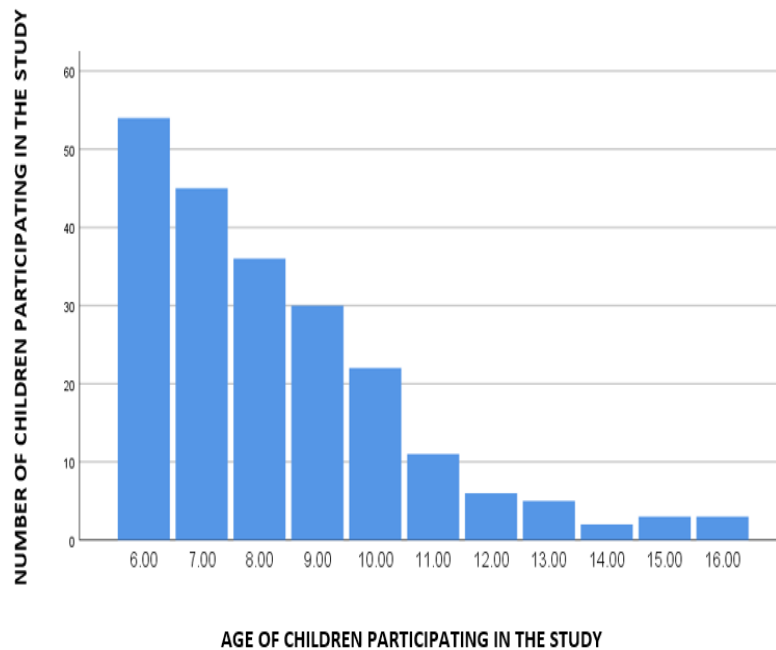


Fig.3: This bar graph represents the descriptive distribution of age of the children participating in the study. X axis represents the age of children participating in the study and Y axis represents the number of children participating in the study. The minimum age group was 6 years (n=54), 7 years (n=45), 8 years (n=36), 9 years (n=30), 10 years (n=22), 11 years (n=11), 12 years (n=6), 13 years (n=5), 14 years (n=2), 15 years (n=3) and 16 years (n=3).

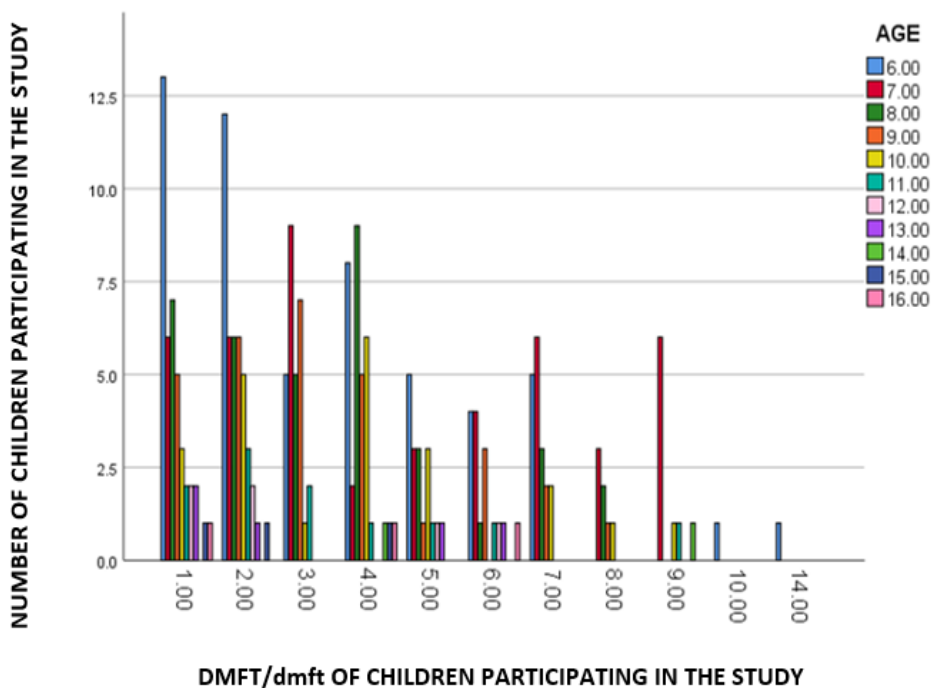


Fig.4: This bar graph represents the comparative analysis of DMFT/dmft score of the children participating in the study with respect to their age. X axis represents the DMFT/dmft score and Y axis the number of children participating in the study. Chi square analysis showed no statistical significant association with respect to age and DMFT/dmft score since p value >0.05.

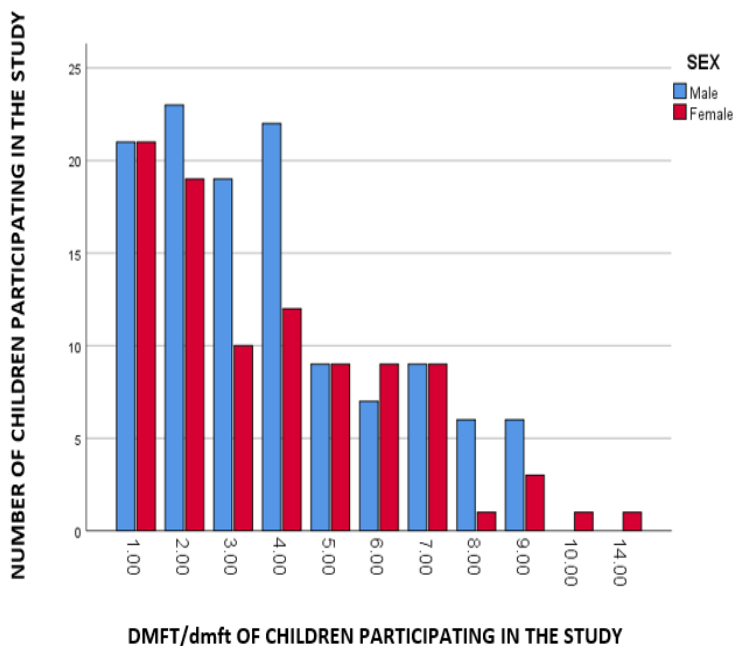


Fig.5: This bar graph represents the comparative evaluation of DMFT/dmft score of the children participating in the study with respect to their gender. X axis represents the DMFT/dmft of children participating in the study and Y axis represents the number of children. Chi square analysis showed p value of 0.465 when DMFT/dmft score is compared with gender of the participants which depicts a statistically, not significant correlation.