

EXTRACTION OF PERMANENT TEETH: ETIOLOGY AND PATTERN AT A TERTIARY CARE HOSPITAL

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ABSTRACT

The aim of the study was to determine the etiology and pattern of tooth extractions in permanent dentition. A cross sectional prospective study was conducted at the department of Oral & Maxillofacial Surgery, Faisalabad Medical University, Faisalabad from October 2018 to March 2019. A total of 1656 patients were picked through non-probability consecutive sampling and data was collected by a skilled clinician using a specially designed performa after informed verbal consent from the patient. Quantitative variables like age were presented as mean and standard deviation. Qualitative data like gender, reason of extraction of tooth, tooth loss pattern and socioeconomic status were presented as frequencies and percentages. In 1656 patients, a total of 2253 teeth were extracted. There were 639 (38.6%) males and 1017 (61.4%) females with a male to female ratio of 1:1.6. Majority of the patients 1235 (74.6%) belong to lower socioeconomic status and 421 (25.4%) belong to middle socioeconomic status. The main etiology of tooth extraction in this study was caries 1503 (66.7%) followed by periodontal diseases 288 (12.8%) and impaction 237 (10.5%). The pattern of tooth removal showed that third molar tooth was the frequently extracted tooth 522 (23.1%) followed by the first molar tooth 438 (19.4%) in both the arches. The results of this study showed that caries followed by periodontal disease were the major cause for tooth extractions. These are largely preventable causes of tooth extraction therefore there is a need for commencement of far reaching preventive actions. Significant consideration should be applied to expand people's awareness and recognition of their overall dental health and change of their viewpoint and behaviour in connection to oral care.

Key Words: Reason, Dental caries, Permanent dentition.

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INTRODUCTION

Teeth serve very important functions in digestion, speech and maintenance of general appearance¹. Eruption of permanent teeth begins at 6thyr and end at

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21styr of age.^{1,2} Conservation of permanent dentition is important as permanent teeth are supposed to last for life time and can be replaced by artificial means only if once lost.^{2,3} However, in some individuals, due to many reasons, conservation of permanent teeth become a challenge, leading to tooth loss.³⁻⁵ The disease specific risk factors include caries, periodontal pathologies, trauma etc.^{3,4,5} Tooth loss results in physical and psychological difficulties⁵. Tooth loss without replacement causes decreased quality of life to the same extent as cancer or renal diseases.⁶ So, extraction of permanent teeth, more and less has a traumatic impact on one's personality and is undesirable.^{3,6}

Tooth loss is associated with multiple factors which can be divided into clinical and non-clinical causes.⁷ Causes which can be clinically ruled out are caries, periodontitis, impacted teeth, prosthetic and orthodontic requirements, root canal failure, trauma to tooth, teeth in line of fracture, malaligned teeth and supernumerary teeth.^{1,4,8} Other nonclinical factors which have

a strong impact on prevalence of extraction involves advanced age, social status, oral hygiene measures and education.^{4,8,9}

Tooth extraction is a routine dental procedure and dentists are practicing it all over the world since centuries.¹⁰ Number of dental extractions is declining in developed countries like United Kingdom.^{10,11} Pakistan is a developing country according to WHO classification and hence, due to scarcity of health facilities and poor socioeconomic status, tooth extraction is preferred over other more expensive dental procedures.^{7,9,11,12} Therefore, due to considerable number of extractions in Pakistan, it is very important to find reason of tooth loss due to extractions.^{3,9}

The objective of this study was to investigate the reasons and pattern of tooth extractions in permanent dentition so that we may choose best preventive measures for general population in order to conserve the dentition in public.

MATERIALS AND METHODS

This was a cross sectional prospective study¹ conducted on out-patients undergoing extractions in Oral & Maxillofacial Surgery department, Allied Hospital/ Faisalabad Medical University, Faisalabad for a period of six months from October 2018 to March 2019. The ethical committee of Faisalabad Medical University, Faisalabad approved the study and informed written consent was obtained from the patients before their inclusion in the study.

Non-probability consecutive sampling was used to enrol the patients for study. All the patients who underwent permanent tooth extraction (single or multiple teeth) and above 06 years of age who consented for study were included in the study. The patients who were medically unfit for extraction or who did not consent for the study were excluded from the study.^{3,6,7}

All the patients were subjected to complete history taking followed by clinical examination. Routine pre-operative investigations were advised and relevant radiographs were taken as per requirement. After history, clinical examination and investigations data was collected in specially designed performa. The performa consist of demographic variables including socioeconomic status, various tooth loss causes and tooth extraction pattern.

The collected data were entered and analyzed using SPSS version 21.0 (SPSS Inc., Chicago, IL, USA). Qualitative data like gender, tooth extraction reasons, tooth loss pattern and socioeconomic status were presented as frequencies and percentages.^{1,6,8}

RESULTS

The current study comprised of 1656 patients in which a total of 2253 teeth were extracted. There were 639 (38.6%) males and 1017 (61.4%) females with a male to female ratio of 1:1.6. The most constant delineated age for extraction was between 41-50 years 408 (24.7%) patients. According to the socioeconomic status majority of the patients 1235 (74.6%) belong to lower class background whereas 421 (25.4%) patients belong to the middle class (Table:1).

The frequency and percentage of etiology of tooth extraction of various teeth in our study was as follows, caries 1503 (66.7%), periodonatl diseases 288 (12.8%),

TABLE 1: GENERAL CHARACTERISTICS OF THE STUDY PARTICIPANTS (N = 1656)

Variables	Number of subjects (%)
Gender	
Male	639 (38.6%)
Female	1017 (61.4%)
Age (years)	
< 20	96 (5.8%)
21-30	354 (21.4%)
31-40	384 (23.2%)
41-50	408 (24.7%)
51-60	291 (17.6%)
61-70	111 (6.6%)
71-75	12 (0.7%)
Socioeconomic Status	
Middle Class	421 (25.4%)
Lower Class	1235 (74.6%)

TABLE 2: FREQUENCY AND PERCENTAGES OF ETIOLOGY OF TOOTH EXTRACTION (N = 2253)

Etiology of Extraction	Frequency	Percentage
Caries	1503	66.7%
Impaction	237	10.5%
Periodonatl Diseases	288	12.8%
Prostodontics	114	5.1%
Orthodontics	21	0.9%
RCT Failure	27	1.2%
Tooth in line of fracture	45	2.0%
Supernumery teeth	9	0.4%
Sensitivity	4	0.2%
Psychological cause	5	0.2%
Total	2253	100%

TABLE 3: FREQUENCY AND PERCENTAGES OF PATTERN OF TOOTH REMOVAL (N = 2253)

Pattern of Tooth Removal	Frequency	Percentage
Central Incisor	177	7.8%
Lateral Incisor	171	7.6%
Canine	147	6.6%
First Premolar	183	8.1%
Second Premolar	249	11.1%
First Molar	438	19.4%
Second Molar	357	15.9%
Third Molar	522	23.1%
Supernumery	9	0.4%
Total	2253	100%

impactions 237 (10.5%), prosthodontics 114 (5.1%), orthodontics 21 (0.9%), RCT failure 27 (1.2%), tooth in line of fracture 45 (2.0%), supernumery teeth 9 (0.4%), sensitivity 4 (0.2%), psychological cause 5 (0.2%) (Table:2).

The results for the pattern of tooth removal showed that the most frequently extracted teeth were third molar 522 (23.1%) in both arches, followed by first molar 438 (19.4%) while supernumery teeth were least frequently extracted 9 (0.4%). Further results regarding pattern of tooth removal has been shown in Table:3.

DISCUSSION

Dental diseases continue to be a major public health burden across the world despite the various preventive measures that have been initiated.¹³ Due to these dental diseases extraction of the tooth is one of the most frequently executed procedures.^{9,12,13} Tooth loss in a selected region or population gives us an insight into the prevalent attitudes toward oral health services as well as the available facilities.¹⁴ It is essential to understand the causative and contributory factors to plan and develop effective strategies to reduce tooth loss.^{2,9,14}

The results of this study confirmed that females were in greater percentage for extractions as compared to their male counterparts. The ground for this might be the stubby self care nature and predominantly oral care in our female community.⁴ It might also be due to absence of appreciation, dependency and strenuous approach to dental care units.⁷ Moreover in our culture females live more in homes, dependent on their male counterparts for daily routine work and travelling thus abandon their oral health.^{4,7} This steer them from choosing treatment modalities which are effortless, affordable, less time consuming and with minimum

schedules of dental consultations.^{4,14} Even if advised such patients instead of a root canal therapy favored tooth extraction.^{4,7} These results are in accordance with the study conducted in India by Nuvvula et al¹ who also reported female patient predominance for tooth extraction as compared to male patients.¹

In this study, most patients whose teeth were extracted were in the fourth decade of life, which contrasts with the report of Taiwo et al⁴ who reported the third decade of life as the model decade of presentation in a study conducted in Nigeria.⁴ However it is in agreement with the reports of Alesia et al¹¹ and Saghafi et al¹⁵ who also reported the fourth decade of life as the most common decade for tooth extractions.^{11,15} This may suggest geographical variations in the pattern of presentation among patients having dental extractions. Subjects who belong to middle socioeconomic status had fewer tooth extractions than those who belong to lower socioeconomic status. This relationship is in agreement with other studies like Censi et al¹⁰ and Kashif et al¹⁶ in which high percentage of tooth loss was associated with a low socioeconomic status.^{10,16}

The caries was contemplated as the paramount cause for extraction of tooth in our study. This is in agreement with numerous studies which exhibit higher prevalence of caries like studies conducted by Nuvvula et al¹ and Osunde et al⁷ who reported caries as the reason for extraction in 49.8% and 57.7% of extractions done, respectively.^{1,7} Treatment inclination for tooth which are carious is usually extraction rather than conservative treatment, chiefly in patients who belong to low socioeconomic status. Numerous rationales had been pinpointed for this reason of tooth loss. It is most likely due to the existence and increased use of refined sugar products in routine diet, inadequate tooth brushing mastery, lack of understanding of oral hygiene preservation, lack of regular visits to dentist and proper follow ups.

Periodontal disease was the second most continuing cause for dental extractions in this particular study which is in agreement with the results of study conducted by Kashif et al¹⁶ who also reported periodontal diseases as one of the leading reason of tooth extraction. However, our study is not in agreement with studies conducted by Samuel et al³ and Alesia et al¹¹ where periodontal disease was the major cause of extraction in the patients.^{3,11} Interestingly impaction was noticed as the third common reason of tooth extraction in our study demonstrating comparability with a research on same standpoint conducted by Taiwo et al⁴ and Silva-Junior et al⁵. Reasons for the increased prevalence of third molar extraction could be because of recurrent pericoronitis, lack of oral hygiene maintenance and awareness. Another cause of third molar removal is

unavailability of conservative treatment alternatives for third molar tooth due to its mal-positioning and approach difficulty for conservative techniques.

This study manifests the pattern of tooth loss and the most usual tooth to be extracted was the third molar i.e. 23.1% followed by first molar tooth 19.4% of both the arches. The results of this study differ from majority of the studies like Taiwo et al⁴, Censi et al¹⁰ and Medina-Solis et al¹² where the first molar was the most commonly extracted tooth.^{10,12,18} This could be due to the increase occurrence of impacted third molar tooth in our population and as the study was conducted in a tertiary care hospital which is the main referral hospital of not only the Faisalabad district but also the surrounding districts too. Therefore, third molar tooth was the most referred tooth for the extraction in our center.

CONCLUSION & RECOMMENDATION

The results of this study confirmed that caries was the most common etiology of tooth extraction whereas the third molar was the most commonly extracted tooth in both the arches. The majority of patients in this study belong to the lower socioeconomic status. This highlights the importance of dental caries in public health and clearly indicates a lack of oral health awareness among general population.

Incomprehension, economic restriction and disruptive conservative treatment are important issues to worry. Greater deliberation should be taken to increase peoples realization and apprehension of their own oral health and changed of their viewpoint and conduct in relation to oral health measures.

To change this trend, we recommend urgent inclusion of oral healthcare facilities by developing mobile dental facilities, intensification of oral healthcare awareness campaigns, increased recruitment of dental experts and fluoridation of community water supply. Furthermore, a research designed to explore the reasons for late presentation among dental patients should be instituted.

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 Data collection and data analysis.
 Drafting of article and tabulation of results.
 Data collection and reviewing of manuscript.