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Survey on the Condition of First Permanent Molars in 15-year-old Students in Ahwaz, Iran in 2005

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Abstract

Background and aims. Many children still face active and uncontrolled dental caries and data is needed for evaluating the situation in many parts of the country. The aim of the present survey was to evaluate the oral health of the young population of Ahwaz, Iran in 2005.

Materials and methods. In this descriptive cross-sectional study, 600 15-year-old students were selected randomly. Data was gathered with clinical examination and a questionnaire, collecting data of DMFT of first permanent molars, OHI-S, oral hygiene and nutrition habits, and parents' education. Statistical analysis was performed by descriptive statistics and *t*-test.

Results. Mean DMFT of first permanent molars was 1.84 ± 1.54, with a higher value seen among girls. Mean decayed teeth component was 1.56, followed by filled (0.17) and missing (0.1) components. Higher DMFT values were significantly associated with poor OHI-S score (P = 0.001).

Conclusion. The observed oral hygiene status among the 15-year-olds necessitates implementing preventive as well as restorative measures to improve the oral health status of the young population.

Key words: **DMFT, first permanent molar, OHI-S**.

Introduction

The first permanent molar is undoubtedly considered the most important oral masticatory unit playing a fundamental role in favorable occlusion evolution, and due to its wide occlusal surface, it is more effective in chewing food than any other teeth.[1,2] This tooth is a cardinal factor in eruption of other permanent teeth in a favorable position and development of a suitable occlusion,[3-5] as well as coordinating horizontal, anterior-posterior and transversal growth of both jaws, facial growth, and facial height.[6]

There are pits, fissures and anatomic depressions on first permanent molars which result in accumulation of microbial plaque. The existence of microbial plaque within susceptible surface enjoying enough time and diet carbohydrate leads to dental caries. According to Pindbourg, dental decay is a contagious infectious disease beginning with microbial activity on teeth surface and advancing into texture.[7] Since first permanent molar is the first permanent tooth appearing in the child's mouth, parents often neglect its importance, considering it a primary insignificant tooth. Other factors such as fear of dental treatment, consumed time, and involved costs keep the child and their parents away from seeking dental treatment, which result in further deterioration and ultimate loss of tooth leading to further tooth/jaw related problems.[8] Waterman & Knutson[9] believed that first permanent molars especially lower molars among the other teeth are most susceptible to caries. Salzmann[10] was the first to prove malocclusion and dental caries increase with extraction of one or more teeth. Hunter et al[11] reported that extraction of first permanent molar doubled probable orthodontic treatment and diminished treatment prognosis up to 50%.

In a research conducted on 15-year-old Latvians, dental decay and gingival disease due to poor oral hygiene was so prevalent that emphasized high treatment needs.[12] The aim of the present study was to determine decayed, missing, and filled teeth (DMFT) index of the first permanent molars and simplified oral hygiene index (OHI-S) of 15-year-old students of Ahwaz, Iran in 2005.

Materials and Methods

This was a cross-sectional descriptive study and the applied method was observation and interview. Study sample included 600 15-year-old boys and girls selected randomly from schools in four regions of Ahwaz, South West Iran. The age group of 15 years old is one of the batches suggested by World Health Organization (WHO) for the evaluation of DMF, oral hygiene prevalence and gingival index.[13] Study samples were examined clinically with a dental mirror and an explorer under artificial light and a questionnaire was filled for each participant. The studied students were given oral hygiene instructions and introduced to a clinic to receive dental treatments, if necessary. The evaluated variables included gender, parents' educational level, DMFT, OHI-S, frequency of tooth brushing, fluoride uptake, frequency of dental visits, and nutrition habits.
The simplified oral hygiene index (OHI-S) is a common index for epidemiological studies, in which only six surfaces are scored, four from posterior and two from anterior teeth. The scoring can be done fairly rapidly and consistently, thereby, giving consistent and reliable results in survey of large population. This index is highly reproducible and easy.[14] In this study, surfaces of teeth 16, 11, 26, 36, 31, and 46 were examined and OHI-S scores 0-1.2 were considered to indicated good, 1.3-3.0 moderate, and 3.1-6.0 poor oral health status.
To measure students' nutrition habits, a chart was filled, in which frequency of sweet, fruit, dairy and nuts consumption within past 24 hours was recorded.

Data were analyzed with descriptive statistics and *t*-test using SPSS 13.0 computer software. In this study, P value < 0.05 was considered statistically significant.

Results

A total of 339 boys and 261 girls (mean age, 15 ± 0.5) were evaluated in the present study. Decayed, missing, and filled components of DMFT score for first permanent molars according to gender and tooth number are presented in Tables 1 & 2. DMFT and gender were significantly associated (P = 0.001, *t*-test). Higher DMFT values were related with lower level of parents' education. Association of DMFT with frequency of tooth brushing was statistically significant (CI = 95% using *t*-test, P = 0). Association of DMFT with frequency of dental visits was also statistically significant (P = 0). It was found that pain and filling of decayed teeth were the most common reasons for dental visits. Association of DMFT with routine fluoride therapy (P = 0.603) and use of fluoride mouth wash (P = 0.964) did not show statistical significance. DMFT score of the

Table 1. Decayed, missing, and filled components of DMFT score for first permanent molars of the studied 15-year-old sample according to gender (n = 600)

	DMFT		Decayed		Missing		Filled	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
girl	1. 90	1.51	1.61	1.42	0.10	0.34	0.18	0.57
Boy	1.79	1.58	1.52	1.48	0.10	0.31	0.16	0.49
Total	1.84	1.54	1.56	1.45	0.10	0.32	0.17	0.53

SD: Standard deviation.

Table 2. Number (%) of decayed, missing, and filled components of DMFT score in the studied first permanent molars according to tooth number (n = 600)

Teeth	Right upper molar (16)	Left upper molar (26)	P-value*	Left lower molar (36)	Right lower molar (46)	P-value*	P-value**
Sound	422 (70.3)	418 (69.7)	P*=0.708	232 (38.7)	242 (40.3)	P=0.245	P=0.046
Decayed	149 (24.8)	160 (26.7)	P=0.215	314 (52.3)	299 (49.9)	P=0.168	P=0.037
Filled	22 (3.7)	16 (2.7)	P=0.21	34(5.7)	36 (6)	P=0.845	P=0.024
Missing	7 (1.2)	6 (1)	P=0.100	20 (3.3)	23 (3.8)	P=0.735	P=0.001

* Comparison of left and right sides; *t*-test.
** Comparison of four permanent first molars; *t*-test.

Table 3. DMFT score of the studied first permanent molars according to the snacks consumed

	Nuts		Milk		Fruit		Sugar	
DMFT	**number**	**mean**	**number**	**mean**	**number**	**mean**	**number**	**mean**
0	299	1.80	42	1.83	13	1.92	98	1.72
1	240	1.79	246	1.86	190	1.88	279	1.77
2	43	2.23	189	1.81	214	1.78	123	1.84
3	15	1.93	105	1.83	138	1.70	80	2.27
>3	3	1.66	18	1.5	45	1.2	20	2.3
P-value	P = 0.345		P = 0.743		P = 0.864		P = 0.043	

studied population according to the snacks consumed is presented in Table 3.

Oral health status in girls (mean OHI-S score, 1.067 ± 0.976) was better than boys (mean OHI-S score, 1.479 ± 1.090). Mean DMFT of first permanent molars according to the OHI-S score of the corresponding sample is shown in Table 4.

Discussion

The present study was conducted with the aim of evaluating the condition of first permanent molars in 15-year-old students of Ahwaz. Some of the predisposing factors of the dental caries included in the assessment of OHI-S, as well as habits like sugar consumption were also determined.

In the present study, mean DMFT of first permanent molars was 1.84 ± 1.54 (1.79 ± 1.58 in boys, 1.90 ± 1.51 in girls) and no significant differences were seen among the four evaluated regions of the city. In one study carried out in Mashhad, North East Iran in 2000, this amount was reported to be 2.3.[15] Mean decayed component (D) in first permanent molars was 1.52 in boys (38.17% of mean DMFT of boys) and 1.61 in girls (41.46% of mean DMFT of girls) (Table 1). In the study of DMFT in Mashhad,[15] D component made up 39.4% and 35.7% of mean DMFT in males and females, respectively. These figures exceed the goals of WHO for the year 2010, in which dental caries of permanent teeth in teenagers must be 15%.[13] The average loss of first permanent molars (M) was 0.1 in boys (2.12% of mean DMFT of boys) and 0.1 in girls (2.62% of mean DMFT of girls) (Table 1). In Mashhad,[15] this amount was reported 4.12% in males and 2.8% in females, which is more than of that of our study. The increased awareness of oral hygiene among individuals over time as well as differences in diet and oral hygiene habits may be reasons for the lower amount of tooth loss in the evaluated samples of the present study. Mean filled component (F) in first permanent molars was 0.16 in boys (3.92% of mean DMFT of boys) and 0.18 in girls (4.51% of mean DMFT of girls) (Table 1); the corresponding figures in Mashhad[15] were 14.6% and 17.6% for males and females, respectively. Filled teeth in first permanent molars was reported to be 16.1% (both genders collectively) in Mashhad,[15] which is higher than that of our study in Ahwaz (4.2%). The difference in amount of filled teeth between two cities could be explained by a variety of reasons such as more dental facilities and better economical status of the population in Mashhad.

Table 4. Mean DMFT of first permanent molars in the studied 15-year-olds according to OHI-S score

OHI-S	Cases	Mean DMFT	SD
Good	257 (42.9 %)	1.46	1.50
Moderate	318 (53%)	2.05	1.58
Poor	25 (4.1%)	3.16	1.26
Total	600 (100%)	1.84	1.55

OHI-S scores 0-1.2 indicating good, 1.3-3.0 moderate, and 3.1-6.0 poor oral health status.
t-test; P = 0.001

Analyzing first permanent molars according to side and arch, it was found that decayed and missing components of DMFT were significantly higher on the left side and the lower arch (Table 2). The higher amount of caries in the lower first permanent molars could be due to their depth, direction and special form of occlusal pits and fissures compared to their upper counterparts, more plaque retention as a result of gravity, and a broader masticatory area.

In this study, only 47 students out of 600 (7.8%) had regular dental checkups. This is far from the aim of WHO for the year 2010 "number of pediatrics and adults that benefit from annual oral hygiene service should increase to 70%."[13] Reasons for not attending routine dental checkups and recalls may be a

lack of awareness of preventive measures for teeth among parents, no insurance coverage for preventive treatments, and poor financial status.

In current study, 67.2% of samples brushed their teeth daily, whilst according to WHO goals in 2010, the number of daily fluoride tooth brushers should approach 95%.[13]

Regarding the nutritional habits, the consumption of nuts, milk, and fruits did not affect DMFT significantly; however, the frequency of sugar consumption, evaluated over a 24-hour period, was significantly associated with high DMFT values (P = 0.043, Table 3). Morita et al[16] found the factors associated with the maintenance of a sufficient number of functioning teeth to be not having a mother with a preference for sweet food, not having a preference for sweet food themselves and not smoking over a long period.

Although DMFT of first permanent molars was not significantly associated with parents' level of education in the present study, there was a decrease in DMFT score as the level of education of parents increased. Kinnby et al[17] also showed that the level of education did not influence the knowledge as such but rather the ability to put the knowledge into practice and suggested that it is essential to make people aware of the information's importance rather than merely teaching facts. Susin et al[18] demonstrated that tooth loss increased sharply with age and was significantly associated with low socioeconomic status among young population.

According to the results of the present study, 34.8% of boys and 51.1% of girls had good oral hygiene, 57.8% of boys and 48.1% of girls had medium, and 7.4% of boys and 0.8% of girls had poor oral hygiene. In Mashhad,[15] oral health status of students was 19.4% good, 58% medium and 22.6% poor.

The association of DMFT with OHI-S in the students was significant (P = 0.001, Table 4). This emphasizes that oral hygiene plays an evident role in the occurrence of dental caries among other multiple factors.

The high DMFT score of the first permanent molars among the 15-year-olds in the present study warrants regular checkups and preventive treatments such as fissure sealant therapy soon after eruption. Delivering oral health instructions as well as emphasizing on the importance of oral health to the children and their parents is recommended in order to promote the oral and dental health of the population.

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