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REASONS OF TOOTH EXTRACTION AT DENTAL EXTRACTION CLINICS OF SYRIAN PRIVATE UNIVERSITY FACULTY OF DENTISTRY

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Abstract

In developing countries, teeth extraction is still the most common treatment despite the big developments in medicine. In Syria, researches about the reasons of tooth extraction are very few compared to those conducted in other countries. Those researches are indicators of oral health and teeth preservation.

This cross sectional study was conducted to investigate the reasons of tooth extraction in a sample of 695 patients who visited the clinics of teeth extraction in the Faculty of Dentistry at Syrian Private University during 2016 from February to May. The cases of 1130 extracted teeth were studied, patients' age ranged from 10 to 80 years.

The results showed that the main reason of tooth extraction is caries with 45.66%, while the extraction due to periodontal disease formed 24.07%, for restorative and orthodontics reasons ranked third forming 18.50% and for other reasons (root canal treatment failure – trauma – impact teeth) formed 11.78%.

The study showed that the most extracted teeth because of caries were the mandibular first molars, whereas the most extracted ones because of periodontal disease were the premolars. The posterior teeth in the total sample were the most extracted due to caries.

We concluded that caries, periodontal disease, restorative and orthodontic reasons are the main reasons of tooth extraction in the Department of Oral and Maxillofacial Surgery of Syrian Private University with different order in males and females .Thus we need to increase medical awareness in the society, and this requires the opening of free dental care clinics to allow patients with limited income to get treatment and move mobile clinics for patients living in remote areas from health centers

KEYWORDS: *extraction, caries, periodontal disease, trauma.*

INTRODUCTION

In developing countries, teeth extraction is still the most common treatment despite the big developments in medicine. In Syria, researches about the reasons of tooth extraction are very few compared to those conducted in other countries. Those researches are indicators of oral health and teeth preservation.

Teeth loss has deep effects. That's why the priority in oral health should be given to prophylaxis and dental care. To identify the type of prophylaxis the main reasons of tooth extractions in dental clinics must be clarified [*Petersen P et al., 2005*].

Many studies have been conducted to identify the reasons of tooth extraction in different countries and those studies show that the main reason of tooth extraction varies from one country to another.

In many countries the dental caries is the main reason of tooth extraction followed by reasons related to periodontal disease [*Ibrahim O, Sayes S, 2000; Aida J et al., 2006; Al-Shammari K et al., 2006; Sharafat F, Alnegrish A, 2008; Aghareed M, 2008; Lesolang R et al., 2009*], which was the main reason of tooth extraction in Germany and Canada [*Reich E, Hiller K, 1993; Murray H et al., 1997*].

In the Faculty of Dentistry of the university of Mussel and dental prophylaxis clinic in Iraq a study was conducted about the reasons of tooth ex-

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traction. From 375 patients (children aged between 3 and 12 years) caries was the reason of tooth extraction in 130 of them [*Aghareed M, 2008*].

In Saudi Arabia a randomized sample of dentists was chosen, and they were asked to write down the history of extracted teeth including patient's gender, age, number of the tooth and the reason of extraction, and after analyzing the results in 3059 patients of all ages and for both temporary and permanent teeth caries, the reason of extraction was found in 62.7% of cases, but after the age of 40 periodontal disease became the main reason with 51% [*Farsi J, 1992*].

In university of Lumbago, South Africa a study that included 3793 cases showed that the main reason of tooth extraction was caries (47.9% of the cases). Periodontal disease came second (22, 6% of the cases) [*Lesolang R et al., 2009*].

Hayran M. and co-authors from Turkey reached the same result in 2012. They found that 47.4% of teeth extraction at the age of 25 and younger was because of caries. While 47.2% of teeth extraction at the age of 26 and older was because of periodontal disease.

In Japan, a study in 7499 patients showed that caries was the main reason, 9115 teeth were extracted because of it. The percentage of caries at the age of 15 and older was 43.3%. The percentage of periodontal disease at the age of 45 and older was 41.8 % [*Aida J et al., 2006*], the middle side of Jordan study showed the same results [*Sharafat F, Alnegrish A, 2008*].

The study results of Jovino-Silveira R. and co-authors (2005) were similar to the previous ones as the main reason of tooth extraction was caries. The percentage of extracted teeth because of caries was 63.3% and because of periodontal disease 13%. Meanwhile the percentage of extractions because of orthodontic reasons was 12%.

In Damascus, Syria, the results of a study, which included 2760 extracted teeth, showed that the main reason of tooth extraction is caries 67.7%, while the percentage of periodontal disease was 25.9%, which was a secondary reason. Moreover, the percentage of extractions because of the other reasons altogether was 6.4% [*Ibrahim O, Sayes S, 2000*].

The study aimed at detecting the main reasons of tooth extraction in the dental clinics of the Syrian Private University in Syria.

MATERIAL AND METHODS

The sample consisted of the group of patients who were treated in the clinics of Syrian Private University, Faculty of Dentistry in 2016 from February to May. The number of patients was 695, from which 499 were male and 196 were female. Most patients (266 patients) were 41 to 60 years old, both male and female. A diagnostic form was filled for each patient before any procedure was done. The form contained information about patient's age, gender, current health status, general disease plus the indication of extraction and the extracted tooth.

According to this study and the data collected from these forms, a list of reasons of tooth extraction was made. The reasons were:

- Caries
- Periodontal disease
- Restorative and orthodontics reasons
- Failed root canal treatment
- Trauma
- Impact teeth.

The following results were reached from these forms. The percentage and the repetition were calculated for all the previous reasons of tooth extraction.

RESULTS

The number of patients who were treated in the clinics of Syrian Private University, Faculty of Dentistry in 2016 was 695, from which 499 (71.8%) were male and 196 (28.2%) were female. Most patients (266 patients) were 41 to 60 (38.27%) years old, both male and female (Table1).

The number of extracted teeth was 1130, from

TABLE 1

Number and percentage of patients who were treated in the clinics of Syrian Private University, in 2016 according to gender and age

		Age (years)				
		≤20	21 to 40	41 to 60	≥61	Total
Total sample	n	81	199	266	149	695
	%	11.65	28.63	38.27	21.44	100
Males	n	52	151	186	110	499
	%	10.42	30.26	37.27	22.04	100
Females	n	22	48	80	39	196
	%	14.80	24.49	40.82	19.90	100

Table 2

Extracted teeth in the sample of patients who were treated in the clinics of Syrian Private University, in 2016 according to gender and reason of extraction

Reason of extraction	Extracted teeth in the total sample		Extracted teeth in male patients		Extracted teeth in female patients	
	n	%	n	%	n	%
Caries	516	45.66	336	44.56	180	47.87
Periodontal disease	272	20.07	192	25.46	80	21.28
Restorative and orthodontic reasons	209	18.50	127	16.84	82	21.81
Root canal treatment failure	69	6.11	44	5.84	25	6.65
Trauma	49	4.34	40	5.31	9	2.39
Impact teeth	15	1.33	15	1.99	0	0
Total	1130	100	754	100	376	100

Table 3

Extracted teeth in the sample of patients who were treated in the clinics of Syrian Private University, in 2016 according to the reason of extraction and the age group

	Age group				
	≤20	21 to 40	41 to 60	≥61	Total
Caries	21 (4.07%)	207 (40.12%)	215 (41.67%)	73 (14.15%)	516 (100%)
Periodontal disease	16 (5.88%)	101 (37.13%)	98 (36.03%)	57 (20.96%)	272 (100%)
Restorative and orthodontic reasons	9 (4.31%)	128 (61.24%)	37 (17.70%)	35 (16.5%)	209 (100%)
Root canal treatment failure	12 (17.39%)	21 (30.43%)	17 (24.64%)	19 (27.54%)	69 (100%)
Trauma	21 (42.86%)	13 (26.53%)	9 (18.37%)	6 (12.24%)	49 (100%)
Impact teeth	0 (0%)	11 (73.33%)	4 (26.67%)	0(0%)	15(100%)
Total sample	79 (6.99%)	481 (42.57%)	380 (33.63%)	190 (16.81%)	1130 (100%)

which 754 were extracted from male patients (66.72%) and 376 from female patients (33.28%).

The main reason of extraction in the total sample was caries (516 extracted teeth 45.66%) followed by periodontal disease (272 extracted teeth 247%) and then the extraction for restorative and orthodontic reasons (209 extracted teeth 18.5%). It should be noted that the last two reasons were at the second place as reasons for tooth extraction in female patients (Table 2).

While studying the effect of gender on the repetition of teeth extraction reasons in the search sample we found that p=0.002 and it is statistically significant (1130 teeth extracted, 18.430 value of K2, 5 freedom degree, as a result p=0.002).

Highest percentage of tooth extraction because of caries and periodontal disease was in patients from ages 21 to 60, whilst the percentage of extraction because of the previous reasons were at their lowest levels in patients younger than 20 years old (4.07 and 5.88% consecutively) and the highest percentage of extraction for restorative and orthodontic reasons were in patients from age group between 20 and 40 (61.24%) years. Highest percentage of tooth extraction because of trauma was in patients younger than 20 years (Table 3).

To study the effect of age group on the repetition of teeth extraction reasons in the search sample we conducted the K2 test (Table 4).

While studying the repetition table and the according percentages we found that the percentage of

Table 4

The result of K2 test

Number of teeth extracted	Value of K2	Freedom degrees	P value	Statistical significance
1130	183.458	15	0.000	Statistically significant

Note: Studied variables = reasons of extraction × patient's age group

extracted teeth because of trauma and failed root canal treatment in the age group (20 and younger) was higher than in all remaining age groups.

The percentage of extracted teeth because of restorative and orthodontic reasons in the age group (21 to 40) was higher than in all remaining age groups. And because of caries, the most teeth were extracted in the age group of 41 to 60 years. Meanwhile most teeth, because of periodontal disease, were extracted in the age group of 61 years and older. All the results were statistically significant ($p<0.05$).

The most extracted teeth in the maxilla were the second premolars (20.21%) followed by first molars (18.8%) and then second molars (16.52%). First molars were the most extracted teeth because of caries followed by second premolars, which were the most extracted teeth because of periodontal disease and restorative or orthodontic reasons. First molars were the most extracted teeth because of failed root canal treatment .The centrals were the most extracted teeth because of trauma and the upper third molars were the most impacted teeth to be extracted (Table 5).

First molars were the most extracted teeth in the mandible (23.53%) followed by the second molars (17.83%) and then first premolars (15.15%). First molars were the most extracted teeth in the mandible because of caries and orthodontic or restorative reasons and trauma. The most extracted teeth in the mandible because of periodontal disease were first premolars whilst second premolars were the most extracted teeth in the mandible because of root canal treatment failure, and third molars were the most impacted teeth to be extracted (Table 6).

To study the effect of the tooth type on the repetition of teeth extraction reasons in the search sample according to the tooth position upper or lower jaw we conducted the K2 test (Table 7).

DISCUSSION

The results showed that the number of male patients exceeded the number of female patients who were treated in the clinics of Syrian Private University in 2016 from February to May in all age groups. This result matched the study results of O. Ibrahim and S. Sayes conducted in Syria in 2000 and M. Aghareed in Iraq in 2008. This can be considered as an indicator that females take better care of oral health in total sample.

The results also showed that caries is the main reason of tooth extraction in both male and female and in all age groups. This result matches the results of most of the similar studies in other countries [*Farsi J, 1992; Aghareed M, 2008; Lesolang R et al., 2009; Hayran M et al., 2012; Aida J et al., 2006*] and contradicted with the results of Reich E, Hiller K (1993) and H. Murray and co-authors (1996).

The number of extracted teeth because of caries increased in the age group from 41 to 60 years and maybe it's because of bad teeth care and oral hygiene that is an indicator that this age group is negligent to teeth treatment (Table 8).

This age group visited the clinics the most and that is an indicator none of the studies had reached before.

We also contradicted with other studies that referred to the increase of the number of extracted teeth in this age group because of periodontal disease, such as the studies of Ibrahim O, Sayes S (2000), Reich E, Hiller K (1993) and H. Murray and co-authors (1996).

The results showed that the second reason of tooth extraction in male patients is periodontal disease and that matches the results of many previous studies in different countries [*Ainamo J et al., 1984; Chauncey H et al., 1989; Hayran M et al., 2012*].

The results also showed the increasing of extraction percentage because of orthodontic and restorative reasons so it becomes the second reason of tooth extraction in females (82 cases). The extraction because of periodontal disease was only in 80 cases, which contradicted with previous studies that showed that the second reason for tooth extraction in females was periodontal disease or caries.

The most extracted teeth in the maxilla were the first molars followed by the second premolars, whereas in the mandible the second molars were the most extracted followed by the first molars.

The main reason for first molar extraction is that it is the first permanent tooth and gets caries and its complication earlier than the other teeth and this matches previous studies [*Corbet E, Davies W, 1991; Murray H et al., 1997; Caldas A, 2000; Al-Zahrani M, Kayal R, 2006*].

Second premolars being the second most extracted teeth in the maxilla indicates that restorative and orthodontic reasons are the main reason of extraction in the maxilla. That is a new indicator that our study has reached.

Table 5

Maxillary extracted teeth in patients who were treated in the clinics of Syrian Private University in 2016 according to tooth type and reason of extraction

Tooth extracted	Total number	%	Caries	Periodontal disease	Restorative and orthodontic reasons	Failed root canal treatment	Trauma	Impact teeth
Upper third molar	69	12.13	25	21	19	0	0	4
Upper second molar	94	16.52	39	17	26	4	6	2
Upper first molar	107	18.80	51	22	20	6	5	3
Upper second premolar	115	20.21	49	25	28	9	4	0
Upper first molar	71	12.48	12	19	25	14	0	1
Upper canine	31	5.45	6	13	4	6	2	0
Lateral incisor	46	8.08	19	11	8	0	8	0
Central incisor	36	6.33	14	7	3	0	12	0
Total	569	100	215	135	133	39	37	10

Table 6

Mandibular extracted teeth in patients who were treated in the clinics of Syrian Private University in 2016 according to tooth type and reason of extraction

Extracted tooth	Total number	%	Carries	Periodontal disease	Restorative and orthodontic reasons	Failed root canal treatment	Trauma	Impact teeth
Lower third molar	49	8.73	23	12	8	3	0	3
Lower second molar	100	17.83	61	24	6	7	2	0
Lower first molar	132	23.53	82	17	19	5	7	2
Lower second premolar	84	14.97	43	21	9	11	0	0
Lower first molar	85	15.15	34	30	17	4	0	0
Lower canine	42	7.49	15	16	11	0	0	0
Lateral incisor	34	6.06	26	5	2	0	1	0
Central incisor	35	6.24	17	12	4	0	2	0
Total	561	100	301	137	76	30	12	5

Table 7

The result of K2 test

Tooth position	Number of extracted teeth	Value of K2	Freedom degrees	P value	Statistical significance
Upper tooth	569	106.806	20	0.000	Statistically significant
Lower tooth	561	52.051	20	0.000	Statistically significant
Note: Studied variables = reasons of extraction × type of tooth					

TABLE 8

Comparison between number of studies about the reasons of tooth extraction and type of teeth extracted

References	Country	Year	No of extracted teeth	Reason of extraction		Type of tooth			Main reason with age group
				Periodontal disease	Caries	Incisor	Premolar	Molar	
				%	%	%	%	%	
Ainamo J. et al	Finland	1984	3883	18	60	-	-	-	Caries
Cahen P. et al	France	1985	14621	32.4	49	29.9	25.8	29.6	Periodontal disease after 50
AgerholmD & Sidi A	England and Whales	1988	5274	26.6	47.5	32.1	36.8	31	Periodontal disease after 60
Chauncey H et al	USA	1989	1142	18.7	33.3	29.5	25.8	30	Always caries
Stephens R et al	Canada	1991	-	34	63	-	-	-	Caries
Reich E & Hiller K	Germany	1993	1215	27.3	20.7	-	-	-	Periodontal disease after 40
Ibrahim O & Sayes S	Syria	2000	2760	25.9	67.7	27.5	31.1	41.3	Periodontal disease between ages 45-54
Current Study	Syria	2013	1130	24.7	45.6	19.8	31.4	48.7	Caries

Second premolars were the most extracted teeth in the mandible because of root canal treatment failure and that contradicted with other studies [*Murray H et al., 1996*; *Jovino-Silveira R et al., 2005*], where the second molars were the most extracted teeth because of root canal treatment failure.

CONCLUSION

We concluded that caries, periodontal disease, restorative and orthodontic reasons are the main reasons of tooth extraction in the Department of Oral and Maxillofacial Surgery in Syrian Private University with different order in males and females. Thus, we need to increase medical awareness in the society, and this requires the opening of free dental care clinics to allow patients with limited income to get treatment and move mobile clinics for patients living in remote areas from health centers.

Therefore, we suggest studying the reasons of tooth extraction for each tooth individually and relating the results to the demographic spreading of the Syrian Arab Republic.

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