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Reasons for teeth extraction in southern regions of Iran, in 2010 short title: teeth extraction in Iran

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ABSTRACT

Objective: This study was to evaluated reasons for teeth extraction in southern regions of Iran.

Method : We evaluated reasons for teeth extraction in 364 persons of sample population of Shiraz, Iran (157 women and 207 men)who were referred to Shiraz Governmental Dental Health Care Centers for extraction of their teeth in a three month period (Oct. to Dec. 2010). There were no special criteria in selection of the patients.

Results: Data showed that dental caries was the main reason for extraction of teeth followed by periodontal disease and orthodontic therapy respectively (P=0.007). A significant relationship was shown between sex and extraction (P=0.015) and location of residence (urban vs. rural) (P=0.007).

Conclusion: According to the data of this study showing that dental caries and periodontal diseases are two main causes of teeth extraction, it seems that following correct oral hygiene instructions via educational principles to the people accompanying mechanical removal of dental plaques, would be the first step in preventing these two common dental problems which may cause extraction of teeth.

Introduction

Tooth has a key function and hardest structure in human jaws (1). Teeth have many important functions including mastication, helping in correct pronunciation of words in talking, and esthetics (2). According to the importance of keeping teeth and their role in different aspects, losing teeth will be critical due to their socio-economic as well as psycho logical effects (3). Furthermore, the greatest input of oral diseases is on disadvantaged and socially marginalized population. Oral diseases qualify as major public health problems owing to their high prevalence and incidence in all regions of the world (4).

WHO in 2003 in its last report regarding global oral health situations has determined objectives to promote oral health conditions in communities. These objectives, include reduction of oral diseases and their related difficulties specially in economically vulnerable groups to elevate the life style and reduce those socio-economic and behavioral factors which lead to prevalence of oral diseases (4).

According to the results of national studies and guidelines performed in Iran in 1998 and 2004, to evaluate quality of oral health care centers in the country, although data showed improvement in quality as well as quantity of oral health care centers and dental schools in training dentists, input of presence of oral diseases specially dental caries was relatively extensive in a way that extraction of many untreated carious teeth was the end result (5). Loss of teeth is in close and direct relation to financial and economic situations of the patients.

According to a research performed by Dye et al in America during 1999 to 2004, while those persons who are in good economic conditions (with earnings of at least two times of those who are on the edge of poverty line) Will lose on average, three teeth due to dental caries between the ages of 20 to 64 years old, persons who are at the vicinity of poverty line will lose teeth twice (6)

In an investigation in 2006 for reasons for tooth extraction and its association with age and gender in Kuwait, a record of all tooth extraction performed in 21 general dental practice centers during one month period was taken. Out of 2783 teeth extracted in 1604 patients, caries and periodontal disease was responsible for 43.7 and 37.4 percent of extractions, respectively. Caries was shown to be the principal cause for extraction in patients under 40 years old while periodontal disease was the main cause of extraction in patients over 40 years old. Extractions for caries and orthodontic reasons were more common in females, while periodontal reasons were more prevalent in males (7).

Reich et al (1993) investigated the reasons for tooth extraction in the western states of Germany. They showed out of 1215 extracted teeth from 882 patients, the reasons for extraction were periodontal diseases (27.3%), dental caries (20.7%), periodontal disease as well as dental caries (18.7%) wisdom teeth (14.7%), fixed and/or removable prosthetics (11.2%), orthodontics (4.1%), miscellaneous (2.9%), and trauma (0.4%) respectively (8).

In another study, Mosha et al showed the reasons for teeth extraction among Tanzanians to be dental caries and its related pain (81%), periodontal disease (13%), and other reasons (6%), respectively (9).

According to Petersen's study, developing countries are not so concerned about approaches of oral preventive and operative measures. In these countries, treatment plan for patients who

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suffer from severe dental pain (whether the patient is a child or adult), will be usually extraction of the involved tooth (10).

The main purpose of the present study is to evaluate the reasons for teeth extraction in southern regions of Iran and comparing the similarity of the results of this research with those of other studies in different parts of the world.

Methods and Materials:

In this cross-sectional study, 364 persons (207 males and 157 females) referring to Shiraz Governmental Care Centers for extraction of their teeth between October to December of 2010 were selected. Since the geographic distribution of these centers is in accordance to principles of primary public health care system, so from demographic point of view, these patients belong to different groups of socio-economical levels. In fact, persons referring to these health care centers which are our target community, can be considered a proportional sample of mother community namely, Shiraz city people.

In this cross-sectional study and according to the objectives of the research, previous information and due to a ratio of 45% error of 5% and accuracy of 5% the correct number of patients needed for such a study will be obtained by use of $n = \frac{Z^2 \frac{\alpha}{2} p(1-p)}{d^2}$ formula, where n is number of patients needed, Z is normal standard, α is primary error level, P is prevalence rate of tooth extraction and d is accuracy rate.

It is necessary to be stated that all of selected health care centers, had dental sections and distribution of patients to each center was in accordance with the potential of the dental office of the center to be able to see and treat the referred patients. Each patient had a specific number to be seen. In this study, there were no special criteria in selection of the patients. Namely, all patients referring to the selected dental health care centers for extraction of their teeth in this three month period, were entered the study regardless of age, sex, educational level, socio-economic and health status and etc.

For each patient, before extraction of teeth a questionnaire was filled by the operating dentist which had information about the routine data (name, age, sex, address, phone number, educational level, and occupation), whether the patient belongs to urban or rural community, reasons for extraction (e.g. caries, periodontal disease, …) type and number of tooth to be extracted (permanent or deciduous).

After completion of all questionnaires, and test of validity and reliability, the data were analyzed by SPSS statistic software, statistical descriptive methods, x^2 and t-test in 5% level.

Results:

Data obtained by statistical analysis showed that dental caries can be considered as the main cause of tooth extraction among the patients followed by periodontal disease, and orthodontic therapy (table 1).

A significant relationship of five percent exists between sex and extraction (x^2=10.42, P=0.015)

According to the results shown in table 2 in females in addition to dental caries and periodontal diseases as the main cause of tooth extraction orthodontic therapy compromised an important cause for extraction while orthodontic reason was not so significant in extraction in men. This could be because women are more interested in esthetic procedures such as orthodontics.

There is a significant relationship between location of residence (urban vs. rural) and reasons for extraction (x^2=12.24, P=0.007).

In urban areas, orthodontic reason for extraction seems to be much more than that of rural areas (Table 1).

In this study, no significant relationship was found between level of education of the patients and reasons for extraction of teeth (x^2=10.4, P=319). Data of this section have been shown in Table 1.

The patients entering this project, were between ten to eighty years old with an average of thirty four years old (Table 2).

Distribution frequency of sex in this study was proportional to the overall number of patients namely, 43.1% for females and 56.9% for males (Table 3).

Educational level of the patients was in such a way that includes illiterate up to the academic level. This is to say that illiterate and primary school education comprises 20.7%, high school level 31.4%, high school diploma level 36.9%, and university educational level 11% respectively (Table 3).

Frequency distribution of the type of occupation of the patients shows that different types of jobs have been present in this study (Table 3).

Generally speaking, frequency distribution of reasons for extraction of teeth regardless of sex, location of residence and level of education show that main cause of extraction was dental caries (60.9%), followed by periodontal disease (19.2%), Orthodontic treatments (12.2%), and miscellaneous reasons (7.3%) respectively (Table 3).

Frequency distribution of type of extracted tooth (permanent vs. deciduous) shows permanent teeth comprise 88.3% and deciduous teeth 11.7% of extracted teeth (Table 3).

Reasons for extraction of teeth in different countries of the world have been shown in Table 4.

Discussion:

Evaluation of oral health, although very important, may be neglected as a part of general body health management. Dental caries is the most common chronic disease of the childhood. In America, 164 million hours in a year will be devoted to visit patients and treat dental problems. In the United States, 30000 persons in a year will be diagnosed to have oral and throat cancer and 8000 persons out of these patients will die eventually. Researches show that etiological factors of chronic oral infections have their own influence in cardiovascular, stroke and premature birth conditions. It is clear that treatment expenses in this regard will have financial input not only on patients but in governmental economic systems.

Generally speaking, there is a close and direct relation between providing oral health care and poverty. Heavy dental care expenses and lack of presence of enough dentists especially in deprived areas make accessibility of people and mostly those who belong to low socio-economical level to dental care, so difficult.

In U.S.A; 40% of poor people are involved with periodontal diseases while 20% of people with good income are suffering from this disease (11)

Lack of following oral hygiene procedures, type of life style, personal behaviors, inappropriate diet, poverty, social detriment, lack of having dental insurances, educational level, and lack of use of fissure sealants, will increase the rate of dental caries (12).

According to the importance of keeping teeth, many researches have been done to evaluate the reasons for extraction of teeth.

Table 1. Reasons for extraction of teeth in relation to the location of residency, sex and level of education of the patients

		miscellaneous	orthodontics	Periodontal disease	caries	total	Missing data	p.value	X^2
Location of residency	Urban	10 (4.8%)	24 (13%)	37 (17.9%)	133 (64.3%)	207 (100%)	83	0.007	12.24
	Rural	8 (10.8%)	1 (1.4%)	19 (25.7 %)	46 (62.2%)	74 (100%)			
sex	Female	12 (8.5%)	24 (16.9%)	19 (13.4%)	87 (61.3%)	142 (100%)	25	0.015	10.42
	Male	13 (6.2%)	16 (8.1%)	24 (23.9%)	121 (61.4%)	197 (100%)			
Level of education	Illiterate &primary school	Trauma 8 (13.1%)	6 (9.8 %)	13 (21.3%)	34 (55.7%)	61 (100%)	70	0.319	10.4
	High school	6 (6.5%)	7 (7.6%)	24 (26.1%)	55 (29.8%)	92 (100%)			
	High school diploma	9 (8.3%)	9 (8.3%)	17 (15.6%)	74 (67.9%)	109 (100%)			
	University diploma	1 (3.1%)	6 (18.8%)	6 (18.8%)	19 (59.4%)	32 (100%)			

Table 2. Age distribution of the patients including mean and average age range

Maximum	Minimum	Standard deviation	Median	Mean	Average	Statistical values variable
80	10	6	40	34	33.88	Age

Table 3. Frequency distribution of sex, level of education, type of occupation, reasons for extraction of teeth, and type of extracted tooth (permanent vs. deciduous) of the patients

	distribution	frequency	Percent of frequency
sex	female	142	41.9
	Male	197	58.1
	Total	339	100
Level of education	Illiterate &primary school	64	20.7
	High school	97	31.4
	High school diploma	114	36.9
	University diploma	34	11
	Total	309	100
type of occupation	Labor	72	21.8
	University staff	54	16.3
	Shop-keeper	76	23
	Clerk	20	6
	House-keeper	11	3.2
	No job	74	22.4
	Student	24	7.3
	Total	331	100
for reasons extraction	Caries	209	60.9
	Periodontal disease	66	19.4
	Orthodontics	43	12.4
	Trauma	0	0
	Miscellaneous	25	7.3
	total	343	100
type of extracted tooth	Deciduous	26	11.7
	Permanent	265	88.3
	Total	291	100

Table 4. Reasons for extraction of teeth in different countries of the world

Country	Year of the publishment	% of extraction due to caries	% of extraction due to poriodisease	Author
Finland	1984	60	18	Alnoma
France	1985	49	32	Cahen
Scot land	1986	50	21	Kay
England Wales	1988	48	27	Ager holm
Norway	1988	35	19	Klock
Canada	1991	63	34	Stephens
Germany	1993	20.7	27.3	Reich
Singapore	1994	35.4	35.8	Ong
Italy	1996	33.4	33.1	Angelillo
Canada	1997	28.9	35.9	Murray

All these articles have similar frame work and results with those we obtained in our research. Chestnut, et al. in 2000, showed the reasons for extraction of teeth in Scot land. They showed out of 917 extracted teeth from 613 patients, dental caries as the main cause of extraction, comprise 51% of extracted teeth followed by periodontal disease (21%), orthodontic therapy (11%), failed endodontically treated teeth (4%), and pericoronitis (0.5%) respectively (13).

McCaul, et al in 2000, in Scotland after a-15-year follow up study, showed the reasons for extraction of permanent teeth. He also obtained similar results with those of Chestnut (14).

In another research in 2000 in Afghanistan, it was shown that in a three month period, out of 184 extracted teeth from 123 patients with an age range of 9 to 62 years old, dental caries was the main cause of teeth extraction (59.2%) followed by periodontal disease (35.3%), patient request (5%), and surgical reasons (4.9%) respectively (15).

In 2004-2005 in Japan under the supervision of Japan Dental Association, reasons of extraction of permanent teeth were evaluated. Out of 9115 extracted teeth from 7499 patients, again dental caries was the main cause of extraction (43.3%) followed by periodontal disease (41.8%) (16).

Khalaf in Kuwait (7), Reich in Western Germany (8), and Mohsa et al in Tanzania (9), also showed similar results.

According to the results of above mentioned name researches and similar data of other researches in other countries such as Italy (1996), Norway (1991), France (1985), England (2001), and Singapore (1996), it is clear that dental caries is the main reason for tooth extraction followed by periodontal diseases (17-21).

Data obtained in almost all of these researches show that although increasing improvement has been developed in dental health care systems in the world, difficulties still exist in providing appropriate dental care to people especially poor patients and those with low socio-economic status in all regions of the world. Being so, most of such patients will be confronted with extraction of their teeth as the end result.

Findings regarding reasons for extraction of teeth obtained in this study were similar to those shown in different researches performed in different countries since 1985.

Conclusion:

According to the data of this study showing that dental caries and periodontal diseases are two main causes of teeth extraction, and due to the similarity of the results of this research with those of other researches in different parts of the world, it seems that following correct oral hygiene instructions via educational principles to the people accompanying mechanical removal of dental plaques, would be the first step in preventing these two common dental problems which may cause extraction of teeth.

Extending the availability of dental services to the people as well as providing better facilities for dental care such as dental insurance coverage, will be with no doubt effective in oral and dental health care promotion.

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