

## Study on the Statistical Index of Decayed, Missed and Filled Teeth (DMFT) in Secondary School Students of Zarand City in 2011

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### Abstract

**Background:** Knowledge of existing situation in each region plays great role in order to prevent oral and dental diseases in people. Meanwhile, DMFT index is one of the best epidemiological indices in dentistry representing oral hygiene situation in society. So, this study was conducted in order to evaluate DMFT index in 12- years-old students of Zarand City at 2011.

**Methods:** This descriptive study was done cross – sectionally using interview, examination and questionnaire among 12- years- old students of Zarand city. Considering WHO criteria, 350 samples were selected for the study and periodontal condition, number of caries, decayed, missed and filled teeth, existing fluorosis, occlusion, orthodontic and preventive treatment were evaluated. The data were analyzed by SPSS software Version 17.

**Results:** The mean of DMFT index was 2.03 that it was zero at 121 students (34.6%) and maximum of DMFT reported at 11 persons (0.6%). The 34.6% of students were caries free. Results revealed no significant differences in need to orthodontic treatment between different groups of DMFT.

**Conclusion:** Considering WHO criteria, the achieved, DMFT index in Zarand city was not acceptable. According to the aim of WHO for the year of 2015 for 12 years old people (SCI of less than 3DMFT<1), it is necessary to perform special program for the purpose.

**Keywords:** Oral hygiene; DMFT; Tooth caries; Caries free

### Introduction

Tooth decay is a microbial disease of calcified dental tissues and the most common chronic disease related to sugar products which despite the dramatic decline in the past half century in the emphasis on using prevention methods, still exist among a high percentage of population (1).

Bacteria which lead to appearance of dental plaque use sugars found in digested food and drinks in body as the source of their energy. Bacteria constitute plaque acids at this stage that attack surfaces of the teeth when sugary foods are consumed and dissolve them that this process lead to dental caries (Tooth decay).

Development of caries, staining and blackening of involved teeth take place simultaneously. At the next stages, cavities are also created in the surface of tooth (2). The effects of decay due to the lack of proper and timely treatment can be loss of tooth tissue, preventive microorganisms to the pulp which

are followed by pains, uneasiness, and ultimate loss of tooth (3). Also, this can lead to nutritional disorders that because of the impossibility of replacing teeth in low socio-economic groups for economic reasons are considered as a significant problem in this group of society. These decays also lead to other remarkable expenses such as pain, discomfort, and beauty defects which cannot be estimated financially. This disease is probably one of the most expensive infections that individuals are affected to during their life compulsorily (4).

Today, in spite of the development of materials and new techniques that have been utilized in dentistry for replacing the lost tissues in the last hundred years, recovery of the performance of the initiative and natural tissue is not possible as the decayed tooth never returns to its original and natural state, and prevention is the only way to prevent the disease. Understanding the existing situation and context in that region is necessary to prevent oral and dental diseases and to achieve this purpose,

accurate statistical analyses are required to record the current status documentarily (3).

Treatment of dental caries is done based on the development stage. In the early stages of decay progress, preventing plaque acids and also the usage of fluoride can prevent the continuation of decay progress. However, if this process leads to the formation of cavities, removal of the affected dental areas and restoration of lesion are inevitable. In the cases of lesion progress and if restoration of the lesion is not possible, extraction is the only option for treatment (5).

On the other hand, as DMFT index represents oral and dental health status of the individuals in society, it is considered as the best and simplest epidemiological indices used in descriptive and epidemiological studies in dentistry (6).

DMFT index is the number of permanent teeth that have been decayed, and filled or pulled as the result of decay. WHO has emphasized that despite the improvement in oral and dental health of individuals in international community, there are still problems in this area that the most important of which is making the existing experiences applicable in the prevention of diseases specially in developing countries that have not been able to use the existing improvements. The aim of WHO about 12-year-old children in the eastern region of Mediterranean (EMRO) until 2010 is the decrease in the main cycle and motive in the improvement of oral health status, WHO has stressed to follow the experiences of developed countries about the prevention of disease and the decrease in its expenses. For this purpose, WHO has proposed strengthening study capacities of countries and their socio-economic improvements (7).

The global aim about 12-year-old children reaching to significant caries index (SCI),  $DMFT < 3$  until 2015 (8,9). Since the minimum time necessary revealing the changes resulting from oral and dental health programs have been determined for 3 years (10). This study, has examined DMFT index in secondary school students of Zarand city to the recommendations of WHO, hoping that steps can be taken in order to estimate the health needs of individuals.

## Materials and Methods

This research is a descriptive, cross-sectional study. In this study, cluster-classified sampling method was used. The city of Zarand was divided into four regions (class) and two schools from each region (in total 8 schools) and from each school (cluster) about 50 of 12-year-old students were entered into studied. The sample size with regard to the 60 prevalence of decay in previous studies (12-15) and with confidence coefficient of 0.05 was determined. In general, 350 boy secondary school students in Zarand city were examined and information form for each sample was completed. The examinations were done by 3 dentists who were trained in this case. The instruments of the examinations were dentistry mirror and pen light and in suspicious cases the probe was used. Samples were studied according to the status of gum, the number of decayed, missed and amended teeth, the existence of fluorosis in teeth, the status of occlusion, the need for orthodontic treatment and the need for remedial treatments. The prevalence of each of the variables in the society was determined. Also, the relationship between the number of decayed, missed and drawn teeth and malocclusion was investigated. Distribution of fluorosis variables, mucous lesions, mat stains and the need for prosthetic treatment due to the limited number of positive cases were not calculated. In this study, all the statistical analyses were conducted by SPSS software, version 17 and data were examined using chi-square test and descriptive statistics.

## Results

From 350 students under examination, 319 students (90.6%) were reported without periodontal problems, 31 students (8.9%) had calculus and 2 students (0.6%) were reported with bleeding. In total, 9.4% of students had periodontal problems.

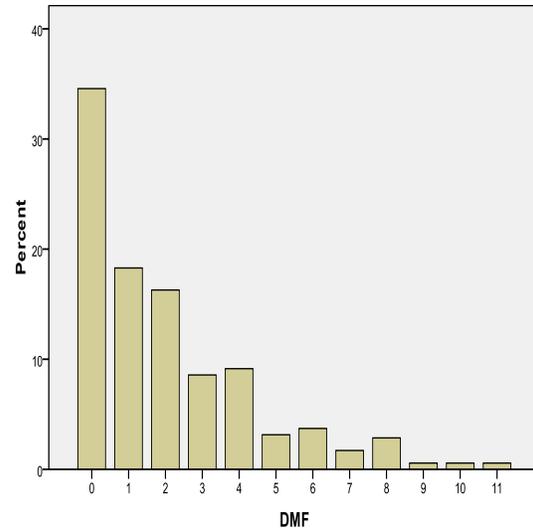
In terms of fluorosis, 346 students (98.9%) were reported normal, 2 students (0.6%) very low, and 1 student (0.3%) mild, and 1 student (0.3%) moderate. The mean of DMFT was 2.03 of which 121 students (34.6%) had zero DMFT, and the maximum of its amount was 11 that were reported in 2 (0.6%)

patients. In order to facilitate statistical analyses, DMFT was divided into three groups and its prevalence among patients was determined that

most patients (%86.9) were in DMFT<4 group (Figure and table 1).

**Table 1:** The average DMFT index in Zarand school students

Grouped DMFT	Total Number	DMFT	Frequency	Percent
0-4	304	0	121	34.6
		1	64	18.3
		2	57	16.3
		3	30	8.6
		4	32	9.1
5-8	40	5	11	3.1
		6	13	3.7
		7	6	1.7
		8	10	2.9
9-12	6	9	2	0.6
		10	2	0.6
		11	2	0.6
Total	350		350	100.0



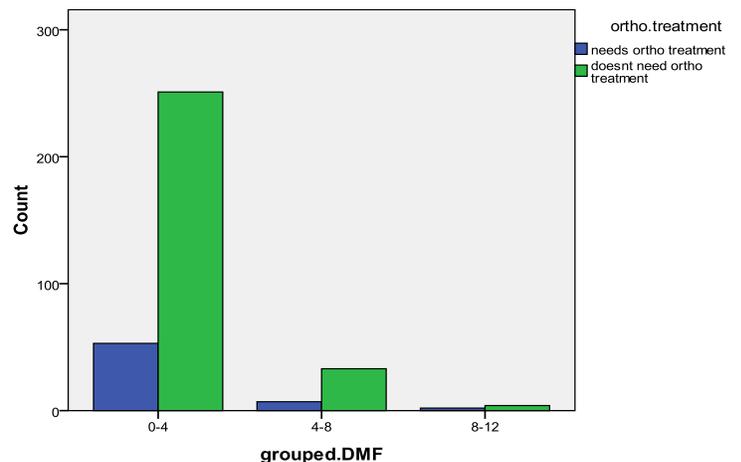
**Figure 1:** The average DMFT index in Zarand school students.

Two hundred forty four patients (%60.7) were without crowding in the anterior part of their jaws, 54 patients (%15.4) in one area and 37 patients (%10.6) in two areas have crowding. In terms of the

presence of space between teeth, the anterior part of the jaws of 290 patients (%82.9) were without space, 26 patients (%7.4) have space in one area and 19 patients (%5.4) in two areas.

**Table 2:** The medical needs in Zarand school students

Treatment	Frequency	Percent
Preventive	143	40.9
Restorative	145	41.4
Res+Ortho	25	7.1
Prev+Ortho	37	10.6
Total	350	100



**Figure 2:** The need for orthodontic treatment in Zarand school students.

In total, 237 patients (%67.7) were without severe malocclusion and among all the patients, 33 persons

(%9.4) were with abnormal occlusion in half the cusp and 63 patients (%18) in full the cusp.

According to the status of oral and dental health of the patients, their needs to different treatments were evaluated. The percentages of cases referred for remedial treatments were reported %40.9, prevention %41.4, remedial and orthodontic treatment %7.1 and prevention and orthodontic %10.6 (table 2). Patients in DMFT=0 group according to the most referral cases to the orthodontist, however, no relationship was observed between

different DMFT groups and the need or no need to orthodontic treatment ( $p>0.05$ ) (Figure, 2).

In comparison between DMFT groups in relation to referral cases for different treatments of dentistry, it was determined that most patients having DMFT=0 to 4 need for remedial and preventive treatments and patients with DMFT>0 were referred to remedial treatments (table 3).

**Table 3:** The need for different treatment according to the DMFT index among school students in each group

Grouped DMF	Preventive	Restorative	Res + Ortho	Prev + Ortho	Total
0-4	138	113	17	36	304
5-8	4	29	6	1	40
9-12	1	3	2	0	6
Total	143	145	25	37	350

## Discussion

An extensive project was conducted in the field of oral and dental health in collaboration with WHO and Ministry of health, Treatment and medical education in February 1993. The results show that DMFT index in Iran was 1.67 that in comparison to WHO criteria was less ( $DMFT<3$ ) in 2000 (10).

In November 1998, the representatives of the countries in the eastern region of Mediterranean (EMRO) gathered together in a workshop under the supervision of WHO in Beirut. In this workshop, goals were set in order to further improvement of oral and dental health states by the year 2010 for this region. The aim of WHO in the eastern region of Mediterranean for 12-year-old children until 2010 was  $DMFT<1$  (7).

Based on WHO suggestion, the amount of SDI for 12-year-old children must be  $DMFT<3$  until 2015 (8,9). According to a study by Nishi et al (2002), this index was investigated in Jamaica, Senegal, Sweden, the UK, Sri Lanka, North Africa, America, Scotland, France, Nicaragua, Honduras, Bolivia, Cost Arica and one state of Mexico that based on the obtained results, the average of DMFT varied from 1 to 8.5 and SDI from 2.8 to 13.8 (12).

Oral and dental health is one of the important indices of personal and public health. Having accurate information about oral health status in

different areas of the country is very important in planning for students' health training. With regard to the significance of epidemiologic study on low age group and also the prevalence of oral and dental diseases in our society, research in this field can be a technique for prevention plans. The present study was conducted with the aim of determining DMFT index in boy secondary school students in Zarand city.

The results of the study showed that the mean of DMFT in all 12 to 15-year old students was 2.03 the amount of caries free was also %34.6 (equivalent to 121 patients). While, in the nationwide project in 1998, DMFT was  $1.5 + 0.01$  that this difference can be due to the difference in the societies under study and/or the increase in the use of prevention methods and observance of oral health.

The amount of DMFT in Rajabi and Moslemi study (13) in 2002 was 1.46 that in comparison to the calculated amount in this study was high. The amount of caries free in their study equals %41.5 that as compared with the current study was higher. Soori and Toumarian (14) in the study on DMFT index of 12-year-old students in Qom city in 2003 reported the amount of DMFT 2.28 that the amount of individuals affected to caries free in this study was %10.7 which is less than the current study. Variji and Navabi (15) in examining DMFT index in the students

of Sari city in 2004 reported the amount of DMFT=3.58 and caries free %51.3.

Regarding that the amount of index in the current study was 2.03 and regarding the decrease in this index since 1995 until now, this amount seems near to the purposes of WHO until 2010. Of course, for achieving more improvement in the oral and dental health status in the society, more attempts must be done in order to decrease the decay in students' teeth. Attempt in increasing the awareness of the society in relation to prevention and health through media, the need to economic support and creating appropriate technique for strengthening economic level and awareness of the society seems necessary. Making facilities in the public education of people

especially parents, increasing the level of awareness in health, prevention and appropriate nutrition, making public plan for controlling nutrition at schools and making healthy nutrition at schools, using human resources in health and other treatment in remedy and prevention can be useful and beneficial in this field.

### Conflict of Interest

The authors declare that they have no conflict of interests.

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