Research Article

DMFT index among 12-year students in 2013: a report in Kermanshah city, Iran

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Abstract: Dental caries is one of the commonest oral diseases in children and DMFT index is the most important quantitative factor for measuring tooth health. The aim of this study was to evaluate the prevalence of caries-free children using DMFT and significant caries (SiC) indexes in students of the West of Iran. In a cross-sectional and descriptive study in 2013, 402 students of 12-year-old from six Junior (guidance) schools. The studied students had no milk tooth and systemic disease and also in the last three months did not take a certain drug on an ongoing basis. The diagnosis of dental caries was done based on the guidelines of WHO for dental caries in 12-year-old. Out of 402 students, 210 (52.2%) were boys and 192 (47.8%) were girls. The mean DMFT was 1.91, DT 1.64, MT 1.91 and FT 0.25. The mean SiC index was 3.9 and the percentage of caries free was 28.6%. Mandibular Molar I teeth had the most decay (51%) following by maxillary Molar I(23.4%) and mandibular Molar II (12.4%). In conclusion, the border areas of Iran had more dental carries compared with central areas that Iran's Ministry of Health should increase its attention to these areas via oral health education and full control of drinking water and also improve diet and public awareness via school health professionals and public media.

Keywords: DMFT, Caries free, SiC index, Western Iran

INTRODUCTION

Unfortunately, 60-90% of students (school-age children) in developing nations suffer from dental diseases, which is remarkably increasing [1]. Dental caries is one of the commonest oral diseases in children and Decayed, Missing and Filled Teeth (DMFT) index is the most important quantitative factor for measuring tooth health [2,3]. Dental caries is still a social problem in many countries. Through epidemiological studies conducted in index groups among children and adults, it is possible to monitor its progress and take appropriate action [4]. In 1981, the World Health Organization (WHO) set the oral health objectives for 2000 which were very detailed in relation to 12-year-olds. They recommended lowering the intensity of the caries DMFT index to 3 [5]. By increasing a variety of health actions, the National Health Program for 2007 to 2015 [6,7] planned to reduce to 2 the mean value of DMFT in 12-year-old children, and to decrease, in comparison to 2003, the differences in caries intensity occurring between provinces and communities of residence. Moreover, in this group a significant caries index should not exceed 4. The DMFT index divided

according to a severity scale. This scale indicates very low prevalence when the DMFT is between 0 to1.1; low prevalence between 1.2 to 2.6; moderate prevalence between 2.7 to 4.4; high prevalence between 4.5 to 6.5; and very high prevalence when the DMFT≥6.6 [8,9]. The aim of this study was to evaluate the prevalence of caries-free children using DMFT and significant caries (SiC) indexes in students of the West of Iran.

MATERIALS AND METHODS

In a cross-sectional and descriptive study in 2013, 402 students of 12-year-old from six Junior (guidance) schools in Kermanshah city entered into our study. The study was approved by the Ethic Committee of Kermanshah University of Medical Sciences, Kermanshah, Iran, (Project code:27). The students randomly and based on the method of cluster and systematic sampling were selected. The status of students' teeth (caries, filling and crown) with the method of face to face and using of disposable mirror and disposable explorer in a room with adequate light were done. The studied students had no milk tooth and systemic disease and also in the last three months did

not take a certain drug on an ongoing basis. The diagnosis of dental caries was done based on the guidelines of WHO for dental caries in 12-year-old [10,11].

RESULTS

Out of 402 students, 210 (52.2%) were boys and 192 (47.8%) were girls that 287 students (71.4%) had dental caries. Table 1 shows the results of the mean DMFT, decayed teeth (DT), missing teeth (MT) and filled teeth (FT) based on sex in all students. The mean of DMFT, DT, MT and FT was more in girls than it in boys. The mean DMFT was 1.91 (1.67 boys and 2.17 girls), DT was 1.64 (1.52 boy and 1.77 girls), MT was 1.91 (1.67 boys and 2.17 girls) and FT was 0.25 (0.14 boys and 0.38 girls).

The SiC index and caries free have been shown in Figure 1 and Figure 2, respectively. The mean SiC index was 3.9 (girls(4.2) that was higher than boys (3.6)), but the percentage of caries free (DMFT=0) was 28.6% (in boys was more than girls (33.3% versus 23.4%)).

Table 2 shows the percentage of dental caries. Mandibular Molar I teeth had the most decay (51%) following by maxillary Molar I(23.4%) and mandibular Molar II (12.4%).

Table 1: The mean of DMFT, DT, MT and FT in all students (n=402)

Variables	Boy	Girl	Total
DMFT	1.67±1.69	2.17±1.87	1.91±1.79
DT	1.52±1.58	1.77±1.66	1.64±1.60
MT	1.67±1.69	2.17±1.87	1.91±1.79
FT	0.14±0.60	0.38±0.99	0.25±0.82

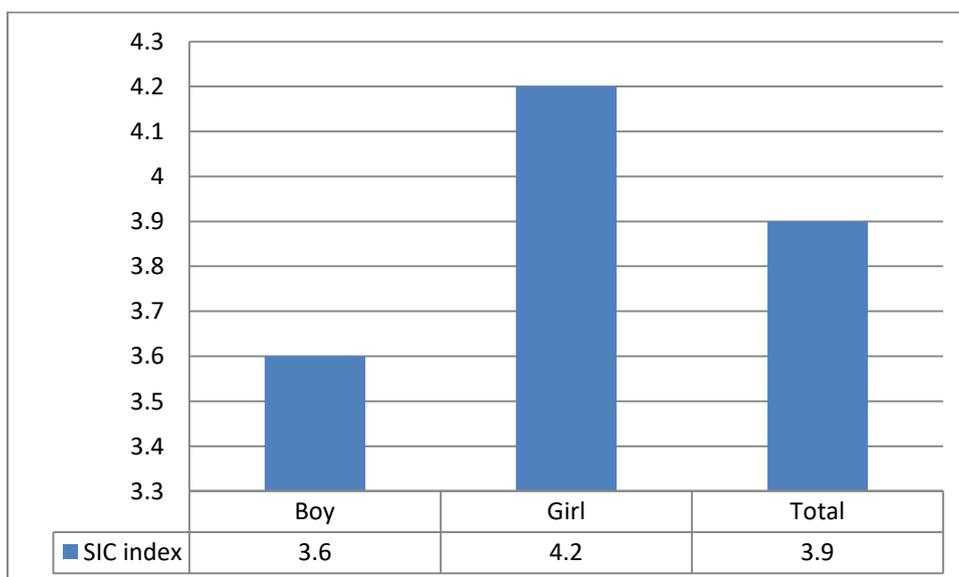**Abbreviations**: D, decayed; M, missing; F, filled; T, teeth
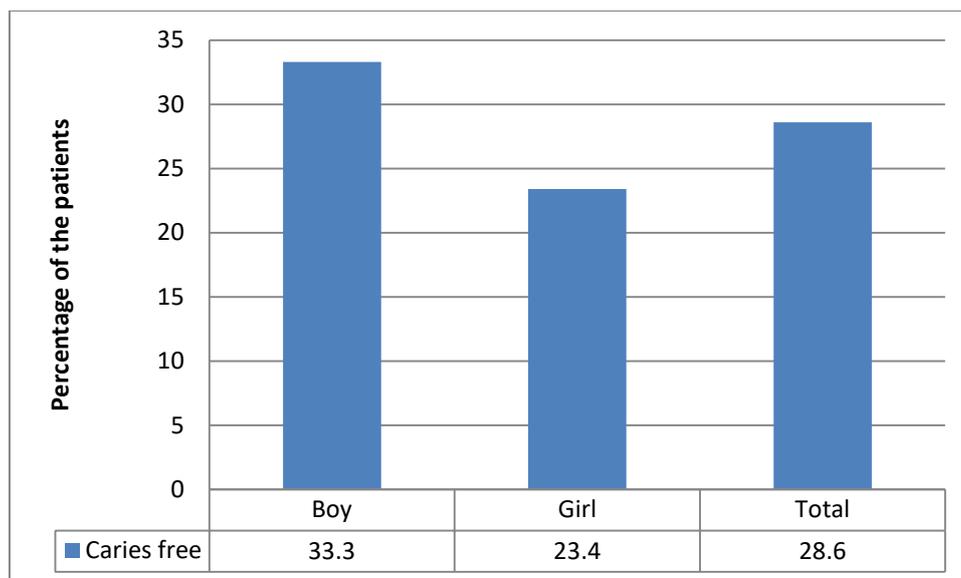

Fig 1: The value of SiC index based on sex

Fig 2: The percentage of caries free based on sex

Table 2: The percentage of dental caries

Tooth	Central	Lateral	Canine	Premolar I	Premolar II	Molar I	Molar II
Maxillary	0.6	1.6	0.2	2.7	1.6	23.4	3.9
Mandibular	0	0	0	0.6	2	51	12.4

DISCUSSION

This study evaluated DMFT, SiC index and caries free in 12-year students in Kermanshah city (Western Iran) in 2013. Ferro *et al.;* [12] evaluated 862 12-year-olds between October 2003 and May 2004 in Italy, among 12-year-olds, mean DMFT was 1.44, SiC=3.88, 55.1% had caries free.

In countries like Germany [13], United Kingdom [14], Switzerland, Uruguay and Mexico [15], the mean DMFT values ranged from 1.2 to 2.5 and the SiC index ranged from 3.2 to 5.3. One study of suburban Nigerian school children (402 consisting of 349 boys and 153 girls) in 2003 [16], showed that the prevalence of caries was 13.9% and the mean DMFT was 0.14. Also, a study in 1995 on 12-year-old in Nigeria reported caries experience of DMFT was 0.7 [17]. One study in Poland in 2003 and 2010 [4], reported that in 2003, the mean value of DMFT was 4.76, and in 2010 it decreased to 3.36 (P<0.0001). One study in Nicaragua [18], showed that 28.6% children had caries free. Caries prevalence in primary teeth in 6-years-old children was 72.6% and 45.0% in permanent teeth in 12-years-old children and the mean DMFT was 0.65 and the SiC at 12 years of age was 4.12. One study in Rafsanjan (Southern Iran) [19], concluded that the mean DMFT score of first permanent molars was 1.9±1.6 and 31.4% (32.9% boys, 29.7% girls) of the students were caries free. Another study in 12-year-old students from two cities of Yazd and Hadi-Shahr (Central Iran) [20], reported that DMFT score was reported to be 1.8±1.75, and 74.73% of the students were found to have caries. Study of Momeni *et al.;* [[21] assessed the prevalence of dental caries and treatment needs of 12-year-old children living in Tehran and a suburb of Isfahan (Central Iran) and reported the mean DMFT score as 0.77 among the study population. A WHO report indicates that the DMFT index in Iran increased from 2.4 in 1974 to 2.6 in 1976, and then to 4.2 in 1977 [22]. Seyedein *et al.;* [23] in a study involving 43772 students of the fifth grade from all provinces of Iran and districts of the country, classified by gender and place of residence, found that the mean DMFT index in 12-year-old students was 1.67 in 1994. The highest prevalence of caries was seen in the first permanent molars. One study out in 2,378 Brazilian 12-year-old children [9], showed that the DMFT ranged from 1.76 to 2.64, SiC index ranged from 4.00 to 6.59 and caries-free percentage ranged from 43.2 to 21.9, showing heterogeneous levels of dental caries. In this study, the mean DMFT index was 1.91, SiC index 3.9 and caries free was at 28.6% students. Therefore, the results showed that the mean DMFT was reducing, movement from the border areas of Iran towards to the Center or Capital of Iran in recent years and dental caries have been reduced compared with past years in all areas. This can result differences in culture and education on the protection of teeth and type of drinking water (adding of fluoride and other useful materials for the protection of teeth) and also malnutrition and none healthy dietary habits that lead to physical and mental growth disorder and cognitive function [24]. The percentage of caries free in this study were lower than standard (50% for 12-year-old children) and similar to other results in recent years and better than past years. Italy had the highest carries free compared with other Countries and Nigeria had the lowest.

David *et al.;* [25] reported that 18% increment of manifest lesions were located in incisors/canines, 40% in premolars, 26% in first molars and 16% in second molars. Premolars had the largest proportion of the approximal surfaces with a manifest caries increment [23]. The percentage of children with DMFT ≥1 was highest in groups with dental fluorosis (TF-score ≥5) in the second molar, followed by the first molar [26]. A cross-section study of 12-19 year-old school children [27], examined premolars and molars teeth that dental caries were detected in 10.8% of the children. Overall, 225 teeth had dental caries, out of which 13.3% were premolars while 86.67% were molars. The first (74.4%) and second molars (16.3%) in this study had the most caries, respectively. Therefore, the results showed that molars teeth had the most caries compared with other teeth.

CONCLUSION

The border areas of Iran had more dental carries compared with central areas that Iran's Ministry of Health should increase its attention to these areas via oral health education and full control of drinking water and also improve diet and public awareness via school health professionals and public media.

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