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Original Article (Pages: 5069-5077)

Decayed, Missing, and Filled Teeth (DMFT) Index among First-grade Elementary Students in Mazandaran Province, Northern Iran

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Abstract

Background

Decayed, Missing, and Filled Teeth (DMFT) indicator is one of the most epidemiologic indexes in dentistry indicating the situation of oral and dental health among people of a society. The present study has been conducted with the aim of determining the dmft index among Iranian first-grade elementary students.

Materials and Methods

This study was conducted on 3,000 (1,500 girls and 1,500 boys), first-grade elementary students in Mazandaran province through descriptive-analytical method. Sample members were gathered using random sampling method. Participants were checked sitting at a conventional seat on the natural light using disposable mirror and dental explorer by a senior dental student.

Results

The total dmft of students was 4.08 ± 2.93 at which there were no significant differences between the dmft of boys and girls. dmft of students in urban areas was 3.94 ± 3 and in rural areas the dmft of students was 4.43 ± 2.66 that the statistical difference between these two groups was significant (P=0.032). dmft difference between healthy people and those with systemic disease was not significant (P=0.818).

Conclusion

The results of this study showed that dental health status of first-grade students in Mazandaran province needs more attention in order to get closer to the international standards in this regard. Also, preventive measures such as Fluoride therapy and fissure sealants, and teaching the appropriate way of brushing and flossing must be used.

Key Words: Children, DMFT, Dental, Iran, Students.

*Please cite this article as: Babaei Hatkehlouei M, Tari H, Goudarzian AH, Hali H. Decayed, Missing, and Filled Teeth (DMFT) Index among First-grade Elementary Students in Mazandaran Province, Northern Iran. Int J Pediatr 2017; 5(6): 5069-77. DOI: **10.22038/ijp.2017.22650.1891**

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Received date Mar.13, 2017; Accepted date: Apr. 22, 2017

1- INTRODUCTION

The situation and level of general hygiene has a considerable effect on development of society capabilities and abilities, so that its implication can be observed in public health (1, 2). According to the extensive conducted studies in world and initial importance of oral health and its effect on health, World Health Organization (WHO), has emphasized on importance of oral health (2-4). Dental decay is the most prevalent chronic disease occurred due to consumption of carbohydrates and effect of microorganisms on teeth causing loss of calcification tissue of tooth (5). Almost, more than 90% of people suffer from this disease and only a few numbers of people are immune against this disease (6).

Dental decay can be considered as one of the most common chronic diseases during childhood, so that children in United Nations are suffering from this disease 5 times more than asthma and 7 times more than hay fever (6-8). WHO reported that 60% to 90% of schoolchildren all around the world suffer from dental decay and this disease is more prevalent in Asian countries and Latin America (9, 10). Since oral health is affected by different factors such as good general nutrition, safe and healthy habitat with high-quality drinking water, appropriate level of knowledge, attitude, and performance in individual health, the indicator of oral and dental health is a good index of social and economic health in a society (11).

Decayed, Missing, and Filled Teeth (DMFT) indicator is one of the most epidemiologic indexes in dentistry indicating the situation of oral and dental health among people of a society (3, 4, 12). In a study in Mexico conducted by Nelly Molina-Frechero et al. (2015), 4 and 5 year-old children of both gender were studied that its dmft was 3.52 + 3.7 at which poor oral hygiene was an effective factor in reducing this index (13). Also, in a study in Germany (2014), its dmft index was reported to be 1.28 + 2.27 which indicated the reduction in caries prevalence compared to earlier studies in the same field (14). In a study which was carried out on 6 to 12 year- old children in Romania, the obtained dmft was DMFT 0.91 and dmft 5.71 which reflects the increased prevalence of decay in this country (15).

Also, various studies have been carried out about dmft in Iran (16, 17). The first extensive national program was done by Research Deputy of Ministry of Health and Medical Education with collaboration of Medical Sciences Universities of Iran during 1990-1992 (18). Iran has the average rank in world in terms of oral health (DMFT=1.2 to 1.6) (19, 20). The other study was conducted on 8-9 years old students in Saveh city that the mean of DMFT was equal to 3.76 ± 2.63 (21).

Since the aim of WHO is to having less than one DMFT index, it is required to recognize the situation of target area in order to do prevention measurements for oral diseases; but based on available databases no studies in this field were found in Mazandaran province, Iran. So the present study has been conducted with the aim of determining the DMFT index among first-grade elementary students in Mazandaran Province, Iran.

2- MATERIALS AND METHODS

2-1. Study design and population

This descriptive-analytical study was conducted in 2016 on 3,000 first-grade elementary students in Mazandardan province, North of Iran (**Figure.1**). Sample members were gathered using Random Sampling method. First 12 important cities (out of 22 cities), of Mazandaran province were chosen based on population number (Amol, Babol, Behshahr, Tonekabon, Chalus, Ramsar, Sari, Ghaemshahr, Mahmood Abad, Neke, Noor, and

Noshahr). Total number of students in these areas was equal to 10,000 that based on similar study (17), 3,000 students (1,500 girls and 1,500 boys), were gathered for study.

Fig.1: Location of Mazandaran province, Iran

2-2. Inclusion criteria's

Eligible students for the trial were those (i) having satisfaction, (ii) having full participation and (iii) having no physical illnesses. Students were invited to participate in the study during class meetings and were assured that taking the survey would not affect their grades in anyway.

2-3. Study procedure

The used questionnaire included total specifications including province name, school name, education region, and checkup date as well as general specification of student including age, and gender. Participants were checked sitting at a conventional seat on the natural light using disposable mirror and dental explorer by a senior dental student. The obtained information was recorded by research colleague (general dentist) in informational form. Hypochlorite solution was used to sterilize instruments (18). At current study, to diagnose decay, the definition of WHO for decay was used. Accordingly, the tooth was diagnosed as decayed tooth, if there were lesions in points and grooves or in the smooth surfaces of teeth where the enamel was empty or surrounding floor was soft. On the other hand, the tooth that were temporarily bandaged by filling substances was considered as decayed tooth and a filled but decayed tooth also diagnosed as decayed tooth. If the tip of dental explorer was entered to a hole at proximal surfaces, the tooth was diagnosed as decayed tooth; otherwise, the tooth was healthy and intact (20). Moreover the difference in the DMFT and dmft of teeth is investigated, so that in DMFT, permanent teeth, particularly first molar teeth is more focused on but in dmft, primary teeth are examined (22).

2-4. Ethical Considerations

Ethical approval was obtained from the research ethics committee of the Research deputy of associated University of Medical Sciences (ID number: 183). All the participants received oral and written information about the aims of the study. It was made clear to them that their participation was voluntary, and that all data would remain confidential. Research participants could not be personally identified.

2-5. Data analysis

The collected data were categorized and codded, then using SPSS version 19.0 software with descriptive statistics (mean and standard deviation). Chi-square was used to determine the possible differences of dmft index with education level of mothers. Also, for assessing the relation among dmft index and other demographic characterizes the t-test was used. P-value less than 0.05 were significant.

3- RESULTS

A total of 3,000 patients were enrolled in the study of which 1,503 (50.1%) were females and 1,497 (49.9%) were males. Among the subjects, 822 subjects (27.4%)

were of rural areas and 2,178 (72.6%) were living in urban areas. Also, 2,202 patients (73.4%) were studying in public schools and 798 patients (26.6%) were studying in non-government schools that there was no significant difference among boys and girls and type of school (*P*= 0.262). Most of mothers (52%) had high school diploma. 204 (6.8%) of students were with systemic disease that there was no statistically significant difference found between males and females (*P*= 0.383).

The total dmft of all students was 4.08 ± 2.93 and according to **Table.1**, there was no significant difference between male and female (*P*= 0.497). Also, the education level of mothers and their health made no significant difference among them (*P* = 0.497). But variables such as location (*P*= 0.032) and type of school (*P*< 0.001) had considerable effect on the dmft index.

Also according to **Table.2**, the status of m, d and f for each tooth of sample students is shown. According to Table.2, most of the examined 51, 52 and 53 teeth had no problem and there was no difference between males and females. 46.7% of 54 teeth which were examined were healthy and that there was no difference between male and female teeth and 41.9% of 54 teeth had caries. 64.1% of 55 teeth were healthy and 30.8% of 55 teeth had caries which there was no difference between genders.

Most of the teeth 61, 62 and 63 were examined and had no problem that it did not differ between boys and girls. Most of 73 teeth had no problem and no difference between the two groups was observed and almost all the studied 81 teeth were healthy. 96.7% of 83 teeth were studied and healthy with no difference among boys and girls. Most of the 84 studied teeth had caries 84 (45.9%) and no difference was seen between the two groups and 39.5% of them were healthy. Also, according to **Figure.2**, the highest rate of decay was related to the first molar.

Table-1: The dmft index based on demographic profile of participants

Variables	Mean ± SD	P-value
Male	4.15 ± 2.9	0.497
Female	4.01 ± 2.95	
Region		
Urban	3.94 ± 3	0.032
Village	4.43 ± 2.66	
School		
Governmental	4.34 ± 2.94	0.001
Non-profit	3.36 ± 2.78	
Health		
Good	4.17 ± 3.12	0.818
Systematic disease	4.07 ± 2.91	

Table-2: DMFT status of student participants

Number of tooth*	Healthy	d	m	f
51b	98.7%	1.3%	0	0
51g	99.2%	0.8%	0	0
52b	98.7%	1.3%	0	0
52g	98.7%	1%	0.3%	0
53b	96.9%	3.1%	0	0
53g	96.4%	3.6%	0	0
54b	46.2%	40.7%	5.5%	7.4%
54g	47.1%	43%	5.7%	4.2%
55b	64.2%	30.8%	1%	3.9%

55g	64.1%	30.7%	1.8%	3.4%
61b	98.4%	1.6%	0	0
61g	98.7%	1.3%	0	0
62b	99%	1%	0	0
62g	99.2%	0.5%	0.3%	0
63b	96.1%	3.4%	0.3%	0.3%
63g	97.1%	2.9%	0	0
64b	49.6%	41.8%	3.4%	5.2%
64g	51%%	42.4%	2.9%	3.6%
65b	66.6%	27.4%	1.6%	4.4%
65g	65.1%	29.2%	1.2%	3.6%
71b	100%	0	0	0
71g	100%	0	0	0
72b	100%	0	0	0
72g	100%	0	0	0
73b	96.1%	3.1%	0.8%	0
73g	96.4%	3.6%	0	0
74b	39.4	44.4%	8.4%	7.8%
74g	40.1%	48.7%	4.7%	6.5%
75b	51.2%	37.3%	3.4%	8.1%
75g	54.2%	36.7%	2.9%	6.2%
81b	99.7%	0.3%	0	0
81g	100%	0	0	0
82b	99.7%	0.3%	0	0
82g	100%	0	0	0
83b	96.9%	2.9%	0.3%	0
83g	96.6%	3.4%	0	0
84b	38.1%	45.4%	8.1%	8.4%
84g	40.9%	46.4%	4.2%	8.6%
85b	49.9%	39.9%	3.4%	6.8%
85g	55.5%	34.4%	3.4%	6.8%

*b=boy; g=girl.

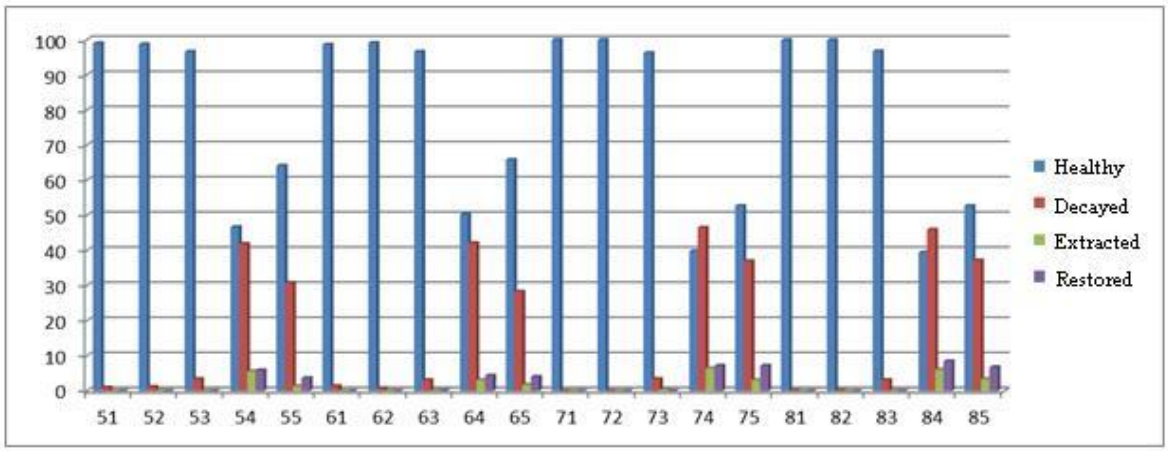

Fig.2: The DMFT status in children studied

4- DISCUSSION

In this study, 3,000 students in first grade school of Mazandaran province were examined and a dmft of 4.08 with a standard deviation of 2.93 was obtained which is consistent with the studied conducted in the city of Mashhad in 2001 (4.72 ± 4.18) (23). But inconsistent with our study, study in Ardebil (2012) calculated the dmft of participants about 2.74 ± 0.09 (24). This difference in the dmft can be due to differences in fluoride content of drinking water of the regions and differences in children's diets and geographical, cultural or genetic differences. While this index was obtained to be 2.27 ± 1.28 in countries such as Germany (25) which indicates their culture about oral health and the existence of necessary education about this field in this country.

In our study, the dmft of girls was 4.01 and it was 4.15 in boys that there was no statistically significant difference between them. While in a study in Saveh, there was a significant relationship in the state of oral health of girls and boys (26) which was consistent with a study carried out in India (27). Unlike the present study, based on epidemiological estimates of dental health status of 6 and 9 and 12 year- old children in Spain and Australia in 1992, the average of dmft in girls has been higher than its average in boys (28).

The greatest contribution of dmft has been for decayed teeth rather than the restored or extracted ones which are consistent with most studies done in this area. This could be due to cultural poverty in relation to oral health and relatively high cost of dental services. Also, the largest share of decay has been related to first molar teeth of lower jaw and the decay of teeth in the lower jaw is more than it in the upper jaw. This result is consistent with the studies of Ghasempour and his colleagues (29). Because in their study, the decay has been more observed in the lower jaw compared to the upper jaw and also in a study carried out in the city of Arani (India) the same result was obtained (15). In this study, the difference between dmft of urban and rural areas, as well as the dmft of students who were in public schools or non-profit schools was significant i.e. dmft of rural areas and students attending public schools was higher. Similarly, in a study conducted in Shemiranat (Iran), there was a significant relationship observed between students' place of living i.e. rural of urban areas with tooth decay (30). Mantonanaki and colleagues in a study conducted in 2013 also showed that average social status is associated with lack of dental caries and children with high social level have fewer decayed, filled or extracted teeth (31).

Albandar in a study on adolescents all over the world showed that children with favorable social and economic situation have less caries (32) that all these issues confirm higher rate of dmft in rural areas. In the present study there was no significant relationship between mothers' education and the average of dmft while in a study done in Karaj on 12 year-old students, employment of mother had a significant effect on DMFT (33). Perhaps this inconsistency is because of the fact that mothers with higher education are usually employed and spend less time at home and are less able to handle and monitor the health status of their children. Children with systemic diseases had lower dmft compered to healthy children that this difference was not significant. However, this small difference could be due to the greater attention parents on the health of these children.

According to the standard value of dmft indicator by WHO, it is obvious that the mean of dmft indicator has been more than standard level among first-grade elementary students in Mazandaran province, while this province has one of the highest dmft indicators in Iran in

comparison with similar domestic studies. It can be stated that oral health services have a low quality in Mazandaran province due to different reasons such as lack of available appropriate and low-cost services as well as the quality of water of this province, because the water has not a proper quality in Northern provinces in Iran instead of high rain.

4-1. Limitations of the study

Present study had also some limitations including: 1) inability to control the emotions and cultural differences of participants, and 2) possible careless of researcher during completing of study, that these limitations may have limited generality of the results. So, recommended that more research be done to assess wider contents of this issue.

Due to the high population of this study, it can be used for various purposes but if in the future studies along with dmft index, the amount of chlorine of drinking water of the province and other factors involved in the dental hygiene of children such as dietary pattern are investigated, more reliable and useful results can be achieved in this regard.

5- CONCLUSION

According to results, dmft index was more than standards among students in this province; also, there was a significant difference between two genders based on results from dmft indicator. This study can be considered for different goals in accordance with its high statistical population, but the more beneficial and reliable results can be obtained in further studies if the other effective factors in oral health of children such as the chlorine rate of drinking water and nutritional pattern besides dmft indicator are examined.

The prevalence of dental caries in primary grade students of the province is higher than the international standards of the World Health Organization; therefore proper planning is necessary to improve the current situation, among actions that can be done in this area is paying attention to preventive measures such as fluoride therapy and family education about oral health that this training will be through the media, as well as health centers and school health educators.

6- CONFLICT OF INTEREST: None.

7- ACKNOWLEDGEMENT

We would like to thanks all the students for participation to this study. Also appreciate to research deputy of Mazandaran University of Medical Sciences for financial supports.

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