

Relationship Between DMF Index and Food Intake in Elementary Students (Sabzevar, Iran)

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Abstract

Background: Dental caries is the most common human disease, which affects about 99% of the human population. This study aimed to evaluate the relationship between the decayed, missing, and filled teeth (DMFT) index and the food intake in elementary students.

Methods: This retrospective study was carried out on 400 primary school students from the population research center in Sabzevar. After coordination and permission from the department of education, from the elementary school of research base, four school students (two elementary school girls and two boys) were randomly selected and sampling was performed according to the population of the school. After obtaining written consent from the parents, questionnaire consisting of 60 questions was completed by the interviewer trained for every person. Data were analyzed using chi-square test, independent t-test, and correlation test using the statistical analysis program SPSS.

Results: This study was conducted on 400 primary school students aged 7 - 12 years studying in the elementary school of research base; of these students, 170 were (42.5%) females and 230 (57.5%) were males. The average height of students was $122.72 \pm 16/11$ cm and weight was 24.97 ± 7 kg, respectively. In this study, habits such as brushing teeth after meals, flossing, and consumption of tea without sugar had a significant inverse correlation on the DMFT index ($P < 0.05$).

Conclusions: The results of this study suggested a high prevalence of dental caries and DMF among primary school students.

Keywords: DMF, Tooth, Students, Nutrition, Sabzevar

1. Background

Food is essential for oral and physical health of children, and helps in strengthening immunity in children. Our diet has an important role in the prevention of oral diseases, including defects in development, dental caries, dental erosion, diseases of the oral mucosa, and periodontal diseases (1). Dental diseases such as dental caries lead to loss causing difficulties in chewing and eating fiber-rich foods such as fruits and vegetables (2, 3).

One of the most common methods of assessing the prevalence of dental caries in communities is using the DMFT index that indicates the number of decayed, missing, and filled teeth (4). According to the Ministry of Health and Medical Education of Iran in 1377, the prevalence of DMFT index has been 1.8, 4.8, 0.9, and 1.5 in children of 3, 6, 9, and 12 years, respectively (5, 6). Promotion of correct dietary practices is an essential activity in caries management (7, 8). This study aimed to evaluate the relationship between the DMFT index and food intake in elementary students.

2. Methods

This retrospective study was carried out on 400 primary school students covered by the population research center in Sabzevar. Sampling was done in multistage cluster. After coordination and permission from the Department of Education, from the elementary school of research base, four school students (two elementary school girls and two boys) were selected randomly and sampling was performed according to the population of the school. After obtaining written consent from the parents, questionnaire consisting of 60 questions was completed by the interviewer trained for every person. The questionnaire was completed by two experienced nutrition experts. Notably, the questionnaire was checked by six faculty members of Sabzevar University of Medical Sciences and its reliability was assessed by Cronbach's alpha test. Children's teeth examination was conducted by three dentists whose skills for determining tooth decay were assessed by one of the experienced professors. Clinical examination was performed using disposable dental mirror and explorer using a den-

tal unit. CVI and CVR for questionnaire was 80% which is acceptable.

In all studies that used questionnaires, there is a possibility of error in the reminder.

Data were analyzed using chi-square test, independent t-test, and correlation test using the statistical analysis program SPSS. The level of significance was set at $P < 0.05$.

3. Results

This study was conducted on 400 primary school students aged 7–12 years covered by the research base; of these, 170 (42.5%) were females and 230 (57.5%) were males. The average height was $122.72 \pm 16/11$ cm and weight was 24.97 ± 7 kg, respectively. The number of teeth, decayed and filled teeth in children, was 7/19%, 6/74% and 5/17%, respectively.

The frequency of missing, decayed, and filled teeth along with the DMF index is shown in Tables 1 and 2.

Table 1. Frequency of Missing, Decayed, and Filled Teeth of the Students in this Study

Teeth Status	Frequency	Percentage
Missing	80	19.7
Decayed	303	74.6
Filled	71	17.5

Table 2. Frequency of DMF Index in the Students in This Study

DMF	Frequency	Percentage
0	73	18.2
1	61	15.3
2	79	19.7
3	48	12.1
4	53	13.3
≥ 5	86	21.4
100	400	100

In this study, the DMF index was not statistically significant between male and female students ($P = 0.42$). The DMF index had a significant inverse relationship with brushing habit after meals ($P = 0.001$). Of the students surveyed, 205 students brushed their teeth before sleeping at night, 87 students after each meal, and 95 students brushed their teeth in morning and at night. The statistical relationship between the number of meals, brushing, and DMF index was observed ($P < 0.05$).

A statistically significant correlation ($P = 0.024$) was observed between the use of mouthwash and DMF index;

however, students who use mouthwash twice a week or more had a lower DMF index ($P = 0.001$).

In all cases assessed for the nutrient consumption in the students, food meals and intake of tea with sugar in a day, showed a statistically significant relationship with the DMF index (Tables 3 and 4). Milk and dairy products were sparsely present in the diet of more than half of the children.

There was no statistically significant association between the DMF index and the education and occupation of parents of students ($P > 0.05$).

4. Discussion

Although the occurrence of dental caries decreased in developed countries over the past 30 years, its prevalence is high in children from undeveloped and developing countries (9). In our study, DMF index was 81.8% in primary school children, which was lower than the results obtained from the study Ashrafizadeh (10). In the study done by Ashrafizadeh on 12-year-old junior high school students in Ahwaz, the DMF index was reported in 98.1% of students; according to this study, 7% boys and 14% girls did not brush their teeth and only 5.7% of them used toothpicks and dental floss. In our study, 15.3% of students did not brush their teeth and did not use dental floss.

In a study by Kazerouni, the socioeconomic status and maternal education were the important factors affecting teeth caries and had an inverse relation with the DMF index; the results of this study were found to be inconsistent with our results (11). In our study, the socioeconomic status had no effect on tooth decay of participants, probably because all samples were selected from similar regional and socioeconomic conditions.

Although in the developed countries and the use of fluoride to prevent tooth decay due to reduced program but due to the increase in sugar consumption, increased behavioral problems and tooth decay. In Iran, during the past two decades, sugar consumption has increased in children and the reports from the ministry of health indicate increased dental caries in children (12). In our study, significant association was observed between consumption of sugar with tea and tooth decay.

But the results were not confirmed by Moynihan. In the field of nutrition, diet, prevention of dental caries in children concluded that intake of sugars less than 20 Kilogram per year and more than 10% of total daily energy expenditure constitutes pediatric not able to increase caries are not managing sugars If more 4 times a day, then there will be no increase in decay (13).

Appropriate dietary habits throughout our life reduce the risk of tooth decay (14).

Table 3. Correlation Between Food Meals and DMF Index in the Students in this Study^a (P = 0.03)

Food Meals	DMF						Total
	0	1	2	3	4	5 ≤	
Food meals/day							
3	23.2	14.7	17	12.5	12.9	19.6	100
4	9.8	19.5	25.6	11.3	12.8	21.1	100
≥ 5	17.1	4.9	14.6	14.6	17.1	31.7	100
Total	18.1	15.3	19.6	12.3	13.3	21.4	100

^aValues are expressed as number percent.

Table 4. Correlation Between Sugar Consumption with Tea and DMF index in the Students in this Study^a (P = 0.001)

Variables	DMF						Total
	0	1	2	3	4	5 ≤	
Tea sugar consumption with tea							
Yes	514.5	15.7	20.9	11.9	14.8	22.3	100
No	50	10	13.3	6.7	3.3	16.7	100
Total	17.3	15.2	20.3	11.5	13.9	21.9	100

^aValues are expressed as number percent.

Sugar consumption and tooth decay are interdependent. Foods that are high in carbohydrates reduce the PH in the mouth and decrease the saliva, leading to a higher incidence of teeth caries (15, 16).

Apart from bacterial infection and consumption of sweet foods, improper nutrition leads to hypoplasia of tooth enamel; during pregnancy, inadequate intake of calcium and vitamin D or premature birth leads to tooth decay (9).

According to another study, intake of vegetables decreased periodontal disease, whereas intake of confectioneries increased prevalence of the disease (17). Moreover, nutritional advice from parents or family members during infancy, decreases caries incidence and severity till 4 years of age in children from a poor community (18).

4.1. Conclusion

The results of this study suggested a high prevalence of dental caries and DMF among primary school students. Furthermore, food meals and amount of sugar consumption with tea in a day, showed a statistically significant relationship with the DMF index.

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