

Association of Gender and Filled Tooth Surfaces - An Institutional Study

Research Article

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Abstract

Background: Development of caries is multifactorial, depending on how many interacting variables are present. The significant impact of caries among the world's population makes the disease an important topic of understanding. In the epidemiological studies, DMFT and DMFS scores are used to reveal the consistent trend in caries occurrence.

Aim: To reveal the association of gender and filled tooth surfaces using DMFS index that reveals the number of carious tooth surfaces restored. **Materials and methods:** A descriptive study was done reviewing patient records from June 2019 to March 2020 and a total of 3082 records were reviewed. Filled tooth surfaces were obtained from Decayed Missing Filled Surface Index records. Descriptive statistics and chi square tests were done.

Results: Out of the total sample size (3082 cases), 54.1% were males and 45.9 % were females. Distribution of filled tooth surfaces among the study sample revealed maximum prevalence of 1-32 filled surfaces (50.3%). Distribution of various age groups showed 18-35 years as the most prevalent age groups.(45.7%). Genderwise distribution of filled surfaces among the sample revealed that among males, 1-32 filled surfaces were predominant (51.2%) and among females, 0 filled surfaces were (50.21%). Chi square test between filled tooth surfaces and gender revealed statistically significant difference.

Conclusion: Within the limitations, the results of the present study showed that the filled tooth surfaces were more among males and among those below 35 years.

Keywords: Filled Surfaces; Gender; Age; Predominance; DMFS Index.

Introduction

Dental caries is a highly prevalent worldwide health problem, representing the most common infectious disease, affecting about 621 million people around the world [1]. The significant impact of caries on the world's population makes the disease an important topic of understanding [2]. Dental caries is a lifetime disease [3], development of caries is multifactorial, depending on many interacting variables to promote its development. In particular, the presence of bacteria which is most commonly streptococcus mutans [4], a substrate for the bacteria (food/sugars) as nutrition and health of oral tissues are interdependent [5], the host's oral environment as it harbours a wide variety of microbes crucial for caries initiation and progression [6, 7], as well as the pass-

ing of time are the main contributing factors in the formation of caries [8]. Using multivariate models, reports from around the world have established the relative importance of specific factors to dental caries experience [9]. Among these factors, low income, deficient oral hygiene, fluorosis, various measures of low socio-economic status [10], older age, prior experience of decay in the primary dentition, especially pit and fissure caries that are approximately eight times vulnerable than smooth surface caries [11], caries experience in the permanent dentition [12], female sex [13], presence of abnormalities, hypoplasia, or enamel defects, as well as low level of parental education and cariogenic diet all affect caries risk [13, 14]. Dentists should be aware of these factors and should be able to advise patients on how nutrition can improve their overall quality of life [15]. Apart from these, the pattern

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of dental caries varies between the primary to permanent dentition; this difference in caries susceptibility is no doubt related to differences in tooth morphology [16]. While various descriptive epidemiological studies of dental caries have been undertaken in Indian population and no multivariate models were included to ascertain the relative role of identified caries risk indicators, along with this, information on caries prevalence and severity forms the basis for the magnitude and quality of caries prevention programs and treatment needs in a population [17]. Therefore, a continuous need remains to field caries prevalence and severity information as well as the preventive measures such as fluoridation in appropriate levels [18, 19], fluoride releasing sealants [20] and ensuring awareness regarding the role of nutrition [6].

In the epidemiology of dental caries, dental researchers exhibit unparallel fidelity to the DMFT/DMFS index, whose origin dates back to Klein, Palmer and Knutson, 1938 [12]. The DMFT/DMFS index counts the total number of decayed (D), missing (M) and filled (F) teeth/surfaces for the whole mouth. The Decayed, Missing, Filled (DMF) index has been used for almost 80 years and is well established as the key measure of caries experience in dental epidemiology [21]. The DMF Index is applied to the permanent dentition and is expressed as the total number of teeth or surfaces that are decayed (D), missing (M), or filled (F) in an individual. When the index is applied to teeth specifically, it is called the DMFT index, and scores per individual can range from 0 to 28 or 32, depending on whether the third molars are included in the scoring. When the index is applied only to tooth surfaces (five per posterior tooth and four per anterior tooth), it is called the DMFS index, and scores per individual can range from 0 to 128 or 148, depending on whether the third molars are included in the scoring [22].

When written in lowercase letters, the dmf index is a variation that is applied to the primary dentition. The caries experience for a child is expressed as the total number of teeth or surfaces that are decayed (d), missing (m), or filled (f). The dmft index expresses the number of affected teeth in the primary dentition, with scores ranging from 0 to 20 for children. The dmfs index expresses the number of affected surfaces in primary dentition (five per posterior tooth and four per anterior tooth), with a score range of 0 to 88 surfaces. Because of the difficulty in distinguishing between teeth extracted due to caries and those that have naturally exfoliated, missing teeth may be ignored according to some protocols. In this case, it is called the df index [23].

There are five surfaces on the posterior teeth: facial, lingual, mesial, distal, and occlusal. There are four surfaces on anterior teeth: facial, lingual, mesial, and distal. The list of teeth not counted is the same as for DMFT calculations, and listing D, M, and F is also done in a similar way: When a carious lesion or both a carious lesion and a restoration are present, the surface is listed as a D. When a tooth has been extracted due to caries, it is listed as an M. When a permanent filling is present, or when a filling is defective but not decayed, this surface is counted as an F. Surfaces restored for reasons other than caries are not counted as an F. The total count is 128 or 148 surfaces [24].

Previous research by hindawi et al., in 2015 revealed that Systemic diseases that have been found to be associated with caries have also been found to have an association with the female gender. An extended exposure to the oral cavity or a more cariogenic oral

microflora has not been proven to contribute to higher caries in women [25].

Similarly, JR Shafer, in his study, also revealed that Sex disparities in dental caries have been observed across many populations, with females typically exhibiting higher prevalence and more affected teeth [26].

Lukacs and Largaespadaet al in 2006 revealed that along with the environmental and genetic risk factors ,sex also affects susceptibility to caries. epidemiological surveys show females at higher risk with greater numbers of affected tooth surfaces than males [27].

The DMFS index is an indicator to assess the relationship between the gender and the filled teeth. The aim of this research was to reveal the association gender and filled tooth surfaces using tools such as the DMFS index that reveals the number of tooth surfaces restored.

Materials and Methods

This Study was carried out in a university setting which consists of subjects of predominantly South Indian population. Approval for the study was by the ethical board of Saveetha University. The study was carried out by 3 authors. The study was done in 2020 in which the patient records from the time period of June 2019 to March 2020 were considered Case sheets reviewed for the research included all patients applicable for the study and cross verification of the required samples were done by a reviewing expert through photographs. Measures were taken to minimise the sampling bias by including all the available data. Internal validation was ascertained by the use of a standard index for measuring dental caries that is Decayed Missing Filled Surface Index. Pros of this study was availability of secondary data and cons of this study was that it was an institutional study and hence the results were not generalisable to the whole population.

The required data for the study was obtained from reviewing patient records from the patient record management system. The required data- i.e, the patients for whom DMFS index was recorded was collected along with the required parameters such as gender and age and entered in a methodical manner in an excel sheet for the tabulation of data and further statistical analysis. Data was validated by 1-2 external reviewers and all the non specific, unclear or incomplete data were excluded from the study.

Statistical software used for analysis is the SPSS (statistical package for the social sciences) by IBM and the statistical tests used were chi square tests, custom tables, frequency tables, bar graphs to analyse and compare the obtained results. The type of analysis performed was exploratory data analysis. Independent variables include ethnicity, gender, age and the dependent variables include the DMFS index.

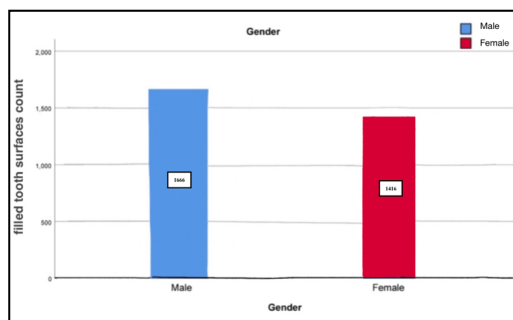
Results

Gender distribution of the study revealed that out of the total sample size (3082 cases), 1666 (54.1%) male participants were there and 1416 (45.9%)females were there depicting male predominance [Figure 1]. Distribution of filled tooth surfaces among

the study sample revealed no filled tooth surfaces among 49.3% (1518), 1-32 filled surfaces among 50.3% (1549), 33-64 filled surfaces among 0.3% (10) and 65-96 filled surfaces among 0.2% (5) of the population. [Figure 2]. Distribution of various age groups for filled surfaces revealed 18-35 years age group having 45.7%(1410) filled surfaces, followed by 36-55 years having 43.3% (1335) filled surfaces and above 55 years having 10.9% (337) filled surfaces [Figure 3]. Gender wise distribution of filled surfaces among the sample size revealed that among the Males, 0 filled surfaces were prevalent among 48.44% (807) of the males; 1-32 filled surfaces

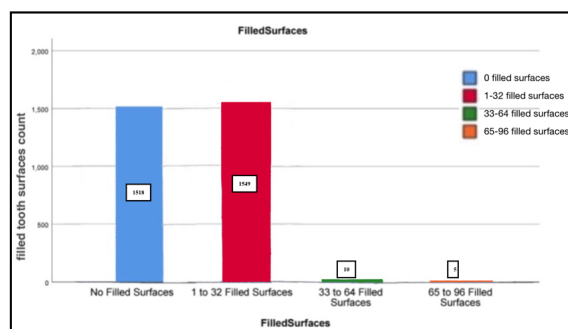
were prevalent among 51.2%(853) of the males; 33-64 filled surfaces were prevalent among 0.12%(2) of the males; 65-96 filled surfaces were prevalent among 0.24% (4) of the males; and 97-128 filled surfaces were prevalent among 0% (0) i.e, none of the males. Among the Females, 0 filled surfaces were 50.21%(711); 1-32 filled surfaces were 49.15%(696); 33-64 filled surfaces were 0.56%(8); 65-96 filled surfaces were 0.07%(1) and 97-128 filled surfaces were 0%(0); Chi square test between filled surfaces and gender - P value < 0.05 (p=0.007) statistically significant [Figure 4].

Figure 1. Gender Wise Distribution Of Filled Surfaces.



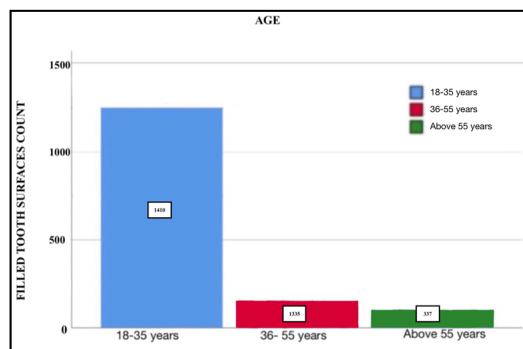
Bar graph representing the frequency distribution of males and females for whom DMFS index was recorded. x axis represents gender and y axis represents the Frequency of the filled tooth surfaces under each gender. Blue colour denotes Males and Red colour denotes females. The number of filled tooth surfaces count is predominant in Males when compared to the females.

Figure 2. Filled Tooth Surfaces Distribution Among The Sample Size.

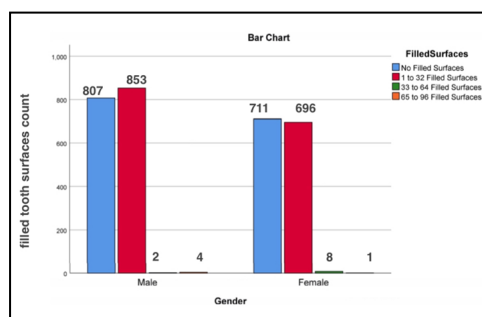


Bar graph representation of the frequency distribution of filled tooth surfaces among the study sample. x axis represents the filled surfaces ranges and y axis represents the number of filled surfaces under each range. Blue colour denotes 0 filled surfaces, red colour denotes 1-32 filled surfaces, green colour depicts 33-64 filled surfaces and orange colour depicts 65-96 filled surfaces. Most predominant filled surfaces count was the 1-32 filled surfaces range among the sample size.

Figure 3. Age Wise Distribution Of Filled Surfaces.



Bar graph representing the frequency distribution of age groups. x axis represents various age groups and y axis represents the filled surfaces count under each age group. Blue colour denotes 18-35 years, Red colour denotes 36-55 years and Green colour denotes above 55 years. Among the various age groups, 18-35 years is the most predominant population for the filled tooth surfaces count when compared to the other age groups.

Figure 4. Association Between Distribution Of Filled Tooth Surfaces And Gender Among The Sample Size.

Bar graph representing the frequency distribution of age groups. x axis represents various age groups and y axis represents the filled surfaces count under each age group. Blue colour denotes 18-35 years, Red colour denotes 36-55 years and Green colour denotes above 55 years. Among the various age groups, 18-35 years is the most predominant population for the filled tooth surfaces count when compared to the other age groups.

Discussion

Awareness of dental caries and assessment of filled tooth surfaces among the Indian population should be an equally important area of emphasis in community dentistry, like other areas such as awareness of nicotine replacement therapy for tobacco cessation [28] and nutritional counselling. India is the second most populous country in the world and dental surgeons form a significant source of untapped health resources [29]. Among the oral diseases, dental caries is the most chronic disease of mankind [30]. If left untreated, it can cause damage upto the pulpal level when it can be root canal treated [31] and the end stage is the chronic decay that leads to the loss of the tooth. Filled tooth surfaces thus is an important parameter to evaluate the filled teeth present in the oral cavity, that is most likely to be due to caries. Awareness of the importance of filled tooth surfaces is essential and this can be done by targeted education programs and through camps and mass media [32], as the medical and dental negligence is increasing in India [33].

Genderwise distribution of filled surfaces revealed that the total filled surfaces among the males was 51.56%; and females was 49.79% thereby showing a male predilection. Supporting our findings, EK Zorić et al in 2014 showed that Males have greater number of restorations than females, whereas research by Shaffer, John & Leslie et al in 2015 revealed that women had more dental restorations though men had more current decay [26].

Agewise distribution of filled tooth surfaces among the study sample revealed 1-35 years age group as the predominant population for filled tooth surfaces. Shaffer, John & Leslie et al., in 2015 revealed that In both women and men, total counts of affected teeth, attains peak during 40-60 years of age. B Broffitt et al., in 2009 showed that 20-40 years has an incidence of maximum prevalence of filled surfaces [34].

Limitations of the study are the non inclusion of some data that were unclear of certain reporting parameters. Other limitations are the Geographic limitations - assessment of predominantly South Indian population. Further, This study is a Unicentered study, which is also a major limitation.

Dental caries is a serious public health issue and collecting data on its prevalence, incidence, and trends is an important field in oral

epidemiology. The DMF index is a standard method for assessing dental caries experience in populations. While linear increases in caries with age in both children and adults indicate that caries affect individuals throughout life, longitudinal surveys indicate a decline in dental caries experience over the past two decades, yet dental caries remain a prevalent oral disease among the children and adults.

Conclusion

Within the limitations, the results of the present study showed that the filled tooth surfaces were more among males and among those below 35 years.

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Authors Contribution

Author 1 (Sadhvi B), carried out the retrospective study by collecting data and drafted the manuscript after performing the necessary statistical analysis. Author 2 (Dr. Leelavathi) aided in the conception of the topic, has participated in the study design, statistical analysis and has supervised in the preparation of the manuscript. Author 3 (Dr. Suresh.V) has participated in the study design and has coordinated in developing the manuscript. All the authors have discussed the results among themselves and contributed to the final manuscript.

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