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Investigation of Dental Caries Prevalence among 6-12 year old Elementary School Children in Andimeshk, Iran

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The aim of this study was to estimate the prevalence and severity of dental caries in 6-12 year old elementary school children in Andimeshk and investigate its relation with socio demographic characteristics and use of dental services. This cross-sectional study used the standard dental indices dmft and DMFT for oral health assessment. This study was carried out in 2005 on 410, 6-12 year old elementary school children, which were randomly selected in Andimeshk, Iran. Clinical examinations for caries were conducted by a single examiner using World Health Organization criteria. A questionnaire was designed to record the status of the teeth along with the occupational and educational levels of parents. Data was analyzed using SPSS software, the Chi-square test andanalysis of variance (ANOVA). Results showed the mean dmft and DMFT scores were 2.62±1.62 and 1.18±0.97, respectively. Also, 18.8 and 43.2% of the students were caries-free, respectively. There were significant differences between the dmft and DMFT with age. The highest dmft values belong to parents under diploma and diploma education. Also, the highest DMFT values are for parents with under diploma education. Tooth brushing frequency was observed 283 (69%). Children who visit the dentist have a less dmft and DMFT (0.73 and 2.77, respectively) than others. 98.5% of students have healthy teeth. No bleeding and no pocket (4-5 mm) were observed in gums. It was concluded that the present study findings for dmft and DMFT scores in 6-12 year old elementary school children are lesser than global standards according to the World Health Organization (WHO). There was an association between brushing, visit to the dentist, parent's occupation and education and dental caries. This subject suggests health education programs and suitable treatments should be emphasized in elementary school aged children.

Key words: Dental caries, dmft, DMFT, elementary school children, oral health

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INTRODUCTION

Dental caries is the most prevalent chronic disease among children in the global scenario. It is a cumulative and progressive disease causing pain, infection and possible disfigurement particularly in children. There are practically no geographic areas in the world whose inhabitants don't exhibit some evidence of dental caries. Early recognition of the disease is of vital importance. This is needed in order to prevent the disease and pain so as to make oral health services more relevant in the health (Kalra, 2005). The process of developing a health system requires mechanisms for collecting and analyzing health information. The determination of need for dental care programs requires a systematic flow of information between the community and the dental profession. With a view to the fact that dental caries causes significant economic loss, it can have been heavy expenses of dental treatment. The most important way to reduce this loss is attention to prevention measures. Dental decay experience is expressed as a dmft or DMFT score. dmft index describes the number of decayed, missing and filled temporary teeth. DMFT describes the number of permanent decayed, missing and filled teeth. The dmft score describes decay experience in deciduous teeth, while the DMFT score describes decay experience in permanent teeth (AIHW, 2000). The basic criteria for evaluation of oral and dental health are DMFT and dmft. DMFT and dmft indices provide a wide range of information about oral public health.

The country of Iran lies on the eastern side of Asia. It is bordered by the Persian Gulf, Pakistan, Afghanistan, Turkmenistan, Caspian Sea, Azerbaijan, Turkey and Iraq. In 2005, the population of the Iran was officially estimated at 68.018 million residents (World Cities, 2006). Children between 0 and 14 years are 27.1% of total population, which emphasizes the importance of child health services. In general, dental services are spread throughout the country. The dental care system is well developed and comprehensive and has a predominantly curative emphasis. There are 18 dentistry schools in Iran that they educate more than 700 dentists yearly. Also, there are more than 45000 dentists, dental hygienists, chair side assistant, denturists and auxiliary health workers in all of dental centers of Iran (Pakshir, 2003, 2004).

Some studies of child oral health had previously been conducted in Iran. Zeraati and Ghandehari Mohaghegh (2006) reported from Tehran Arbabzadeh Zavare *et al.* (2004) reported from Shiraz Mortazavi Najafabadi *et al.* (2004) reported from Isfahan. The city of Andimeshk was selected for this study because there was no information available on the oral health of elementary school children. The objectives of this study were to determine the prevalence and severity of dental caries among 6-12 year old elementary school children in Andimeshk city in Iran andto investigate the association of disease with socio demographic characteristics

MATERIALS AND METHODS

This descriptive study was carried out about prevalence of dmft and DMFT on 410, 6-12 year old elementary students, which were randomly selected in Andimeshk city of Iran in 2005. These students were chosen from 5 girl's elementary schools and 5 boy's elementary schools. Fourty students were selected from five classes of elementary school. There were 5 classes in each elementary school and eight students aged 6-12 years were examined. The examination was performed by a dentist, using No. 4 disposable mouth mirror, sterilized instruments, disinfectant solution, disposable gloves, mask and periodontal probe. A questionnaire was designed to record the status of the teeth along with the occupational, educational levels of parents, health habits and Community Periodontal Index (CPI) (WHO, 1997). Children were examined at the school clinic while sitting on an ordinary chair. Natural day light was used for illumination and no radiographs were taken. Children with food remnants on their teeth were asked to rinse with water before their examination. Decay criteria were used on the World Health Organization (WHO) and carried was diagnosed at the cavitation stage. According that, a tooth is considered as decayed when in addition to color change, the explorer is retained and white spots are not considered as decayed in this study. Dental decay experience is expressed as a dmft or DMFT score: the number of teeth currently decayed, teeth extracted due to decay and teeth with fillings (AIHW, 2000). The dmft score describes decay experience in deciduous teeth, while the DMFT score describes decay experience in permanent teeth. The other commonly used statistic is the percentage of individuals who are decay free, that is, when both dmft and DMFT equal zero. The information from the questionnaires and caries forms was coded and entered into spread sheet for analyzing SPSS. Data analysis was undertaken, first, to determine dental caries prevalence (represented by the percentage of children who had one or more dmft and DMFT) and severity (represented by the mean dmft and DMFT) and secondly, to investigate possible risk markers and indicators for caries prevalence and severity. After computing descriptive statistics, bivariate analyses used Chi-square tests for carries prevalence and analysis of variance (ANOVA) for caries severity. p-values of less than 0.05 were considered to be statistically significant.

Table 1: Frequency distribution of students according to dmft and DMFT values

	dmft		DMFT	
dmft/DMFT	Frequency	(%)	Frequency	(%)
0	77	18.8	177	43.2
1	49	12.0	64	15.6
2	64	15.6	129	31.5
3	58	14.1	34	8.3
4	55	13.4	6	1.5
5	41	10.0	-	-
6	29	7.1	-	-
7	17	4.1	-	-
8	20	4.9	-	-
Total	410	100.0	410	100.0

Table 2: Comparison of dmft and DMFT values in students according to age

Age	No.	dmft (Mean±SD)	DMFT (Mean±SD)
7	97	4.54±2.25	0.38±0.71
8	72	3.97±2.04	0.72±0.96
9	69	3.65±1.88	1.02±0.98
10	64	2.17±1.74	1.68±1.09
11	92	1.16±1.40	1.67±1.05
12	16	0.25±0.44	1.62±1.02
Total	410	2.62±1.62*	1.18±0.97*

*p<0.05

Table 3: Comparison of dmft and DMFT values in students according to gender

Gender	No.	dmft (Mean±SD)	DMFT (Mean±SD)
Female	182	3.17±2.20	1.19±1.04
Male	228	2.85±2.40	1.00±1.13
Total	410	3.01±2.30	1.09±1.02

Table 4: dmft and DMFT values according to parents, Job and education

Variables		No.	dmft±SD	DMFT±SD
Father's education	Under diploma	263	3.07±2.30	1.18±1.09
	Diploma	109	2.95±2.37	0.90±1.11
	Upper diploma	32	2.68±2.32	0.87±0.94*
Mother's education	Under diploma	320	3.04±2.31	1.15±1.12
	Diploma	71	3.11±2.37	0.83±0.98
	Upper diploma	14	1.71±2.26	1.00±1.10
Father's job	Employee	139	3.06±2.25	1.30±1.02*
	Business man	117	3.10±2.42	1.00±1.17
	Other	138	2.92±2.35	0.92±1.02
Mother's job	House wife	397	3.02±2.34	1.08±1.08
	Employee	2	2.00±2.82	2.50±0.70

*p<0.05

Table 5: DMFT and dmft values according to the health habits

Questions		No.	dmft±SD	DMFT±SD
Do you brush daily?	Yes	283	2.79±2.21*	1.12±1.06
	No	103	3.42±2.41	1.16±1.18
Do you visit to the dentist?	Yes	46	0.73±1.04*	2.77±2.22*
	No	336	1.19±1.08	3.95±2.31
Do you use the dental floss?	Yes	2	1.50±2.12	1.50±0.70
	No	378	2.90±2.27	1.13±1.09
Have you a background of health education?	Yes	91	2.13±2.10*	0.86±1.09*
	No	287	3.17±2.27	1.22±1.07

*p<0.05

Table 6: Frequency distribution of CPI* index in students

Index	Frequency	(%)
Healthy gums	403	98.5
Bleeding gums	0	0.0
Calculus	7	1.5
Pocket (4-5 mm)	0	0.0
Total	410	100.0

* Community periodontal index

RESULTS

In this study, the gender distribution was 55.7% (228) males and 44.3% (182) females. Frequency distribution of elementary school children according to dmft and DMFT were showed in Table 1. Seventy seven (18.8%) and 177 (43.2%) students were zero in dmft and DMFT index, respectively. Results showed that there were significant differences between the dmft and DMFT with age (Table 2) ($p<0.05$). The mean dmft and DMFT in students of seven years old are 4.54±2.25 and 0.38±0.71, respectively. Also, the mean dmft and DMFT in students of twelve years old are 0.25±0.44 and 1.62±1.024.54, respectively.

Table 3 shows the dmft and DMFT index and gender in studied students. There were no significant differences between the increase in the dmft and DMFT with gender ($p>0.05$).

The highest dmft values belong to parents under diploma and diploma education (Table 4). Also, the highest DMFT values are for parents with under diploma education. There are no differences significant between dmft or DMFT and mother's education. Students, with house wife mothers, have a greater dmft value (3.02) than those, with employee mothers. Students, with employee father and or employee mother have a greater DMFT than others.

At present study, it was observed that 283 (69%) of students brushed their teeth daily. Students who brush their teeth, they have a less dmft and DMFT (1.12 and 2.79, respectively) than others. Students who go to dentist have a less dmft and DMFT (0.73 and 2.77, respectively) than others. It has also been observed that students who don't use the dental floss, they have a great dmft and DMFT. Also, students that have a background of health education, they have a less dmft and DMFT than others (Table 5).

In the Table 6, 403 (98.5%) of students have a healthy gums. No bleeding was observed in gums. Calculus observed in 7 (1.5%) students. No pocket (4-5 mm) was observed in mouth of students.

DISCUSSION

Dental caries is the most prevalent chronic disease among children in the global scenario. There are practically no geographic areas in the world whose inhabitants don't exhibit some evidence of dental caries. Early recognition of the disease is of vital importance. This is needed in order to prevent the disease and pain so as to make oral health services more relevant in the health. Prevalence of dental caries has an increasing trend

among school going children (Kalra, 2005). According to present study, the average reported dmft and DMFT for 6-12 years old students is 2.62 and 1.18, respectively and it is less than value suggested by WHO references for the year 2000 (FDI, 1982; WHO, 2006a). DMFT is also less 1.5 that WHO reported from Iran in 1998 (WHO, 2006b). WHO proposed DMFT values, for European countries and all 12 years old population, that they should 2 and 3. Samimi *et al.* (2004) evaluated 151 people about dental caries in diabetic children of Isfahan in Iran. They reported that the mean DMFT for diabetic group was 4.97±2.76. The high prevalence of dental caries in these patients shows the importance of attention to oral hygiene and treatment of caries. At a study, Mansoori Karkavandi *et al.* (2004) determined DMFT indices in Iranian villagers and Afghan refugees living in villages of Isfahan province in those age groups. They examined 220 women (110 Iranian and 110 Afghan) and 256 men (128 Iranian and 128 Afghan). None of the cases examined had the regular habit of tooth brushing. DMFT indices were 9.7±6.5 and 5.7±5.6 in Iranian and Afghan men. Also, DMFT index was 2.2±6.5 and 7±5.2 in Iranian and Afghan women, respectively. Ten percent of Afghan women and 15.6% of Afghan men were caries free. In other study, Mortazavi Najafabadi *et al.* (2004) determined the DMFT index between 12 year old girl students living in Isfahan and Kashan, two cities of Iran, with different fluoride concentration in drinking water (0.4 and 0.6 ppm respectively). They reported that DMFT is 4.44±2.38 and 3.88±2.40 in Isfahan and in Kashan, respectively. The DMFT indices in Isfahan were significantly higher ($p<0.05$). The lower-level mean of plaque index in Isfahan showed the role of oral hygienists in schools of Isfahan and the role of more dental centers in this city. The high level of mean DMFT in both cities showed the importance of attention to appropriate preventive and treatment programming. In present study, DMFT value is less than the mentioned study. With a view to the fact that DMFT index provides a wide range of information about oral public health, Arbabzadeh Zavareh *et al.* (2004) studied the DMFT index in Shahreza city in Iran. They examined two hundred twelve-year-old students (100 girls and 100 boys). They reported that DMFT indices are 6.12±3.67 and 4.52±3.05 in girls and boys respectively. Also, they surveyed the influence of occupation and educational background of parents, number of brushings per day and dental visits per year in 212 year old students. The occupation and educational background of parents had no significant correlation with DMFT ($p<0.05$). The higher level of DMFT index in girls indicated the less attention of oral and dental health in girls. In comparison with WHO standard (year 2000) of three for DMFT, the index was higher in Shahreza. Dummer *et al.* (1990) presented an analysis of factors influencing the caries experience of a group of children at the ages of 11-12 and 15-16 years. They observed 4 for DMFT mean when aged 11-12 years. Since age is not very important as a quantitative variable; it would have been necessary to introduce it as a qualitative variable with different age groups (Smyth and Caamano, 2005). In present study, there is a significant association between dental caries and age. Daneshkazemi and Davari (2005) were carried out a study to assess the prevalence and distribution of DMFT in 12 year old students in junior high school in Iran. They surveyed 1,223 12 year old students in Yazd and Hadi-Shahr.They reported that the mean DMFT score was 1.8±1.75 and 28.6% of the students were caries-free. Also, there was no significant relationship between DMFT and the rate of dental caries with parents' education and occupation. No statistically significant relationships were found between DMFT with regard to gender. In our study, there is also no significant difference between dmft and DMFT indices with gender in elementary school students ($p>0.05$) but there is a significant differences between DMFT index with father's occupation and education ($p<0.05$).

The number of visits to the dentist is not associated with an increase in the DMFT, possibly because of the way in which the mean was calculated between the beginning and the end of the study (Smyth and Caamano, 2005). In this study, it has been observed a significant association between dmft and DMFT with visiting a dentist. The parents must take a lead in this regard, as they should accept responsibility for the oral hygiene status of the children. The caries situation in children is compatible with the fact that young children with their habit of consuming sweet and sugary articles are more prone to develop dental caries. Thus parents should not wait for pains occur before they consult the dentist, but should go for regular dental check-ups, which may prevent any painful experience in future.

Calculus is formed by the deposition of mineral salts in plaque. It is hard and firmly adherent to the tooth surfaces on which it forms and it cannot be removed by brushing. Calculus acts as a focal point for plaque accumulation, a nidus of bacteria and hinders complete removal of plaque (Beemsterboer, 2006). Frequency of calculus in studied students was 7 (1.5%) and 403 (98.5%) of students had a healthy gums.

In the present study findings for dmft and DMFT scores in 6-12 year old elementary school children are lesser than global standards according to the World Health Organization (WHO) references for the year 2000

(FDI, 1982). There was an association between brushing, visit to the dentist, parent's occupation and education and dental caries. This subject suggests health education programs and suitable treatments should be emphasized in elementary school aged children.

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