



## Age and Gender Distribution of Patients Undergoing Extraction of Teeth for Dental Caries - An Institutional Study

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### ABSTRACT

Loss of tooth affects mastication, speech, esthetics and impairs the quality of life. Dental caries is a common oral health problem affecting people globally. A knowledge of etiology of tooth loss may help us to take preventive measures and limit future extractions of teeth. The aim of the study was to investigate the age and gender distribution of patients undergoing extraction of teeth for dental caries at Saveetha Dental College and Hospitals. In this retrospective cross-sectional study, digital case records of all patients who underwent extractions for dental caries in Saveetha Dental College and hospital from June 2019 to March 2020 were reviewed. Demographic details of patients were recorded from digital case records. Retrieved data was analysed using IBM SPSS Software Version 23.0. Descriptive statistics and tests of association of categorical variables by Chi square tests were done and results were obtained. P value < 0.05 was considered statistically significant. Among 6808 patients who underwent extraction of teeth for dental caries in Saveetha Dental College, more extraction were done among patients in the age group of 31-40 (22.31%). Extractions for dental caries in males (53.98%) were predominantly higher compared to females (46.02%). On comparing the association between age and gender, the results were statistically significant. (Pearson's Chi square test,  $p < 0.001$ ). Within the limits of the present study, it can be concluded that the prevalence of tooth loss was more in the age group of 31-40 years with male predilection. This study will create awareness among people regarding the cause and reasons behind tooth loss, thereby preventing it at an early stage.

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## INTRODUCTION

Dental caries remain a global health care issue with eminent economic impact and skewed distribution across and within countries [1]. In India, with diverse food habits, socioeconomic and cultural variations, as well as a skewed oral health care workforce, the impact on the incidence of dental caries is huge [2,3]. Dental caries occurs due to demineralization of dental hard tissues by acidic byproducts from the bacterial fermentation of dietary carbohydrates [4]. The cause of dental caries includes: host, bacteria and diet [5,6]. Risk factors for dental caries include salivary composition, insufficient fluoride, the standard of living, oral hygiene, eating habits, social status and socio-demographic factors [7]. The problem related with dental caries leads to a decrease in the quality of life of affected individuals and high economic costs equally for individuals and society, with disparities related to well-known issues of socio economics, immigration, lack of preventive efforts, and dietary changes [8,9]. Dental caries in children can affect school attendance, eating and speaking, and impair their growth and development [10]. In preschoolers, high consumption of sucrose, sweet drinks, high sugar intake between meals, frequent snacking, child's oral hygiene practices and the parents' ability to withhold cariogenic snacks are factors associated with dental caries [11,12].

Tooth loss affects mastication and esthetics, thereby also people's quality of life [13]. Tooth loss is an indicator of the condition of oral health [14,15]. Loss of teeth results in nutritional imbalances and adversely affects oral health related quality of life [16]; [17]. In general, various reasons for tooth loss include dental caries, periodontal diseases, socioeconomic status, malnutrition [18,19]. Gender difference has played a major role in tooth loss and edentulousness due to culturally mediated behavior which can be temporal or regional [20].

Lifestyle is measured by dietary habits, smoking habits and physical activity. Women have better lifestyles than men as they are more concerned about general and oral health, esthetics and are very sensitive to illness.[21]; [22,23]; [24]. Men have worse habits like consuming more processed meat, fat-containing items, excessive alcohol, smoking and less fruits, vegetables and milk,[25]. Women, as opposed to men, displayed more interest in comprehensive "primary" preventive medical examinations[26,27].

In general, the prevalence of tooth loss and dental caries has been documented more among women than in men in many parts of the world due to more consumption of cariogenic diet [28]. Alterations of hormone levels during pregnancy increase oral vascular permeability, decrease host

immunocompetence and alter the levels of oral bacteria [29,30]. Women have lower stimulated and unstimulated salivary flow rates than men. Thus cleaning effects and buffering capacity will be decreased [31]. Menopause is associated with xerostomia [32,33]. And this leads to an increased incidence of dental caries. Recent research has found that there is an association between a gene called "Amelogenesis X" which is present in X-chromosome and experience of high caries [34]. The protein "Amelogenin" contributes to 90% of enamel matrix formation during amelogenesis (enamel formation). A defect in Amelogenin gene with decreased enamel protein disrupts enamel formation leading to enamel hypoplasia which in turn increases the caries susceptibility [35,36].

According to a study done by Byahatti et.al in Libyan population, where the prevalence was higher in males (61.13%) compared to females (46.17%) [37]. But in Pakistan, females were the ones who underwent more extraction (56%) compared to males [38]. Thus, this study was done to analyse the age and gender distribution of extraction patients among the South Indian population.

Factors related to tooth loss include smoking, diet and oral hygiene practices. In periodontal diseases, smoking is implicated as a risk factor [39]. Socioeconomic status of less wealth, lower income, less education can lead to poor oral hygiene. Oral health habits like brushing and flossing play an important role in oral hygiene. It was found that women use floss and brush in comparison to men [40,41]. Estrogen may provide protection against tooth loss in menopausal women, and testosterone may be related to periodontal health in hypogonadotropic men. Sex steroids like estrogen and androgen directly affects the periodontium by modulation of immunological events [42]. Understanding the progression of dental caries will facilitate identifying the risk periods for the disease which will help to intervene at the appropriate period [43,44] Previously we have focused our research on various invitro and invivo studies. [45-64] We have currently shifted our focus to this retrospective analysis. This study was contemplated to evaluate the association of gender and age with tooth loss due to dental caries in our institution.

## MATERIALS AND METHODS

### Study design and study setting

descriptive study was conducted in Saveetha Dental College and Hospital, Saveetha University, Chennai, to evaluate the age and gender distribution in patients undergoing dental extractions for dental caries from June 2019 to March 2020. The study was initiated after approval from the institutional review board

**Study population and sampling**

Inclusion criteria for the study were dental patients between the age group of 11-90 years who underwent extraction for dental caries in our institution. The exclusion criteria were missing or incomplete data. After assessment in the university patient data registry, case records of 6808 patients who underwent dental extractions for dental caries were included in the study. Cross verification of data for errors was done with the help of an external examiner.

**Data collection**

A single calibrated examiner evaluated the digital case records of 9082 patients who underwent dental extractions from June 2019 to March 2020. Demographic details like age, gender were also recorded.

**Statistical Analysis**

The collected data was validated, tabulated and analysed with the Statistical Package for Social Sciences for Windows, version 23.0 (SPSS Inc., Chicago, IL, USA) and the results were obtained. Categorical variables were expressed in frequency and percentage; and continuous variables in mean and standard deviation. The Pearson's chi-square test was used to test associations between categorical variables. P value < 0.05 was considered statistically significant.

**RESULTS AND DISCUSSION**

In our study, among 6808 patients who underwent dental extractions for dental caries, the majority of patients belonged to the age group of 31-40 years (22.31%) followed by the age group of 41-50 years (21.43%) and the least number of extraction patients belonged to the age group of 81-90 years (0.40%) [Figure 1].

On analysing gender [Figure 2], extractions for dental caries in males (53.98%) were predominantly higher compared to females (46.02%). Among patients who underwent extractions for dental caries, about 3.7% of males and 2.92% of females belonged to the age group of 11-20 years, 9.89% of males and 8.87% of females in the age group of 21-30 years, 10.59% of males and 11.72% in the age group of 31-40 years, 10.68% of males and 10.75% of females in the age group of 41-50 years, 9.9% of males and 7.17% of females in the age group of 51-60 years, 6.62% of males and 3.66% of females in the age group of 61-70 years, 2.25% of males and 0.88% of females in the age group of 71-80 years, and 0.35% of males and 0.04% of females belonged to the age group of 81-90 years [Figure 3]. On comparing the association between age and gender, the results were statistically significant. (Pearson's Chi square test,  $p < 0.001$  ( $< 0.05$ )). The patients of an age group

31-40 yrs had undergone more number of extractions and males underwent more extractions for dental caries than females in most of the age categories and the differences were statistically significant. [Figure 3].

Our study was based on the residents of Chennai seeking dental treatment at Saveetha Dental college, Chennai. 6808 patients underwent dental extractions for dental caries, with the majority of extractions belonging to the age group of 31-40 years followed by the age group of 41-50 years and the least number of dental extractions in the age group of 81-90 years. Males underwent more extractions for dental caries compared to females. An age wise distribution of extraction patients showed that the highest number of patients was present in the age group of 30-39 years (52.7%) in Jordanian population [65] and the results were similar to our study. According to Kumar et. al., the patients who underwent dental extraction were present more in the age group of 35-44 years [66] which was in agreement with our study results. According to Tassoker et. al., the more prevalent age group to undergo dental extraction was 31-40 years [67] which was also in accordance with our study. According to Desai et.al, in Kantipur Dental College, dental extraction was done more in the age group of 41-50 years (19%) [68] which was contradictory to our study results. In contrast to our study, Hamagharib DS et.al showed that the more number of dental extraction was done at the age group of 41-50 yrs (23.5%) [69]. Farah Naz showed that the age group less than 30yrs had undergone more dental extraction compared to other age groups [38] which disagrees with our study results.

Gender distribution according to our study showed male predilection. This result was similar to a study by Byahatti et.al in Libyan population, where the prevalence was higher in males (61.13%) compared to females (46.17%) [37]. In Jordanian population, dental extraction was undergone more in males (50.5%) compared to females (49.5%) [65] which was in agreement with our study results. According to Tassoker et.al, Among 193 patients who underwent dental extraction due to dental caries, 103 were males and 90 were females favouring male predilection [67]. This literature was supporting our study results. In Kantipur Dental College, among 18720 extraction patients, 7488 patients were males and 11232 were females thereby proving the female prevalence [68] which was contradicting our study results. According to Kumar et.al, study showed female predominance (52.5%) undergoing dental extraction compared to males (47.5%) [66] which was not in agreement with our study. Patterns of extraction in School of Dentistry, the University of Sulaimani showed the

male and female percentage of 47% and 53% respectively [69] which disagrees with our study. According to Farah Naz, in Pakistan, females were the ones who underwent more dental extractions (56%) compared to males (44%) [38] which was opposing our study results.

Limitation of this study was less sample size, and data was from university patients, thus cannot be generalized to the entire population. Thus multicenter study with large sample size should be conducted in the future.

## CONCLUSION

Within the limits of the present study, it can be concluded that the prevalence of tooth loss due to dental caries was more in the age group of 31-40 years with male predilection. Despite the advancements in preventive and restorative dentistry, dental caries is the main reason for extraction of teeth. It is the duty of dental practitioners to emphasize the importance of oral hygiene maintenance impart knowledge about oral health in the society. Undergraduate dental students also play an important role in this process as they are the future dental professionals.

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## AUTHOR'S CONTRIBUTION

M.P.Santhosh Kumar contributed to study conception and design, data collection, analysis and interpretation and drafted the work. A.Ashwatha Pratha contributed to data interpretation, study design and data collection. Ravindra Kumar Jain contributed to study conception and design and data collection. All authors critically reviewed the manuscript and approved the final version.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Self.

## Ethical Clearance

It is taken from "Saveetha Institute Human Ethical Committee" (Ethical Approval Number-SDC/SIHEC/2020/DIASDATA/0619-0320)

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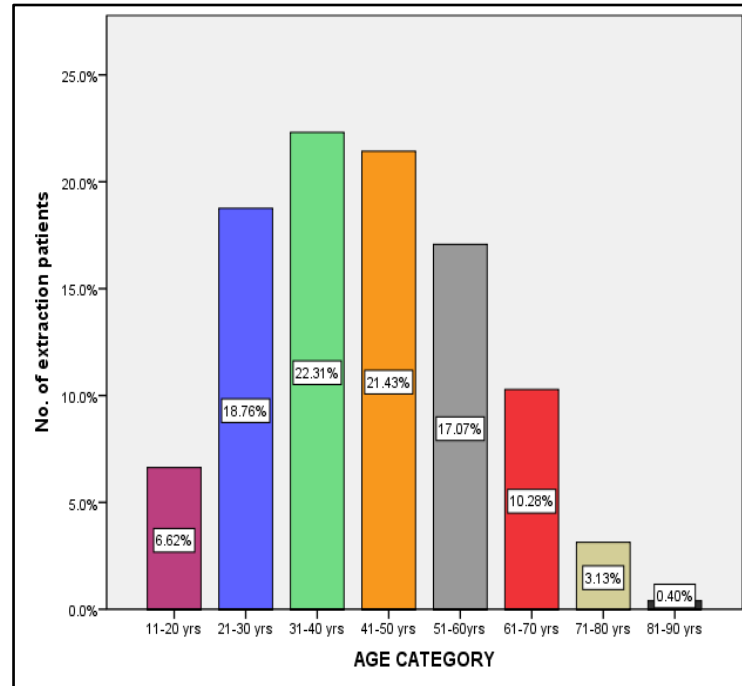


Figure 1: Bar chart depicting age wise distribution of patients undergoing extractions for dental caries. X-axis represents the age category and Y-axis represents the number of extraction patients. The patients of age group 31-40 yrs underwent more number of extractions (22.31%) compared to other age groups.

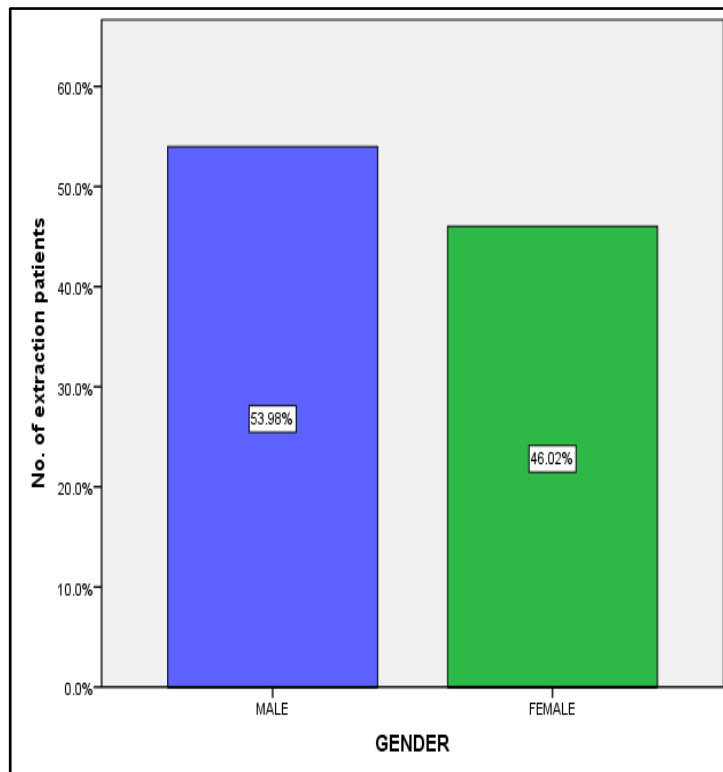
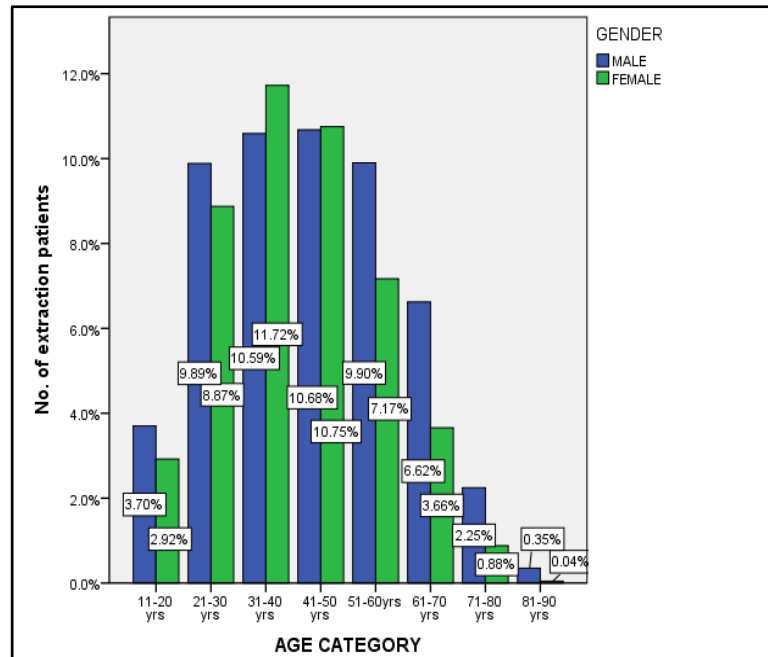


Figure 2: Bar chart depicting gender distribution of patients undergoing extractions for dental caries. X-axis represents the gender and Y-axis represents the number of extraction patients. Males (53.98%) underwent more number of extractions for dental caries compared to females (46.02%).





**Figure 3:** Bar chart depicting association between age and gender among patients undergoing extractions for dental caries. X-axis represents the age category and Y-axis represents the number of extraction patients in each gender. Association between age and gender among patients undergoing dental extraction was done using Chi-square test and was significant. Pearson’s Chi square test,  $p < 0.001$  ( $< 0.05$ ). The patients of age group 31-40 yrs underwent more number of extractions and males underwent more number of extractions for dental caries than females in most of the age categories.