Journal of Contemporary Issues in Business and Government Vol. 27, No. 2, 2021
https://cibg.org.au/

P-ISSN: 2204-1990; E-ISSN: 1323-6903
DOI: 10.47750/cibg.2021.27.02.342

Analysis Of Factors Associated With Dental Caries In Children Aged 6-12 Years Visiting A Private Dental Hospital

KEERTHANA BALAJI[1], PRADEEP KUMAR R[2*], PRADEEP D[3]

[1]Saveetha Dental College and Hospitals,Saveetha Institute of Medical and Technical Sciences, Saveetha University,Chennai, India
[2]Professor,Department of Public Health Dentistry,Saveetha Dental College and Hospitals,Saveetha Institute of Medical and Technical Sciences,Saveetha University, Chennai, India
[3]Associate Professor,Department of Oral and Maxillofacial surgery,Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences,Saveetha University, Chennai, India
*Corresponding Author
Email :151501068.sdc@saveetha.com[1], pradeepkumarr.sdc@saveetha.com[2], pradeep@saveetha.com[3]

Abstract: Dental caries is the most common oral health disease of school aged children around the world. In the present study we aimed to analyse the factors associated with dental caries among 6 to 12 years old children visiting Private Dental Hospital.This study was designed as a retrospective study, conducted among patients who reported to the University Hospital.Subjects of age group 6-12 years, patient records with complete data were included in this study.Medically compromised patients and patients records with incomplete data were excluded from this study.Data was collected and tabulated in Excel and Data was analysed using IBM SPSS Statistical Analyser(23.0 version).Frequency distribution and descriptive analysis were carried out.The association between the variables was analysed and assessed using Chi-square test.p value less than or equal to 0.05 was considered to be statistically significant.Mean decay value was found to be higher in 6 years old and Mean DMFT value was found to be higher in 9 years old.These mean differences were statistically significant.Increased prevalence of dental caries was most commonly seen in maxillary molars and least in maxillary canines.Prevalence of dental caries was observed to be higher in children with more sugar consumption and irregular oral hygiene practices.Dietary factors and oral Hygiene habits play significant roles in the prevalence of dental caries among school children.

Keywords: Dental caries , dietary factors, oral hygiene habits , school aged children.

INTRODUCTION

Dental caries is the most prevalent disease of the oral health in school-aged children around the world.(Escoffié-Ramirez et al., 2017)Dental caries lead to tooth pain, discomfort, eating impairment, loss of tooth and delayed language development in children.(Zhang et al., 2014)Furthermore, dental caries affects children's functions and body growth and imposes a financial burden on their families.(Nomura et al., 2019; Pavithra and Jayashri, 2019) Dental carious lesions and cavities commonly occur in pits and fissures of the occlusal surfaces in primary and permanent posterior teeth.(Prabakar, John, Arumugham, Kumar and Sakthi, 2018a; Prabakar, John, Arumugham, Kumar and Srisakthi, 2018)Dental caries is a lifetime disease, and the highest priority risk group is school children.(Prabakar, John and Srisakthi, 2016)In addition, children with dental caries are exposing to fear and anxiety which can result to both severity and incomplete treatment of the condition.(Martins et al., 2014; Kumar and Vijayalakshmi, 2017)According to world health organization reports, dental caries affects 60%-90% of school children in both developing and developed countries.(Ditmyer et al., 2010; Kannan et al., 2017; Kumar, Pradeep Kumar and Preethi, 2017)Inspite of recent improvement in awareness about oral and dental health among public; dental caries remains a significant problem especially in developing countries.(Plaka et al., 2017; Khatri et al., 2019; Mebin George Mathew et al., 2020).Due to the complex etiology of dental caries, the major challenge for the dentists is to identify the potential determinants and predictors of dental caries in order to target public health measures to control the disease and its consequences.Studies on risk factors of high caries prevalence have demonstrated that one of the most common predictors for dental caries was baseline caries experience in primary teeth.Considering that school age is an influential period during which every child extends health related behaviors, beliefs and attitudes and that the disease is irreversible, efforts should be focused on revealing factors that predispose students to dental caries during this stage.(Liu, Zhou and Feng, 2016; Prabakar, John, Arumugham, Kumar and Sakthi, 2018b; Neralla et al., 2019)Studies have reported that age, sex, parents education , occupation , residential place, oral hygiene and dietary habits have an impact on their dental caries experiences.(Joshi et al., 2013; Harini and Leelavathi, 2019; Mohapatra et al., 2019)However,

data on the association of parents occupation and resident place with dental caries in children are limited.(Masood et al., 2012; Priya, Kumar and Saraswathi, 2018)Poor oral health literacy and dental neglect among caregivers also result in children's poor oral health status.(Pratha and Prabakar, 2019; Samuel, Acharya and Rao, 2020).It is important to maintain low prevalence of caries among children by increasing awareness and promoting oral health care strategies.(And and Pradeep Kumar, no date; Vimalakshan, Gurunathan and Kumar, 2019) 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, John, Arumugham, Kumar and Srisakthi, 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 aim of this study was to analyse the factors associated with dental caries in children aged 6-12 years visiting a private dental hospital in chennai.The considerate potential risk factors observed in this study were oral hygiene habits and dietary factors.

MATERIALS AND METHODS

This study was designed as a retrospective study, conducted among subjects reported to the dental hospital. After obtaining approval from the institutional ethical committee, the dental records of patients who reported to the dental hospital between June 2019 to March 2020 were assessed for eligibility to be included in the study. A total of 86,000 patient records were screened for eligibility by the principal investigator based on the following inclusion and exclusion criteria.

Inclusion criteria

- Subjects belonging to age group 6-12 years
- Subjects who had at least one decay
- Patient records with complete data regarding the general examination, clinical examination, preoperative findings and observations and treatment records were included.

Exclusion criteria:

- Medically compromised patients
- Patient records with incomplete data were excluded.

A total of 350 records which satisfied the inclusion and exclusion criteria were included in the study.From the pre operative and post operative records of the study population, data such as age, gender, DMFT data, oral hygiene habit, dietary intake records were obtained.The data was analysed by IBM SPSS Statistical Analyzer(23.0 version). Frequency distribution for categorical variables and descriptive analysis for quantitative variables were carried out.The association between the variables were analysed and assessed using Pearson Chi-square test. p value less than 0.05 was considered to be statistically significant.

RESULTS AND DISCUSSION

The study included 350 participants with dental caries of the age group 6-12 years.The demographic distribution of the study population with dental caries according to age and gender was found. Among the study population, 5.71% of males and 7.71% of females were six years old, 8% of males and 6.57% of females were 7 years old, 8.86% of males and 7.43% of females were 8 years old, 7.71% of males and 4.86% of females were 9 years old, 10.57% of males and 8.29% of females were 10 years old, 6.29% of males and 7.71% of females were 11 years old, 5.71% of males and 4.57% of females were 12 years old children with dental caries(Figure 1)The mean and standard deviation of decay value were calculated.One-way ANOVA test was done to find the association between mean Decay value and different age.Statistically significant correlation was found between decay value and different age with p value=0.054 which is equal to 0.05.The mean difference between decay value and age is presented in(Figure 2).The mean decay value for 6 years old is 5.81, 7 years old is 4.45, 8 years old is 4.35, 9 years old is 4.86, 10 years old is 3.58, 11 years old is 4.06 and 12 years old is 4.69.The mean decay value was found to high in 6 years old.The mean and standard deviation of DMFT value were calculated.One-way ANOVA test was done to find the association between mean DMFT value and different age.Statistically significant correlation was found between DMFT value and different age with p value=0.049 which is less than 0.05.The mean difference between DMFT value and age group is presented in (Figure 3).The mean DMFT value for 6 years old is 6.70, 7 years old is 6.10, 8 years old is 5.95, 9 years old is 7.14, 10 years old is 5.76, 11 years old is 6.61 and 12 years old is 6.36.The mean DMFT value was found to high in 9 years old.In Terms of commonly affected teeth by dental caries, 58.29% of maxillary molars followed by 36.29% of mandibular molars, 3.71% of maxillary incisors,1.14% of mandibular incisors and 0.57% of maxillary canines were found to be affected by dental caries among the study population(Figure-4).With regards to sugar consumption,Increased prevalence of dental caries was found in children with more sugar consumption 84.57%

compared to children with less sugar consumption 15.43%(Figure-5).Considering the brushing frequency, 83.43% of patients who brushed their teeth once everyday and 16.57% of patients who brushed their teeth twice everyday were affected by dental caries(Figure-6).

Early detection of caries is one of the important steps in modern dentistry to create awareness among the community.In epidemiological studies, DMFT is the most commonly used index for caries assessment.The result of the present study showed that mean DMFT value was higher in 9 years old.This is in agreement with the results of the study conducted by Yabao et al where prevalence of dental caries in primary dentition was found to be 71.7% and they concluded in their study that as age increased the mean DMFT increased.(Yabao et al., 2005)Most of the carried out studies have investigated the tooth caries among children at two age groups: less than or equal six and twelve or higher years.This present study has provided data on the prevalence of dental caries and associated risk factors at mixed dentition stage among 6-12 years old children.he caries prevalence was significantly higher in children who brushes their teeth once daily and consumes more sugar substitutes.This is in accordance with the results of numerous published studies including Dawkins et al concluded in their study that inappropriateness of oral hygiene practices among children attributes to higher dental caries prevalence.(Dawkins et al., 2013)

In this present study we observed that prevalence of dental caries was higher in females than males.This result was in line with the study conducted by Darwish W et al who stated in their study that prevalence of caries in girls was significantly higher than that in the boys.This may be attributed to the permanent teeth that erupt earlier in girls than boys.Therefore, being exposed to influent factors for longer time could raise the caries prevalence among the girls.(Al-Darwish, El Ansari and Bener, 2014)From the present data, it is seen that factors such as oral hygiene habits and dietary factors play major roles in dental caries prevalence.Veiga concluded that uncontrolled consumption of processed foods which are rich in sugar does not bring particular health benefits, it certainly played a role in the onset of caries.(Veiga, Pereira and Amaral, 2015)Marshall et al in their study stated that escalation in caries prevalence has been reported in association with sugar added foods and sugary drinks ingestion.(Marshall et al., 2005)Wulaerhan et al stated that brushing frequency and dietary factors play prominent roles in the prevalence of dental caries in mixed dentition stage.(Wulaerhan et al., 2014)Ingle NA et al concluded in their study that caries prevalence was higher in children who brushed once daily were highly attributed towards dental caries.(Ingle et al., 2014)

In contrast, Ismail et al disagreed over the impact of sugar consumption on high dental caries prevalence.(Kumar et al., 2017)Hillson et al in their study found no difference in the risk of developing carious lesions when children brushes once in a day.(Hillson, 2008)Regardless, all data points to higher prevalence of dental caries in children with inappropriate oral hygiene routine and children with more sugar consumption.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; M. G. Mathew et al., 2020)

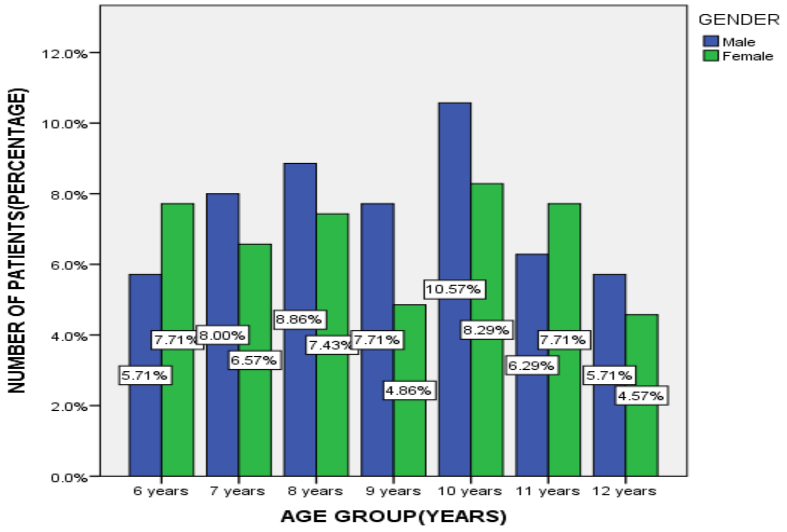

Fig.1: Bar graph represents the demographic distribution of the study population with dental caries based on age and gender. X-axis represents the age group and Y-axis represents the number of participants.Among the study population, increased prevalence of dental caries was seen in children aged 10 years constituting 10.57% of males(blue) and 8.29% of females(green) compared to children of other age.

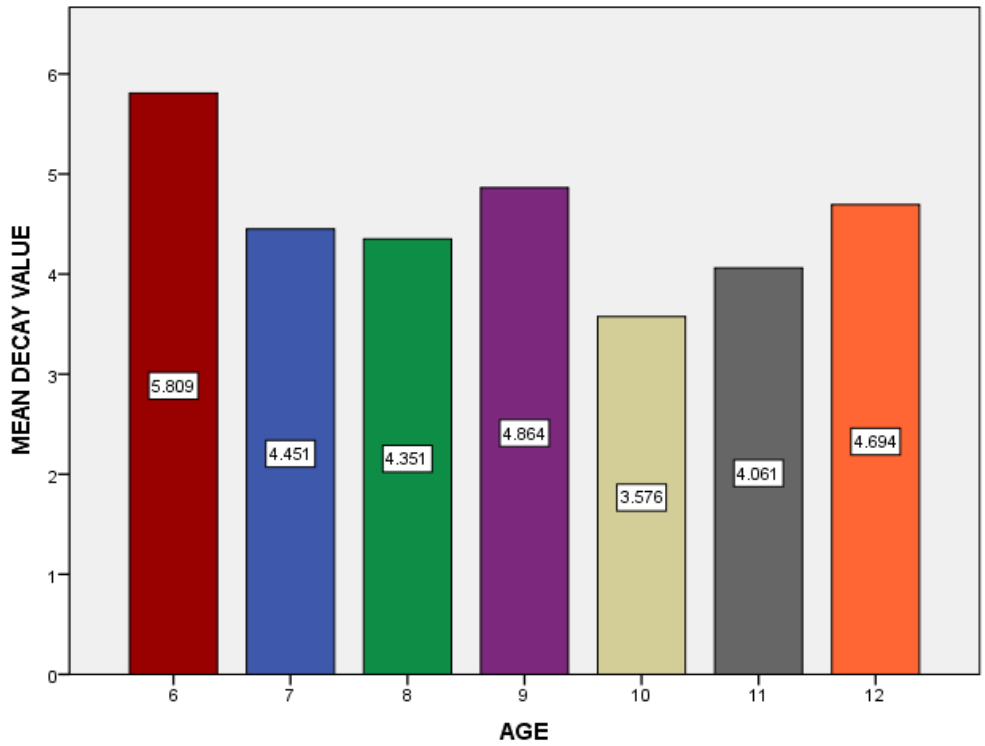

Fig.2: This bar graph depicts the association between age and mean decay value.X-axis represents the age group and Y-axis represents the mean decay value.The mean decay value was found to be higher(5.089) in 6 years old children(red) compared to children of other age.One way Anova test was done p value = 0.054. The association between age and mean decay value is statistically significant.

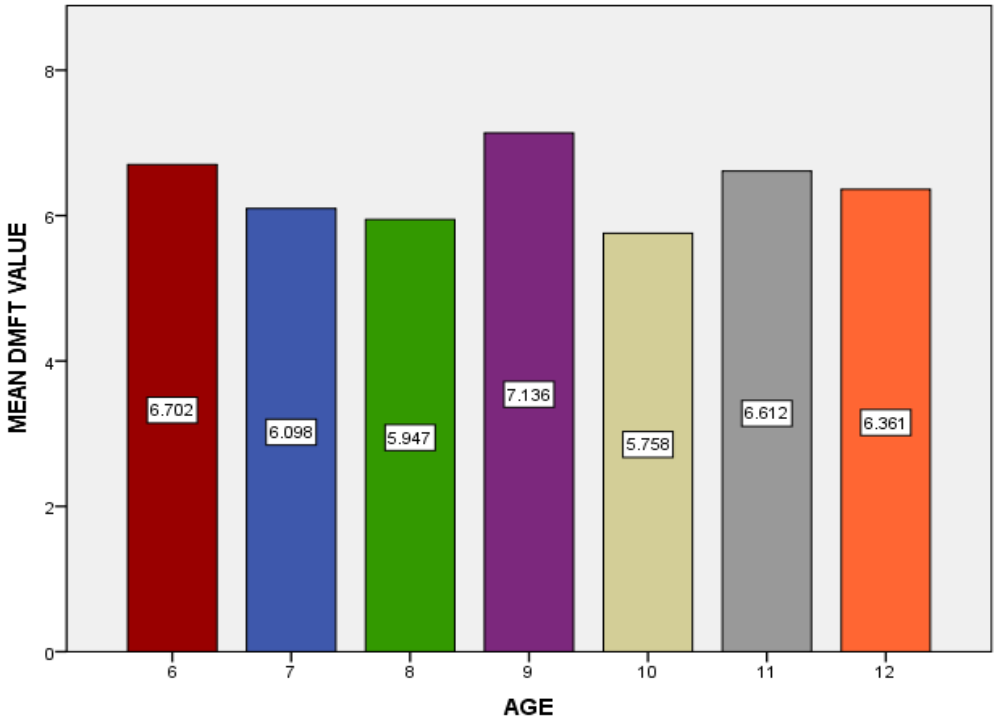

Fig.3: This bar graph depicts the association between age and mean DMFT value.X-axis represents the age group and Y-axis represents the mean DMFT value.The Mean DMFT value was found to be higher(7.136) in 9 years old children (red) compared to children of other age.One way Anova test was done p value=0.049.The association between age and mean DMFT value is statistically significant.

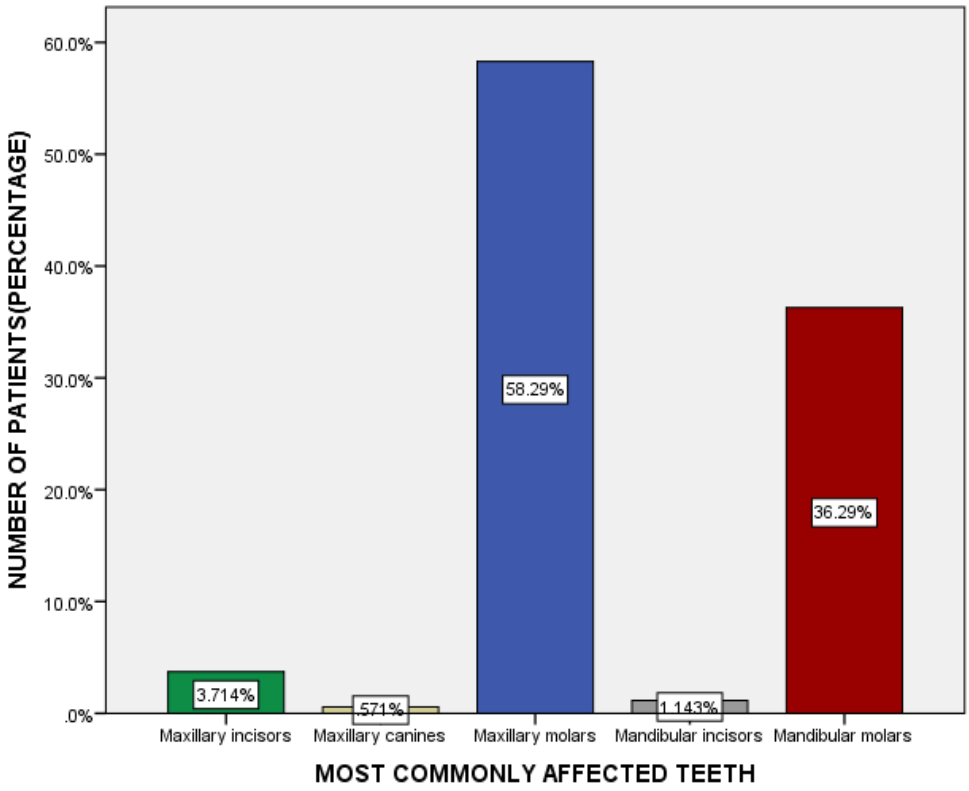

Fig.4:This bar graph represents the distribution of most commonly affected teeth by dental caries.X-axis represents the most commonly affected teeth and Y-axis represents the number of patients.58.29% of maxillary molars(blue) followed by 36.29% of mandibular molars(red), 3.71% of maxillary incisors(green),1.14% of mandibular incisors(grey) and 0.57% of maxillary canines(beige) were found to be affected by dental caries among the study population.

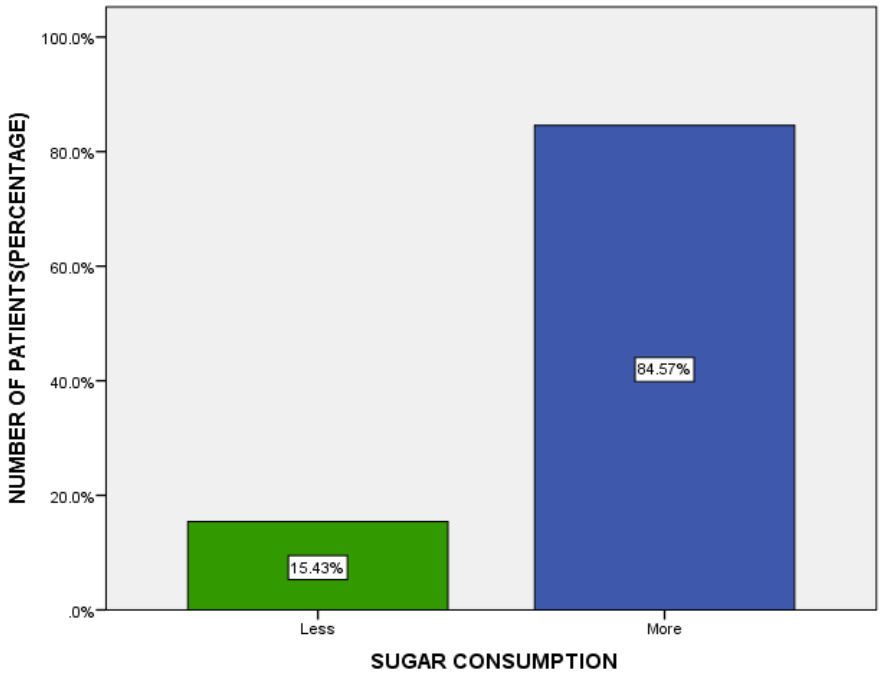

Fig.5: his bar graph represents the prevalence of dental caries based on the sugar consumption of the study population.X-axis represents the sugar consumption and Y-axis represents the number of patients.Increased prevalence of dental caries was found in children with more sugar consumption(blue) 84.57% compared to children with less sugar consumption(green) 15.43%.

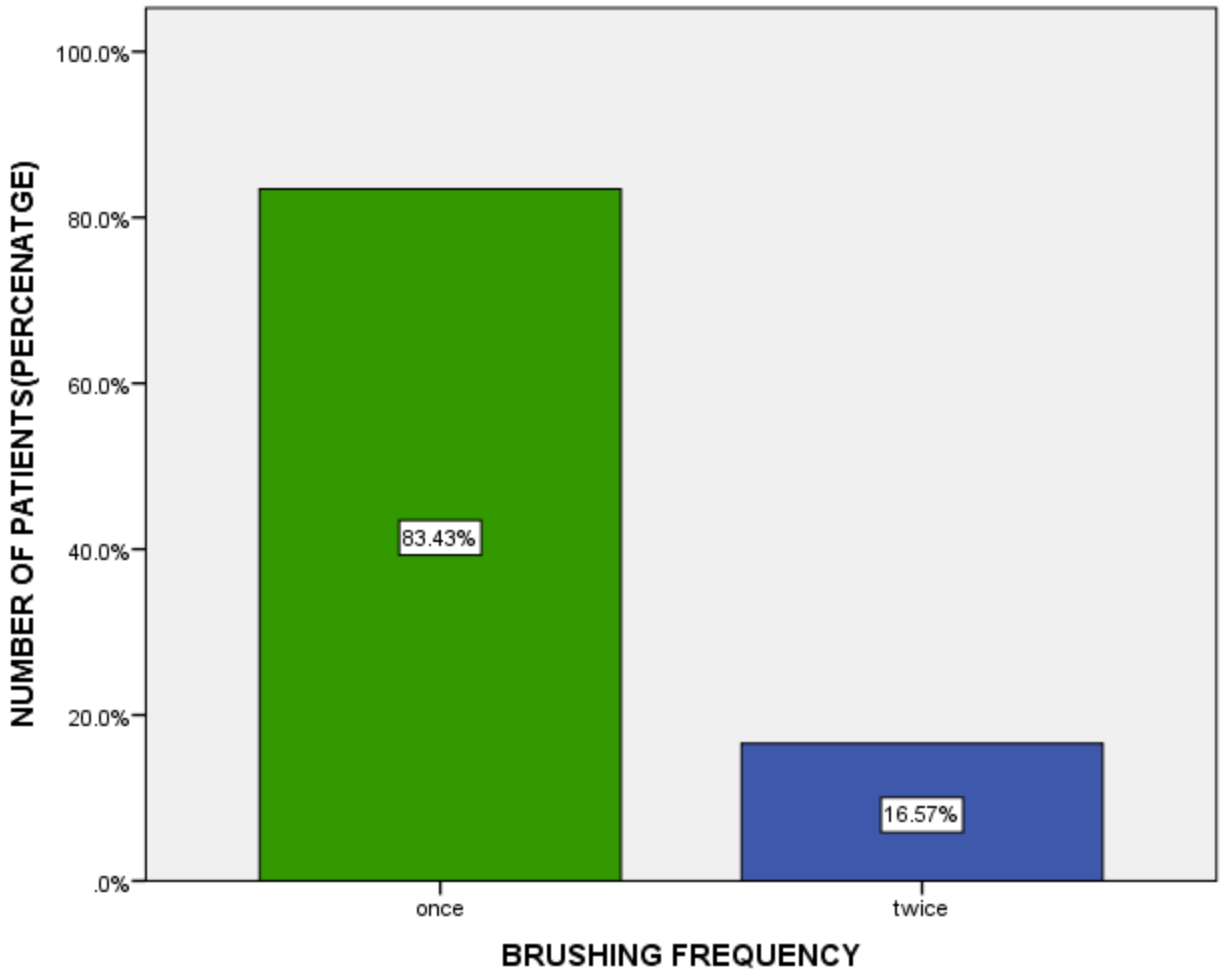

Fig.5: This bar graph represents the prevalence of dental caries among the study population based on their brushing frequency.X-axis represents the frequency of brushing and Y-axis represents the number of patients.83.43% of patients who brushed their teeth once everyday(green) and 16.57% of patients who brushed their teeth twice(blue) everyday were affected by dental caries.

CONCLUSION

Within the limitations of the study, it can be concluded that mean decay value was higher in 6 years old and mean DMFT value was found to be higher in 9 years old.These mean differences were statistically significant.Prevalence of caries were found to be higher in maxillary molars followed by mandibular molars and least in maxillary canines.Increased prevalence of dental caries was seen in children with more sugar consumption and who brush their teeth once everyday.Therefore, proper oral hygiene practice and dietary factors play vital roles in the prevalence of dental caries among children of age group 6-12 years.However due to small sample size, studies with large sample size are required to be conducted for further analysis among different population.

REFERENCES

1. Al-Darwish, M., El Ansari, W. and Bener, A. (2014) 'Prevalence of dental caries among 12-14 year old children in Qatar', The Saudi dental journal, 26(3), pp. 115–125.
2. And, K. R. and Pradeep Kumar, R. (no date) 'PREVALENCE OF DENTAL CARIES AMONG SCHOOL CHILDREN IN CHENNAI PREVALENCE OF DENTAL CARIES AMONG SCHOOL CHILDREN IN CHENNAI PREVALENCE OF DENTAL CARIES AMONG SCHOOL CHILDREN IN CHENNAI Roshna'. Available at: https://www.journalcra.com/sites/default/files/issue-pdf/15809.pdf.
3. Dawkins, E. et al. (2013) 'Dental caries among children visiting a mobile dental clinic in South Central Kentucky: a pooled cross-sectional study', BMC oral health, 13, p. 19.
4. 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.
5. Ditmyer, M. et al. (2010) 'A case-control study of determinants for high and low dental caries prevalence in

Nevada youth', BMC oral health, 10, p. 24.
6. 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.
7. 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.
8. Escoffié-Ramirez, M. et al. (2017) 'Factors Associated with Dental Pain in Mexican Schoolchildren Aged 6 to 12 Years', BioMed research international, 2017, p. 7431301.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. Harini, G. and Leelavathi, L. (2019) 'Nicotine Replacement Therapy for Smoking Cessation-An Overview', Indian Journal of Public Health Research & Development, p. 3588. doi: 10.5958/0976-5506.2019.04144.5.
15. Hillson, S. (2008) 'The current state of dental decay', in Technique and Application in Dental Anthropology. Cambridge University Press, pp. 111–135.
16. Ingle, N. A. et al. (2014) 'Prevalence of dental caries among school children of Bharatpur city, India', Journal of International Society of Preventive & Community Dentistry, 4(1), pp. 52–55.
17. 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, pp. 273–278. doi: 10.1007/s40368-018-0356-6.
18. Joshi, N. et al. (2013) 'Prevalence, severity and related factors of dental caries in school going children of vadodara city - an epidemiological study', Journal of international oral health : JIOH, 5(4), pp. 35–39.
19. 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.
20. Kannan, S. S. D. et al. (2017) AWARENESS AND ATTITUDE TOWARDS MASS DISASTER AND ITS MANAGEMENT AMONG HOUSE SURGEONS IN A DENTAL COLLEGE AND HOSPITAL IN CHENNAI, INDIA. WIT Press, pp. 121–129.
21. Khatri, S. G. et al. (2019) 'Retention of moisture-tolerant fluoride-releasing sealant and amorphous calcium phosphate-containing sealant in 6-9-year-old children: A randomized controlled trial', Journal of the Indian Society of Pedodontics and Preventive Dentistry, 37(1), pp. 92–98.
22. Kumar, R. P., Pradeep Kumar, R. and Preethi, R. (2017) 'Assessment of Water Quality and Pollution of Porur, Chembarambakkam and Puzhal Lake', Research Journal of Pharmacy and Technology, p. 2157. doi: 10.5958/0974-360x.2017.00380.8.
23. Kumar, R. P. and Vijayalakshmi, B. (2017) 'Assessment of fluoride concentration in ground water in Madurai district, Tamil Nadu, India', Research Journal of Pharmacy and Technology, 10(1), pp. 309–310.
24. Kumar, S. et al. (2017) 'Oral health impact, dental caries experience, and associated factors in 12-15-year-old school children in India', International journal of adolescent medicine and health, 29(2). doi: 10.1515/ijamh-2015-0041.
25. Liu, C.-J., Zhou, W. and Feng, X.-S. (2016) 'Dental caries status of students from migrant primary schools in Shanghai Pudong New Area', BMC oral health, 16, p. 28.
26. 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.
27. Marshall, T. A. et al. (2005) 'The roles of meal, snack, and daily total food and beverage exposures on caries experience in young children', Journal of public health dentistry, 65(3), pp. 166–173.
28. Martins, M. T. et al. (2014) 'Factors associated with dental caries in Brazilian children: a multilevel approach', Community dentistry and oral epidemiology, 42(4), pp. 289–299.
29. Masood, M. et al. (2012) 'Assessment of dental caries predictors in 6-year-old school children - results

from 5-year retrospective cohort study', BMC public health, 12, p. 989.
30. 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.
31. 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 molars: Randomized controlled trial', Clinical oral investigations, pp. 1–6.
32. 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.
33. 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.
34. Mohapatra, S. et al. (2019) 'Assessment of Microhardness of Enamel Carious Like Lesions After Treatment with Nova Min, Bio Min and Remin Pro Containing Toothpastes: An in Vitro Study', Indian Journal of Public Health Research & Development, 10(10), pp. 375–380.
35. Neralla, M. et al. (2019) 'Role of nutrition in rehabilitation of patients following surgery for oral squamous cell carcinoma', International Journal of Research in Pharmaceutical Sciences, 10(4), pp. 3197–3203.
36. Nomura, Y. et al. (2019) 'Prevalence of Dental Caries in 5- and 6-Year-Old Myanmar Children', International journal of dentistry, 2019, p. 5948379.
37. 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.
38. Pavithra, R. P. and Jayashri, P. (2019) 'Influence of Naturally Occurring Phytochemicals on Oral Health', Research Journal of Pharmacy and Technology, 12(8), pp. 3979–3983.
39. 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.
40. Plaka, K. et al. (2017) 'Risk factors and prevalence of dental fluorosis and dental caries in school children of North India', Environmental monitoring and assessment, 189(1), p. 40.
41. Prabakar, J., John, J., Arumugham, I. M., Kumar, R. P. and Srisakthi, D. (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.
42. Prabakar, J., John, J., Arumugham, I. M., Kumar, R. P. and Sakthi, D. S. (2018a) 'Comparative Evaluation of the Viscosity and Length of Resin Tags of Conventional and Hydrophilic Pit and Fissure Sealants on Permanent Molars: An In vitro Study', Contemporary clinical dentistry, 9(3), pp. 388–394.
43. Prabakar, J., John, J., Arumugham, I. M., Kumar, R. P. and Sakthi, D. S. (2018b) 'Comparing the Effectiveness of Probiotic, Green Tea, and Chlorhexidine- and Fluoride-containing Dentifrices on Oral Microbial Flora: A Double-blind, Randomized Clinical Trial', Contemporary clinical dentistry, 9(4), pp. 560–569.
44. Prabakar, J., John, J. and Srisakthi, D. (2016) 'Prevalence of dental caries and treatment needs among school going children of Chandigarh', Indian journal of dental research: official publication of Indian Society for Dental Research, 27(5), pp. 547–552.
45. Pratha, A. A. and Prabakar, J. (2019) 'Comparing the effect of Carbonated and energy drinks on salivary pH-In Vivo Randomized Controlled Trial', Research Journal of Pharmacy and Technology, 12(10), pp. 4699–4702.
46. Priya, M., Kumar, P. and Saraswathi, S. (2018) 'Assessment of parental oral health knowledge, attitude, and behavior', Journal of pharmacy research, 12(1), pp. 47–50.
47. 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.
48. Rajeshkumar, S. et al. (2018) 'Biosynthesis of zinc oxide nanoparticles usingMangifera indica leaves and evaluation of their antioxidant and cytotoxic properties in lung cancer (A549) cells', Enzyme and microbial technology, 117, pp. 91–95.
49. 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.
50. 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.

51. 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.
52. 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.
53. 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.
54. 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.
55. 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.
56. 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.
57. Veiga, N., Pereira, C. and Amaral, O. (2015) 'Prevalence and Determinants of Dental Caries in Portuguese Children', Procedia - Social and Behavioral Sciences, 171. doi: 10.1016/j.sbspro.2015.01.219.
58. 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.
59. Vimalakshan, I., Gurunathan, D. and Kumar, P. (2019) 'Prevalence of Dental Caries among 9 to 13 Years School Children of Tiruvallur District-Chennai Tamil Nadu', Indian Journal of Public Health Research & Development, 10(6), pp. 15–19.
60. 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.
61. 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.
62. Wulaerhan, J. et al. (2014) 'Risk determinants associated with early childhood caries in Uygur children: a preschool-based cross-sectional study', BMC oral health, 14, p. 136.
63. Yabao, R. N. et al. (2005) 'Prevalence of dental caries and sugar consumption among 6-12-y-old schoolchildren in La Trinidad, Benguet, Philippines', European journal of clinical nutrition, 59(12), pp. 1429–1438.
64. Zhang, S. et al. (2014) 'Dental caries and erosion status of 12-year-old Hong Kong children', BMC public health, 14, p. 7.