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# Adolescent Eating Behavior in the Secondary Medical School in Novi Sad and the Technical School in Subotica

Hajnalka Požar<sup>1</sup>,  
Čaba Požar<sup>2</sup>

<sup>1</sup> Preschool Teacher and Sport Trainer High school in Subotica, Serbia

<sup>2</sup> Technical school "Ivan Sarić" Subotica, Serbia

Hajnalka Požar  
Preschool Teacher and Sport Trainer High school in Subotica, Banijska 67, 24000 Subotica  
Tel: +381 69 557 1980; E-mail address: pozarh@gmail.com

## Abstract:

*Introduction.* Adolescence is the period when children, due to increased obligations at school, disrupt their usual lifestyle, they often skip family meals, and usually consume "fast food". The goal of the paper is to determine the eating habits of secondary school students, and to determine the difference in eating habits between boys and girls.

*Method.* The research was conducted as a cross-sectional study during 2015/16 school year, in a medical school in Novi Sad and a technical school in Subotica. The research instrument was a part of questionnaire designed for the "Health status, health needs and utilization of health services in Serbia", which was anonymous and voluntary, filled out by 209 students (107 male and 102 female), aged 14-18 years. The data was analyzed by the statistical package SPSS. To determine the statistical significance and frequency in the consumption of daily meals, fruits, vegetables and sweets between girls and boys, we used the method of crossed tables and Pearson 2 test.

*Results.* Regular breakfast had 51.2% of respondents, 34.4% had breakfast only several days a week, while 14.4% never had breakfast. Each day lunch had 68.9% of respondents, and 56% had each day dinner. Daily consumption of fruits was recorded in 20.1%, and vegetables by 14.4% of the tested adolescents. One third of them used to eat non-cereal plant foods only every 2-4 days. At least once or even several times a day sweets were consumed by 21.1% of the respondents.

*Conclusion.* A relatively large percentage of the tested adolescent population in both schools had irregular breakfast and lunch, 4/5 students did not use fruit in their daily diet, however sweets all respondents used several times a day. Girls were more frequently recorded to avoid a meal, consumed more sweets, snacks and fizzy drinks, while boys preferred greasy foods.

**Key words:** adolescent, nutrition, regularity of meals, food frequency

## INTRODUCTION

A balanced diet for adolescent represents the foundation for healthy development, preservation and for improvement of health. Inadequate nutrition of young people seriously compromises their physical and mental development, reduces learning ability and worsen seating habits that affect the prevalence of certain diseases, not only in adolescence but also in adulthood [1]. In adolescence, students consume more food outside the home, usually irregularly, and make own decisions about nutrition, they often have a snack between meals, drinking sweetened drinks, eating sandwiches as alternatives for school lunches. Such diet is usually poor in fruits and vegetables, as well as in high quality sources of protein, which leads to certain deficits or to

excessive intake of some nutrients [2,3]. The entire system of nourishment in schools still is not based on the principles of proper nutrition. The school meal is only a part of the total food intake, but it is very important because secondary school students spend six or more hours in school daily [4]. As a result of inadequate nutrition, related to the World Health Organization data, overweight and obesity were recorded in 20-30% of children and adolescents in Europe [5]. In 2013 an increased percentage of obese children (4.9%) was recorded in Serbia compared to data obtained in 2006 (2.6%). A significantly higher percentage of moderately obese (13.2%) and obese (7.5%) children were also recorded among children aged 11-14 years [6]. Most worrying is the fact that obese children remain obese in adulthood, and are prone to and often suffer from

chronic diseases. Chronic diseases such as cardiovascular disease, cancer, and diabetes are responsible for 86% of deaths and 77% of diseases in Europe [7,8]. The identification and healthy eating habits can be considered as a strategy to prevent, control and combat obesity [9].

The goal of this study was to determine the daily eating habits of adolescents aged 14-18 years in two secondary schools, to determine the regularity of daily meals, eating frequency of certain foods, especially fruits, vegetables and sweets, and to find out if there are differences in nutritional habits among adolescent boys and girls.

## METHODS

### Respondents:

The survey was conducted as across-sectional study that included 209 respondents, aged 14-18 years, from different parts of Autonomous Province of Vojvodina, 107 (51.2%) male and 102 (48.8%) female subjects. From the Medical school "7 April" in Novi Sad (nursing course) 119 (56.9%) respondents were included in the study, 44 boys (37.0%) and 75 girls (63.0%). From the Technical high school "Ivan Sarić" in Subotica (electric technician and traffic technician courses) 90 (43.1%) respondent respondents participated, 63 boys (70.0%) and 27 girls (30%).

### Questionnaire:

Data on dietary habits were obtained by interviewing during the school year of 2015/16. The survey was completely anonymous. To share the survey, the written consent of the school directors was obtained. The applied questionnaire was a part of the questionnaire that had been designed and applied for the health survey of the Serbian population "Health status, health needs and utilization of health services in Serbia" [6,11].

Parts of the questionnaire related to eating habits included:

a) frequency of main meals on weekdays and weekends (answers: never, 1 day, 2 days, 3 days, 4 days and 5 days); b) frequency of consumptions of fruits, vegetables, sweets and sodas (answers: never; less than once a week; once a week; 2-4 days per week; 5-6 days per week; every day-once a day; every day-several times a day); c) how many times during the week they consume milk and milk products, potatoes, pasta, bread, different types of meat, visible fats, sweeteners and alcoholic drink (answers: never; 1-2 times; 3-5 times; 6-7 times).

### Statistical analysis:

For data statistical analysis descriptive statistical methods and non-parametric tests were applied. In order to evaluate the statistical significance of the above mentioned parameters between boys and girls' eating hab-

its a Pearson's  $\chi^2$  test (Chi-square test) was used. The analysis has been performed using standardized SPSS 20.0 software package.

## RESULTS

The study included 209 respondents, 107 (51.2%) male and 102 female (48.8%) students. The structure of the respondents by age is shown in Figure 1.

Regularity of taking meals on weekdays and weekends are showed in the Table 1. Regularly breakfast had 51.2% respondents (55% of boys and 47% of girls). Irregularly, few days per week, breakfast had 34% of respondents, while 14.4% of the respondents answered that they had no habit eating breakfast on weekdays (18.6% girls and 10.2% boys). It was recorded that during weekends regular breakfast had been taken only by 45% of the respondents, 53% boys and 36% girls and this difference was statistically significant ( $p=0.001$ ). Obtained data indicated that one quarter of the respondents had no breakfast during the weekends with the higher percentage (35%) in the group of tested girls. Regular morning snack on weekdays was consumed by 36.8% of the respondents (40% of boys and 33% of girls). A morning snack never have been taken by 21.5 % respondents, more often by girls (27%). During weekend a morning snack had not been taken by 63.2% of the respondents, mostly by girls (75.5 %). Regular lunch on weekdays had 69% respondents (72% girls and 65% boys). Irregular lunch, a few days during a week, had 27% of the respondents. A regular lunch during weekends had 92% of the respondents. An afternoon snack had been regularly taken by 24% respondents (25% boys and 22% girls). No snack had 33% respondents (37% girls). On weekends an afternoon snack had been taken by a quarter of the tested respondents. Regular dinner had 56% respondents, 64.5% boys and 47% girls. The difference was statistically significant ( $p=0,032$ ). Irregularly diner had 37% of the respondents. On weekends, dinner was regularly consumed by 63% of the respondents, more by boys (75%).

Snacks were daily consumed by 6.2% of the respondents (7.5% boys and 5% girls). The largest percentage of participants (29%) consumed snacks 2 to 4 days a week, 12.4% never consumed snacks, and 16.3% used snacks less than once a week (Figure 1).

The largest percentage of respondents (41.6%) used to take fruit 2-4 times a week, and daily only 29% of the respondents (Figure 2). Vegetables, the largest percentage of respondents (37.3%) used to consume 2-4 times a week, once a day it was consumed by 22% of the respondents (Figure 3).

Sweets were consumed every day by 11.5%, and more than once a day by 9.6% of the respondents, a total of 21.1% of the respondents (Figure 4), 26.5% girls and 16% boys. Boys had higher rates of using sweets once a day or 2-4 times a week. Soft drinks with sugar were consumed once a day by 8.6%, and several times a

day by 7.2% of young people, in a total of 15.8% (Figure 5). The higher percentage was recorded among girls (19.6%) than boys (11.7). The difference was statistically significant ( $p=0.012$ ). The largest percentage (31%) of respondents used soda 2-4 times a week. This group includes 37% of girls. Only 9% of students reported not using any kind of soft drink.

Milk and dairy drinks had been consumed daily by 40% of respondents. Milk was consumed 3-5 times a week by a third of the respondents. Cheese was consumed 1-2 times weekly by 51.7% of respondents, 3-5 times a week consumed a third of the girls.

Boiled potatoes consumed 60% of respondents 1-2 times a week and they were preferred by girls (64.7%). Baked potatoes were consumed more often, 3-5 times a week by 26% respondents, more by boys (28.3%). Pasta and rice were consumed 1-2 times a week by 57.4% of respondents, 60% of which were girls. More often, 3-5 times a week, pasta had been consumed by 28% of respondents.

Chicken meat was consumed 3-5 times a week by 40.7% respondents, more by boys (42%) than by girls (39%). Pork was consumed by the majority (62%) 1-2 times a week, nearly 65% by girls ( $p=0.000$ ). Almost 30% of boys ate pork more frequently, 3-5 times a week.

Beef and veal had been consumed 1-2 times by 42% of respondents, more boys (52%) than girls (30%) ( $p=0.000$ ). Often, 3-5 times a week beef was eaten by boys (12%). Meat products were consumed 1-2 times a week by 42.6%, 3-5 times by 28.7% of respondents, more by boys (74%), than girls (68%). Fish was used by 56% of respondents 1-2 times per week, more boys (59.8%) than girls (53%) ( $p=0.015$ ). Eggs, by 50% of the respondents were also consumed 1-2 times a week, more by girls (53%) than boys (45.7%) ( $p=0.003$ ).

Near a half (47.4%) of the tested students used to consume white bread (52.3% boys and 42% of girls). The difference was statistically significant ( $p=0.030$ ). Black rye bread was consumed by 11.5% of respondents, more girls (15.7%) than boys (7.5%). Semi-white bread had been regularly used by 6.7% of the respondents, more by girls (7.8%) than boys (5.6%). For the preparation of food 3-5 times a week vegetable oil was used (25.4%), more often by girls (21.5%) than boys (16.6%). Girls often do not use oil (35%). Lard was used by 20.5% of boys.

As a spread on bread, margarine was used 3-5 times a week by 25% of respondents, and third of boys. Butter usage was more prevalent among girls (16.6%). Mayonnaise was used daily by 7.7% of the respondents, 11% of boys versus 4% of girls ( $p=0.028$ ).

As a sweetener, sugar had been used 3-5 times a week by 26% of the respondents, more by girls (28.4%) than boys (23.3%). Honey was more frequently used by boys (17%). Artificially sweeteners had been used by 11.4% of the respondents, more often by boys (15%) than girls (8%), with statistical significance  $p=0.030$ .

Alcoholic beverages were used once a week by 38.8% of respondents, 48.5% of boys and 28% of girls. The difference was statistically significant.

## DISCUSSION

From the obtained results, we could see that the habit of regular breakfast had half of the respondents, lunch near 70% and dinner near 60%. Every day fruit used to consume 20.1% students and vegetables only 14.4%. Sweets had been consumed once or even several times a day by 21.1% of children. Similar results were found in Zaječar district [2], where 53% of the students had a regular breakfast, 76% of the respondents had lunch. About 55% of the respondents had dinner regularly, a noticeable differences between the genders was recorded. The largest number of participants had consumed fruits and vegetables 2-4 times a week, sweets every day, even several times a day. In Croatia, also some inadequate eating habits were noticed, 40% of high school students did not eat breakfast at home, so they later consumed "junk food" and snacks and sweets (47.9%). It was observed that they did not have regular fruits, vegetables and milk in their daily diet [10].

Results of the national health survey published in 2013 are different then our results [6]. According to the national findings, in Serbia most of the children have a habit of having a daily breakfast (93.8%), the percentage of children who regularly consumed integral breads is decreased in comparison with 2006 (3.5% vs. 6.1%), every second child consume fruits and vegetables daily.

As for the differences between boys and girls, we noticed that boys had more regular meals and snacks. They consumed more vegetables, lard, mayonnaise, eggs, and white bread. They used to drink more soft sparkling and alcoholic beverages, and consumed less sweets. Girls, however, had a larger percentage of skipped meals and a greater percentage of consumed sweets and sweet pastries, and drinks. However, they had a greater intake of fresh fruit, boiled potatoes, black bread, use of vegetable oil, but not avoiding sugar. Similar habits were shown among student population in a study by Dimoski et al, where just over half of the students had breakfast every day, however, daily lunch was consumed by more respondents (81%), compared to our study, and daily dinner by only half of the participants. Breakfast and dinner were more regularly used by male students [11].

Nutritional status of adolescents is of great interest to public health, in terms of prevention of diseases associated with obesity. The obesity in adolescence can lead to long-term health problems in adulthood, but their development can be prevented with healthy nutrition [12]. The strategy for improving the quality of adolescent dietary habits should be continuously carried out in families and in schools, where children spend most of their time. This is best achieved by the activi-

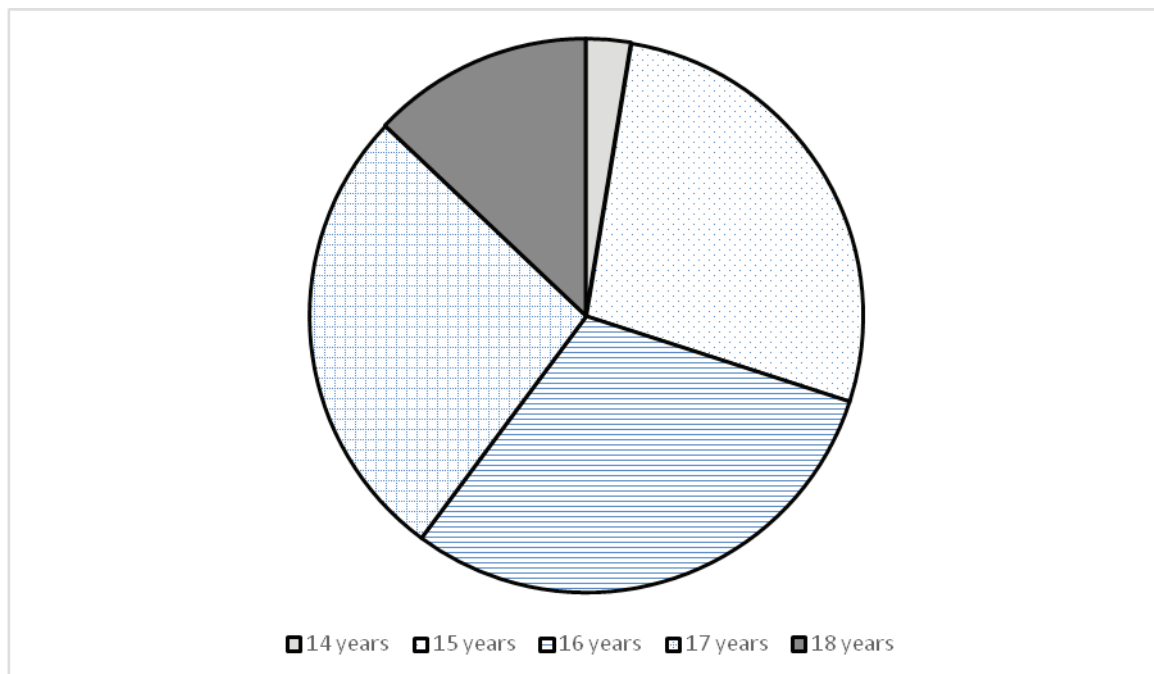
ties of education about proper nutrition, about possible consequences of obesity, and by applying physical activity in the daily rhythm of young people, in order to promote and preserve health.

**CONCLUSION**

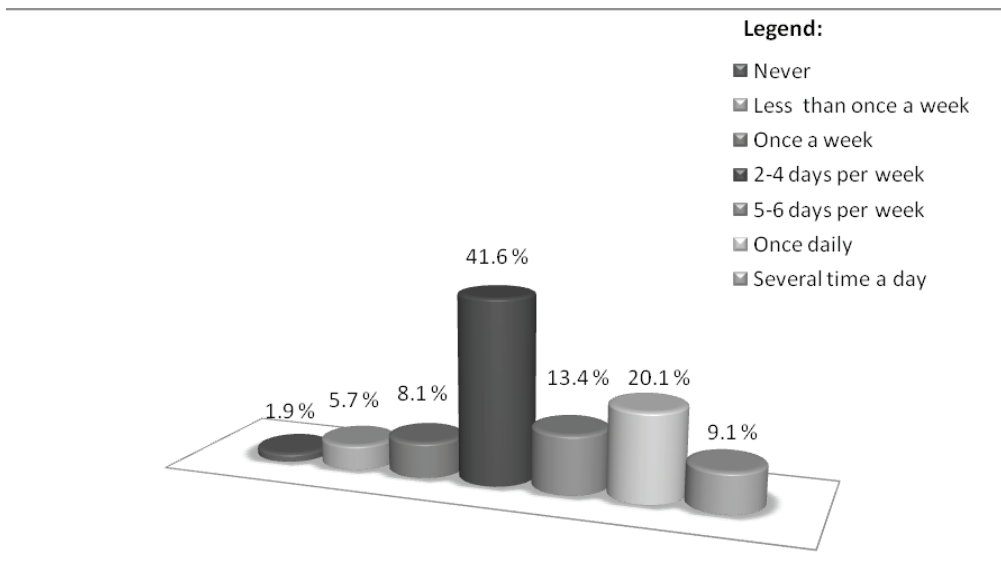
From conducted research we concluded that a relatively large percentage of students in the two secondary schools had irregular breakfast and lunch, most students did not use fruit regularly in their daily diet, while all respondents used sweets one to several times per day. The girls often skipped meal, they consumed more sweets, snacks and sodas, while boys preferred greasy dishes. Only 20% of adolescents had adequate nutrition, where fruits and vegetables were presented daily. In future studies it is necessary to obtain more information on the quantity of food consumed, and the type of food that teenagers usually take for lunch.

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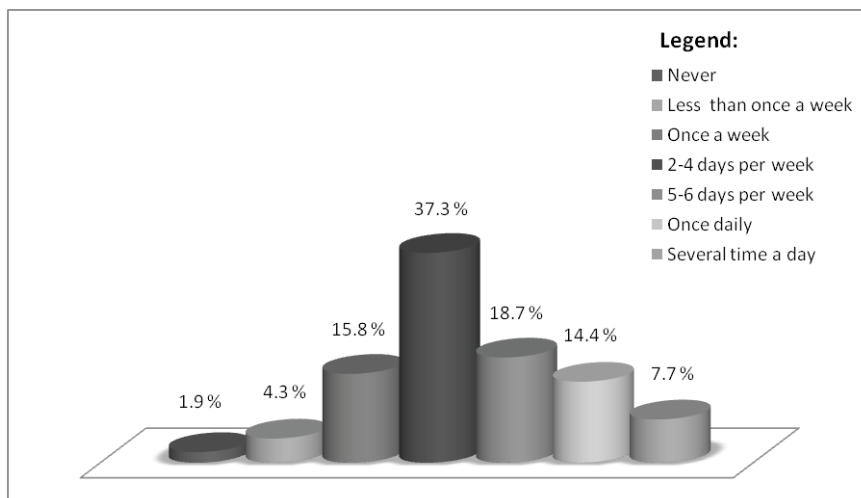
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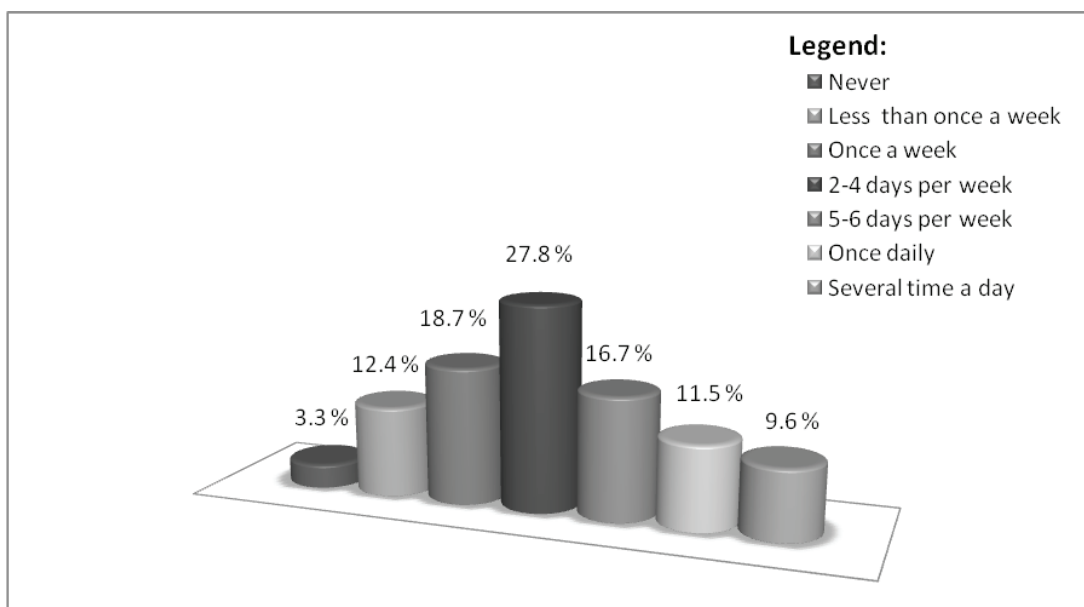
**Figure 1.** The structure of the respondents by age



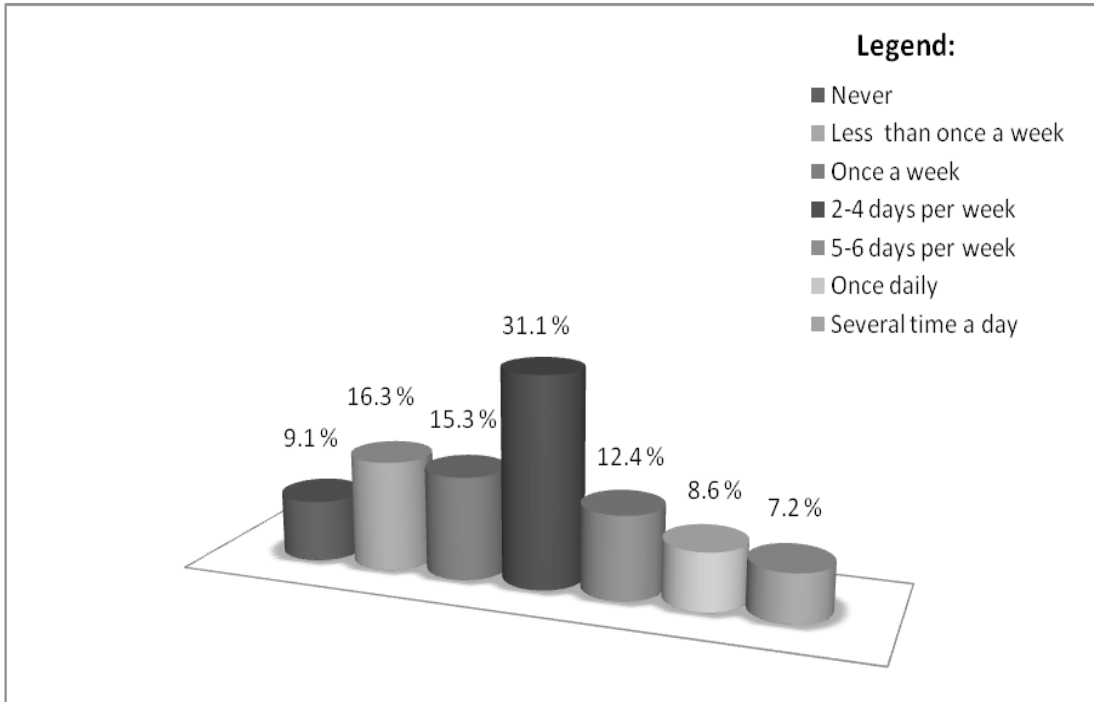
**Figure 2.** The frequency of consumption of fruits



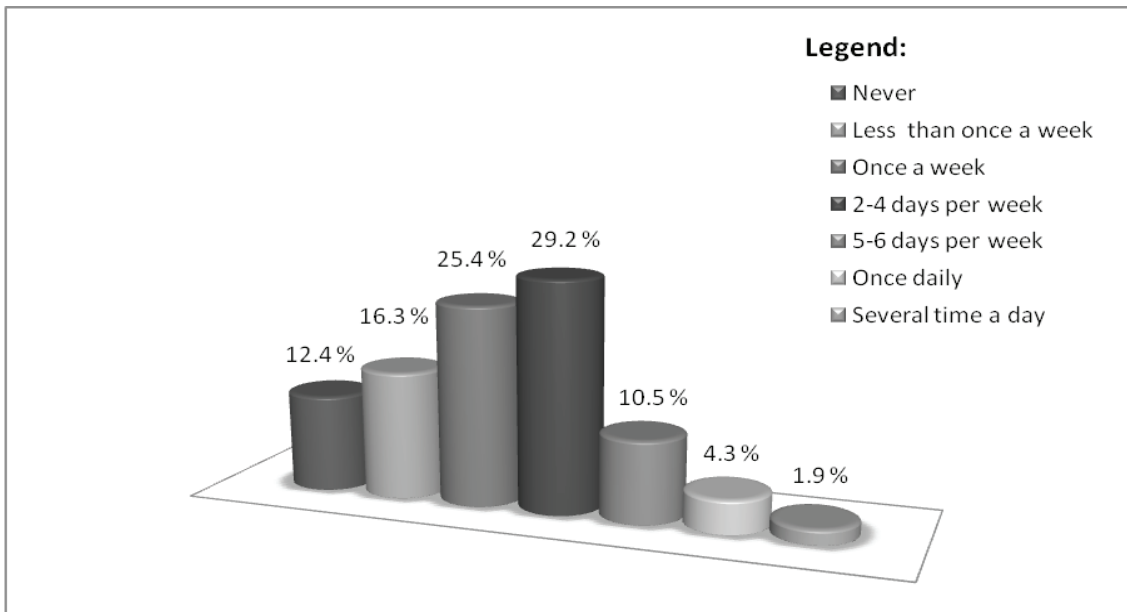
**Figure 3.** The frequency of consumption of vegetables



**Figure 4.** Frequency of consumption of sweets



**Figure 5.** Frequency of consumption sugary soft drinks



**Figure 6.** Frequency of consumption of snacks

**Table 1.** Frequency of taking meals on weekdays

	<b>Total</b> n 209 (%)	<b>Boys</b> n 107 (%)	<b>Girls</b> n 102 (%)
<b>Breakfast on weekdays</b>			
		<b>p=0.207</b>	
Never	30 (14.4)	11 (10.3)	19 (18.6)
1 day	17 (8.1)	8 (7.5)	9 (8.8)
2 days	17 (8.1)	10 (9.4)	7 (6.9)
3 days	24 (11.5)	16 (14.9)	8 (7.8)
4 days	14 (6.7)	3 (2.8)	11 (10.8)
5 days	107 (51.2)	59 (55.1)	48 (47.1)
<b>Snack on weekdays</b>			
		<b>p=0.222</b>	
Never	45 (21.5)	17 (15.9)	28 (27.5)
1 day	16 (7.7)	11 (10.3)	5 (4.9)
2 days	22 (10.5)	14 (13.1)	8 (7.8)
3 days	23 (11.0)	8 (7.5)	15 (14.7)
4 days	26 (12.4)	14 (13.1)	12 (11.8)
5 days	77 (36.8)	43 (40.2)	34 (33.3)
<b>Lunch on weekdays</b>			
		<b>p=0.571</b>	
Never	8 (3.8)	4 (3.7)	4 (3.9)
1 day	5 (2.4)	4 (3.7)	1 (0.98)
2 days	7 (3.3)	3 (2.8)	4 (3.9)
3 days	18 (8.6)	8 (7.5)	10 (9.8)
4 days	27 (12.9)	18 (16.8)	9 (8.8)
5 days	144 (68.9)	70 (65.4)	74 (72.6)
<b>Afternoon snack on weekdays</b>			
		<b>p=0.847</b>	
Never	69 (33.0)	31 (29.0)	38 (37.3)
1 day	22 (10.5)	16 (14.95)	6 (5.9)
2 days	24 (11.5)	14 (13.1)	10 (9.8)
3 days	21 (10.0)	9 (8.4)	12 (11.8)
4 days	23 (11.0)	10 (9.4)	13 (12.7)
5 days	50 (24.0)	27 (25.2)	23 (22.6)
<b>Dinner on weekdays</b>			
		<b>p=0.032</b>	
Never	12 (5.7)	4 (3.7)	8 (7.8)
1 day	9 (4.3)	5 (4.7)	4 (3.9)
2 days	20 (9.6)	8 (7.5)	12 (11.8)
3 days	23 (11.0)	9 (8.4)	14 (13.7)
4 days	28 (13.4)	12 (11.2)	16 (15.7)
5 days	117 (56.0)	69 (64.45)	48 (47.1)
<b>Breakfast on weekends</b>			
		<b>p=0.001*</b>	
Never	53 (25.4)	17 (15.9)	36 (35.3)
One day weekend	62 (29.6)	33 (30.8)	29 (28.4)
Both weekend days	94 (45.0)	57 (53.3)	37 (36.3)
<b>Snack on weekends</b>			
		<b>p=0.001**</b>	
Never	132 (63.2)	55 (51.4)	77 (75.5)
One day weekend	42 (20.1)	29 (27.1)	13 (12.8)
Both weekend days	35 (16.8)	23 (21.5)	12 (11.8)
<b>Lunch on weekends</b>			
		<b>p=0.368</b>	
Never	4 (1.9)	3 (2.8)	1 (0.98)
One day weekend	11 (5.3)	6 (5.6)	5 (4.9)
Both weekend days	194 (92.8)	98 (91.6)	96 (92.8)
<b>Afternoon snack on weekends</b>			
		<b>p=0.046*</b>	
Never	77 (36.8)	31 (29.0)	46 (45.1)
One day weekend	79 (37.8)	46 (43.0)	33 (32.4)
Both weekend days	53 (25.4)	30 (28.0)	23 (22.8)
<b>Dinner on weekends</b>			
		<b>p=0.001**</b>	
Never	11 (5.3)	4 (3.7)	7 (6.9)
One day weekend	65 (31.1)	23 (21.5)	42 (41.2)
Both weekend days	133 (63.6)	80 (74.8)	53 (51.9)

\* Significant correlation at the level  $p < 0.05$ ,\*\* Significant correlation at the level  $p < 0.01$

**NAVIKE U ISHRANI ADOLESCENATA SREDNJE MEDICINSKE ŠKOLE U NOVOM SADU I SREDNJE TEHNIČKE ŠKOLE U SUBOTICI**

Hajnalka Požar<sup>1</sup>,  
Čaba Požar<sup>2</sup>

<sup>1</sup> Visoka škola strukovnih studija za obrazovanje vaspitača i trenera, Subotica

<sup>2</sup> Tehnička škola „Ivan Sarić“, Subotica

**Kratak sadržaj:**

*Uvod.* U adolescentnom periodu, deca zbog povećanih školskih obaveza poremete dotadašnji stil života, češće preskaču porodične obroke i konzumiraju brzu hranu. Cilj rada je da sagleda svakodnevne navike u ishrani adolescenata, te da utvrdi razlike u navikama u ishrani dečaka i devojaka.

*Metode.* Istraživanje je sprovedeno kao studija preseka tokom školske 2015/16. godine, u Medicinskoj školi u Novom Sadu i Tehničkoj školi u Subotici. Instrument istraživanja je deo anketnog upitnika „Zdravstveno stanje, zdravstvene potrebe i korišćenje zdravstvene zaštite stanovništva Srbije“, koje je anonimno i dobrovoljno popunilo 209 adolescenata (107 muškog i 102 ženskog pola), uzrasta 14-18 godina. Analiza podataka je obrađeno statističkom SPSS paketom. Za utvrđivanje postojanja statistički značajne razlike u redovnosti konzumacije dnevnih obroka, korišćenju voća, povrća i slatkiša odstrane učenika dve škole, korišćen je metod ukrštenih tabela i Pirsonov  $\chi^2$  test.

*Rezultati.* Redovan doručak ima 51,2% ispitanika, 34,4% doručkuje neredovno samo nekoliko dana u nedelji, dok 14,4% anketiranih učenika nikad ne doručkuje. Svakodnevno ruča 68,9%, a svakodnevno večera 56% ispitanika. Voće svakodnevno konzumira 20,1%, a povrće 14,4% ispitanih adolescenata, trećina ih jede svaki 2-4 dana. Slatkiše jednom i čak više puta dnevno uzima 21,1% ispitanika.

*Zaključak.* Relativno veliki procenat učenika u obe škole ima neredovan doručak i ručak, 4/5 učenika ne koristi voće u svakodnevnoj ishrani, dok slatkiše svi ispitanici koriste nekoliko puta u toku dana. Devojke češće preskaču obrok, konzumiraju više slatkiša, grickalica i zaslađenih napitaka, dok dečaci preferiraju masnija jela.

**Ključne reči:** adolescenti, ishrana, redovnost obroka, unos namirnica