

 ISSN NO. 2320-5407	Journal Homepage: www.journalijar.com INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR) Article DOI:10.21474/IJAR01/11079 DOI URL: http://dx.doi.org/10.21474/IJAR01/11079	 INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR) ISSN 2320-5407 Available homepage: http://www.journalijar.com Journal DOI:10.21474/IJAR01
---	--	---

RESEARCH ARTICLE

REASONS FOR AND PATTERNS RELATING TO THE EXTRACTION OF PERMANENT TEETH IN A SAMPLE OF THE EGYPTIAN POPULATION: A CROSS-SECTIONAL STUDY

Ramy H. Seif El Nasr El Shater¹, Christine K. Ramzy², Khaled M. Keraa³ and Tamer A. Nasr⁴

1. Assistant Lecturer, Department of Oral and Maxillofacial Surgery - Faculty of Oral and Dental Medicine - Misr International University.
2. Teaching Assistant, Department of Oral and Maxillofacial Surgery - Faculty of Oral and Dental Medicine - Misr International University.
3. Biostatistician, Quality Management Specialist - Faculty of Oral and Dental Medicine - Misr International University.
4. Associate Professor of Oral and Maxillofacial Surgery - Faculty of Oral and Dental Medicine - Misr International University.

Manuscript Info

Manuscript History

Received: 05 April 2020

Final Accepted: 07 May 2020

Published: June 2020

Key words: -

Causes, Reasons, Tooth Loss, Teeth
Extraction, Permanent teeth

Abstract

Objectives: To identify reasons of tooth extraction in Egypt, from a sample of adult patients seeking dental extraction in Misr International University (MIU) dental clinic complex and to test whether they differ by socio-economic groups and levels of caries experience.

Materials & Methods: This Cross-sectional study was performed during a 6 months' period from June till December in the year 2016. Dentists were asked to record the reasons for every extraction of permanent teeth including 3rd molars from a total of 461 candidates. The reasons for teeth extraction were allocated to different causes such as: remaining roots, dental caries, periodontal disease, impaction, preprosthetic reasons, failed root canal treatment, and others. The data requested for each extraction were: patient age, gender, and type of tooth removed and the reason for its extraction. Data retrieved were analyzed using the Statistical Package for the Social Sciences (SPSS) software, version 20.

Results: Of the 580 teeth extracted in 461 patients comprising 220 males and 241 females, 32.1% were due to non-restorability of the tooth and its sequelae; 31% were remaining roots; 27.2% for being hopeless teeth; 0.25% as being supernumerary, 0.3% for other causes. There was a statistically significant association between gender and cause of extraction (P -value <0.001). Females were predominating in extraction due to remaining roots and non-restorable teeth, however males were dominant in pre-prosthetic and periodontal reasons. There was a statistically significant association between age and cause of extraction (P -value <0.001) stating that preprosthetic and periodontal disease have the highest mean of age.

Conclusion: Non- restorable teeth due to caries and its sequelae and periodontal disease were the most common reasons for teeth extraction therefore health care workers should raise awareness programs in order to overcome this problem.

Corresponding Author: - Christine K. Ramzy

Address: - Teaching Assistant, Department of Oral and Maxillofacial Surgery – Faculty of Oral and Dental Medicine - Misr International University.

Introduction: -

An old myth about tooth extraction is that it is the relief of any dental pain, whenever pain was felt, patients with low socioeconomic status or poor awareness tend to extract automatically but what they do not know, is that they lose more than gain. Tooth extraction worldwide tends to be the last resort the dentist might do after failing to save the tooth or restoring it, since loss of teeth affects the quality of life and deteriorates mastication never the less the pronounced psychological embarrassment it leaves. ⁽¹⁾

Reasons of teeth loss vary according to socioeconomic status of the patients, level of education, and certainly oral hygiene. Extraction remains the first solution in the developing countries though it should be the last. ^(1,2) Permanent teeth extraction is accomplished for several reasons including dental caries, periodontal disease which renders teeth mobile and hopeless, orthodontic reasons, impacted teeth, trauma, teeth involved in tumors or cysts, failed endodontic treatment, prosthetic reasons and other reasons including cost related factors and supernumerary teeth. ^(2,3)

In European countries as in Scotland it was found that caries is a major cause of extraction except for lower incisors that were extracted for periodontal reasons, also it was found that most premolars were extracted for orthodontic reasons by a percentage of (84.5%). ⁽⁵⁾

In Italy, several epidemiological studies have been conducted to relate the causes of extraction with the level of socioeconomic status. ⁽⁴⁾ Whereas in another study they conducted a research extracting 1056 teeth in 839 patients. Results showed that 2/3 of teeth were extracted due to dental caries (34.4%) and then periodontal disease (33.1%). They also found that the most commonly extracted tooth was the mandibular wisdom tooth due to impaction reasons (41.3%). Many teeth were removed for prosthetic reasons especially mandibular incisors and canines (57.1%) and (47.4%) for the first and second premolars intended for orthodontic reasons. ⁽⁶⁾

In Greece, it was found that among 2418 permanent teeth extracted; The results displayed that caries was the first reason for extraction by (45.6%), secondly periodontal disease by (32.1%), failed endodontic treatment by (7.3%) and root fracture by (4.4%). Caries was found to be the main reason for extraction in patients up to 44 years old by (64.7%), conversely periodontal disease was the main reason for extraction in patients over 55 years of age by (77.6%). The study also showed that maxillary and mandibular 1st and 2nd molars, were extracted due to dental caries. However maxillary & mandibular anterior teeth were extracted due to periodontal disease. ⁽⁷⁾

In Germany, an epidemiological study showed that in all 1215 teeth extracted for a variety of reasons, Caries percentage was (20.7%) of all extractions; periodontal diseases were (27.3%); caries and periodontal reasons combined were (18.7%); wisdom teeth were (14.7%); prosthetic reasons for extraction were (11.2%); orthodontic reasons were (4.1%); trauma was (0.4%) and others were (2.9%). Caries still occupy a very important reason in all age groups. Upon inquiring about the main cause for extraction, they clarified that pain was the first reason for extraction by (47.2%). To conclude that periodontal disease is the most common cause of tooth extraction for people over 40 years of age, on the other hand, those below 40 years of age, caries and third molar extractions occupy the first place. ⁽⁸⁾

On the other side of the world, in the North American Continent; the following countries will be demonstrated to see the most common causes of extraction and percentages which will differ accordingly due to different nature of food and different cultures. One study in Canada revealed that out of 909 patients, age ranging from 14 to 91 years. The principle reason of extraction by (63%) was caries, followed by periodontitis by (34%). Despite the belief that periodontal disease was the major cause of tooth loss in adults, after getting back to the literature its shown that it does not support this position. Only one fifth of the population or maybe less seems to be losing their teeth because of periodontal disease. ⁽⁹⁾

In the United States, of 1142 extractions in 736 patients, caries still remains the first cause of extraction (33.3%), followed by teeth extracted for prosthesis (31.3%) then periodontal reasons (18.7%). They concluded that caries in the United States specially in adult males was the main reason for extraction however a second main cause was preparation for prosthetics extracting sound or carious teeth even though the ability of their restorability. ⁽¹⁰⁾

Asian countries did not cut themselves out from conducting several epidemiological studies in order to clarify the causes of extraction and conclude that in each different country results and percentages differ according to demographic data and socioeconomic status of each country. As a first Iran, ran a study upon 1,382 patients with a total of 2,620 teeth extracted. Results show that most patients prone to extraction were those whose age ranges from 41-60 years by (36.9%). Tooth loss occurred due to caries by (51%), followed by periodontal disease by (14.4%) and then supernumerary and tooth impaction by (13.9%). Male patients included extracted more than females with a percentage (55.3%) than that of females by (43.9%).⁽²⁾

In Japan, a group of dentists conducted a study on 7333 patients evaluating the causes of tooth loss and assigned the findings to 5 categories: caries, fracture of teeth weakened by caries or endodontics, periodontal diseases, orthodontics and other reasons. Results showed that (43.6%) of patients performed tooth extraction due to caries and its consequences, whereas (37.1%) patients undergone tooth extraction due to periodontal disease. Analysis showed that denture wearers are more likely to undergo tooth extraction due to periodontal disease in all age groups. Males are more likely to undergo tooth extraction due to periodontal disease than females in most age groups.⁽¹¹⁾

A study in Singapore done within a 1-year period, data were collected from 1276 patients, showing that there is no significant difference in percentages between the most 2 common causes of extraction; caries and periodontal disease among extracted teeth. that is (35.8%) and (35.4%), respectively. Yet it proved that by increasing age specifically above 40 years the periodontal reasons dominate by (76%). While it is (26.7%) of teeth were lost under 40 years due to the same cause. Eventually concluding that both caries and periodontal disease share equal possibilities for tooth extraction.⁽¹²⁾

In Taiwan, through a study where they reviewed past data of 4811 patients who undergone extraction and results show that dental caries was the main reason for tooth extraction by (55.3%), subsequently periodontal disease by (22.1%). They also proved that extraction because of caries was usually detected in all age-groups, and extractions because of periodontal disease increase in those older than 35 years as many others studies prove.⁽¹³⁾

Another group of countries to be explored are the Arabian Countries, which have different cultures with different food habits as well which may dictate different results. Different studies were conducted to answer the same question and to assess the different causes of tooth extraction. Kuwait as one, showed that out of 2,783 teeth extracted in 1,604 patients. Caries and periodontal disease show to be responsible for (43.7%) and (37.4%) of extractions, respectively. The principal cause for extraction in patients less or equal to 40 years old was caries by (60.7%), whereas periodontal disease was the main cause of extractions in patients more than 40 years of age by (63.0%). Female tend to extract teeth more likely for caries and orthodontic reasons, however males extract for periodontal disease.⁽¹⁴⁾

In Saudi Arabia, 1473 teeth were extracted in 404 patients and found that caries was the main reason for extraction in all ages by (60.6%), then follows eruption problems by (20.8%), then subsequently periodontal disease by (7.9%), orthodontics by (6.4%), prosthodontic reasons by (1.8%), pericoronitis by (1.6%), and finally trauma by (0.9%).⁽¹⁵⁾ In another study in Saudi Arabia they found that caries prevailed as usual in causes of extraction by (67.2%) followed by periodontal disease which was found responsible for (51%) of total extractions mainly in patients above 40 years of age, orthodontic reasons follows.⁽¹⁶⁾

Jordanian study showed that out of 3069 extracted teeth, (46.9%) were removed due to caries and its consequences however (18%) were lost because of periodontal disease, (8%) were extracted due to both caries and periodontal disease combined, (19.4%) for pre-prosthetic reasons, (4%) for orthodontic reasons; (2.8%) extracted for eruption problems and finally (0.7%) due to trauma. More analysis elaborated that caries was the main cause of extraction in people below 40 years of age unlike periodontal causes occurring in people above 40 years of age.⁽¹⁷⁾

In a study conducted in Libya, it was found that in 9,570 extractions performed on 8,514 patients. Two principle causes of tooth loss were found to occur; dental caries by (55.90%) specially from the second till fourth decade and periodontal diseases occurring mainly from the fourth till the seventh decades by (34.42%). Other causes include trauma (3.76%), impacted teeth (1.83%), prosthodontic reasons (2.19%), and orthodontic causes (1.30%). Other reasons include extraction due to teeth associated with a tumor or cyst or supernumerary tooth (1.61%). As for the teeth extracted, mandibular molars most commonly extracted for caries reasons by (43.92%). Whereas anterior teeth for periodontal diseases by (28%) with the remaining posterior teeth also being extracted by (7%).⁽¹⁸⁾

In the United Emirates, in a group of 618 patients, 979 teeth were extracted. Caries was the first reason by (81.5%), following periodontal diseases and orthodontic reasons by (10%) and (4.7%) respectively. Proving that the highest rates of extraction occur among those whose ages range from 31 to 40 years by (94.5%).⁽¹⁹⁾

Therefore, the aim of this study is to report causes of tooth extraction and their distribution and pattern according to age and sex of the patient in a convenient sample of the Egyptian population.

Materials and Methods: -

This Cross-sectional study investigated a convenient sample of 461 patients attending Misr International University Dental Clinics Complex from June to December 2016.

Inclusion and exclusion criteria:

No.	Inclusion Criteria	Exclusion Criteria
1.	Both genders	Patients below 12 years of age
2.	Smokers	Patients with epileptic disease
3.	Pregnant healthy female patients	Patients with bleeding disorders
4.	Patients with Controlled medical illness	Patients with severe uncontrolled medical illness requiring hospitalization
5.	All differences in education levels	
6.	Patients whose teeth were extracted for dental caries and its sequela	
7.	Remaining roots in case the crown was fractured or weakened by dental caries	
8.	Periodontally affected teeth either mobile or with furcation involvement	
9.	Failed root canal treatment which was diagnosed either clinically or radiographically	
10.	Patients who needed more space for orthodontic treatment thereby requiring extraction	

All patients were informed about the research to which they would be submitted and gave their informed consent to participate in the study, not to mention that an informed consent was obtained from parents of the children underneath 18 years allowing their data to be used in research.

For each patient undertaking teeth extraction, comprehensive history was obtained in all the cases. It was requested that the oral surgeon completes a written form. Data filled were: patient's name, age, gender, type and number of teeth extracted and the principal cause of extraction. Accordingly, in all the 580 teeth extracted; data involving all aspects as the patient age, patient gender, the tooth number and type however; it proved to be irrelevant between right or left sides therefore it wasn't mentioned in this study. The exact causes of extraction were explained. All permanent teeth were extracted, not excluding the third molars.

Sample size determination

Cochran's sample size formula for categorical data was used to determine the sample size. The alpha level was set to 0.05. The calculation resulted in a sample size of 422. Oversampling was performed and we chose 461 cases to participate in the study.

Statistical Analysis:

Descriptive statistics included frequencies and percentages for qualitative data, minimum, maximum, mean $\pm$ standard deviation (SD) values for quantitative data. Chi-square (χ^2) test was used to determine if there were significant associations between different qualitative variables. One-way ANOVA test was used to study the association between age, extracted teeth and causes of extraction. Tukey's post-hoc test was used for pair-wise comparisons between the mean values when ANOVA test is significant. The significance level was set at $P \leq 0.05$. Statistical analysis was conducted using IBM® SPSS® Statistics Version 20 for Windows.

Results: -

The present study comprised 461 cases; 220 males (47.7%) and 241 females (52.3%). The number of extracted teeth were 580 teeth. The mean and standard deviation values of age were (44.4 ± 13.2) years with a minimum of 12 years and a maximum of 80 years. Extractions performed for maxillary teeth showed higher prevalence than mandibular teeth (54.3% and 45.7%, respectively).

The most common cause of extraction was non-restorability comprising (32.1%) of all extracted teeth. This was followed by remaining roots (31%) then periodontally hopeless teeth (27.2%). The least common cause of extraction was supernumerary teeth (0.2%) followed by other causes (0.3%). The most extracted teeth were upper third molars comprising (10.2%) of all extracted teeth; this was followed by upper second premolar (9.7%) then lower third molar (9.1%). The least extracted teeth were lower canines (3.3%) followed by upper canine (3.8%).

Age and Gender Predilection

There was a statistically significant association between gender and cause of extraction (P -value < 0.001). Males showed statistically significantly higher prevalence of extractions due to periodontally hopeless teeth and pre-prosthetic reasons. Females showed higher prevalence of extractions due to remaining roots and non-restorable teeth. There was no statistically significant association between gender, extracted teeth or their site (upper or lower jaw).

There was a statistically significant association between age and cause of extraction (P -value < 0.001) according to ANOVA test results but pair-wise comparisons between the reasons could not be performed because we have only one case in one category (supernumerary teeth). However, the results showed that pre-prosthetic reasons followed by periodontally hopeless teeth had the highest mean age. The case with supernumerary teeth showed the lowest mean age.

There was a statistically significant association between age and extracted teeth (P -value < 0.001) according to ANOVA test results. Pair-wise comparisons between the teeth revealed that there was no statistically significant difference between upper lateral incisor and lower lateral incisor; both showed the statistically significantly highest mean age. There was no statistically significant difference between upper third molar and lower third molar; both showed the statistically significantly lowest mean age.

Table (1): - Frequencies (n) and percentages (%) of extracted teeth data.

	n (%)
Jaw	
• Upper	315 (54.3)
• Lower	265 (45.7)
Cause of extraction	
• Remaining roots	180 (31)
• Non-restorable teeth	186 (32.1)
• Periodontally hopeless	158 (27.2)

• Impaction • Supernumerary teeth • Pre-prosthetic reasons • Endodontic failure • Patients' request • Other	13 (2.2) 1 (0.2) 24 (4.1) 10 (1.7) 6 (1) 2 (0.3)
Teeth • Upper central incisor • Upper lateral incisor • Upper canine • Upper first premolar • Upper second premolar • Upper first molar • Upper second molar • Upper third molar • Lower central incisor • Lower lateral incisor • Lower canine • Lower first premolar • Lower second premolar • Lower first molar • Lower second molar • Lower third molar	34 (5.9) 28 (4.8) 22 (3.8) 42 (7.2) 56 (9.7) 44 (7.6) 30 (5.2) 59 (10.2) 29 (5) 33 (5.7) 19 (3.3) 26 (4.5) 36 (6.2) 36 (6.2) 33 (5.7) 53 (9.1)

Table (2): - Descriptive statistics and results of Chi-square test for the association between gender and different variables.

	<i>Male</i>	<i>Female</i>	<i>P-value</i>
	n (%)	n (%)	
Jaw			
• Upper • Lower	158 (54.5) 132 (45.5)	157 (54.1) 133 (45.9)	0.934
Cause of extraction			
• Remaining roots • Non-restorable teeth • Periodontally hopeless • Impaction • Supernumerary teeth • Pre-prosthetic reasons • Endodontic failure • Patients' request • Other	78 (26.9) 82 (28.3) 102 (35.2) 5 (1.7) 1 (0.3) 17 (5.9) 2 (0.7) 3 (1) 0 (0)	102 (35.2) 104 (35.9) 56 (19.3) 8 (2.8) 0 (0) 7 (2.4) 8 (2.8) 3 (1) 2 (0.7)	<0.001*
Teeth			
• Upper central incisor • Upper lateral incisor • Upper canine • Upper first premolar • Upper second premolar • Upper first molar • Upper second molar • Upper third molar	19 (6.6) 17 (5.9) 11 (3.8) 17 (5.9) 28 (9.7) 21 (7.2) 20 (6.9) 25 (8.6)	15 (5.2) 11 (3.8) 11 (3.8) 25 (8.6) 28 (9.7) 23 (7.9) 10 (3.4) 34 (11.7)	0.379

• Lower central incisor	12 (4.1)	17 (5.9)	
• Lower lateral incisor	16 (5.5)	17 (5.9)	
• Lower canine	14 (4.8)	5 (1.7)	
• Lower first premolar	14 (4.8)	12 (4.1)	
• Lower second premolar	18 (6.2)	18 (6.2)	
• Lower first molar	19 (6.6)	17 (5.9)	
• Lower second molar	18 (6.2)	15 (5.2)	
• Lower third molar	21 (7.2)	32 (11)	

*: Significant at $P \leq 0.05$

Table (3): - Descriptive statistics and results of ANOVA test for the association between age, cause of extraction and extracted teeth

	Mean $\pm$ SD	P-value
Cause of extraction		
• Remaining roots	43.3 $\pm$ 11.9	
• Non-restorable teeth	40.7 $\pm$ 14	
• Periodontally hopeless	51.7 $\pm$ 10.2	
• Impaction	32.7 $\pm$ 11.1	
• Supernumerary teeth	25 (Only 1 case)	
• Pre-prosthetic reasons	55.1 $\pm$ 6.3	<0.001*
• Endodontic failure	35.7 $\pm$ 13.9	
• Patients' request	48 $\pm$ 11.9	
• Other	37 $\pm$ 3.5	
Teeth		
• Upper central incisor	46.9 $\pm$ 12.6 ^{ab}	
• Upper lateral incisor	55.4 $\pm$ 9 ^a	
• Upper canine	49 $\pm$ 8.9 ^{ab}	
• Upper first premolar	44.5 $\pm$ 14.7 ^b	
• Upper second premolar	39.4 $\pm$ 11.7 ^c	
• Upper first molar	42 $\pm$ 14.2 ^b	
• Upper second molar	45 $\pm$ 12.7 ^b	
• Upper third molar	38.6 $\pm$ 9.6 ^c	
• Lower central incisor	50.9 $\pm$ 12.2 ^{ab}	
• Lower lateral incisor	55.9 $\pm$ 6.4 ^a	
• Lower canine	52 $\pm$ 10.7 ^{ab}	
• Lower first premolar	51.8 $\pm$ 13 ^{ab}	
• Lower second premolar	47.1 $\pm$ 11.1 ^{ab}	
• Lower first molar	40.4 $\pm$ 15.9 ^c	
• Lower second molar	43 $\pm$ 10.9 ^b	
• Lower third molar	35.7 $\pm$ 11.5 ^c	<0.001*

*: Significant at $P \leq 0.05$, Different letters are statistically significantly different

Discussion: -

Tooth extraction remains one of the most repeatedly performed procedures in dental clinics specially in low levels of awareness and education. They gain no advantages teeth loss does affect the quality of life. They are not only considered as an important marker of oral hygiene, but also having healthy teeth and rigorous oral hygiene measures give a clue about other systemic diseases, predict other conditions such as cardiovascular events or gastric illnesses. Moreover, it may offer a suggestion of the patients' personality and compliance to oral maintenance. ⁽¹⁾

It is always tempting whenever epidemiological study is made to be able to compare results to those with other researches. For this type of study, such contrast should be made. In many studies worldwide it was found that dental caries was the main cause for tooth extraction but a few studies showed that a greater proportion of tooth extractions

were due to periodontal disease. ⁽²⁾ Several epidemiological studies have been conducted worldwide to relate the causes of extraction with the geographic data and level of socioeconomic status. ⁽⁴⁾

This study aims to highlight the reasons of extraction of permanent teeth in Egypt in relation to demographic data as age, gender. It was completed through 461 patients age ranging from 12-80 years old; 241 females and 220 males in total of 580 teeth and statistics showed that non restorable teeth due to caries and sequelae were the first principle and major reason for extraction as was the case with many countries displayed above, followed by remaining roots then periodontal disease, preprosthetic, impaction and finally supernumerary teeth.

The finding that caries is the main reason of extraction meets an agreement with many other countries, in this study the first reason goes to un-restorable teeth due to caries by percentage of (32.1%) as in many countries. In the literature, European countries as Scotland, Greece and Italy, their studies show that caries is a major cause ^(4,5,6,7). And also in the North American countries as in Canada and United States caries is leading ^(9,10). In Asian countries as Iran, Japan and Taiwan caries is the main reason as our study, however in Singapore both caries and periodontal disease have approximately the same percentages and this could be attributed to their dietary habits ^(2,11,12,13). As for the Arabic countries caries also prove to be the first reason in Saudi Arabia, Libya, Jordan and United Emirates. Whereas in Kuwait both percentages of caries and periodontal disease are closely resembling each other ^(3,14,15,16,17,18,19).

The second reason is remaining roots by (31%) which also could have happened due to caries and lack of hygiene not to mention lack of awareness as well. The third reason is periodontal disease by percentage of (27.2%) which is not only common in our study but also matches the results in many other countries; mostly lies in the second place. The Germans suffer from periodontal disease as the major cause of extraction specially in patients above 40 years. ⁽⁸⁾ And this could be attributed to their different diet, socio-economic factors, degree of dental awareness not to mention their water fluoridation ⁽²⁾. As clarified in Kuwait and Singapore both caries and periodontal disease have nearly the same numbers. ^(12,14)

This study showed that males predominate in the preprosthetic and periodontally hopeless reasons as males tend to lose more teeth and so seeking prosthodontics. Whereas females predominate in remaining roots and un-restorable teeth and this could be credited for the low level of awareness and low socio economic status that make extraction the easiest and cheapest option. These results matched Iran in that they also found that males lose teeth due to their lack of interest in wasting time in restoring them. where they also stated that males were candidates for losing their teeth to periodontal disease. Also Iran came up with a status that patients with higher education levels don't suffer from teeth loss in comparison to patients with incomplete or lower education levels i.e. tooth loss was associated with a low level of education. ⁽²⁾

In a Greek study, results also showed that females were more prone to extraction due to caries unlike males who were more prone to losing theirs for periodontal reason as our study. ⁽⁷⁾

Japan and Kuwait also prove that females are more affected by caries whereas males by periodontal disease. ^(11,14) Nevertheless Saudi Arabia which displayed the same results confirming the relation between males and periodontal disease and caries with females. ⁽¹⁶⁾

As for the age of the patients they were ranging from 12-80 years; mean age (44.4 ± 13.2), this study elaborated that periodontal diseases and preprosthetic have the highest mean ages, and this matches several countries that share the same idea. In European countries as Italy, Greece and Germany these countries show the same results where this conclusion could be attributed to the negative attitude of the old patients in seeking preventive or restorative dental treatment. ^(4,6,7,8)

In Asian countries as Iran and Singapore, the latter came up with a finding that 76% of patients extracted due to periodontal reasons were above 40 years of age. ^(2,12) In Saudi Arabia they state that patients above 40 years of age were more vulnerable for tooth extraction due to periodontal disease, also matching this finding is Jordan not to mention Libya showing that people liable for extracting due to periodontal disease are above 40 years of age. ⁽¹⁵⁻¹⁸⁾

Other causes of extraction observed in this study were pre-prosthetic causes, impacted teeth, endodontic failure, patients' requests when they can't tolerate the pain and need quick relief thereby refusing any sort of repair and finally supernumerary teeth is the least common cause and other causes existed as well.

The limitations of this study were due to narrow sample size upon which this study was approached and it was done in only one governorate therefore further studies are recommended to be done through larger sample size and in different governments so as to be able to show the socioeconomic background and its relation to teeth extraction and to be able to conclude the principle causes of extraction in different governorates.

Conclusion: -

This investigation offers a survey about the reasons of extraction from a randomly chosen sample of adults' patients seeking help and dental care from Misr International University outpatient clinics reaching a finding that the principle cause of extraction was non restorable teeth due to caries and its sequelae. This highlights the importance of dental care health workers to spread awareness to be able to overcome such issue. For that reason, it's advised to intensify healthcare awareness campaigns also putting some efforts towards application dental sealants and fluoride application in order to raise the public awareness of oral hygiene instructions and decreasing the statistics of losing teeth for caries.

References: -

1. Taiwo, Abdurrazaq Olanrewaju et al. "Tooth extraction: Pattern and etiology from extreme Northwestern Nigeria." *European journal of dentistry* vol. 11,3 (2017): 335-339.
2. Jafarian M, Etebarian A. "Reasons for extraction of permanent teeth in general dental practices in Tehran, Iran". *Med PrincPract*. 2013;22(3):239-244.
3. Alesia, Khalil, and Hesham S Khalil. "Reasons for and patterns relating to the extraction of permanent teeth in a subset of the Saudi population." *Clinical, cosmetic and investigational dentistry* vol. 5 51-6. 30 Jul. 2013.
4. La Torre, Giuseppe et al. "Socio-demographic inequalities and teeth extraction in the last 12 months in Italy." *Annali di stomatologia* vol. 5,4 131-5. 9 Feb. 2015.
5. McCaul LK, Jenkins WM, Kay EJ. "The reasons for the extraction of various tooth types in Scotland: a 15-year follow up". *J Dent*. 2001 Aug;29(6):401-7.
6. Italo F. Angelillo Carmelo G. A. Nobile Maria Pavia. "Survey of reasons for extraction of permanent teeth in Italy". *Community Dent Oral Epidemiol*. 1996 Oct;24(5):336-40.
7. Chrysanthakopoulos NA. "Reasons for extraction of permanent teeth in Greece: a five-year follow-up study". *International Dental Journal* Mar 2011; 61: 19-24.
8. Reich E, Hiller KA. "Reasons for tooth extraction in the western states of Germany". *Community Dent Oral Epidemiol*. 1993 Dec;21(6):379-83.
9. Stephens RG, Kogon SL, Jarvis AM. "A study of the reasons for tooth extraction in a Canadian population sample". *J Can Dent Assoc*. 1991 Jun; 57(6):501-4.
10. Chauncey HH, Glass RL, Alman JE. Dental caries. "Principal cause of tooth extraction in a sample of US male adults". *Caries Res*. 1989;23(3):200-5.
11. Aida J, Morita M, Akhter R, Aoyama H, Masui M, Ando Y. "Relationships between patient characteristics and reasons for tooth extraction in Japan". *Community Dent Health*. 2009 Jun;26(2):104-9.
12. Ong G, Yeo JF, Bhole S. "A survey of reasons for extraction of permanent teeth in Singapore. " *Community Dent Oral Epidemiol*. 1996 Apr;24(2):124-7.
13. Lee CY, Chang YY, Shieh TY, Chang CS. "Reasons for permanent tooth extractions in Taiwan". *Asia Pac J Public Health*. 2015 Mar;27(2):NP2350-7.
14. Al-Shammari KF1, Al-Ansari JM, Al-Melh MA, Al-Khabbaz AK. "Reasons for tooth extraction in Kuwait". *Med PrincPract*. 2006;15(6):417-22.
15. Al-Safadi, R., R. Al-Safadi, R. Al-Safadi, et al. "Prevalence of and Reasons for Tooth Loss in a Saudi Population". *International Journal of Emerging Trends in Science and Technology*, Vol. 6, no. 02, May 2019, pp. 6774-86.
16. Farsi JMA. "Common causes of extraction of teeth in Saudi Arabia". *Saudi Dental Journal* 1992;4(3):101-105.
17. Sayegh H. Hilow R. Bedi. "Pattern of tooth loss in recipients of free dental treatment at the University Hospital of Amman, Jordan". *Journal of Oral Rehabilitation* 2004 31; 124-130.
17. Byahatti SM, Ingafou MSH. "Reasons for extraction in a group of Libyan patients". *International Dental Journal* 2011; 61: 199-203.
18. Hashim R, Salah A, Hamid A, Hamad A, Slieby K. "Reasons for permanent teeth extraction in the United Arab Emirates". *J Int Oral Health* 2019; 11:304-8.

19. Hashim R, Salah A, Hamid A, Hamad A, Slieby K. "Reasons for permanent teeth extraction in the United Arab Emirates". J Int Oral Health 2019; 11:304-8.