



Dental Health Status of Junior High Schools Students; Golpaygan City, Iran

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ABSTRACT

Aims Decayed, Missing and Filled Teeth (DMFT) index plays a key role in health care decision-making. According to WHO guideline, DMFT should not be more than 1 in 12-year old children. The role of fluoride intake in tooth and bone health is also well known. This study was carried out to investigate the DMFT index in junior high school students of Golpaygan City, Iran, and its relation the Fluoride concentration of drinking water.

Instrument & Methods This descriptive cross-sectional study was carried out in all 530 junior high school students of Golpaygan City, Iran, during 2010-11. The DMFT index was determined by educated and trained mouth and teeth health experts. The Fluoride concentration was measured by SPADNS method from 4 different places in 2 different times, May and June (4 samples each). Data were analyzed by statistical descriptive methods and one-way ANOVA test.

Findings DMFT was 3.07 ± 2.34 in boys and 3.28 ± 2.56 in girls ($p=0.34$). There were no significant differences between boys and girls in the averages of decayed ($p=0.95$), missing ($p=0.89$) and filled ($p=0.13$) teeth. There was a significant difference in the DMFT value of the different age groups. There was also a significant difference between the DMFT values according to mothers' level of education. The average of Fluoride concentration in water samples of 4 different places of the region in 2 period of times was 0.33 ± 0.09 mg/l.

Conclusion DMFT index in the students of Golpaygan City, Iran, is more than WHO standards.

Keywords Fluoride; DMF index; Drinking Water; Dental Health Services

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Introduction

Mouth and teeth diseases are among the most senior, widespread and costly chronic diseases which are very important from the standpoint of health, economics and suitable appearance. Various reports from unrelated regions of Iran showed that in this case, there is not a desirable status in the country [1]. DMFT and dmft are the most important and current worldwide epidemiological indices for teeth health and decay reports [1]. Total number of decayed (D), missing (M) and filled (F) for permanent teeth is known as DMFT and dmft is used for deciduous teeth. These indexes have an important role in policy and health decision-making [1].

Since mouth and teeth health are affected by different factors such as good public nutrition, healthy and safe environment and drinking water quality, good Knowledge, attitude and practice in personal health, the mouth and teeth health indexes are good representative of health and socio-economical characteristics of a society [2]. According to World Health Organization (WHO) guideline, the DMFT should be less than 1 in 12-year old children [3].

The first research was carried out on 12-year old Iranian children in 1995 and showed that DMFT index value was 2.02 [3]. Iran was ranked in the medium range (DMFT=1.2-1.6) of mouth and teeth health in the world [4]. Research on 6- to 12-year old students in Saravan City, Iran showed that dmft was 2.86 ± 2.51 and DMFT was 0.37 ± 0.76 [5]. Another research on 8- and 9-year old students in Saveh City, Iran, have shown that the mean of DMFT and dmft were 0.83 ± 1.36 and 3.76 ± 2.63 , respectively [2] and the dmft in Saveh is more than WHO guideline (3.5 ± 3.4). The DMFT in Ramian City, Iran, students has been reported higher than the reported DMFT of other parts of Iran [3]. Some studies have shown that permanent teeth decay prevalence in women is more than men while deciduous teeth decay in boys is more than girls [6]. An explanation for this issue is that deciduous teeth in the boys appear earlier than girls; so, their contact duration with environment is longer than the others [6].

Tooth number 6 is one of the first teeth that usually appear in the age about 6. In every 5 Iranian children, there is at least 1 decayed

permanent teeth number 6. As the age increase to 9, there is less than 1 decayed grinder-tooth in everybody while in 12-year old cases, it is somewhat more [7].

The level of Fluoride and sugar intake, mouth and teeth health and socio-economic status are the most effective factors in dental decay prevalence [8]. Nowadays, the role of Fluoride concentration in drinking water in tooth and bone health is well known [3]. The permissible daily intake of Fluoride varies with meteorological status [8]. Fluoride is one of the components of drinking water, which is effective in the standard level to prevent dental decay and in more than standard level can lead to dental mottling and in the more progressed circumstances teeth missing [8].

Fluoride may naturally be in drinking water or added to it, in water treatment process; however, the standard concentration of Fluoride is suitable for dental decay prevention. Fluoride may be found in different values in the water and soil and it is more in ground water than other water sources [8-10]. As the main way of maximum systematic Fluoride intake is drinking water, so its fluoridation has been recommended by WHO as the best way of Fluoride intake [9]. Desirable level of Fluoride concentration in drinking water is generally about 0.7-1.5mg/l, and the low and high concentrations result in evil effects on consumer's health [1, 8].

As Iran has a young population, a comprehensive planning to prevent mouth and teeth diseases is necessary. The first step is to provide the fundamental indices. Hence, this study was carried out to investigate the DMFT index in junior high school students of Golpaygan City, Iran, and its relation the Fluoride concentration of drinking water.

Instrument & Methods

This descriptive cross-sectional study was carried out in all the junior high school students of Golpaygan City, Iran, during 2010-11. The DMFT index was determined along with the Fluoride concentration in drinking water sources. All 530 sample students were inspected for decayed, missing and filled teeth by educated and trained mouth and teeth health experts. Personal and life style data were collected by the Iranian standard questionnaire list which has had been used by

Iran Ministry of Health and Medical Education in its annual report in 1997 [7].

The Fluoride concentration in drinking water sources was measured in the Spring, 2011. 32 water samples were collected according to the quantitative sampling volume formula [9]. The confidence limit, accuracy and standard deviation were selected 95%, 0.1 and 0.17, respectively. The average of maximum daily weather temperature for five years to the research period was taken from the regional meteorological administration. The minimum, approved and maximum Fluoride concentration were obtained from the water quality standard publication of Iran according to the average temperature [11]. The Fluoride concentration was measured by SPADNS method according to the 21st edition of the Standard Methods Book for Examination of Water and Wastewater [12] from 4 different places in 2 different times, May and June (4 samples each).

Data were analyzed by statistical descriptive methods and one-way ANOVA test.

Findings

286 of junior high school students of Golpaygan City, Iran (54.0%) were girls and 244 (46.0%) were boys. The students were in the range of 12-17 years old with the mean of 13.73 ± 1.09 years.

DMFT was 3.07 ± 2.34 in boys and 3.28 ± 2.56 in girls ($p=0.34$). There were no significant differences between boys and girls in the averages of decayed ($p=0.95$), missing ($p=0.89$) and filled ($p=0.13$) teeth.

There was a significant difference in the DMFT value of the different age groups. There was also a significant difference between the DMFT values according to mothers' level of education. However, there was not a significant difference between DMFT and fathers' level of education (Figure 1).

A significant relation was seen between DMFT and fathers' job ($p=0.005$) and mothers' job ($p=0.02$). There was a significant relation between DMFT value and DMF value of tooth number 6 ($p<0.001$), number of family members ($p=0.03$) and use of tooth string ($p=0.009$). No significant relations were observed between DMFT value and fish intake, tea eating, times of sugar consumption, tooth brushing and usage of mouthwash ($p>0.05$).

Figure 1 DMFT values among the junior high school students in Golpaygan City, Iran, in 2010-11 according to age and their parents level of education

Parameter	DMFT	p Value
Age (years)		
12	2.98±2.58	0.001
13	2.71±2.16	
14	3.29±2.42	
15	3.33±2.35	
16	5.22±3.73	
17	6.50±0.70	
Mothers' level of education		
Middlebrow (n=142; 28%)	3.83±2.46	0.002
Under diploma (n=161; 30%)	3.14±2.34	
Diploma (n=166; 31%)	2.81±2.38	
Bachelor or further (n=58; 11%)	2.79±2.74	
Fathers' level of education		
Middlebrow (n=112; 21%)	3.66±2.25	0.08
Under diploma (n=128; 24%)	3.25±2.25	
Diploma (n=224; 42%)	3.01±2.55	
Bachelor or further (n=65; 12.3%)	2.84±2.97	

The average of Fluoride concentration in water samples of 4 different places of the region in 2 periods of times was 0.33 ± 0.09 mg/l; 0.45 ± 0.04 mg/l in May and 0.24 ± 0.07 mg/l in June (Figure 2).

Figure 2 Mean of Fluoride level (mg/l) in drinking water resources in Golpaygan City, Iran, in May and June 2011 (Number in parentheses are number of collected samples)

Water source	May	June
Alvand Town (4 each)	0.46±0.05	0.34±0.04
Charsaddasgah (4 each)	0.45±0.08	0.29±0.06
Pistonsazi (4 each)	0.51±0.02	0.29±0.04
Rekabdar (4 each)	0.45±0.04	0.33±0.09
Total (16 each)	0.45±0.04	0.34±0.07

Discussion

DMFT index among 12-year old junior high school students in Golpaygan City, Iran, was 2.98 ± 2.58 , which is more than WHO goal for 2010 (less than 1 for 12year old children). Our findings were more than the average value, which has been stated for Iran [3]. Additionally, some cultural and economic problems and healthy customs and practices might have effect on high DMFT in the junior high school students in Golpaygan City, Iran.

The index for all the students (in the range of 12-17 years old) was calculated 3.28 ± 2.54 in girls and 3.07 ± 2.34 in boys and difference between boys and girls was not statistically significant ($p=0.34$). The mean of decayed permanent teeth was 2.54 ± 2.10 in boys and 2.55 ± 2.27 in girls; means that about 80% of the students in Golpaygan City, Iran, need dental restoration. This finding is in

agreement with some reports [13-15] but is not compatible with Bazrafshan *et al.* that have reported DMFT values as 2.68 ± 2.15 in boys and 2.13 ± 1.91 in girls [16].

Mean of DMFT was increased from 2.71 ± 2.16 in 13-year old to 6.50 ± 0.70 in 17-year old students. This finding is a serious warning to health authorities. DMFT value was decreased from 2.98 ± 2.58 in 12-year old to 2.71 ± 2.16 in 13-year old students that may be due to more initial attentions by parents.

The observed significant correlation between DMFT and mothers level of education ($p < 0.002$) is in agreement with Ashtiani *et al.* in Saveh City, Iran [2], and absence of significant relationship between DMFT and fathers level of education ($p = 0.08$) suggests that the mothers role in family health is more than fathers.

A major relation was obtained between DMFT and the number of family members ($p = 0.009$). This finding may be due to low per capita income and less attention in crowded families. This is compatible with findings of Morowati-Sharifabad *et al.*, on demand for dental care in Household Mothers in Yazd, Iran [16].

The relation between low DMFT and use of tooth string was significant ($p = 0.009$) but there was not such a relation to tooth brushing. It may be due to bad performance of tooth brushing. Especially 45.5% of the students said that they had brushed their teeth once a day and 57% had not done it after eating immediately. While in industrialized nations, availability and affordability of modern oral health care has a key role on decrease the DMFT index [17].

The minimum, approved and maximum fluoride concentration based on climate condition of the city are 0.8, 0.9 and 1.2mg/l, respectively [11]. The fluoride concentration in Golpaygan City, Iran, drinking water sources was less than the Iranian standard value (0.33 ± 0.09 mg/l). According to this finding, it seems that the average of fluoride concentration in the city water resources was not enough for dental decay prevention and the high rate of dental decay can be related to low concentration of fluoride in the drinking water in this city. This is compatible with many reports in Iran and according to many reports fluoridation of drinking water is an excellent technique to prevent dental decay [16-25].

Fluoridation of drinking water in Golpaygan City, Iran, is recommended and more attentions should be taken place on mouth and teeth health in this city. Also, more public education for improvement of knowledge, attitude and practices about dental care is needed. Fluoridation of drinking water in Golpaygan City, Iran, is recommended and more attentions should be taken place on mouth and teeth health in this city.

Conclusion

DMFT index in the students of Golpaygan City, Iran, is more than WHO standards. Cultural and economic status and people lifestyle are important factors in determination of DMFT.

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References

- 1- Azami-Aghdash S, Ghojazadeh M, Pournaghi Azar F, Naghavi-Behzad M, Mahmoudi M, Jamali Z. Fluoride concentration of drinking waters and prevalence of fluorosis in Iran: A systematic review. *J Dent Res Dent Clin Dent Prospects*. 2013;7(1):1-7.
- 2- Mohammad-Nejad E, Shariat E, Begiani J, Abotalebi Gh. Evaluation of oral health in primary school children in Saveh, Iran. *Sci J Gogran Nurs Midwif Sch*. 2011;8(1):74-80. [Persian]
- 3- Fallah SH, Molana Z, Mir-arab Razi MR. Fluoride measurement in drinking water and DMFT index in Ramian city Students. 12th National Conference of Environmental Health. Tehran: Shahid Beheshti University of Medical Sciences; 2009. Available from: http://www.civilica.com/Paper-NCEH12-NCEH12_237.html
- 4- Pakshir HR. Oral health in Iran. *Int Dent J*. 2004;54(6 Suppl 1):367-72.
- 5- Reshadmanesh N, Arshiaii S, Hoseyni Z, Rahimi Sh. Nitrate and fluoride in drinking water of villages in Sanandaj county (Iran) in 2005. 10th National Conference of Environmental Health. Hamedan: Hamedan University of Medical Sciences; 2007.

- Available from: http://www.civilica.com/Paper-NCEH10-NCEH10_016.html
- 6- Nasehinia HR, Naseri S. A survey of fluoride dosage in drinking water and DMF index in Damghan city. *J Water wastewater.* 2004;15(1):70-2. [Persian]
 - 7- Annual report of Iran Ministry of Health, Care and Medical Education, Deputy for Health. A perspective of mouth and tooth health of Iranian children. Tehran: Iran Ministry of Health, Care and Medical Education Publication; 1997.
 - 8- Shahid M, Sobia A, Al-Misned F, Ahmed Z, Sultana S. Determination of fluoride concentration in underground water from different urban areas of Faisalabad city. *Life Sci J.* 2013;10(10s):60-70.
 - 9- Norisepehr M. Guidelines for drinking water quality. 1st edition. Tehran: Hayyan Publication; 1993. pp. 90-3. [Persian]
 - 10- Forozani M. Fundamental of nutrition. 5th edition. Tehran: Kalhor; 1986. pp. 296-8. [Persian]
 - 11- Iran management and planning organization, Iran ministry of energy. Water quality standards. Publication No: 116-3; 1991. Available from: <http://goo.gl/JYc8kw>
 - 12- Greenberg AE, Clesceri LS, Eaton AD. Standard methods for the examination of water and wastewat. 21st edition. Washington DC: APHA, AWWA, WPCF; 2005. pp. 1-70.
 - 13- Rahmani K, Rahmani A, Rahmani H, Mahvi AH, Yousefi M, Goadini K. Effects of fluoride on child dental carries in Noorabad Mamasani town in 2008. *Sci J Ilam Univ Med Sci.* 2011;19(4s):12-9. [Persian]
 - 14- Ramezani GH, Valaei N, Eikani H. Prevalence of DMFT and fluorosis in the students of Dayer city (Iran). *J Indian Soc Pedod Prev Dent.* 2004; 22(2):49-53.
 - 15- Daneshkazemi AR, Davari A. Assessment of DMFT and enamel hypoplasia among junior high school children in Iran. *J Contemp Dent Pract.* 2005;6(4):85-92.
 - 16- Morowatisharifabad MA, Shirazi KK. Determinants of oral health behaviors among preuniversity (12th-grade) students in Yazd (Iran): an application of the health promotion model. *Fam Community Health.* 2007;30(4):342-50.
 - 17- Løe H. Oral hygiene in the prevention of caries and periodontal disease. *Int Dent J.* 2000;50(3):129-39.
 - 18- Bazrafshan E, Kamani H, Kord Mostafapour F, Mahvi AH. Determination of the decayed, missing, filled teeth Index in Iranian students: A case study of Zahedan city. *J Health Scope.* 2012;1(2):84-8.
 - 19- Cortes DF, Ellwood RP, O'Mullane DM, Bastos JR. Drinking water fluoride Levels, dental fluorosis and caries experience in Brazil. *J Public Health Dent.* 1996;56(4):226-8.
 - 20- Downer MC. The 1993 national survey of children's dental health: a commentary on the preliminary report. *Br Dent J.* 1994;176(6):209-14.
 - 21- Treasure ET, Dever JG. Relationship of caries with socioeconomic status in 14-year-old children from communities with different fluoride histories. *Community Dent Oral Epidemiol.* 1994;22(4):226-30.
 - 22- Sterritt GR, Frew RA, Rozier RG. Evaluation of Guamanian dental caries preventive programs after 13 years. *J Public Health Dent.* 1994;54(3):153-9.
 - 23- Tubert-Jeannin S, Lardon JP, Pham E, Martin JL. Factors affecting caries experience in French adolescents. *Community Dent Oral Epidemiol.* 1994;22(1):30-5.
 - 24- Evans RW, Lo EC. Effects of School Dental Care Service in Hong Kong--primary teeth. *Community Dent Oral Epidemiol.* 1992;20(4):193-5.
 - 25- Cochrane N, Poureslami H. Necessity of water fluoridation in Iran: A review on water fluoridation and prevention of dental caries. *J Oral Health Oral Epidemiol.* 2014; 3(1):1-7.