



Reasons for Permanent Teeth Extraction in Al-Madinah Al- Munawarah

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Authors' contributions

This work was carried out in collaboration between both authors. Author HMAA designed the study, performed the statistical analysis. Author SA wrote the protocol, wrote the first draft of the manuscript, managed the literature searches and the analyses of the study. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: The purpose of this study was to determine the reasons for extraction of permanent teeth in Al-Madinah Al- Munawarah.

Methods: A questionnaire was distributed to 180 dental students and dentists at Taibah university dental clinic to record the patient's information, the extracted tooth number, and the reason for extraction. Collected data were analyzed using Statistical Package for Social Sciences software (SPSS) and Chi-square test was used to compare between different variables.

Results: Caries and its sequelae were the primary cause of extraction in all age groups (from 10- to > 60). The highest percentage of extraction due to caries and its sequelae was in (30-39) age group, whereas lowest percentage were in age groups (10-19) and (> 60 years). The number of extractions in females was higher than males in all groups except in-group of patients above 60 years. First molars were the most extracted teeth in both arches.

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Conclusion: Advanced caries was the main cause of extraction in all age groups, while periodontal diseases followed by prosthetic reasons were the most common causes in patients above 40 years old.

Keywords: Tooth extraction; advanced caries; periodontal disease; Saudi Arabia.

1. INTRODUCTION

Teeth loss has a serious impact on an individuals' quality of life since it affects esthetics, speech and mastication. Collecting data about tooth loss in different countries worldwide is crucial for evaluating the dental status and measuring the adequacy of dental care in the community [1]. Several studies worldwide have been carried out to determine the reasons for tooth extraction and dental caries has been reported to be the most common reason [2-12].

Studies in Germany, Canada, and Jordan have reported periodontal disease as the most common cause of extraction, [13,14,15] while in Italy and Singapore [16,17] studies showed nearly the same percentages of caries and periodontal diseases.

In Kingdom of Saudi Arabia, limited number of epidemiological studies was carried out to investigate the reasons for teeth extraction in Jeddah [18], Riyadh [19], Jazan [20] and in other regions [21]. Up to date, similar studies are not available in Al-Madinah. Therefore, the present study aims at determining the reasons for permanent teeth extraction in relation to age and gender in Al-Madinah Al Munawarah, Saudi Arabia.

2. MATERIALS AND METHODS

This was an observational descriptive study that was conducted in the clinics of Taibah University (TU), College of Dentistry, Al-Madinah Al-Munawarah, Saudi Arabia. The Taibah University, College of Dentistry Research Ethics Committee, approved it by number (TUCDREC/20160204). No informed consent was needed because the patient's data were completely anonymous and there was no intervention. A questionnaire that was used explained the purpose of the study and included a list of reasons for extractions. It was distributed to a total of 180 dental students and dentists in the university dental clinics to be filled, in the period between February to April 2016. The dentists were asked to record the patient's age, gender, nationality, tooth type, and the reason for

extraction. If multiple extractions were done in the same patient, the dentist recorded the teeth numbers and the reason for extraction of each tooth.

The dentists chose the reason from the following list;

1. Dental caries, caries or its sequelae including root remnants, failed endodontics, fractured tooth due to caries or endodontics.
2. Periodontal disease; mobility.
3. Combination of caries / periodontal disease.
4. Trauma
5. Orthodontics
6. Prosthetics.
7. Eruption problems including (impactions)
8. Other reasons for extraction.

The above list of possible reasons was modified from those used in earlier studies. [16,19,20] the inclusion criteria were patients from both genders, above the age of 10 years. The reasons recorded by the dentists were cross-tabulated to the age, gender, and each tooth type in the upper and lower arches. Data were coded and analyzed descriptively using Statistical Package for Social Sciences software ((SPSS-20, Chicago, IL, USA), and Chi-square test was used to compare between different variables.

3. RESULTS

The total number of extracted teeth and percentages in male subjects were 673 (42.3%), and females 916 (57.6%). The number of extracted teeth in female patients was higher than in the male patients in all age groups except in male patients over 60 years as shown in (Table 1).

Table 2 showed that caries and its sequelae (root remnants, fractured crowns, and failed endodontics) were the primary cause of extraction in all age groups, representing (63.4%), followed by periodontal diseases, the percentage of patients who underwent extraction for periodontal disease was predominant in age groups over 40 years (14.6%). Prosthetic

reasons showed (9%), Combination of caries and periodontal diseases (5.8%), eruption problems (mostly impaction) accounting for (5.1%), orthodontic reasons (1.3%), and trauma was the least frequent cause of extraction showed (0.2%).

Caries and its sequelae were the main cause of extraction in both genders. The differences between male and female were ($P < 0.001$). In female patients, the percentage of caries extractions were (39.5%), while in male patients, the percentage was (23.9%). More teeth were extracted because of periodontal diseases in males (11.4%) than in females (3.2%), followed by prosthetic reasons that were (6.3%) in

females, and (2.6%) in males as illustrated in (Fig. 1)

Table 1. Number and percentage of extracted teeth in relation to Patient's age and gender

Age	Male	Female	Total	%
10-19	21	54	75	4.7
20-29	82	212	294	18.5
30-39	138	178	316	19.9
40-49	128	193	321	20.2
50-59	149	179	328	20.6
> 60	155	100	255	16.0
Total	673	916	1589	100

Notes: $\chi^2 = 69.294$, Degrees of freedom = 5, $P < 0.001$

Table 2. Reasons for extraction in relation to patient's age

Age groups	10-19	20-29	30-39	40-49	50-59	> 60 Yr.*	Total	%
Reasons								
Root remnants	17	84	151	88	118	98	556	34.9
Caries	36	98	90	92	52	42	410	25.6
Combination**	1	31	21	21	14	5	93	5.8
Failed endodontics	1	11	9	8	5	9	43	2.7
Periodontal diseases	0	6	12	55	98	62	233	14.7
Prosthetic reasons	1	11	8	45	39	39	143	9.0
Orthodontic reasons	13	8	0	0	0	0	21	1.3
Eruption problems	6	41	22	11	1	0	81	5.1
Trauma	0	2	0	1	0	0	3	0.2
Others	0	3	3	0	0	0	6	0.4
Total	75	295	316	321	327	255	1589	100

*Years; **Combination of caries and periodontal diseases; $\chi^2 = 5.65$; Degrees of freedom = 70; $P < 0.001$

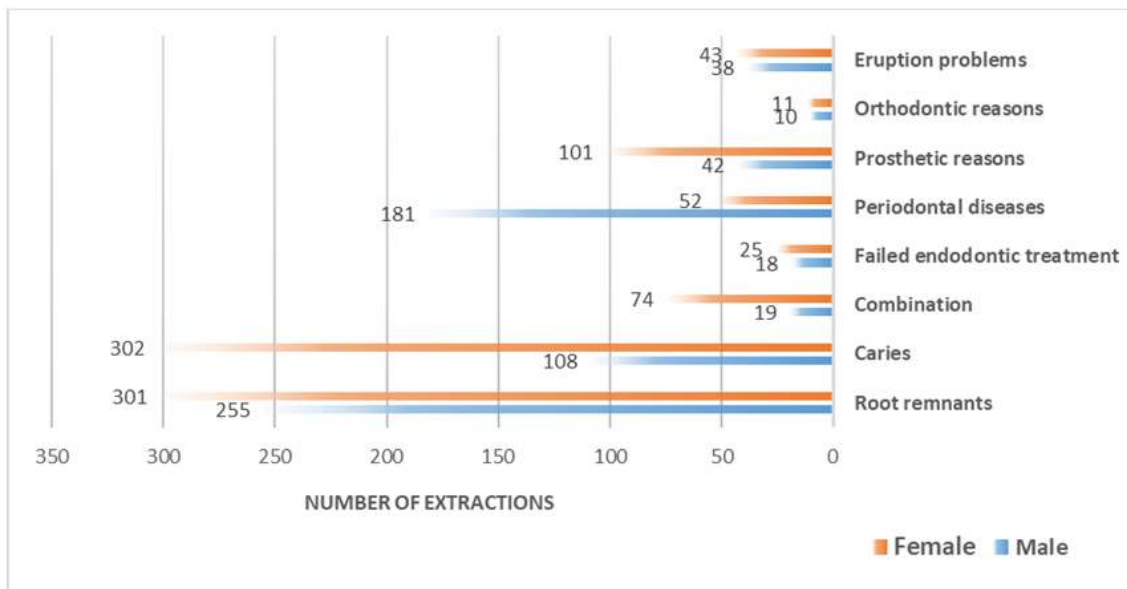


Fig. 1. Demonstrated the common reasons for teeth extraction in relation to patient's gender

Table 3a showed the most frequently extracted tooth in the upper arch, that was first molar in both sides accounting for (22.2%), and caries was the main reason for their extractions. Followed by second molars and second premolars with the same ratio (15%), and centrals represented the least extracted teeth in the upper arch (5.5%).

In the lower arch, similarly first molars were the most frequently extracted teeth showed (24.9%) and mainly extracted due to caries. Followed by second molars (16%), and centrals represented the least extracted teeth with (4.9%) as shown in (Table 3b).

4. DISCUSSION

Causes of teeth loss are affected by cultural differences between countries e.g. dietary habits, even in different regions within the same country. In Saudi Arabia, there are limited numbers of

epidemiological studies that report on causes of teeth extractions.

The results of the present study demonstrated the reasons for extractions in Al Madinah. The process of dental caries and its sequelae were the prime reason for extraction accounting for 63.4%, similar to the finding of several other studies from Saudi Arabia [19,20,21] and other parts of the world [2,4,5-12,22,23,24]. The number of extractions due to caries in females were higher than in males (39.5% vs. 23.9%), a finding that was in agreement with Alesia and Khalil [19] and with Thomas and Al-Maqdassy [24]. The higher percentage of extractions in females may be because they are more caring for managing dental problems compared with males. Our finding was different from Aida et al., [22] who reported a higher percentage of extractions because of caries in males, and from McCaul et al. [23] who showed (60.6% in males vs. 48.1% in females).

Table 3a. Distribution of extracted teeth in upper arch according to tooth type& most common reasons for extraction

Tooth	Central	Lateral	Canine	P1 ^a	P2 ^b	1 st Molar	2 nd Molar	3 rd Molar	Total
Reason									
Caries ^c	20	36	38	79	90	146	80	44	533
Combination	4	9	4	4	1	6	9	5	42
Periodontal diseases	10	12	10	8	12	10	20	6	88
Eruption problems	0	0	5	0	0	1	0	20	26
Prosthetic reasons	9	6	13	10	12	8	8	2	68
Orthodontic reasons	0	0	0	10	2	0	0	0	12
Total	43	63	70	111	117	171	117	77	769

^a First premolar; ^b Second premolar; ^c Caries and its sequelae; p< 0.001

Table 3b. Distribution of extracted teeth in lower arch according to tooth type& most common reasons for the extraction

Tooth	Central	Lateral	Canine	P1 ^a	P2 ^b	1 st Molar	2 nd Molar	3 rd Molar	Total
Reasons									
Caries ^c	11	21	26	54	68	155	92	49	476
Combination	0	1	2	7	8	13	13	7	51
Periodontal diseases	21	28	17	11	11	21	21	15	145
Eruption problems	1	0	0	0	0	0	0	54	55
Prosthetic reasons	7	11	13	16	8	13	5	2	75
Orthodontic reasons	0	0	0	9	0	0	0	0	9
Total	40	61	58	97	95	202	131	127	811

P< 0.001

In the current study, periodontal diseases were the second reason for extraction representing 14.6% in accordance with many studies, [23,25, 26] and in contrast with other studies in Germany, [13] Canada [14] and Jordan [15]. The percentage of teeth loss due to periodontal diseases were higher in males than in females (11.3%vs.3.2%) and this result was in conformity with Thomas and Al-Maqdassy [24] who found that periodontitis was more predominant in male than in female patients (43.1% vs.16.8%).

Our results showed that caries was the primary reason for extraction in all age groups included in the study, the same as the findings of many studies. [11,22,23] while periodontal diseases starts in patients over 40 years, similar to a study by Reich and Hiller, [13] and by Aida et al. [22].

First molar was the most frequently extracted tooth in both the upper and lower arch; it was extracted mainly because of caries, this finding was similar to the finding of many studies [8,27,28,29]. First molar tooth is the first permanent tooth to erupt in the oral cavity and this may be the cause of its early exposure to carious attack more than other molars.

5. CONCLUSIONS

Advanced caries and orthodontic reasons were the most common reasons for extraction in young age patients < 20 years. Advanced caries, impaction, and prosthetic reasons were the most common causes in middle age patients (20-40) years, while advanced caries, periodontal diseases, followed by prosthetic reasons were the most common in elder patients over 40 years.

Therefore, implementation of efficient educational programs on caries prevention are compulsory starting from elementary schools to increase the level of awareness among young populations and decrease the percentage of teeth loss because of caries in Al-Madinah Al-Munawarah.

CONSENT

It is not applicable.

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee

has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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