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Comparison Of Dental Caries Experience Among 35-40 Year Old Population Using Dmft And Dmfs Index - An Institution Based Cross Sectional Study

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Abstract: In recent years, there is much higher prevalence and severity of dental caries. Even the countries which had low incidence of dental caries have been experiencing an increase in the prevalence of caries. Patterns of dental caries distribution have also been changed over the years with a small group of people representing the high-risk minority. Therefore a more detailed epidemiological study on prevalence of dental caries is required. The aim of the current study was to assess the prevalence and compare dental caries of 35 to 40 year old population visiting a private dental college using DMFT and DMFS indexes. A total of 954 who visited Saveetha dental college from the period of June 2019 to March 2020 were included in the study. Demographic details were collected. The caries experience of the 35 to 40 year old population was evaluated using the DMFT and DMFS indexes. Data was analysed using IBM SPSS Software Version 20.0. Independent t test was used to compare the mean DMFT and DMFS score with age and gender respectively. The results revealed that the mean DMFT score in females (7.99±0.19) was more than males (6.47±0.16) and this was highly significant (p value- 0.00). Mean DMFS score was also higher in females (24.11± 0.74) than males and this was also highly significant (p value-0.00). Females were found to be more prone to dental caries with high prevalence found among the 38-40 years age group with respect to both DMFT and DMFS scores. More awareness must be created among the population about the incidence of caries and early restorative procedures to prevent further loss.

Keywords: Age; Dental caries; Diet; DMFS; DMFT; Gender

INTRODUCTION:

Dental caries is a pathological process which causes chemical dissolution of the tooth surface by the metabolic events taking place in the biofilm (Featherstone, 2004). It is a chronic infection of calcified tissue caused by microbial agents. Initially caries starts in the form of white spot lesion which is reversible under ideal conditions. But its progression to produce cavitation makes it an irreversible (Bj\orndal, 2008; Fejerskov and Kidd, 2009). The demineralisation of the enamel surface progresses towards the dentin and finally reaches the pulp causing inflammation and necrosis (Fejerskov, 2004). Few areas on the tooth surface are more susceptible to demineralisation like the fissures on the occlusal surface and proximal surfaces (Hegde et al., 2011). Lower incisors are less susceptible to caries because of increased amount of saliva production and flushing action by the saliva (Lukacs and Largaespada, 2006). A study conducted by van Palestian observed increased frequency of sugar intake leading to increased formation of dental caries (van Palenstein Helderman, Soe and van 't Hof, 2006). The main causative organism causing the initiation of dental caries was said to be streptococcus according to specific plaque hypothesis. But non-specific plaque hypothesis states even the plaque free from streptococcus can cause initiation of caries (Loesche, 1979). Other organisms like the lactobacillus species are also associated with the caries process.

Dental caries affects the population of all age groups. A WHO report observed 60-90% of the children worldwide suffer from dental caries (Mishra and Meherotra, 2014). The U.S department of Health stated that dental caries is the most chronic disease and is even more common than allergies (Health, US Department of Health & Human Services; Centers for Disease Control and Prevention; National Center for Chronic Disease Prevention & Health Promotion and Office on Smoking & Health, 2000). Dental caries prevalence has an

increasing trend in developing countries. This may be due to the fact that the oral health care services in these countries focus mainly on curative treatments (Sturdevant, 1995).

Several factors contribute to the formation and progress of dental caries including diet, microorganisms, tooth morphology, saliva, genetic predisposition and oral hygiene practices (Faggiano et al., 1999). Other related factors like social, environmental, cultural and individual factors (Adekoya–Sofowora et al., 2006) also influenced dental caries (Saxena and Shashikiran, 2010). Dental caries must be treated in an early stage to avoid further loss of tooth structure and also avoid complex treatment strategies (Doifode, Ambadekar and Lanewar, 2000).

According to the World Health Organization, the DMFT index is the tool most commonly used for epidemiological surveys. Even though it has failed to meet the challenges of the 21st century, it is still being used as a well-established key for measuring caries experience in dental epidemiology (Dye et al., 2007). The DMFT/DMFS index can be applied to both primary and permanent dentition and is expressed as the total number of teeth (DMFT) or surfaces (DMFS) that are decayed (D), missing (M), or filled (F) in an individual (Gasgoos, Al-Sayagh and Jazrawi, 2012). Dental caries can be prevented by early diagnosis, risk assessment, patient counselling, education and preventive care measures. Progression of caries affects the general health and the quality of life of the patients and negligence can lead to long-term adverse effects.

Previously our team had conducted numerous research studies, mainly on various advancements about performing a successful root canal treatment (PradeepKumar et al., 2016; Teja and Ramesh, 2019; Janani, Palanivelu and Sandhya, 2020; Jose, P. and Subbaiyan, 2020) and other advancements (Ramamoorthi, Nivedhitha and Divyanand, 2015; Noor and Others, 2016; Hussainy et al., 2018; Kumar and Antony, 2018; Manohar and Sharma, 2018; Ravinthar and Others, 2018; Teja, Ramesh and Priya, 2018). Several plant based studies (Nandakumar and Nasim, 2018; Siddique et al., 2019) have also been carried on which had an impact on the longer run in the advancements in providing efficient treatments (Ramanathan and Solete, 2015; Rajendran et al., 2019; R, Rajakeerthi and Ms, 2019) along with various in vitro studies belonging to this entity. Currently our focus has been mainly on dental caries and this study is being conducted in this context.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 aim of this study was to compare the dental caries experience among the 35-40 year old population using DMFT and DMFS indexes.

MATERIALS AND METHOD:

The present study is a descriptive, record based retrospective study conducted in a university setting at Saveetha dental college, Chennai . The case sheets of all the patients that visited the out patient department of Saveetha dental college from June 2019 to March 2020 were evaluated and the case records of 954 patients belonging to age group 35 to 40 years were obtained. The

approval for the study was given by the institutional ethics committee of SIMATS (SDC/SIHEC/2020/DIASDATA/0619-0320). The data was reviewed by two reviewers to minimize bias.

Assessment of dental caries was carried out using decayed, missing, and filled teeth (DMFT) and surface (DMFS) index given by Klein, Palmer and Knutson for permanent dentition. For DMFT scoring was done for each tooth, while for DMFS each surface is calculated. For the DMFS index, five surfaces on the posterior teeth: facial, lingual, mesial, distal, and occlusal and four surfaces on anterior teeth: facial, lingual, mesial, and distal were evaluated. The total number of teeth evaluated are 28 (excluding third molars) and total number of surfaces are 128 surfaces. The tooth was considered carious (D component) if any clinically evident caries were diagnosed. The missing (M component) included teeth that are indicated for extraction or extracted due to caries. The filled (F component) included all filled/ restored teeth due to caries. Surfaces restored for reasons other than caries are not counted as an F.

Inclusion criteria

- Age group- 35-40 years
- Complete patient records

Exclusion criteria

- Systemic illness
- Immunocompromised individuals

Data collection / Tabulation:

The scores of the DMFT and DMFS indexes were taken from the case records of patients between 35-40 years of age. The data collected was entered in MS Excel Sheets and tabulated. It was then imported to SPSS.

Statistical analysis

IBM SPSS Version 20.0 was used to carry out descriptive and inferential statistics. Descriptive statistics were expressed by means of frequency and percentage. Independent t test was used to compare the mean DMFT and DMFS score with both age and gender.

RESULTS AND DISCUSSION:

In the present study, 48.43% of subjects belonged to the 35-37 years age group and 51.57% of subjects belonged to the 38-40 years age group [Figure 1]. The gender distribution showed 47.27% of subjects were females and 52.73% of subjects were males [Figure 2]. From Figure 3, it is observed that among 35-37 years, the mean DMFT score is (7.05± 0.18) whereas in 38-40 years the mean is (7.32± 0.17). There was no statistically significant difference observed on comparison of age with mean DMFT score using Independent t-test (p-value 0.272) [Figure 3]. From Figure 4, on comparing gender with mean DMFT score, females (7.99± 0.19) had higher DMFT mean scores than males (6.47± 0.16) and this was statistically highly significant (p value-0.00; Independent t-test). From Figure 5, on comparing age and mean DMFS score, it is observed that among 35-40 years the mean is (22.26± 0.71) whereas in 38-40 years, the mean is (21.79± 0.67) and this difference was not statistically significant (p value- 0.622; Independent t-test). From Figure 6, on comparing gender with mean DMFS score, females (24.11± 0.74) had higher mean DMFS score than males (20.14± 0.61) and this was statistically highly significant (p value-0.00; Independent t-test).

DMFT and DMFS indexes have been universally accepted for assessing the severity and prevalence of caries in a population (Dye et al., 2007). Mean DMFT and DMFS gives the value of severity of the disease distribution within the population (Gasgoos, Al-Sayagh and Jazrawi, 2012). DMFT index can provide powerful data and perspectives on dental caries, they also have some limitations. Few researchers have noted a significant amount of inter-observer bias and variability. Others include that the values do not provide any indication as to the number of teeth at risk or data that is useful in estimating treatment needs (Ditmyer et al., 2011).

In our study, based on the results obtained the mean DMFT score was relatively high [Figures 3&4]. This can be due to various factors such as socioeconomic status, systemic diseases, poor oral hygiene, lack of knowledge and geographic location (Beck, 1990). This study has been conducted on the patients visiting a private dental college. Most of them cannot afford the treatment and have a high degree of negligence to orah health (Budtz-Jorgensen, Pazos and Mojon, 2000). Many studies have observed low socioeconomic status to be one of the main risk factors for dental caries (Vehkalahti and Paunio, 1988; Shekar et al., 2011).

The mean DMFT index was higher in females (7.99± 0.19) than males (6.47± 0.16) [Figure 4]. Females demonstrated higher degrees of caries score than the males in all age groups [Figure 3]. This is in accordance with few other studies that have also reported female predominance than males (Singh et al., 2014). Women are believed to be more prone to caries because of the salivary and hormonal fluctuations (Neralla et al., 2019; Pratha and Prabakar, 2019). On the contrary, some studies show males predominance of caries (Adekoya–Sofowora et al., 2006; Arora Sachit et al., 2012).

The age of the patient was another parameter taken. The results showed that the mean DMFT among 35-37 years of age group was 7.05± 0.18 and for 38-40 years was and 7.32± 0.17 [Figure 3]. This shows that the mean DMFT increases with age, and therefore dental caries are a lifetime disease. Previous studies also concluded that dental caries increase with age. Prevention can be better done with the use of fluoridated toothpaste and other fluoride products. Fluoride forms a protective barrier and makes teeth less susceptible to caries (Mosha et al., 2005).

Poor oral health not only affects the oral cavity but also affects the routine day to day activities (Eli, Bar-Tal and Kostovetzki, 2001). Caries, when present in anterior teeth affects the esthetics and self confidence of the individual. In this modern society, good appearance often means a lot in both professional and personal lives. Both men and women are very conscious about their appearance.

Dental caries is the most chronic disease which interferes with nutrition intake, speech and normal daily activities. Despite many researches being conducted in various countries, it continues to be a major health problem. Higher intake of food sugar and starch at mealtime was associated with a decreased risk of caries, however when people are more exposed to sugar from snacks, they are more at risk of caries (Marshall, Burrows and Collins, 2014). Caries and associated infection can cause pain and discomfort and reduce intake of foods disturbed sleeping habits. Although not all untreated dental caries affect general health, it significantly impacts on the quality of life (Reisine, 1988).

Not many studies have been conducted in the literature with DMFS index. DMFS index can give a more detailed data about the extent of caries experience as it considers individual tooth surfaces. In this study, the mean DMFS score was in accordance with the mean DMFT score obtained for both age and gender. Females had a higher DMFS score that was statistically significant however no significant difference was found between the age groups [Figures 5&6].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:

Within the limitations of the study, it can be concluded that dental caries prevalence increases as the age increases, with the majority as females with a mean value of 7.99 in the age group of 38-40 years. The limitations of the current study are small sample size with different ethnic groups. Prevention is the only key solution for this chronic disease. More awareness camps, campaigns, workshops can be organised which will aid in early diagnosis and treatment plan.

AUTHOR CONTRIBUTIONS:

Author 1 (Subashri.A) carried out retrospective study by collecting data and drafted the manuscript after performing the necessary statistical analysis. Author 2 (Dr.Sowmya) aided in the conception of the topic, participated in the study design, statistical analysis and supervised the preparation of manuscript. Author 3 helped in study design and coordinated in developing the manuscript. All the authors have equally contributed in developing the manuscript.

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CONFLICT OF INTEREST:

There are no conflicts of interest.

REFERENCES:

1. Adekoya–Sofowora, C. A. et al. (2006) 'Dental caries in 12-year-old suburban Nigerian school children', African health sciences, 6(3), pp. 145–150.
2. Arora Sachit, A. et al. (2012) 'Prevalence Of Dental Caries Among Pre-school Children Of Greater Noida City, UP (India)', Indian Journal of Dental Sciences, 4(2). Available at: http://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=09764003&AN=77413826&h=lPtdZpLDiBk2CXUgw%2BcW7r%2Fg58VdQCWW0cPZaHKDDwNXpAxsRkozHnHx4b5ZgDK08hq8CzEYn0lb8FSKPphfKg%3D%3D&crl=c.
3. Beck, J. (1990) 'The epidemiology of root surface caries', Journal of dental research, 69(5), pp. 1216–1221.
4. Budtz-Jorgensen, E., Pazos, E. and Mojon, P. (2000) 'Effect of Socio-Economic and General Health Status on Periondontal Conditions in Old Age', Journal of clinical periodontology, 27.
5. 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.
6. Ditmyer, M. et al. (2011) 'Inequalities of caries experience in Nevada youth expressed by DMFT index vs. Significant Caries Index (SiC) over time', BMC oral health, 11, p. 12.
7. Doifode, V. V., Ambadekar, N. N. and Lanewar, A. G. (2000) 'Assessment of oral health status and its association with some epidemiological factors in population of Nagpur, India', Indian journal of medical sciences, 54(7), pp. 261–269.
8. 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.
9. 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.
10. Dye, B. A. et al. (2007) 'Trends in oral health status: United States, 1988-1994 and 1999-2004', Vital and health statistics. Series 11, Data from the national health survey, (248), pp. 1–92.
11. Eli, I., Bar-Tal, Y. and Kostovetzki, I. (2001) 'At first glance: social meanings of dental appearance', Journal of public health dentistry, 61(3), pp. 150–154.
12. 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.
13. 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.

14. 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.
15. Faggiano, F. et al. (1999) 'Role of social class in caries occurrence in 12 year olds in Turin, Italy', European journal of public health, 9(2), pp. 109–113.
16. Featherstone, J. D. B. (2004) 'The Continuum of Dental Caries—Evidence for a Dynamic Disease Process', Journal of dental research, 83(1_suppl), pp. 39–42.
17. Fejerskov, O. (2004) 'Changing paradigms in concepts on dental caries: consequences for oral health care', Caries research, 38(3), pp. 182–191.
18. Gasgoos, S. S., Al-Sayagh, G. D. and Jazrawi, K. H. (2012) 'Evaluation of dental caries prevalence among children in Mosul City Center using Significant caries Index', Al-Rafidain Dental Journal, 12(1), pp. 191–197.
19. 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.
20. 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.
21. Health, U. S. D. of &. H. S. C. F. D. C. A. P. N. C. F. C. D. P. &. P. O. on S. &., US Department of Health & Human Services; Centers for Disease Control and Prevention; National Center for Chronic Disease Prevention & Health Promotion and Office on Smoking & Health (2000) 'Reducing Tobacco Use: A Report of the Surgeon General: Executive Summary', PsycEXTRA Dataset. doi: 10.1037/e300842003-001.
22. Hegde, D. M. N. et al. (2011) 'Prevalence of Dental Caries in Anterior Teeth in South Canara Population- a Three Year Epidemiological Study', Indian Journal of Applied Research, pp. 32–34. doi: 10.15373/2249555x/feb2014/127.
23. Hussainy, S. N. et al. (2018) 'Clinical performance of resin-modified glass ionomer cement, flowable composite, and polyacid-modified resin composite in noncarious cervical lesions: One-year follow-up', Journal of conservative dentistry: JCD, 21(5), pp. 510–515.
24. Janani, K., Palanivelu, A. and Sandhya, R. (2020) 'Diagnostic accuracy of dental pulse oximeter with customized sensor holder, thermal test and electric pulp test for the evaluation of pulp vitality: an in vivo study', Brazilian Dental Science, 23(1), p. 8.
25. 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.
26. Jose, J., P., A. and Subbaiyan, H. (2020) 'Different Treatment Modalities followed by Dental Practitioners for Ellis Class 2 Fracture – A Questionnaire-based Survey', The Open Dentistry Journal, pp. 59–65. doi: 10.2174/1874210602014010059.
27. 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.
28. Kumar, D. and Antony, S. (2018) 'Calcified Canal and Negotiation-A Review', Research Journal of Pharmacy and Technology, 11(8), pp. 3727–3730.
29. Loesche, W. J. (1979) 'Clinical and microbiological aspects of chemotherapeutic agents used according to the specific plaque hypothesis', Journal of dental research, 58(12), pp. 2404–2412.
30. Lukacs, J. R. and Largaespada, L. L. (2006) 'Explaining sex differences in dental caries prevalence: Saliva, hormones, and "life-history" etiologies', American Journal of Human Biology, pp. 540–555. doi: 10.1002/ajhb.20530.
31. 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.
32. Manohar, M. P. and Sharma, S. (2018) 'A survey of the knowledge, attitude, and awareness about the principal choice of intracanal medicaments among the general dental practitioners and nonendodontic specialists', Indian journal of dental research: official publication of Indian Society for Dental Research, 29(6), pp. 716–720.
33. Marshall, S., Burrows, T. and Collins, C. E. (2014) 'Systematic review of diet quality indices and their associations with health-related outcomes in children and adolescents', Journal of human nutrition and dietetics: the official journal of the British Dietetic Association, 27(6), pp. 577–598.
34. 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.
35. 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.

36. 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.
37. Mishra, A. and Meherotra, R. (2014) 'Head and neck cancer: global burden and regional trends in India', Asian Pacific journal of cancer prevention: APJCP, 15(2), pp. 537–550.
38. Mosha, H. J. et al. (2005) 'Oral health status and treatment needs among Tanzanians of different age groups', Tanzania Dental Journal, 12(1), pp. 18–27.
39. Nandakumar, M. and Nasim, I. (2018) 'Comparative evaluation of grape seed and cranberry extracts in preventing enamel erosion: An optical emission spectrometric analysis', Journal of conservative dentistry: JCD, 21(5), pp. 516–520.
40. 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, pp. 3197–3203. doi: 10.26452/ijrps.v10i4.1622.
41. Noor, S. and Others (2016) 'Chlorhexidine: Its properties and effects', Research Journal of Pharmacy and Technology, 9(10), pp. 1755–1760.
42. van Palenstein Helderman, W. H., Soe, W. and van 't Hof, M. A. (2006) 'Risk factors of early childhood caries in a Southeast Asian population', Journal of dental research, 85(1), pp. 85–88.
43. 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.
44. 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.
45. 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.
46. PradeepKumar, A. R. et al. (2016) 'Diagnosis of Vertical Root Fractures in Restored Endodontically Treated Teeth: A Time-dependent Retrospective Cohort Study', Journal of endodontia, 42(8), pp. 1175–1180.
47. 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.
48. 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.
49. 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.
50. 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.
51. 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.
52. 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.
53. Ramamoorthi, S., Nivedhitha, M. S. and Divyanand, M. J. (2015) 'Comparative evaluation of postoperative pain after using endodontic needle and EndoActivator during root canal irrigation: A randomised controlled trial', Australian endodontic journal: the journal of the Australian Society of Endodontology Inc, 41(2), pp. 78–87.
54. Ramanathan, S. and Solete, P. (2015) 'Cone-beam Computed Tomography Evaluation of Root Canal Preparation using Various Rotary Instruments: An in vitro Study', The journal of contemporary dental practice, 16(11), pp. 869–872.
55. 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.
56. Ravinthar, K. and Others (2018) 'Recent advancements in laminates and veneers in dentistry', Research Journal of Pharmacy and Technology, 11(2), pp. 785–787.
57. Reisine, S. T. (1988) 'The impact of dental conditions on social functioning and the quality of life', Annual review of public health, 9, pp. 1–19.

58. R, R., Rajakeerthi, R. and Ms, N. (2019) 'Natural Product as the Storage medium for an avulsed tooth – A Systematic Review', Cumhuriyet Dental Journal, pp. 249–256. doi: 10.7126/cumudj.525182.
59. 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.
60. Saxena, S. and Shashikiran, N. D. (2010) 'Prevalence of dental caries and treatment needs among hemophilic children of Kota city, Rajasthan', Ann Essences Dent, 2, pp. 18–21.
61. 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.
62. Shekar, B. R. C. et al. (2011) 'Dental health awareness, attitude, oral health-related habits, and behaviors in relation to socio-economic factors among the municipal employees of Mysore city', Annals of Tropical Medicine and Public Health, 4(2), p. 99.
63. Siddique, R. et al. (2019) 'Qualitative and quantitative analysis of precipitate formation following interaction of chlorhexidine with sodium hypochlorite, neem, and tulsi', Journal of conservative dentistry: JCD, 22(1), pp. 40–47.
64. Singh, A. et al. (2014) 'Comparative study of oral hygiene status in blind and deaf children of Rajasthan', Advances in Medical and Dental Sciences, 2(1), pp. 26–31.
65. 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.
66. Sturdevant, C. M. (1995) The art and science of operative dentistry. Mosby Elsevier Health Science.
67. Teja, K. V. and Ramesh, S. (2019) 'Shape optimal and clean more', Saudi Endodontic Journal, 9(3), p. 235.
68. Teja, K. V., Ramesh, S. and Priya, V. (2018) 'Regulation of matrix metalloproteinase-3 gene expression in inflammation: A molecular study', Journal of conservative dentistry: JCD, 21(6), pp. 592–596.
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. Vehkalahti, M. M. and Paunio, I. K. (1988) 'Occurrence of root caries in relation to dental health behavior', Journal of dental research, 67(6), pp. 911–914.
71. 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.
72. 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.
73. 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.

GRAPHS:

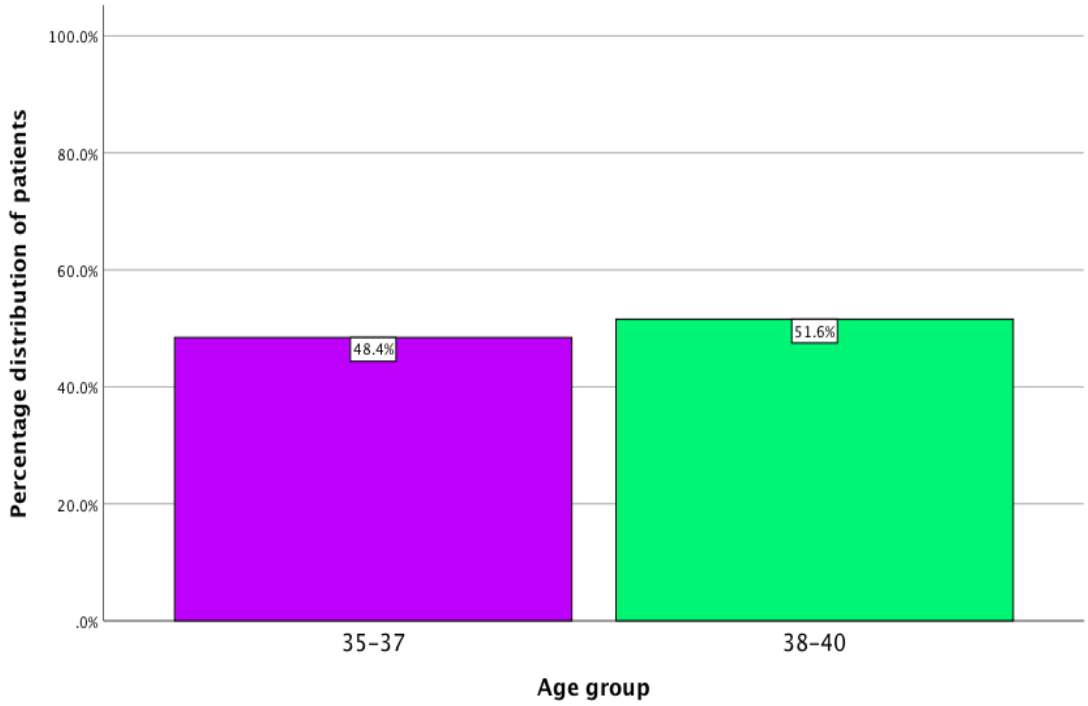

Fig.1: Bar graph represents the percentage distribution of study subjects based on age. X-axis represents the age group and Y-axis represents the percentage distribution of patients. 48.4% of the patients belonged to 35-37 years of age (Purple) and 51.6% of them belonged to 38-40 years of age (Green).

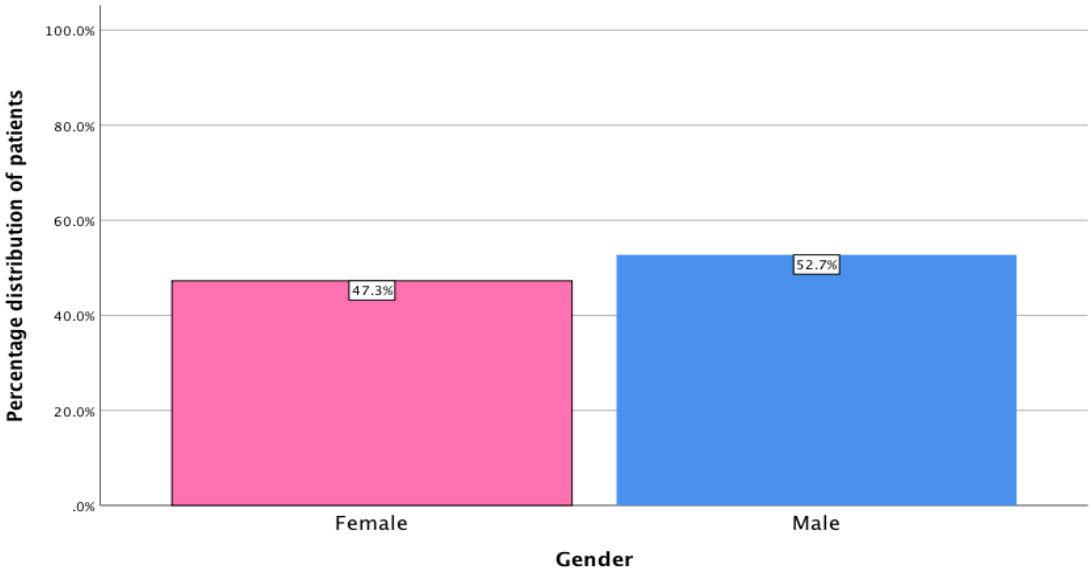

Fig.2: Bar graph represents the percentage distribution of study subjects based on gender. X-axis represents gender of patients and Y-axis represents percentage distribution of patients. 47.3% of them were females (Pink) and 52.7% of them males (Blue).

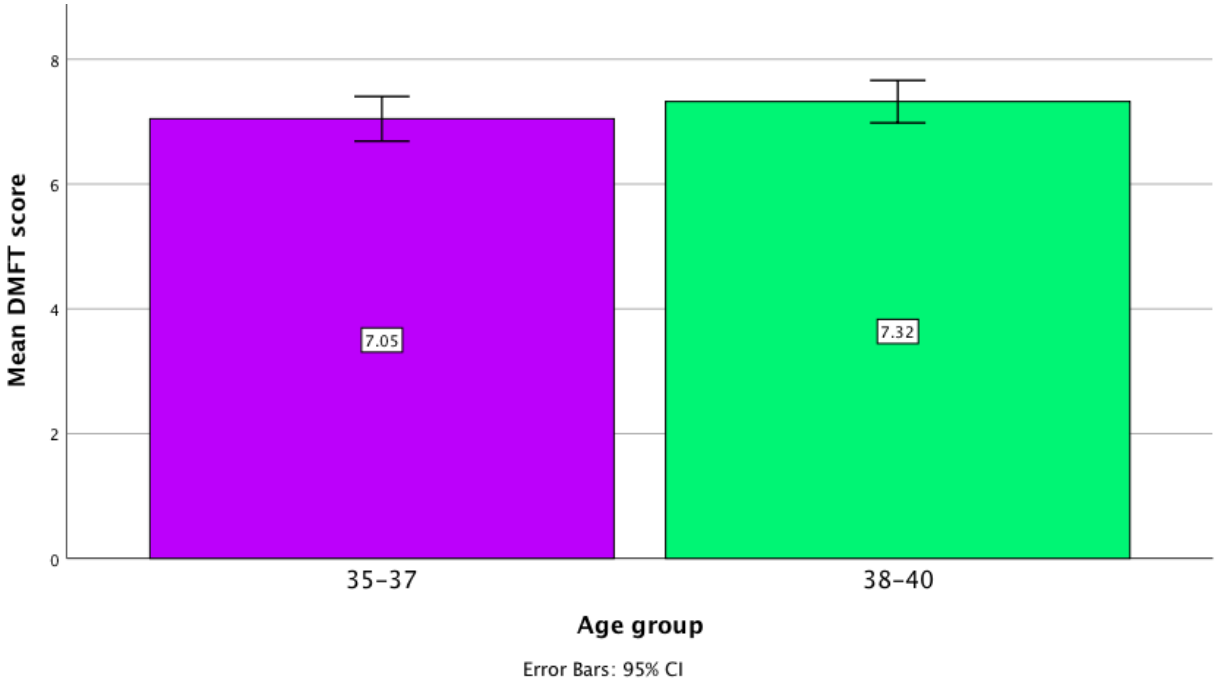

Fig.3: Bar graph represents the comparison between mean DMFT score and age of the patients. X-axis represents age of patients and Y-axis represents mean DMFT score. The mean DMFT score for the subjects between 35-37 years and 38-40 years were 7.05± 0.18 and 7.32± 0.17 respectively. Independent t-test was used to find the difference between subjects of 35-37 years and 38-40 years with respect to mean DMFT score and was found to be statistically insignificant (t value-1.09 and p value- 0.272). Even though the test was found to be statistically not significant, 38-40 years (Green) had a higher mean DMFT score than 35-37 years (Purple).

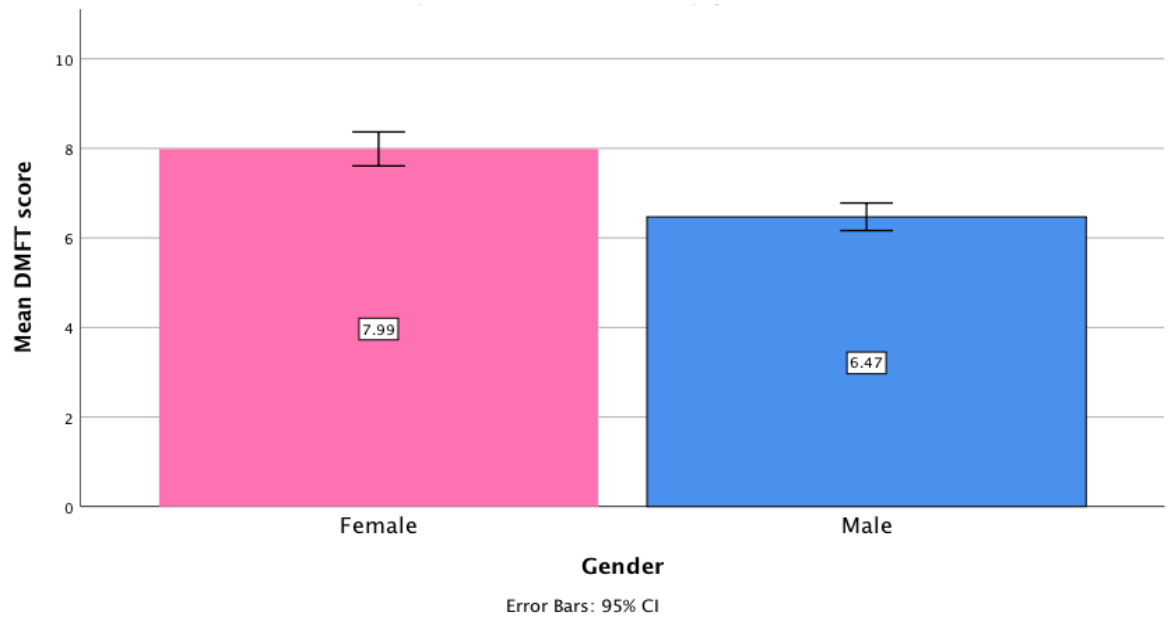

Fig.4: Bar graph represents the comparison between mean DMFT score and gender of the patients. X-axis represents gender of the patients and Y-axis represents mean DMFT score. The mean DMFT score for the subjects between females and males were 7.99± 0.19 and 6.47± 0.16 respectively. Independent t-test was used to find the difference between subjects of females and males with respect to mean DMFT score and was found to be statistically highly significant (t value- 6.14 and p value-0.00) where females (Pink) had a higher mean DMFT score than males (Blue).

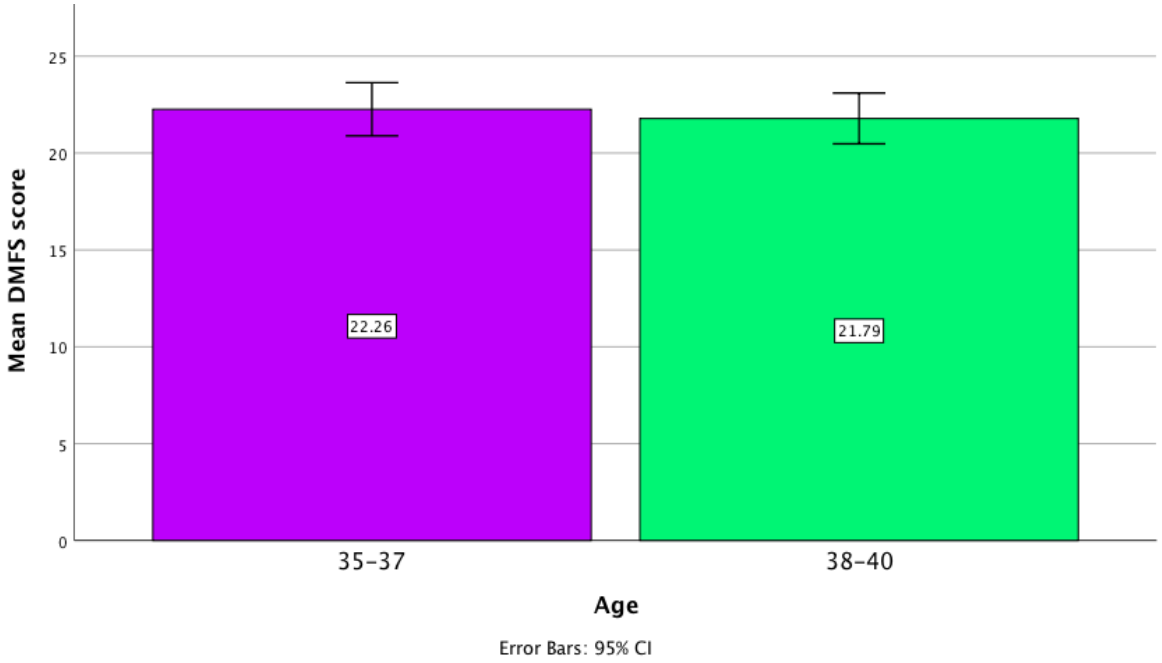

Fig.5: Bar graph represents the comparison between the mean DMFS score and Age of the study subjects. X-axis represents age of patients and Y-axis represents mean DMFS score of patients. The mean DMFS score for the subjects between 35-37 years and 38-40 years were 22.26± 0.71 and 21.79± 0.67 respectively. Independent t-test was used to find the difference between subjects of 35-37 years and 38-40 years with respect to mean DMFS score and was found to be statistically not significant (t value- 0.492 and p value-0.62), 35-37 years (Purple) had a higher mean DMFS score than 38-40 years (Green).

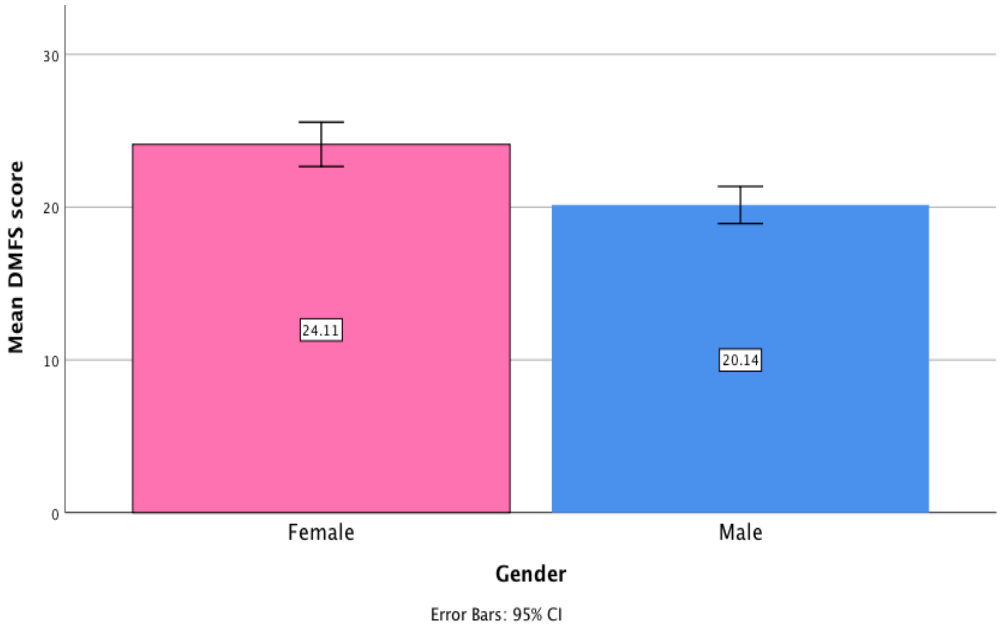

Fig.6: Bar graph represents the comparison mean DMFS score and gender of the study subjects. X-axis represents gender of patients and Y-axis represents mean DMFS score of the patients. The mean DMFS score for the subjects between females and males were 24.11± 0.74 and 20.14± 0.61 respectively. Independent t-test was used to find the difference between subjects of females and males with respect to mean DMFS score and was found to be statistically highly significant (t value- 6.14 and p value-0.00) where females (pink) had a higher mean DMFS score than males (blue).