Association of age and caries experience among adult population - An institutional study

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Abstract: Oral health is closely related with general health and people’s quality of life, through affecting their oral functions and social interactions. Dental caries are the major concerns among oral health. The aim of the study is to assess caries experience based on Decayed Missing Filled Teeth Index (DMFT) index among adults patients visiting a private dental college in Chennai. DMFT index was used to evaluate the caries experience. Patient case sheets were reviewed, index scores and age of the patients were collected. 4567 patients were selected for the study and tabulated in excel sheet and statistically analysed using SPSS. Frequency distribution was done using descriptive statistics and Chi-square test was used to analyse the association of caries experience with different age groups. In this study, it was observed that 18-35 year old patients were most prevalent (47.7%) and DMFT scores ranging from 0-7 were maximum with 58.2%. Within the limits of the study, results of the study showed that DMFT score of more than 8 suggesting higher caries experience was prevalent in study participants above 55 years of age. DMFT score of 0-7 was the most prevalent score among 18-35 years and 36-55 years.

Keywords: Age; Caries prevalence; DMFT index; Oral hygiene; Oral health.

INTRODUCTION
Oral health is closely related to general health and one’s quality of life. Among that caries are the foremost issues for both children and adults. Dental caries is the most typical chronic disease in children: it’s 5 times as common as respiratory disorder and 7 times as common as allergic rhinitis. The foremost common explanation for tooth loss among adults is untreated periodontal disease. 53 million individuals live with untreated dental caries in their permanent teeth. One fourth of adults aged sixty five years and higher than have lost all of their teeth because of untreated oral disease. The silent epidemic of oral diseases disproportionately affects underprivileged communities, particularly youngsters, the older, and racial/ethnic minority teams [((cdc) and US Department of Health and Human Services; Centers for Disease Control (CDC), 2005)]. Dental caries damage the tooth structure and so affect the people’s quality of health and life. Decay etiology has been debatable. It is multifactorial, among that bacterium, time, susceptible tooth surface and fermentable carbohydrates are major four factors affecting teeth, whereas there are different modifying factors that go hand in hand with major factors like age, ethnic cluster, occupation, lifestyle, surroundings and socio-economic status being secondary modifying factors. While primary modifying factors are tooth anatomy, saliva, use of fluoride, biofilm PH, diet specifies and vast system [([Petersen, 2003; Peres et al., 2007; Namal et al., 2008; Patro et al., 2008]). Only 1 in 5 school-aged kids from low-income families receives dental sealants to prevent dental caries. Educational programs accentuate the importance of oral health promotion/disease interference are necessary to boost awareness and discourage the lack of concern relating to oral health. Proper oral health is important to a productive and healthy life [((cdc) and US Department of Health and Human Services; Centers for Disease Control (CDC), 2005)].
Many studies up to now engaged on dental caries experience in children. There are restricted documentation relating to adult tooth decay expertise. 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; Ezhlilarasan, 2018; Ezhlilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J et al., 2018; Menon et al., 2018; Prabakar, John and Arumugham, 2018; Rajeshkumar et al., 2018, 2019; Vishnu Prasad et al., 2018; Wahab et al., 2018; Dua et al., 2019; Duraisamy et al., 2019; Ezhlilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhlilarasan, 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; Srinivasan Raj Samuel, Acharya and Rao, 2020)

Thus the aim of the study is to assess dental caries experience based on DMFT index among different age groups.

**MATERIALS AND METHODS**

Study setting: This was a retrospective study of 4567 patients from a private dental college and hospitals. A university setup study in which the pros includes flexibility of the study and less time consumption. The cons of the study includes, it is limited to a certain population. Approval was obtained from the institutional ethical committee. The ethical approval number for the present study is SDC/SIHEC/2020/DIADSDATA/0619-0320. Two examiners were involved in the study.

Sampling: Data was collected from June 2019 to March 2020. Patients records from a Dental University were reviewed. A sample size of 4567 patients were considered for this study. Cross verification of data for error was done by the presence of additional reviewers, and by photographic evaluation. Simple random sampling was done to minimise sampling bias. It was generalised to the South Indian population.

Data Collection /Tabulation: DMFT scores of the patients and their age are the parameters taken. Data was collected and entered in excel. Later data was imported to SPSS. Incomplete data was excluded from the study.

Analysis: IBM SPSS 2.0 software was used for data analysis. Independent variables include age and dependent variables include DMFT scores. Descriptive and inferential statistics were used. Descriptive statistics include the frequency of distribution of a patient's age. Inferential tests include the Chi-square test. The level of statistical significance was set at p value equals to 0.05.

**RESULTS:**

The study consisted of a total of 4574 patient records whose DMFT scores were assessed for caries prevalence. On analysing the age groups, 18-35 years old patients were most prevalent with (47.7%), followed by 36-55 years old age group which constitutes 41.8% of the population. And the least prevalent was those patients who were above 56 years (Figure 1). Frequency distribution of DMFT scores among the study population shows DMFT scores ranging from 0-7 were maximum with 58.2% followed by scores ranging 8-14 (35.4%), 15-21 (5.4%) and 22-28 (0.9%) (Figure 2).

Among 18-35 years old groups (2180 patients), 1445 (66.4%) patients had 0-7 DMFT scores. 684 (29.7%) patients had 8-14 DMFT scores, 48 (2.2%) patients had 15-21 DMFT scores and only 3 (0.13%) patients had 22-28 DMFT scores. Among 36-55 years old groups (1911 patients), 1029 (53.8%) patients had 0-7 DMFT scores. 737 (38.5%) patients had 8-14 DMFT scores, 124 (6.4%) patients had 15-21 DMFT scores and only 21 (1.09%) patients had 22-28 DMFT scores. Among the age above 56 (476 patients), 187 (38.4%) patients had 0-7 DMFT scores. 196 (41.17%) patients had 8-14 DMFT scores, 75 (15.75%) patients had 15-21 DMFT scores and only 18 (3.78%) patients had 22-28 DMFT scores (Figure 3). This is suggestive of increase in caries experience with increase in age. (P value = 0.000) (P Value <0.05 statistically significant) (Figure 3 and Table 1). This is suggestive of increase in caries experience with increase in age.

**DISCUSSION**

Many studies regarding public health in Saveetha Dental College and hospitals have engrossed youngsters and gender prevalence. Previously our team had conducted various studies related to fluoride levels in water and water quality ([Kumar, Pradeep Kumar and Preethi, 2017; Kumar, Pradeep Kumar and Vijayalakshmi, 2017]) ph level of saliva after carbonated drinks and its effects on teeth ([Pratha, Ashwatha Pratha and Prabakar, 2019]), smoking and rehabilitation and its effects on oral health ([L et al., 2015; Harini and Leelavathi, 2019; Neralla et al., 2019]), variations in different dental dentifrices ([Prabakar et al., 2018b]) ([Mohapatra et al., 2019]), role of phytochemicals and microbes in different oral hygiene ([Khatri et al., 2019; Mebin George Mathew et al., 2020]), medicolegal cases in dentistry ([Leelavathi, Srdhly and Anitha, 2015]), avulsed teeth ([Leelavathi et al., 2016]), rotary instruments in endodontics ([Patturaja, Leelavathi and Jayalakshmi, 2018]) and also in disaster and its management ([Kannan et al., 2017]).

A previous study in assessing prevalence of dental caries among the outpatients attending dental college showed female predominance with average DMFT score of 5. The study also analysed oral hygiene practices and dietary


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habits [(Rasidi, Mohamad Qulam Zaki Bin and Gheena, 2018)]. In compatibility with this study various studies also show mild higher in females than in males [(Medina-Solis et al., 2006; Pontigo-Loyola et al., 2007; García-Cortés et al., 2009)].

Now we have collected data related to caries in adults, and from our study we analysed the age prevalence in adults. Various age groups were selected like 18-35 years, 36-55 and 56 above. Among these 18-35 year old show maximum prevalence in caries experience. Similarly another study also shows high prevalence among same age group (18-34 years) as the present study. They also quoted that this outcome can be as a result of low socioeconomic status, lack of awareness about preventive health measures [(Kamberi et al., 2016)].

Whereas few studies report predominance of caries in the 35-44 year age group. In contrast, present study shows prevalence of about 41.8% which is lower than other reported articles [(Eustaquio, Montiel and Almerich, 2010; Mamai-Homata et al., 2012)]. The present study also presents the age is inversely proportional to caries experience. But few studies conflict this by saying caries prevalence increases with increasing age [(Loh, Chan and Low, 1996)].

These differences from one study to another may be influenced by socioeconomic factors [(Madlána et al., 2008)]. Rural and urban areas may have differences in their caries experience. Lack of awareness among the countryside population can be a reason for such high prevalence. Therefore, it is necessary to spread awareness among the rural study.

Another similar study done in our university involving school children: A cross-sectional study was done among school going children of Chandigarh in the age group of 3-17 years. Out of the total 4493 sample size, 47.3% of the population showed caries prevalence. By analysing the treatment requirements, 42.6% of the subjects required oral prophylaxis and 45% required restorative procedures [(Prabakar, John and Srisakthi, 2016)].

Various other measures such as prohibition of sugary snacking in school and daily supervised tooth brushing, with or without oral health education is effective in preventing ECC among preschool children with health neglect in very low-resource settings [(S. R. Samuel, Acharya and Rao, 2020)].

As a preventive measure for dental caries, application of pit and fissure sealant has been a practice in many places. A study was conducted to compare resin tags and viscosity of conventional and hydrophilic pit and fissure sealant. Based on its results, it can be concluded that hydrophilic sealant exhibited lower viscosity and formed a resin tag of sufficient length than that of conventional sealants. Therefore, hydrophilic sealant showed better results as compared to a conventional sealant [(Prabakar et al., 2018a)]. A clinical trial was conducted among 30 schoolchildren aged 12-15 years. Commercially available sealants such as Clinpro™ (conventional sealants) and UltraSeal XT™ (hydrophilic sealants). Sealant coverage between the two sealants was compared among the population. Hydrophilic sealant yielded better retention of the sealant compared to the conventional sealant [(Prabakar, John and Arumugham, 2018)].

A study compared the retention rates and development of caries in permanent molars of children sealed with amorphous calcium phosphate-containing (Aegis™) and moisture-tolerant fluoride-releasing (Embrace WetBond™) sealant over a period of 1 year. Aegis™ was superior to Embrace WetBond™ sealant as Aegis™ exhibited higher retention and lower caries scores [(Khatri et al., 2019)]. 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)]

CONCLUSION
Within the limitations of the study, DMFT scores ranging from 0-7 were most prevalent among the study population with 58.2%. DMFT score of more than 8 suggesting higher caries experience was prevalent in study participants above 55 years of age. DMFT score of 0-7 was the most prevalent score among 18-35 years.

AUTHORS CONTRIBUTIONS
First author (Vaishnavi Sivakali Subramanian) performed the analysis, and interpretation and wrote the manuscript. Second author (Dr L.Leelavathi) contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Third author (Dr. Aravind Kumar S) participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

ACKNOWLEDGEMENT
I would like to acknowledge the Information Technology department of the institution for their support in data collection

CONFLICT OF INTEREST
Nil
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Fig. 1: shows age wise distribution of study population. X axis denotes age group of the study population and Y axis denotes percentage distribution of caries experience. About 47.78% were in the age group of 18-35 yrs, 41.82% were in 36-55 yrs and 10.42% of the study participants were above 56 yrs. It is inferred that majority of the study population were among the 18-35 years age group.

Fig. 2 shows distribution of DMFT scores among the study population. X axis denotes DMFT scores and Y axis denotes the percentage of study population. DMFT score of 0-7 was prevalent among 58.24% of the study participants, DMFT score of 8-14 was prevalent among 36.43% of the study population, score of 15-21 and 22-28 were prevalent among 5.41% and 0.92% respectively, suggesting that DMFT score of 0-7 was the most prevalent DMFT score in the study population.
Fig. 3 shows association of DMFT scores and age of the study participants. X axis denotes age group of study participants and Y axis represents number of study participants. Highest DMFT scores (Orange colour) was more prevalent among study participants above 56 years of age when compared with other age groups and this was statistically significant suggesting that, as with the increase in age, there was an increase in caries experience based on DMFT index (Chi-square value - 292.54, p value -0.000, P value < 0.05, statistically significant).

Table 1 shows association of DMFT scores and age of the study participants. There was an increase in caries experience with age.
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