Evaluation of Various Factors for Extraction of Permanent Teeth in a Dental College

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Abstract:

Aim:
The aim is to investigate the various major and minor reasons for extraction of permanent teeth.

Objectives:
To evaluate the various major and minor reasons for extraction of permanent teeth taking into consideration various factors such as age, gender, type of teeth being extracted, extent of pathology and non willingness of the patient to save the teeth. To know about the oral hygiene status between the individuals and the most common reason among individuals for extraction of teeth, whether it's because of dental caries, periodontitis or any other conditions.

Materials and methods:
This prospective study was conducted on 258 patients reporting to Saveetha dental college and hospitals, Chennai, oral surgery department for extraction of teeth during a period of two months [may and june] in 2015. Reasons for extraction of teeth were considered and recorded in a preformed chart. Data obtained were analysed statistically and results were obtained.

Conclusion:
This study reveals that dental caries is the main cause for extraction of teeth followed by periodontitis.. Dental caries affects all age groups both the younger and older age groups while periodontitis is the cause of extraction in older age groups. Females reported for extraction more than males. Molars both mandibular and maxillary molars were extracted more compared to other teeth.

INTRODUCTION :

Extraction of teeth is a commonest and an important procedure in dentistry. There are many reasons for extraction of teeth such as dental Caries, Periodontitis, impacted teeth, supernumerary and over retained teeth, intentional extraction of teeth for orthodontic and prosthetic treatment, trauma, infected teeth and root canal failure teeth which cannot be retained by any treatment modalities that are presently available. This study was done to evaluate the various minor and major factors for extraction of teeth in Saveetha dental college and to find out its correlation to factors such as age, gender and type of teeth being extracted. Extraction of single or multiple teeth has significant effect on masticatory efficiency, esthetics, speech as well as occlusal harmony and periodontal health of the individuals(1)

Overall the two main reasons are dental caries and periodontitis, regardless of the age of the patient(2). Many researches gives the results among various factors for extraction as dental caries and periodontitis and mainly molars are most extracted teeth compared to others.

The main purpose of this study to evaluate the various major and minor causes of extraction of teeth so as to reduce the various etiological factors for extraction of teeth and to evaluate the oral hygiene status of population and to improve the overall dental health of population at large.

MATERIALS AND METHODS :

258 patients came for extraction of teeth to the Department of Oral and Maxillofacial Surgery, Saveetha dental college, chennai, tamilnadu, during a period, 01 may 2015 to 01 June 2015.Out of them 109 patients were males and 149 were females. Patients included were from 6 years of age to more than 75 Yrs of age. The total patients were divided into eleven groups with a range of 6 years difference in each age group.

Group 1: 6 - 12Yrs,
Group 2: 13-19 Yrs,
Group 3: 20-26 Yrs,
Group 4: 27-33 Yrs,
Group 5: 34-40Yrs,
Group 6: 41-47Yrs,
Group 7: 48-54 Yrs,
Group 8: 55-61 Yrs,
Group 9: 62-68 Yrs,
Group 10: 69-75 Yrs,
Group 11: >75 Yrs.

All possible causes for extraction were recorded in this research. It includes caries which cannot be restored, periodontitis which had bad and hopeless prognosis. And also patients who were willing for extraction of teeth which can be restored. Others included in this research were impacted, supernumerary, over retained teeth, intentional extractions for orthodontic and prosthetic treatment, teeth

with extensive abrasion and attrition and trauma inflicted teeth that could not be saved by any restorative means.

All the patients were informed regarding this follow up study and duly signed consent was obtained for their participation in the study. A detailed medical and dental history was taken for all patients. All the patients were found to be fit for extraction under local anesthesia. Complete medical dental history and examination were carried out by only one investigator and findings were noted in the printed proforma so as to avoid bias. Teeth were extracted following the normal aseptic measures under local anesthesia.

Clinical examination :
Clinical examination done by one investigator as mentioned above.(1)

Periodontal examination
Periodontal examination was carried out by considering the tooth mobility, severity of periodontal attachment loss and furcation involvement in multirooted teeth, severe bone loss. These above were considered the main criteria which indicated the need for extraction of periodontally involved teeth.(3,4)

Caries:
The criteria for teeth extraction due to dental Caries included initial caries, recurrent caries its sequel, root stump remains in cases where crown was lost due to dental caries or fracture of crown due to weakening by dental Caries(5).Root fracture as a result of trauma, impacted teeth, extractions for prosthetic treatment were diagnosed by radiographic examination. Failed root canal treated teeth and fracture of teeth which could not be restored were also diag- nosed by radiographic examination. The criterion for tooth extraction due to orthodontic reasons was lack of space as recommended by orthodontist.

Statistical Analysis:
The main outcome variable was the reason for teeth extraction. Relations of variables such as age & gender with reasons for extraction were analyzed by chi-square test. This test was applied to calculate the "P" value for total number of patients, total number of teeth extracted and reasons for extractions by gender. The p value calculate< 0.1 which is highly significant.

RESULTS :
A total of 357 teeth were extracted from 258 patients. 109 were males and 149 were females. In a total of 357 teeth, 158 teeth were extracted in males and 214 in females (Table 1 and 2). The chi-square value for total number of patients was 60.385and 87.246 for total number of extractions done. The "P" value calculated for both above finding was less than 0.01 which indicates that the results of the study are extremely statistically significant as regards number of patients and number of teeth extracted is concerned. The female patients reported more in number for extractions than males and therefore also reported more number of extractions. This study reveals that middle age group patients of 34-40 Yrs had the maximum number of extractions. The incidence of extraction increases with age but those over 75 Yrs of age reported a lower number of extractions. This difference in the number of extractions in various age groups shows a lot of statistical significance ("P" value < 0.01) as regards the number of teeth extracted in each age group.

It is evident from the results that dental Caries was the main reason for extraction of teeth (29.7%) followed by Periodontitis (21.6%). In both males and females, the main reason for extraction of teeth was dental Caries (18.1%) and (11.7%) respectively. Extraction of teeth due to Periodontitis in males amounted to (11.1%) where as in females (10.5%) of extractions was due to Periodontitis. Over all, maximum extractions were done because of dental Caries and Periodontitis as compared to all the other reasons for extraction. This difference as regards the various reasons for extraction also shows a statistical difference a "P" value of <0.1 As regards reasons for extraction by gender, the "P" value in this table also is the same <0.1 and is again statistically very significant. Extractions for orthodontic reasons were same in females (2.3%) and males (2.3%), while surgical extractions of impacted teeth were more in males (11.7%) as compared to females (9.3%). Failure of root canal treated teeth or fracture of teeth after root canal treatment also comprised to a few (0.6%)percent. Extractions due to other reasons such as attrited, abraded teeth, supernumerary, overretained teeth were also reported more in males (2.6%)

As regards the type of teeth concerned, both mandibular molars and mandibular incisors were the teeth that were extracted more in number as compared to all other teeth.

Total number of patients				Total number of teeth			
Age	**Male**	**Female**	**Total**	**Age**	**Male**	**Female**	**Total**
6 - 12	7	3	10	6 - 12	10	3	13
13-19	10	4	14	13-19	12	4	16
20-26	14	8	22	20-26	14	8	22
27-33	8	8	16	27-33	11	8	19
34-40	8	36	44	34-40	16	43	59
41-47	20	20	40	41-47	28	37	65
48-54	12	26	38	48-54	11	42	53
55-61	14	10	24	55-61	15	14	29
62-68	4	34	38	62-68	10	55	65
69-75	10	0	10	69-75	18	0	18
>75	2	0	2	>75	5	0	5

Age * Gender Cross tabulation

Age		Male	Female	Total
6-12	Count	7	3	10
	% of Total	2.70%	1.20%	3.90%
>75	Count	2	0	2
	% of Total	0.80%	0.00%	0.80%
13-19	Count	10	4	14
	% of Total	3.90%	1.60%	5.40%
20-26	Count	14	8	22
	% of Total	5.40%	3.10%	8.50%
27-33	Count	8	8	16
	% of Total	3.10%	3.10%	6.20%
34-40	Count	8	36	44
	% of Total	3.10%	14.00%	17.10%
41-47	Count	20	20	40
	% of Total	7.80%	7.80%	15.50%
48-54	Count	12	26	38
	% of Total	4.70%	10.10%	14.70%
55-61	Count	14	10	24
	% of Total	5.40%	3.90%	9.30%
62-68	Count	4	34	38
	% of Total	1.60%	13.20%	14.70%
Total	Count	10	0	10
	% of Total	3.90%	0.00%	3.90%
	Count	109	149	258
	% of Total	42.20%	57.80%	100.00%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	60.385[a]	10	0
Likelihood Ratio	68.698	10	0
N of Valid Cases	258		

[a.] 4 cells (18.2%) have expected count less than 5. The minimum expected count is .84.
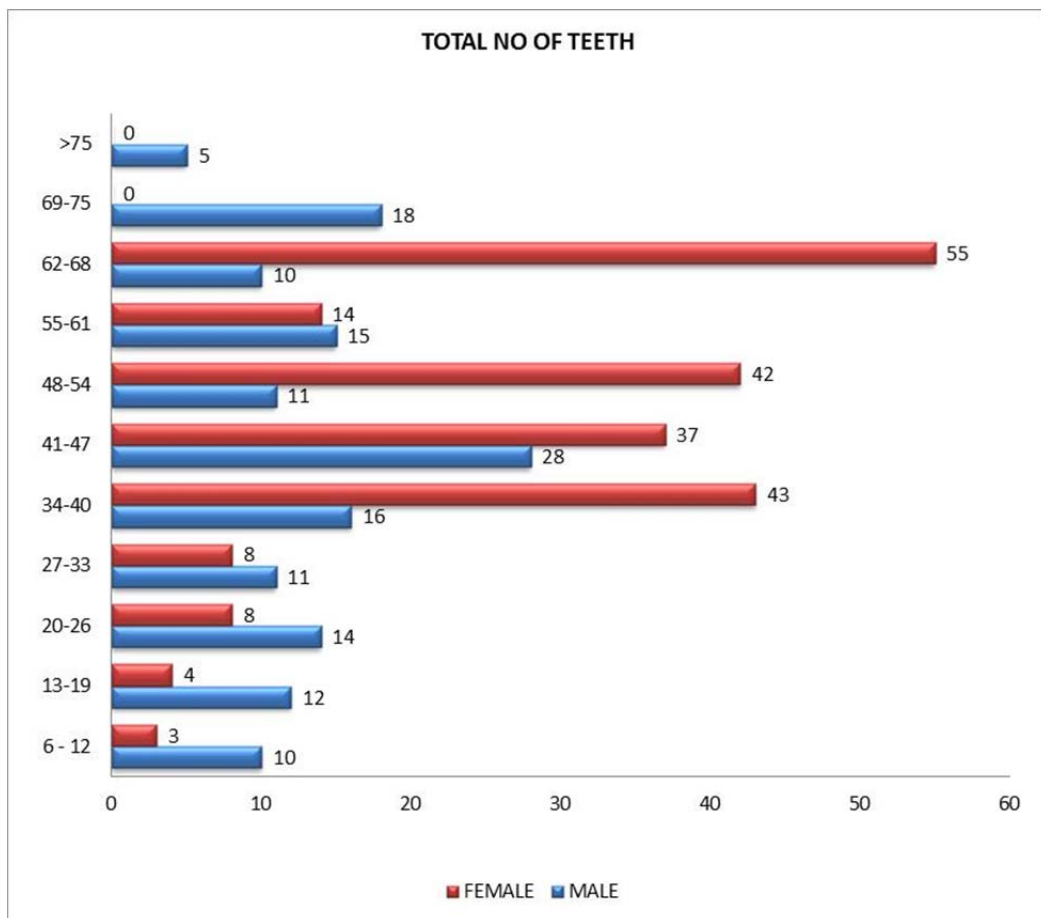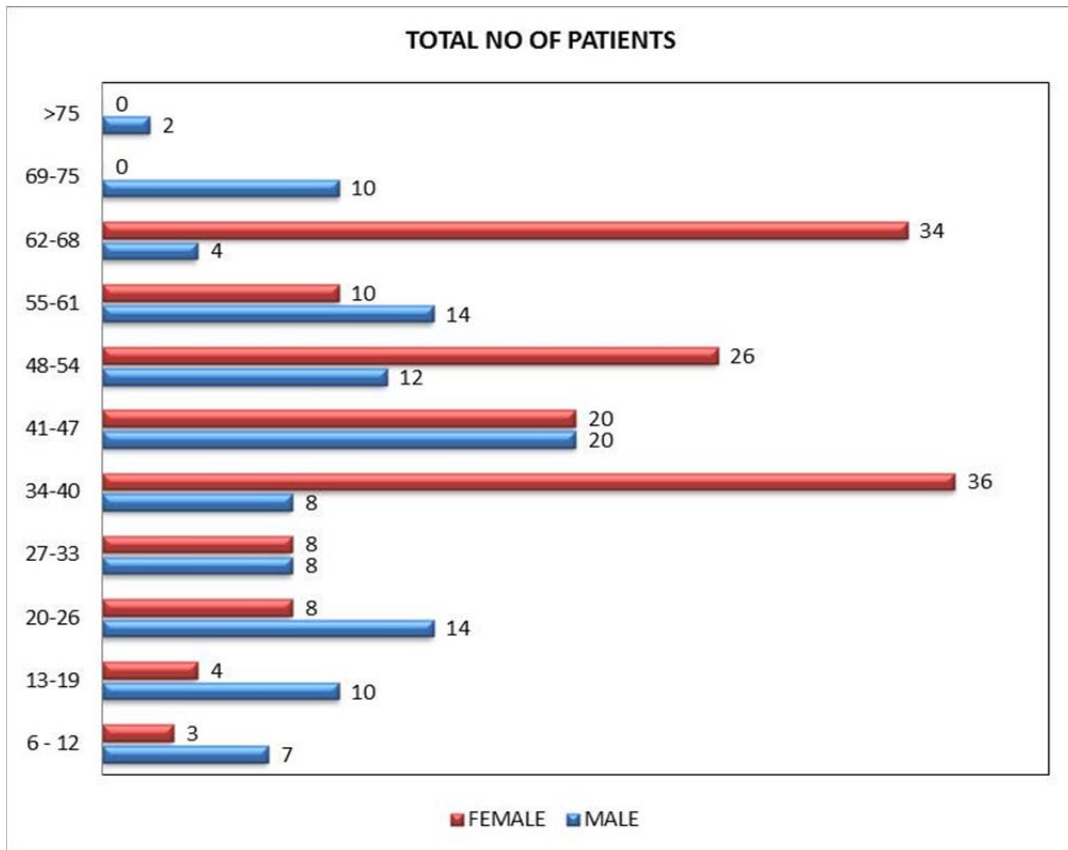
Cross Tabs

Age * Gender Cross tabulation

Age		Male	Female
06-12	Count	10	3
	% of Total	2.70%	0.80%
>75	Count	5	0
	% of Total	1.40%	0.00%
13-19	Count	12	4
	% of Total	3.30%	1.10%
20-26	Count	14	8
	% of Total	3.80%	2.20%
27-33	Count	11	8
	% of Total	3.00%	2.20%
34-40	Count	16	43
	% of Total	4.40%	11.80%
41-47	Count	28	37
	% of Total	7.70%	10.20%
48-54	Count	11	42
	% of Total	3.00%	11.50%
55-61	Count	15	14
	% of Total	4.10%	3.80%
62-68	Count	10	55
	% of Total	2.70%	15.10%
69-75	Count	18	0
	% of Total	4.90%	0.00%
Total	Count	150	214
	% of Total	41.20%	58.80%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	87.246[a]	10	0
Likelihood Ratio	98.619	10	0
N of Valid Cases	364		

[a.] 2 cells (9.1%) have expected count less than 5. The minimum expected count is 2.06.

Cross Tabls

Extraction * Gender Cross tabulation

Extraction		Male	Female
ATTRITION	Count	1	1
	% of Total	0.30%	0.30%
DECIDIOUS TEETH	Count	9	2
	% of Total	2.60%	0.60%
DENTAL CARIES	Count	62	40
	% of Total	18.10%	11.70%
FAILURE OF RCT	Count	0	2
	% of Total	0.00%	0.60%
IMPACTION	Count	40	32
	% of Total	11.70%	9.30%
ORTHO CORRECTION	Count	8	8
	% of Total	2.30%	2.30%
OTHER CYST	Count	1	1
	% of Total	0.30%	0.30%
PERIODONTAL PROBLEM	Count	38	36
	% of Total	11.10%	10.50%
PROSTHO CORRECTION	Count	1	2
	% of Total	0.30%	0.60%
ROOT STUMP	Count	28	26
	% of Total	8.20%	7.60%
SUPERNUMERARY	Count	0	1
	% of Total	0.00%	0.30%
TRAUMA	Count	2	2
	% of Total	0.60%	0.60%
Total	Count	190	153
	% of Total	55.40%	44.60%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.671[a]	11	0.56
Likelihood Ratio	11.119	11	0.433
N of Valid Cases	343		

[a.] 13 cells (54.2%) have expected count less than 5. The minimum expected count is .45.

P-Value	Highly Significant at $P \leq .01$
P-Value	No Significant at $P \geq .05$

TOTAL NO OF PATIENTS

Age	FEMALE	MALE
>75	0	2
69-75	0	10
62-68	34	4
55-61	10	14
48-54	26	12
41-47	20	20
34-40	36	8
27-33	8	8
20-26	8	14
13-19	4	10
6 - 12	3	7

■ FEMALE ■ MALE

TOTAL NO OF TEETH

Age	FEMALE	MALE
>75	0	5
69-75	0	18
62-68	55	10
55-61	14	15
48-54	42	11
41-47	37	28
34-40	43	16
27-33	8	11
20-26	8	14
13-19	4	12
6 - 12	3	10

■ FEMALE ■ MALE

Reason for Extraction by Gender

S No	Reason for extraction	Male	Female	Total
1	DENTAL CARIES	62	40	102
2	PERIODONTAL PROBLEM	38	36	74
3	FAILURE OF RCT	0	2	2
4	DECIDIOUS TEETH	9	2	11
5	ROOT STUMP	28	26	54
6	SUPERNUMERARY	0	1	1
7	IMPACTION	40	32	72
8	SUPRA ERUPTION	0	0	0
9	TRAUMA	2	2	4
10	ORTHO CORRECTION	8	8	16
11	PROSTHO CORRECTION	1	2	3
12	ATTRITION	1	1	2
13	ABRASION	0	0	0
14	EROSION	0	0	0
15	MAL POSED TEETH	0	0	0
16	OTHER CYST	1	1	2

Reason For Extraction By Tooth Type

Sno	Teeth type	Number of extraction
1	MAXILLARY CENTRAL AND LATERAL	43
2	MAXILLARY CANINE	24
3	MAXILLARY PREMOLARS	30
4	MAXILLARY MOLAR	54
5	MANDIBULAR CENTRAL AND LATERAL	56
6	MANDIBULAR CANINE	20
7	MANDIBULAR PREMOLARS	35
8	MANDIBULAR MOLAR	77

REASON FOR EXTRACTION

REASON FOR EXTRACTION BY TOOTH TYPE

Tooth Type	Value
MANDIBULAR MOLAR	77
MANDIBULAR PREMOLARS	35
MANDIBULAR CANINE	20
MANDIBULAR CENTRAL AND LATERAL	56
MAXILLARY MOLAR	54
MAXILLARY PREMOLARS	30
MAXILLARY CANINE	24
MAXILLARY CENTRAL AND LATERAL	43

(X-axis scale: 0 10 20 30 40 50 60 70 80 90)
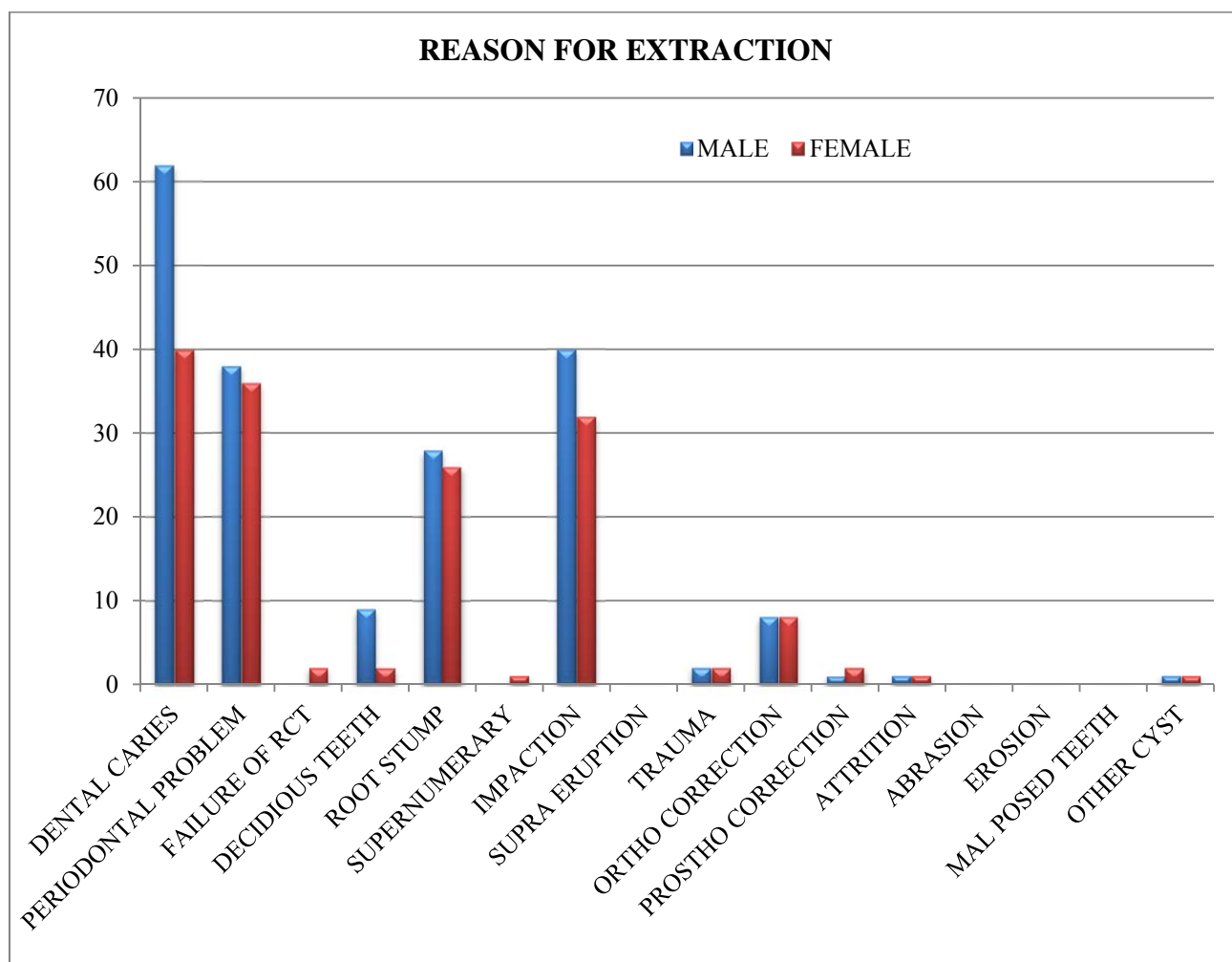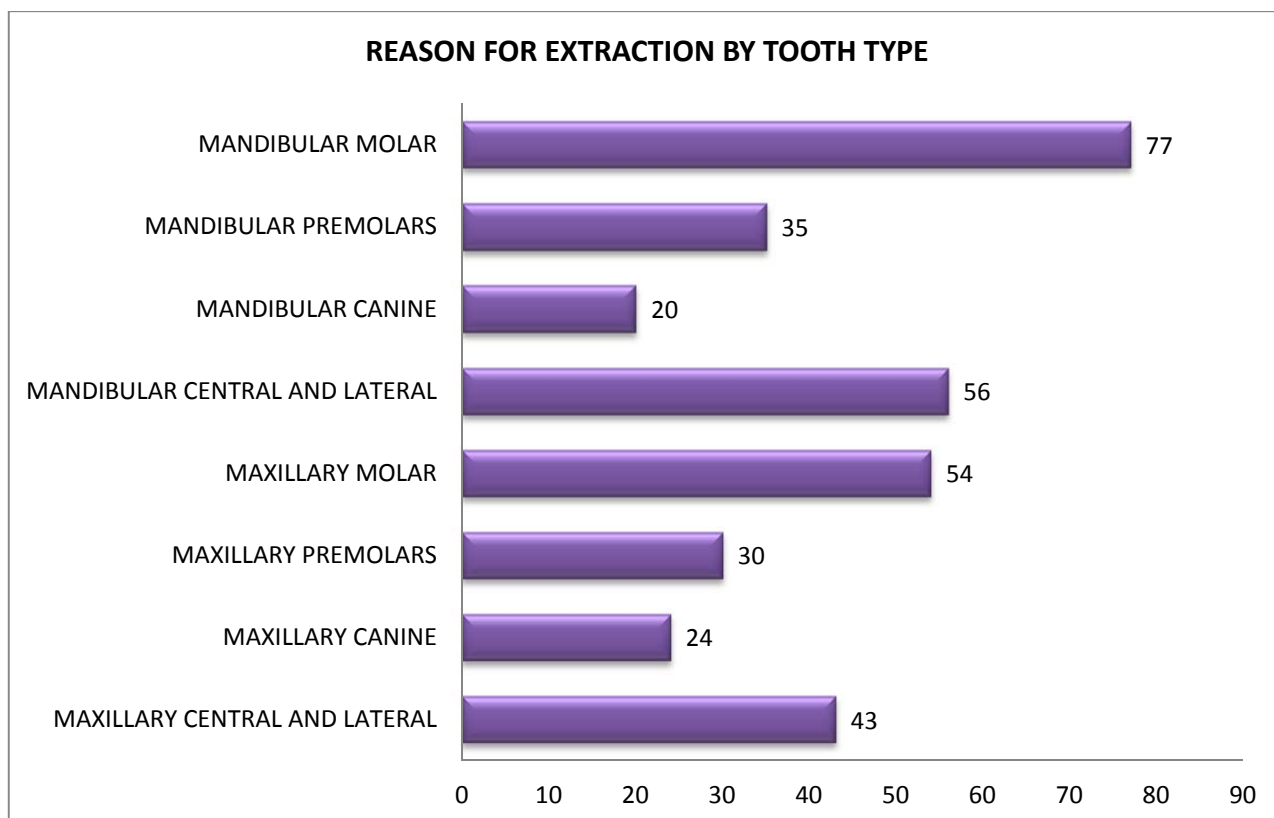
DISCUSSION

The various prevention conservation procedures are going on clinical practice but still extraction also remains cut to various causes .several studies researched about the various causes ,age and gender predilections. The World Health Organization recommends that countries adopt certain strategies for improving the oral health of the elderly. National public health programmes should incorporate oral health promotion and disease prevention based on the common risk factors approach (6).The research have reported that dental caries and periodontitis are the main causes of extraction. This statement was supported by Shigli, Hebbal in their study regarding contribution of dental Caries and Periodontitis as reasons for tooth loss in teaching institute in Belgaum(7). A similar finding was reported in a study on reasons for extraction of teeth by Caldas(8). Akhter, Hassain, Aida in their study in an adult population group held in Bangladesh also report similar results.(9) A study by Byahatti and Ingafou in a group of Libyan patients claimed that loss of 89% of all teeth is due to dental Caries & Periodontitis(10). Org, Yeo, in a study in an adult population in Singapore, also blamed dental Caries & Periodontitis to be the two main reasons for loss of teeth(11).

Anand, Kuriakose, in a study on reasons for extraction of teeth in a teaching institute in south India also reported that dental Caries is the main cause for extraction of teeth(12). Allen, reported similar findings in their statistical study for primary cause of extraction(13). Chaunccy, Glass, in their study in a sample of U S. Male adults, also stated dental Caries to be the main reason for extraction of teeth(14). Burt, Ismail, Morrison reported in their study that Periodontitis is the main reason for extraction of teeth as compared to dental Caries. Although with a very marginal difference,still(15), Ong,in a study also held Periodontitis (35.8%) as main reason for extraction as compared to dental Caries (35.4%) (16). Matthews in a study also supported Periodontitis as the main reason for extraction(17). Reich, Hiller, in their study in German population regarding reasons for extraction, reported that main reason for extraction of teeth is Periodontitis (27.5%) as compared to dental Caries (20.7%)(18). Another study shows that dental Caries (53.96%) is the main reason for extraction as compared to Periodontitis (33.12%) as reported by the Rashmi Saikhedkar ,H.C. Neema(1).

Our study shows that dental caries (29.7%) is the main reason for extraction compared to periodontitis. Other reasons for extraction are impacted teeth, intentional extraction for orthodontic and prosthetic treatment, root canal failure teeth, unrestorable, attrited and abraded teeth, which comprised a few number of reasons for extraction. As regards surgical extraction of impacted teeth, these were performed more in males (11.7%) as compared to females (9.3%). There is no specific reason seen for male predominence. Surgical extraction for orthodontic treatment was same in both female (2.3%) and male gender (2.3%). This shows that esthetic awareness between female and male are same.

Females reported more in number for extractions (58.8%) as compared to males (41.2%) and also underwent more extractions, females (57.8%),males (42.2%). Reasons for extraction in males due to Periodontitis were more (11.1%) as compared to females (10.5%). Farelal in a study also reported that, extractions in males are more due to

periodontitis because of adverse habits of smoking , using of tobacco, arecanut, pan etc.(19)

In our study molars were the teeth that had to be extracted more as compared to other teeth. Among the molars mandibular molars(77) were extracted more, compared to maxillary molars (54). The main reason is due to early eruption of teeth predisposing to the environment conditions compared to the other teeth erupting later in which periodontitis can be seen at older age. Oginni also reported that molars are highly susceptible to dental Caries from a very early age group till the older age group(20).Klein, Palmer, reported the above findings in their study on comparison of caries susceptibility of permanent teeth(21).

Present study also shows that incisors(56) were extracted most next to molars. Among incisors, mandibular incisors (56) were extracted more than maxillary incisors (43). Incisors that were extracted was due to Periodontitis at an older age. Incisors, in general do not get carious, but are prone to Periodontitis at an older age group if retained. Daameh, in a study also reported that incisors are extracted more because of Periodontitis in the elderly age group(22). Next to the incisors, premolars were extracted more for mainly orthodontic correction and also because of periodontitis in older age people. Among premolars, mandibular premolars (35) we're extracted more than maxillary premolars (30).Canines were the least extracted because of their anatomic features and periodontal attachment.

Many studies have been done in the past to find out various reasons for extraction of teeth. Most of the studies claim different findings and results. Few factors can be attributed to these differences: these include, type and methodology of the study, socio economic status of the patient, type of tooth being extracted, extent of pathology affecting the tooth, age and gender of the patients, statistical analysis, results etc. These differences in findings and results also reflect patient's attitude dentist's attitude, availability and accessibility of care with prevailing philosophies of care (23).

CONCLUSION

This study reveals that dental caries is the main cause for extraction of teeth followed by periodontitis.. Dental caries affects all age groups both the younger and older age groups while periodontitis is the cause of extraction in older age groups. Females reported for extraction more than males. Molars both mandibular and maxillary molars were extracted more compared to other teeth.

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