

## REASONS FOR PERMANENT TEETH EXTRACTION IN JIZAN REGION OF SAUDI ARABIA

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### Abstract:

**Background:** Tooth loss is one of the main indicators of the overall oral health in a given population. The purpose of this study was to investigate the reasons of permanent teeth extraction and its association with age and gender in Jizan population.

**Subjects and Methods:** The data were collected by general dental practitioners from government polyclinics and primary health centers of Jizan region from patient's file who have attended the clinics from February to December 2014. The inclusion criteria were patients from both genders, above the age of 10 years and indicated for extraction of permanent tooth. The numbers of subjects were 424 males and 267 females, divided into six groups according to age groups. The data were entered into SPSS program version 20.0 and results were analyzed.

**Results:** The highest percentage of extraction was found in young patients of age group 20-29 years. Caries was the highest reason for teeth extraction in age groups 20-29 (33.3 %) followed by orthodontics cause which was considered as a high cause of tooth extraction in the same age group. Periodontal diseases causes were the most common causes of teeth extraction in age group of 40 -49 and 50 – 59 years groups (23.4) (37.5%). The lowest cause in male and female was the combination of periodontal disease and trauma.

**Conclusions:** Dental caries was the principal cause for extractions in younger patients followed by orthodontics, while periodontal diseases were the major cause of tooth extractions in elder patients.

**Keywords:** Tooth, extraction, Caries, Periodontal disease, Saudi Arabia.

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### I. Introduction

Tooth loss affects speech evokes masticatory difficulties and may end with poor aesthetics, which impact the quality of life of any population [1]. Surveys on the causes for tooth loss in many countries have been conducted and have produced some controversy regarding whether caries and /or periodontal diseases are the main reason for tooth loss. While other studies suggested the reasons to such extractions are the caries, periodontitis, orthodontics, trauma and prosthetic treatments [2-4].

In many studies, caries was reported to be the most frequent reason for tooth extraction in early age groups [5,6], while others found that caries and periodontal disease were equally responsible [7,8]. Other studies reported periodontal disease to account for the majority of tooth extractions in older patients [6, 9-11]. However, some reported that caries is the main reason of tooth loss in all ages [12-13].

In the presence of preventive measures, periodontal disease became the main reason for extraction in age group 46–65 years [14], while orthodontics extractions might replace caries as the common reason for extraction in young populations less than 20 years of age [7,9,12,15].

In Germany and Canada studies have reported periodontal disease as the most frequent cause for tooth extraction [4, 16], whereas Italy and Singapore studies reported almost same percentage of periodontal disease and caries [7, 8]. While dental caries and periodontal disease are the main reasons for tooth extractions in relation to gender, age, behavioral, socioeconomic and attitudinal characteristics tend to affect the tooth retention of the population [17].

Few studies have been done in the past to assess the reasons for tooth extractions in Saudi Arabia population [18-21]. Assessment of tooth mortality data in different parts of the world is essential for evaluating the adequacy of dental care and preventive oral health programs [22]. Additionally, understanding the relative contributions of the two major oral diseases, caries and periodontal disease, to tooth loss rates should aid in the proper allocation of available dental resources aimed at reducing such rates. Limited number of epidemiological surveys was carried out in Saudi Arabia and Gulf Countries to investigate the reasons of tooth loss amongst their

populations[5, 6, 15, 18-19]. Therefore, the aim of this study was to investigate the causes of tooth extractions and its relation to gender and age among Jizan populations.

## II. Subjects And Methods

In this cross-sectional study, data was collected from Government polyclinics and primary health centers of Jizan region from patient's file who have attended the clinics from February to December 2014. The inclusion criteria were patients from both genders, above the age of 10 years and indicated for extraction of permanent tooth. The total number of 691 subjects, 424 males and 267 females were included in the study. The selected subjects were divided into six groups, according to the age, (10-19), (20-29), (30-39), (40-49), (50 -59), and (>60 years) respectively. All the causes of extracted teeth were recorded and data collected were registered onto a preform.

The list of possible reasons for the extractions was modified from those used in previous studies [9, 12]. The reasons for extractions were caries, periodontal disease, combination of caries / periodontal disease, and trauma. In addition, prosthodontics and orthodontic treatment reasons were also recorded.

The data were processed and analyzed by means of the Statistical Package for Social Sciences (SPSS version 20.0, Institute Inc, Cary, NC, USA). Frequency distributions of variables were computed separately for male and female subjects. The Chi-square test was used for comparisons between male and female and age groups. A difference with a  $p < 0.05$  was considered statistically significant.

## III. Results

A total number of 691 subjects were included in this study. The total number and percentages of male subjects were 424 (61.2%), and females 267 (38.2%). Table 1 showed the descriptive statistics with patient's age ranged from 10 to >60 years old. The highest age group and percentage were in group 40- 49 (20.2%) followed by 10 – 19 (19.2%) years old, while the lowest age and percentage was in the group of 60 years and above (14.1%).

**Table 1: Number and percentage of patients in relation to age group**

Age group (Mean age)	10 – 19	20 – 29	30 - 39	40 - 49	50 – 59	60	Total
N	133	111	99	140	110	98	691
%	19.2	16.0	14.3	20.2	15.9	14.1	100

Figure: 1 demonstrated the common causes for teeth extraction in this study. The most common cause was caries (26.9%) followed by periodontal disease (18.5%) and orthodontic treatment (17.1%). The combination of caries with trauma (6.1%), and trauma with periodontal disease (4.2%) accounts for the lowest causes for extraction.

**Figure -1. Number and percentage of extracted teeth in relation to cause.**

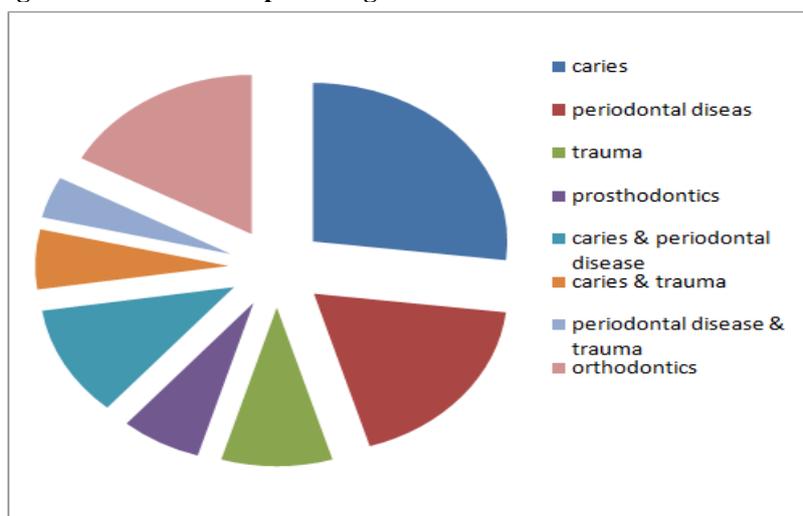


Table -2 showed that, caries was the most common cause for teeth extraction in both male and female 25.9 % and 28.5 % respectively. Approximately equal percentages were found in males and females for the orthodontics and periodontal diseases causes. The lowest cause in male and female was the combination of periodontal disease and trauma 4.7% and 3.4% respectively. When the data subjected to statistical analysis it showed statistically significant difference in the causes of caries, periodontal disease, caries and periodontal

disease and orthodontics. While there were no significant differences at level of  $p < 0.05$  among the other causes as showed in table – 2.

**Table – 2. Number, percentage and causes of extracted teeth in relation to gender**

Gender	Caries	Periodontal disease	Trauma	Prosthodontics	Caries & periodontal disease	Caries & trauma	Periodontal disease & trauma	Orthodontics
Male # / %	110/ 25.9	81 / 19.9	37 / 8.7	24 / 5.7	51 / 12.0	27 / 6.4	20 / 4.7	74 / 17.5
Female # / %	76/28.5	47 / 17.6	27 / 0.1	22 / 8.2	27 / 10.0	15 / 5.6	9 / 3.4	44 / 16.5
Total 691	186	128	64	46	78	42	29	118
100 %	26.9	18.5	9.3	6.7	11.3	6.1	4.2	17.1
<b>P value</b>	<b>.013*</b>	<b>.003*</b>	<b>.211</b>	<b>.768</b>	<b>.007*</b>	<b>.064</b>	<b>.041</b>	<b>.006*</b>

\*Significance level at 5%

Table – 3 showed that, caries is the most common reason for teeth extraction among young patients in both age groups 20-29 ( 33.3 %) and 10 -19 (21.5 %). Also orthodontics cause was considered as a high cause of tooth extraction in the same age group (32.2 %) (56.8 %). Periodontal diseases were the most common cause of teeth extraction in age groups of 40 -49 and 50 – 59 years groups (23.4) (37.5%) respectively. When the data subjected to statistical analysis there were statistically significant difference in the dental caries alone, caries with periodontal disease, periodontal disease with trauma and orthodontics. While there were no significant differences at level of  $p < 0.05$  among the other causes as showed in table – 3.

**Table – 3. Number, percentage and causes of extracted teeth in relation to age group.**

Age group (Mean age)	Caries	Periodontal disease	Trauma	Prosthodontics	Caries & periodontal disease	Caries & trauma	Periodontal disease & trauma	Orthodontics
10 – 19	40/21.5	0/0	26/40.6	0	13/16.7	8/19.0	2/6.9	67/56.8
20 – 29	62/33.3	12/9.4	27/42.2	0	23/29.5	18/42.9	9/31.0	38/32.2
30 – 39	33/17.7	14/10.9	11/17.2	0	11/14.1	16/38.1	12/41.4	13/11.0
40 – 49	28/15.0	30/23.4	0	3/6.5	18/23.1	0	6/20.7	0
50 – 59	13/7.0	48/37.5	0	18/39.1	13/16.7	0	0	0
> 60	10/5.4	24/18.8	0	25/54.3	0	0	0	0
<b>Total 691</b>	<b>186</b>	<b>128</b>	<b>64</b>	<b>46</b>	<b>78</b>	<b>42</b>	<b>29</b>	<b>118</b>
%	26.9	18.5	9.3	6.7	11.3	6.1	4.2	17.1
<b>P value</b>	<b>.000*</b>	<b>.289</b>	<b>.453</b>	<b>.379</b>	<b>.000*</b>	<b>.357</b>	<b>.000*</b>	<b>.000*</b>

\*Significance level at 5%

#### IV. Discussion

Causes of teeth extractions had large geographical and cultural differences between various countries as well as region with in a country. In different regions of Saudi Arabia, a limited number of epidemiological studies have been conducted to investigate such causes of teeth extractions.

Retention of the complete dentition throughout life should be one of the main goals of the dental health care providers [20]. So this study was designed to investigate the causes of teeth extraction in Jizan region in relation to age and gender. We are going to discuss our findings in relation to the studies conducted in close countries with similarity of geographical, eating habits and cultural as well as governmental health services.

From our findings as shown in table -2 and figure -1, it is clear that caries is the highest cause of teeth extraction among Jizan subjects 26.9 %. In comparison with the same cause in the previous studies which showed 60 % Riyadh [5], 43 % in Kuwait [6], 50.2 % in Riyadh [15], 53 % in Al-Baha [17], 62 % Riyadh [20] and 83% in Jeddah [23]. This could be explained by the type and habit of food which contain low amount of sugar. Approximately same percentages were found between male and female in our results. This is in agreement with previous findings mentioned in the literatures (18, 19). Significant age groups differences were noted in our findings. Several previous studies [6,15,17,20], had been concluded that caries is the major cause of teeth loss in early age, our result coincided with the previous finding as shown in table -3.

Periodontal disease in both males and females showed in our finding as the second cause of teeth loss in Jizan population and it is 18.5% of the total cause and as the subjects become elder it increases with highest percentage in the age group 50-59. This is in agreement with the investigation of [6, 17-19]. Significant differences were obvious in this study related to gender with higher percentage in male, this because male gender has been reported as a risk indicator for periodontal disease severity [24].

The present study shows, high cause of extraction due to orthodontic needs among Jizan subjects as shown in figure -1, table -2 & 3. These finding coincided with those studies conducted in Riyadh [15] and in Jordan [25]. This could be explained by the increases in esthetic demands of patients and free orthodontic services in governmental centers.

No combined causes of teeth extraction were studied before in different countries as well as regions even if it is in small percentage as it is obvious in our findings as shown in figure -1, table -2 and 3. Combined causes of caries and periodontal disease were found in previous investigation in private clinics and in Riyadh [18-19].

## V. Recommendations

Preventive programs need to be implemented in order to decrease the level of caries in this region. The collaboration of caries prevention programs with national public health programs is considered the most effective strategy. Combined reasons of extraction of teeth should be investigate in further study.

## VI. Conclusions

From this cross sectional study, it can be concluded that:

1. Caries is the major cause for teeth extractions, followed by periodontal disease and orthodontics. While prosthodontics and trauma were the least reasons for extractions.
2. In the younger age groups caries and orthodontics were the major reasons for extractions, while periodontal disease accounts for the majority of tooth extractions in the older groups.
3. Same percentage of causes of caries and periodontal diseases were found in both gender.
4. The combinations of any two causes were the least reason, with the combination of caries and periodontal disease were slightly more.

## References

- [1]. Brodeur JM, Benigeri M, Naccache H, Oliver M, Payette M. Trend in the Level of Education in Quebec Between 1980-1993. *J Can Dent Assoc*, 1996; 62: 159-160.
- [2]. Richards W, Ameen J, Coll AM, Higgs G. Reasons for tooth extraction in four general dental practices in South Wales. *Br Dent J* 2005; 198:275–278.
- [3]. Chestnutt IG, Binnie VI, Taylor MM. Reasons for tooth extraction in Scotland. *J Dent* 2000; 28:295–297.
- [4]. Reich E, Hiller KA. Reasons for tooth extraction in the western states of Germany. *Community Dent Oral Epidemiol*. 1993;21: 379–383.
- [5]. Al-Emran S. REVALENCE OF TOOTH LOSS IN SAUDI ARABIAN SCHOOL CHILDREN: AN EPIDEMIOLOGICAL STUDY OF SAUDI MALE CHILDREN. *S Dent J* 1990; 2: 137-140.
- [6]. Al-Shammari KF, Al-Ansari J, Abu Al-Melh M, Al-Khabbaz AK. Reasons for Tooth Extraction in Kuwait. *Med Princ Pract* 2006; 15:417–422.
- [7]. Angelillo IF, Nobile CG, Pavia M: Survey of reasons for extraction of permanent teeth in Italy. *Community Dent Oral Epidemiol* 1996; 24: 336–40.
- [8]. Ong G, Yeo JF, Bhole S: A survey of reasons for extraction of permanent teeth in Singapore. *Community Dent Oral Epidemiol* 1996; 24: 124–7.
- [9]. Cahen PM, Frank RM, Turlot JC: A survey of the reasons for dental extractions in France. *J Dent Res* 1985; 64: 1087–93.
- [10]. Fure S, Zickert I: Incidence of tooth loss and dental caries in 60-, 70- and 80-year-old Swedish individuals. *Community Dent Oral Epidemiol* 1997; 25: 137–42.
- [11]. Agerholm DM, Sidi AD: Reasons given for extraction of permanent teeth by general dental practitioners in England and Wales. *Br Dent J* 1988; 164: 345–8.
- [12]. McCaul LK, Jenkins WM, Kay EJ: The reasons for extraction of permanent teeth in Scotland: a 15-year follow-up study. *Br Dent J* 2001; 190: 658–62.
- [13]. Bailit HL, Braun R, Maryniuk GA, Camp P: Is periodontal disease the primary cause of tooth extraction in adults? *J Am Dent Assoc* 1987; 114: 40–5.
- [14]. Morita M, Kimura T, Kanegae M, Ishikawa A, Watanabe T. Reasons for extraction of permanent teeth in Japan. *Community Dent Oral Epidemiol*. 1994; 22(5 Pt 1):303–306. .
- [15]. Alesia K, Khalil H. Reasons for and patterns relating to the extraction of permanent teeth in a subset of the Saudi population. *Clinical, Cosmetic and Investigational Dent* 2013; 5:51-56.
- [16]. Murray H, Locker D, Kay EJ. Patterns of and reasons for tooth extractions in general dental practice in Ontario, Canada. *Community Dent Oral Epidemiol*. 1996;24:196-200.
- [17]. PREETHANATH RS. REASONS FOR TOOTH EXTRACTION IN URBAN AND RURAL POPULATIONS OF SAUDI ARABIA. *Pakistan Oral & Dent J* 2010;30: 199204.
- [18]. Al-Zahrani MS. Reasons for tooth extraction at three private dental clinics in Saudi Arabia. *Egypt Dent J* 2009; 55:21-23.
- [19]. Alsufayyan S, Khan N. Reasons for extraction of teeth in paramilitary personnel in Saudi Arabia - a pilot study. *J Pak Dent Assoc* 2004; 13:198-203.
- [20]. Farsi JMA. Common causes of extraction of teeth in Saudi Arabia. *S Dent J* 1992; 4:101-05.
- [21]. Ashri NY, Awartani F. Reasons for permanent tooth extraction in Riyadh area. *Egypt Dent J* 2003; 49: 2049-54. .
- [22]. Al-Ansari AA. Prevalence, Severity, and Secular Trends of Dental Caries among Various Saudi Populations: A Literature Review. *SJMMS* 2014; 2: 142-9.
- [23]. Gandeh MBS, MilaatWa. Dental caries among schoolchildren: report of a health education campaign in Jeddah, Saudi Arabia. *East Mediterr Health J* 2000; 6: 396-401.
- [24]. Grossi SG, Genco RJ, Machtei EE, Ho AW, Koch G, Dunford R, Zambon JJ, Hausmann E: Assessment of risk for periodontal disease. II. Risk indicators for alveolar bone loss. *J Periodontol* 1995; 66: 23–29.
- [25]. Wahab F. A survey of reasons for extraction of permanent teeth in Jordan. *S Dent J*. 2001; 13:148–154.