

Examination of the Relationship Between Nutrition and Dental Health of Adolescent Students

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Abstract

Nutrition is the use of nutrients for the continuation of life and the maintenance of growth and development. Proper and balanced nutrition affects both cognitive and physical health positively and is important for oral and dental health. Being healthy is equally concerned with dental health and general health. The primary factor to be considered in caries epidemiology is children's dietary habits. The main factor in dietary caries formation is the time elapsed during the direct interaction of fermentable carbohydrates with dental plaque. Tooth decay is a fairly common chronic disease and its consequences cause a lot of pain and suffering. Sugars, especially sucrose, are one of the most important etiological causes of caries. This research was planned to examine the relationship between nutrition and dental health of a total of 150 students, 74 girls and 76 boys, studying in the 8th-11th grades of adolescence, aged between 15-18, at Şanlıurfa Private Yeni İzler Secondary School, Anatolian and Science High School.

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Keywords: Oral and dental health, nutrition, adolescent period.

Introduction

Nutrition is an important factor for the biological events in the living system to be perfect. An unbalanced diet or malnutrition is a malnutrition. Malnutrition affects our health negatively (1). Nutrition is an important physiological event in obtaining the energy necessary for the continuity of metabolism in the body. Energy, on the other hand, is the essential condition for the continuity of organic activities and the provision of body temperature (2). Digestion begins with the ingestion of food into the body, so the contribution of oral health to digestion is very important (3). Healthy eating habits are extremely

important in the dental development and health of children (4).

Although it has been accepted that tooth decay has existed with history since the first ages, the nutritional habits of the societies and the prevalence of caries have changed since ancient times. While dental caries was very low in the Mesolithic and Paleolithic periods, the prevalence of dental caries increased as a result of the changes in human nutrition with the prominence of agriculture in the Neolithic period.

After historical events such as the industrial revolution and the beginning of sugar processing, which

had a significant impact on nutritional habits, caries has become a common disease especially in developed populations (5). In a study examining the link between caries and nutrition, it was concluded that the consumption of more than four sugary foods a day at snacks and the prevalence of sugar intake increased the risk of dental caries (6). In order to prevent caries, it is necessary to reduce the use of sugar in snacks and to pay attention to oral care (7). According to the World Health Organization (WHO) (2011), the definition of a healthy individual; It is a state of "social, mental and physical well-being". It is not possible to consider oral and dental health separately from general health. The health of the mouth and teeth is a factor that should be taken into consideration, which affects the social relations of individuals, their standard of living, as well as their mental and physical health (8).

In this study, it was aimed to examine the relationship between nutrition and oral-dental health of adolescent students studying at the "Şanlıurfa Private Yeni İzler Secondary School, Anatolian and Science High School" educational institution.

Material and Method

In this survey study, a questionnaire was applied to 155 students studying at Şanlıurfa Private Yeni İzler Secondary School, Anatolian and Science High School in the 2021-2022 academic year, in grades 8-11. Oral information about the study was given to the students who voluntarily participated in the study. The students answered a questionnaire consisting of 31 questions about the socio-demographic characteristics, nutrition and tooth brushing habits of the participants, which was prepared by making use of previous epidemiological studies under the supervision of teachers. Questions; 11 questions about demographic characteristics, 10 questions about eating habits, 10 questions about dental health and dental care. As a result of the study, the forms given by the students participating in the survey were evaluated and the forms that were filled incompletely or incorrectly were excluded from the study. 150 forms that were filled in completely and without errors were included in the study. The answers given to the questionnaire forms filled by the students were evaluated as percentages.

The obtained data were analyzed with the Statistical Package for Social Science version 23.0 (SPSS Inc., Chicago, IL, USA) program. Median, minimum-

maximum and percentage values were calculated for descriptive statistics. Histograms and Kolmogorov-Smirnov test were used for normality of data distribution. In cases where the data were normally distributed, the Independent t test was used for comparisons between groups. Variables in more than two groups were compared using the one-way ANOVA test. Relationships between categorical variables were determined by the Pearson chi-square test. Statistical significance was accepted as $p < 0.05$ for all results.

Results

150 students studying at Şanlıurfa Private Yeni İzler Secondary School, Anatolian and Science High School in the 2021-2022 academic year were included in the 8-11th grades.

Forty (26.7%) of the participants were 8th grade, 34 (22.7%) were 9th grade, 37 (24.7%) were 10th grade, 39 (26.0%) were 11th grade students (Table 1).

Table 1. Graph showing the distribution of students by grade

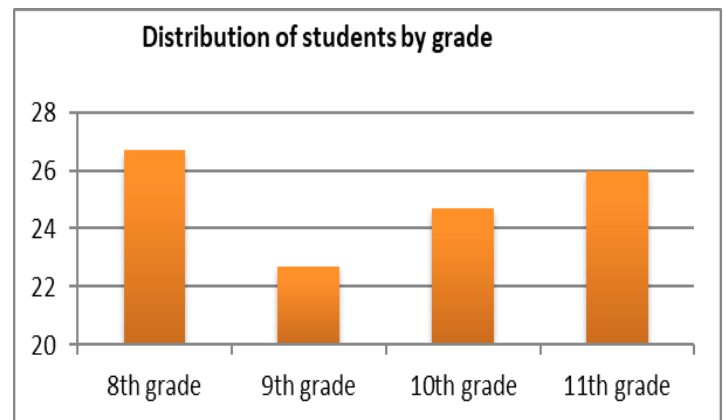


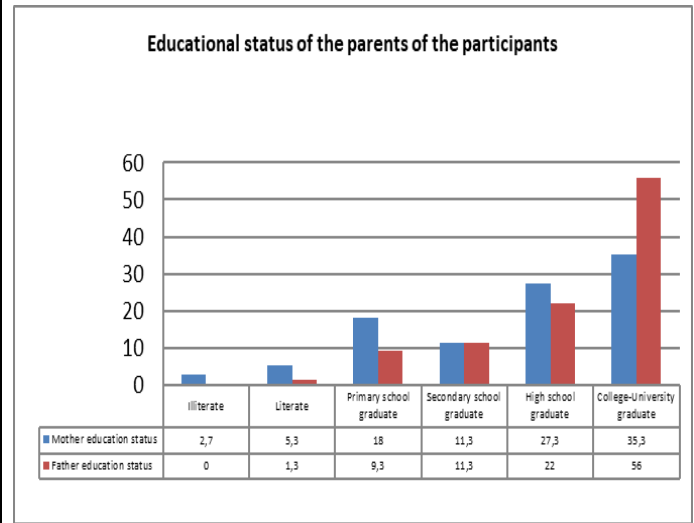
Table 2. Demographic information of students

	Subgroups	Number of Persons	Percent (%)
Distribution of students by gender	Female	74	49,3
	Male	76	50,7
	15	88	58,7
	16	24	16,0

Distribution of students by age	17	29	19,3
	18 and over	9	6,0
Distribution of students' height	Between 1.40-1.50 cm	2	1,3
	Between 1.51-1.60 cm	27	18,0
	Between 1.61-1.70 cm	52	34,7
	1.71 cm and above	69	46,0
Weight distribution of students	40-50 kg	32	21,3
	51-60 kg	43	28,7
	61-70 kg	37	24,7
	71 kg and above	38	25,3
Do you have an athlete license?	Yes	48	32,0
	No	102	68,0
Distribution of the occupations of the mothers of the participants	Housewife	106	70,7
	Employee	1	,7
	Officer	25	16,7
	Retired	1	,7
	Self-employment	2	1,3
	Other	15	10,0
Distribution of the occupations of the participants' fathers	Unemployed	2	1,3
	Employee	3	2,0
	Officer	31	20,7
	Retired	8	5,3
	Self-employment	47	31,3
	Other	59	39,3

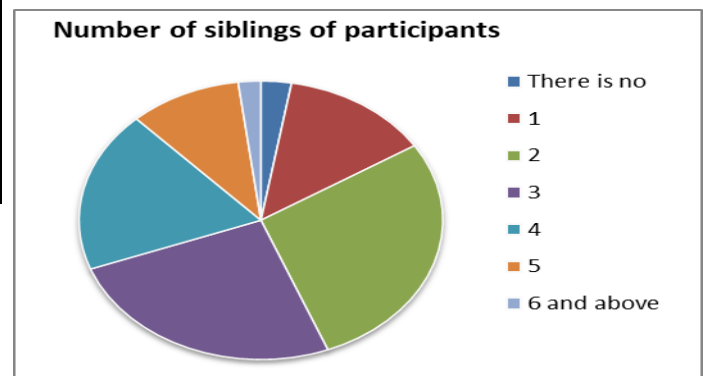
The demographic information of the students participating in the study is shown in Table 2. The ages of the students vary between 15-18 and consist of 74 (49.3%) female and 76 (50.7%) male students. (Table 2). While 32% of the students had an athlete license, 68% reported that they did not have a license. Considering the weight distribution of the students, the majority (28.7%) reported that they weighed 51-60 kg.

Table 3. Table showing the educational status of the parents of the participants



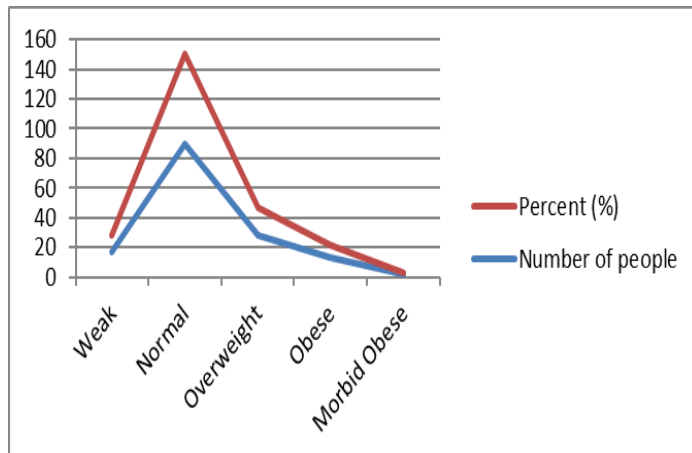
While 53 (35.3%) of the majority of the participants were found to be graduates of a college-university mother, 84 (56%) of the participants stated their father's education level as a college-university graduate (Table 3).

Table 4. Graph showing the number of siblings of the participants



Of the students, 4 (2.7%) had no siblings, 20 (13.3%) had a sibling, 42 (28.0%) had two siblings, 38 (25.3%) had three siblings, 28 (18.7%) reported that they had four siblings, 15 (10.0%) had five siblings, and 3 (2.0%) had six or more siblings (Table 4).

Table 5. Body mass index (BMI) of students



When we look at the body mass indices of the participants, 17 thin people (11.3%), 90 people with normal weight (60%), 28 people who are overweight (18.7%), 13 people who are obese (8.7%), 2 people who are morbidly obese. (1.3%) (Table 5).

Table 6. Information about students' eating habits

	Subgroups	Number of Persons	Percent (%)
How many meals do you eat per day?	1 meal	11	7,3
	2 meals	46	30,7
	3 meals	77	51,3
	4 meals or more	16	10,7
Do you skip meals?	Yes	68	45,3
	No	0	0,0
	Sometimes	82	54,7
Which meal are you skipping?	Breakfast	79	52,7
	Lunch	61	40,7
	Evening meal	10	6,7
If you are skipping meals, what is the reason for skipping?	I don't want	80	53,3
	I want to lose weight	15	10,0
	I do not have a time	22	14,7
	No one prepared	6	4,0

Do you choose food?	financial impossibility	5	3,3
	Because I'm not used to	13	8,7
	Other	9	6,0
Do you choose food?	yes i choose	106	70,6
	No I wouldn't choose	44	29,3
Where do you have your breakfast?	in the school canteen	63	42,0
	At home	70	46,7
	Patisserie, cafeteria	4	2,7
	Other	13	8,7
In the morning, foods such as cheese, olives, eggs, butter, honey, jam, tahini-molasses, toast-sandwich-simit, biscuits, sausage-sausage	1	33	22,0
	2	13	8,7
	3	23	15,3
	4	24	16,0
	5	30	20,0
	6	8	5,3
	7	9	6,0
	8	4	2,7
	9	5	3,3
	10		
How many do you consume?	1		0,7
What do you drink for breakfast?	Tea	101	67,3
	Coffee	5	3,3
	Milk	10	6,7
	Fruit juice	21	14,0
	Other	13	8,7
Where do you eat lunch?	in the school canteen	44	29,3
Where do you eat lunch?	At home	12	8,0
	I bring it from home	1	0,7
	In shops around the school	2	1,3
	in the cafeteria	91	60,7
Do you consume food and drink between meals?	Yes	89	59,3
	No	9	6,0
	Sometimes	52	34,7

The majority of the students (%51.3) reported eating three meals a day and all of the students (%100.0) reported skipping meals (Table 6). 79 students (%52.7) reported skipping breakfast, 61 students (%40.7) reported skipping lunch, and 10 students (%6.7) reported skipping dinner (Table 6). The majority of the participants, 89 (%59.3), reported consuming food and drinks as snacks, 52 (%34.7) reported consuming them sometimes, and 9 (%6) reported not consuming them (Table 6).

Table 7. Situations of students regarding dental health and dental care

	Subgroups	Number of Persons	Percent (%)
What is your tooth brushing frequency?	None	2	1,3
	Rare	8	5,3
	Now and again	27	18,0
	1 per day	50	33,3
	2 per day	63	42,0
How many of the materials such as toothbrush, toothpaste, mouthwash, dental floss do you use for your teeth cleaning?	1	52	34,7
	2	67	44,7
	3	28	18,6
	4	3	2
How often do you change toothbrushes?	1 time per year	41	27,3
	2 times a year	29	19,3
	3 times a year	16	10,7
	4 times a year	24	16,0
	No idea	40	26,7
What is your use of toothpaste?	Toothpaste should not be used	3	2,0
	as lentils	17	11,3
	Chickpeas, peas	61	40,7
	Enough to cover half of the toothbrush bristles	39	26,0
	Enough to cover all of the toothbrush bristles	30	20,0
What is your average brushing time?	less than 1 minute	9	6,0
	1 minutes	25	16,7
	2 minutes	67	44,7
	more than 2 minutes	38	25,3
	I don't know	11	7,3
	I never go	20	13,3
How often do you go to the dentist?	Only when my tooth hurts	65	43,3
	Now and again	32	21,3
	1 per year	20	13,3
	1 in six months	13	8,7
Do you have an extracted tooth?	Yes	66	44,0
	No	84	56,0
Do you have a habit of clenching your teeth?	Yes	73	48,7
	No	77	51,3
Candy, soda, etc. What is your eating frequency?	Always	68	45,3
	Sometimes	77	51,3
	None	5	3,3
Candy, soda, etc. when will you eat?	Whenever I want	129	86,0
	Only at snacks	15	10,0
	Only at main meals	6	4,0

Majority of the students, 63 (42.0%) reported that they brushed their teeth twice a day, and 2 (1.3%) of them did not brush their teeth at all (Table 7). According to the distribution of the answers given to the question 'What is the frequency of your toothbrush replacement?', 41 (27.3%) of the students stated that they change their toothbrush once a year, and 40 (26.7%) stated that they had no idea about this issue (Table 7). When the amount of toothpaste usage is examined in Table 7, 61 (40.7%) of the students stated that they use as much as chickpeas and peas. As can be seen in Table 7, 67 (44.7%) of the students had 2 minutes, 38 (25.3%) more than 2 minutes, 25 (16.7%) 1 minutes, 11 (7.3%) do not know, 9 (6.0%) stated that they brush their teeth for less than 1 minute. The majority of the participants, 65 (43.3%) reported that they only went to the dentist when their tooth ached (Table 7). While 56% of the students have an extracted tooth, 44% do not have an extracted tooth (Table x). When students were asked about the habit of clenching, 51.3% reported that they did not have a habit of clenching, and 48.7% reported that they had a habit of clenching (Table 7). 77 of the students (51.3%) occasionally used sugar, acid, etc. stated that they consume it occasionally (Table 7).

Table 8: The relationship between maternal education level and tooth brushing habits.

Mother Education Status	Tooth Brushing Frequency					P value
	Never	Rarely	Occasionally	1 per day	2 per day	
Illiterate	0	1	1	0	2	0,09
Literate	0	0	4	1	3	
Primary school graduate	0	4	5	10	8	
Secondary school graduate	0	1	5	5	6	
High school graduate	2	2	4	15	18	
College-University graduate	0	0	8	19	26	

Table 9: The relationship between father's education level and tooth brushing habits.

Father Educational Status	Diş Fırçalama Sıklığı					P value
	Never	Rarely	Occasionally	1 per day	2 per day	
Literate	0	0	0	0	2	0,445
Primary school graduate	0	3	0	2	3	
Secondary school graduate	0	3	4	8	12	
High school graduate	0	4	7	11	28	
College-University graduate	2	4	6	12	39	

Table 8 shows the relationship between the maternal education level of the participants and their tooth brushing habits. The relationship between father's education level and tooth brushing is shown in Table 9. According to the results of our study, there is no statistically significant difference between the education levels of parents and tooth brushing habits ($p>0.05$).

Table 10: The relationship between eating habits and tooth brushing habits

Number of meals	Tooth Brushing Frequency					P value
	Never	Rarely	Occasionally	1 per day	2 per day	
One meal	0	0	2	5	4	0,025*
Two meals	0	2	6	19	19	
Three meals	1	6	16	22	32	
Four meals or more	1	0	3	4	8	

A significant relationship was found between tooth brushing and nutritional habits ($p<0.05$). It was determined that 51 of 63 (80.95%) out of 63 people who stated that they brushed their teeth twice a day ate 2 or 3 meals a day.

Table 11: The relationship between maternal education level and going to the dentist

Mother Education Status	Frequency of Visiting the Dentist					P value
	Hiç	Dişim Ağrındığında	Arasıra	Yılda 1	Yılda 2	
Illiterate	3	1	0	0	0	0,09
Literate	2	5	1	0	0	
Primary school graduate	4	16	2	4	1	
secondary school graduate	1	10	4	0	2	
high school graduate	7	14	11	5	4	
College-University graduate	3	19	14	11	6	

Table 12: The relationship between father's education level and going to the dentist

Father Educational Status	Frequency of Visiting the Dentist					P value
	Never	When My Tooth Aches	Sometimes	1 per year	2 per year	
Literate	0	1	0	1	0	0,049*
Primary school graduate	2	7	4	1	0	
Secondary school graduate	4	10	1	2	0	
High school graduate	6	20	3	3	1	
College-University graduate	8	27	24	13	12	

A statistically significant relationship was found between the frequency of going to the dentist and the education level of the parents. It has been determined that 25 (75.75%) of 33 people who go to check-ups once or twice a year have father's education level and 17 (51.51%) mother's education level is college-university.

Discussion

From birth, children grow up seeing the habits and behaviors of their parents, and the nutrition and brushing habits they acquire from them affect the child's oral and dental health (9). Recent studies indicate that healthy

nutrition, which is started in childhood, does not have a systemic effect on dental health that will continue throughout life, and that the nutritional process after the teeth erupt in the mouth is more important in the formation of caries (5). Oral health and functioning teeth are an integral part of general health and provide the necessity of a nutritionally balanced and varied diet (10). Today, the importance of healthy and regular nutrition is increasing, as nutritional disorders are increasing. As in adults, the prevalence of obesity in adolescence and childhood is increasing. The childhood obesity rate has a large impact on the adult obesity rate. It has been determined that in a large part of the world population, more than 10% of individuals in the reading age have obesity (11). Childhood obesity has increased significantly in many cities after the 1990s, and 1% of children in developed countries are included in the overweight group each year (12). The most important factor in childhood obesity and caries epidemiology is the dietary habits of children. The fact that the prevalence of obesity has a tendency to increase in the world increases the possibility of meeting obese patients more frequently in dentistry clinics (13). Lifestyle during adolescence, as well as the eating habits they acquire, are factors that should be considered in terms of health problems and eating disorders. As it is revealed in many studies on health problems that occur in interaction with nutrition in adolescence; There is an important relationship between the nutritional habits of individuals in adulthood and their childhood eating habits in determining their health status (14).

Meals are of great importance in ensuring a healthy and regular diet. The foods that should be taken daily can be taken in three main meals and the metabolism can work in a balanced and healthy order. Turk et al. (2007) found that 81% of high school students skipped meals and the most skipped meal was breakfast. It was determined that the first two reasons for skipping meals were time constraint and loss of appetite. In another study, it was observed that the majority of male students skipped breakfast and female students skipped lunch, and they marked "reluctance" as the reason for skipping (15). It has been determined that 71.7% of individuals in the adolescence period of 15-18 years of age consume 3 main meals throughout Turkey, and breakfast is the most uneaten meal (21.0%) (16).

In our study, it was determined that the most skipped meal was breakfast with 47.3%, lunch with 40.7% and dinner with 6.7%. The most common reason for skipping meals was reluctance (53.3%). These findings show that our study group has a more irregular meal skipping habit

than the study group in Turkey, while the reasons for skipping meals are similar to other studies (15,16).

It is of great importance for dentists to have information about oral care habits and diets of people in terms of determining the formation of caries related to nutrition. Diet is an integral part of oral health (17). In our study, a significant relationship was found between eating habits and tooth brushing habits.

Visiting the dentist for regular check-ups will help to detect problems that may be associated with oral health while they are not yet advanced, and to prevent them at the initial stage, such as tooth loss. Tooth brushing habits and awareness of going to the dentist are essential elements for the continuity of oral health (18). The basic principle of preventing gingival diseases and dental caries, which are common in children, is the habit of regular tooth brushing (9). According to the study of Kara et al. (2009), 84.5% of the individuals who participated in the survey brushed their teeth two or three times a day, and the rate of individuals who brushed their teeth at least once a day was 98.6% (7). Similar to these results, the majority of the participants in our study, 63 (42.0%) reported that they brushed their teeth twice a day, and 2 (1.3%) of them did not brush their teeth at all.

Demographic/socioeconomic status of parents and oral hygiene education to children are also important in caries formation (19). A substantial amount of literature has documented a verse relationship between socioeconomic status and dental caries. Analysis of socioeconomic variables in one study revealed that maternal education level was strongly associated with dental caries. However, this inverse relationship between education level and dental caries was not observed to be related to the education of the father, which shows the importance of improving health education in mothers first (20). It has been suggested that the level of consciousness and education of the family is associated with the incidence of caries in the child (22). In our study, 53 (35.3%) of the participants stated their mother's education level as a college-university graduate, while 84 (56%) of the participants stated their father's education level as a college-university graduate. In our study, unlike other studies, no relationship was found between the education level of both parents and tooth brushing habits. This may be due to the limited number of students participating in the study.

In addition, it is known that some foods and beverages consumed during snacks increase the risk of caries formation. Ambrosius et al. (2005) reported that skipping main meals increases the risk of caries. In the studies, it was determined that in case of skipping the

main meals, individuals prefer foods rich in carbohydrates for snacks and this situation increases the risk of caries. (7). While 89 (59.3%) of the individuals who participated in the study consumed food and beverage during snacks, 52 (34.7%) reported that they sometimes consumed them, and 9 (6%) did not.

The limitations of our study are that the students study at the same school and have approximately the same socio-demographic characteristics. In addition, the small number of participants is another limitation of our study. More participants with different characteristics can be included in the study by conducting multicenter studies in future studies.

Conclusion

Socio-demographic characteristics affect both eating habits and tooth brushing habits. There is a significant relationship between nutritional habits and dental health.

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