INTRODUCTION

Adolescence is a period of intense physical growth and intellectual development, which represents the transition from childhood to adulthood, so it is important that adolescents have a balanced diet [1]. A balanced diet is based on the intake of nutritionally rich foods and a moderate intake of substances that can adversely affect health. Principles of proper nutrition and dietary guidelines should be considered when buying groceries, choosing foods, and preparing meals [2]. Common eating behaviors in adolescents are reflected through skipping meals, undergoing various diets, frequent consumption of snacks, taking meals outside the home, frequent consumption of fast food, sweets and sugary drinks. Excessive consumption of sweetened beverages leads to tooth decay, hyperlipidemia, hyperactivity, and diarrhea. Dairy beverages are often replaced by sweetened juices and the risk of these disorders increases [3].

Abstract

During the study period, inadequate nutritional habits such as skipping of breakfasts, insufficient consumption of fruit, vegetables and dairy products and excessive fast-food consumption may develop. Understanding undesirable dietary patterns in adolescents is one of the measures in prevention of many diseases. The aim of this study was to estimate differences in dietary habits among students from medical and non-medical faculties at Universities in Novi Sad. The research was conducted in May 2018 and included 514 students aged from 19 to 24 (133 males and 381 females) from 4 faculties (Faculty of Medicine, Pharmacy, Faculty of Sciences and Faculty of Technology) whose study programs contain nutritional items. The original anonymous questionnaire was used. Statistical processing was done in SPSS20. Results showed that 50% of students have 3 meals and only 10% have all 5 meals during the day. Student from Technology faculty in the large percentage (12%) constantly eat during the day in comparison with other faculties (4-5%). One half of students have breakfast every day, while a little less than 5% never has breakfast. Regarding the food types, only 5% of the participants consumed vegetables and only 6% of them consumed fruits more than once a day with statistical significance between faculties (p < 0.01). At the same time, 92% of participants consumed meat a few times a week and 77% of participants consumed fish at least once a week. Water consumption higher than 2 l daily was reported by only one third of the students (faculty differences were statistically significant p < 0.05) although 85% of participants reported water as their first choice of drinks. Results indicate presence of differences in dietary habits among students from different faculties. The necessity of education should be directly focused on increasing proper nutrition habits among students especially in study programs which contain nutritional items.

Key words: students; dietary habits; life habits; medical faculties; non-medical faculties.
The WHO defines physical activity as movement in daily life, including work, recreation, exercise, and sports activities [1]. Physical activity has a number of positive effects on all systems of the human body such as decreasing lipid status, prevention of atherosclerosis and cardiovascular disease, prevention and treatment of obesity, prevention of osteoporosis, creating proper life habits, maintaining optimal levels of vitamin D in the body and reduction of stress [4]. Physical activity and a balanced diet synergistically have a positive effect on an individual’s health. Therefore, the popularization of physical activity and sports has public health significance. Driving a car, when possible, should be replaced by riding a bicycle [4].

Insufficient physical activity is a risk factor for the development of obesity, cardiovascular diseases, and cancer. Since the effects of physical activity are dose-dependent, the desirable effects increase with increasing time spent in the activity as well as its intensity [5]. Sedentary lifestyle (or physical inactivity) is very widespread in young people [6,7].

Smoking is one of the main public health problems of modern society and significantly increases the risk of developing chronic non-communicable diseases. Cigarette consumption increases the incidence of death from coronary heart disease by 30-40% [8]. More than 50 ingredients of tobacco smoke, especially tar and benzopyrene, have been shown to have carcinogenic effects. Mortality from chronic obstructive pulmonary disease is six times more common in smokers than in non-smokers. Smoking is also one of the main factors for respiratory infections and the development of asthma [4,9].

Alcohol consumption is associated with many serious societal issues, including violence, neglect, and absence. Each year, alcohol abuse is responsible for the deaths of 2.5 million people, including 320 000 young people between the ages of 15 and 29, and is responsible for nearly 4% of total global mortality [10]. According to recent research, 70% of deaths and permanent disabilities in adolescence are associated with risky behaviors that are mainly linked with the use of psychoactive substances [4,9]. Smoking and alcohol consumption are closely related. Alcohol affects the desire to smoke, and this effect is dose-dependent, even in people who smoke occasionally. This can be explained by the fact that nicotine can compensate for the sedative properties of alcohol. According to published results, alcohol can cause the desire to smoke even in non-smokers [11].

For many adolescents, cell phones and televisions are key factors in relaxing at home. Prolonged excessive television viewing can lead to disturbances in psychological development. Adolescents also have problems with daily activities, school success, family relationships, and mood. As a consequence of this type of addiction, lower self-esteem and life satisfaction are often cited [9,12]. Excessive use of mobile phones can lead to nomophobia, i.e., fear and panic of losing the phone or fear that they will not be available due to battery discharge or uncovered network. 66% of adults and 76% of young people aged 18 to 24 showed great concern about thinking about losing their phones. 66% of adults and 76% of young people aged 18 to 24 showed great concern regarding the thought of losing their phone [4].

Recognition of undesirable dietary and lifestyle patterns in adolescents is very important as a starting point for the implementation of measures for the prevention of chronic non-communicable diseases. The main factors are diet, smoking, alcohol consumption, and inadequate physical activity. Therefore, the aim of this study was to estimate differences in dietary habits among students from medical and non-medical faculties at Universities in Novi Sad.

MATERIALS AND METHODS

Respondents

This cross-sectional research was conducted in May 2018 and included 514 students aged from 19 to 24 (133 males and 381 females). Two universities and four faculties are included: Faculty of Pharmacy, University Business Academy in Novi Sad, integrated academic studies of Pharmacy; Faculty of Medicine, University of Novi Sad, integrated academic studies of Medicine; Faculty of Technology, University of Novi Sad, academic studies of Food Biotechnology; Faculty of Sciences, University of Novi Sad, Bachelor studies of Tourism, module: Gastronomy. All faculties, i.e., the study programs, were selected on the basis to contain at least one subject about nutritional and/or life habits. The sample of respondents was grouped according to the faculty, type of residence, status of nutrition, and sex.

Methods

For the experimental part, the original anonymous questionnaire with 26 questions was prepared. The questionnaire consisted of questions with selectable answers and those with the possibility to write in the answers. Participation in this study was voluntary. Each questionnaire had its identification number, from 1 to 514. All 514 questionnaires were distributed, fully completed and entered into a statistical analysis. The data has been collected in May 2018, during lectures at selected faculties. The students were chosen by random selection.

The basic set of information included information about sex, age, type of residence, year and type of study, height, and body mass of respondents. The
following questions were about general eating habits, consumption of fruits, vegetables, dairy products, meat, and fish. In the third segment of the survey respondents answered the questions about life habits, i.e. physical activity, cigarette, and alcohol consumption. Respondents were also surveyed on the use of dietary supplements and were able to indicate the group of dietary supplements they use, choosing among the offered vitamins and minerals, amino acids, omega-3 fatty acids, creatinine, and steroids, or they had the ability to self-mention supplements if they are not mentioned.

Statistical program Statistics 12 and R were used for data processing. To determine statistically significant differences between the different groups, Pearson’s χ²-test was used (p < 0.05 was statistically significant). The results are shown graphically.

RESULTS AND DISCUSSION

A comparison of life and nutritional habits was made between different study programs (Figure 1). Since all study programs include subjects about healthy habits in their curriculum, it was expected that students have basic knowledge of proper nutrition. About half of all students only have 3 meals a day, while as little as 10% of students have all 5 meals. It has been observed that students from food biotechnology snack more often during the day (11.82%) compared to students from other faculties (less than 5%).

Only half of all students (55-60%) eat breakfast every day, which is a surprisingly small percentage (Figure 2). Between 2 and 4% of students in medicine, pharmacy, and gastronomy have no breakfast, while this percentage is higher than 5% among the students from food biotechnology studies. There was a statistically significant difference (p < 0.01) in the frequency of breakfast consumption compared to the enrolled study program. Students from module food biotechnology in high percentage (23%) eat breakfast in student canteen, while that percentage is between 1-4% among other faculties. Breakfast is a very important meal – it can either make or break your day. If someone does not eat breakfast during the first or second hour upon waking up, the body goes into the rhythm of energy saving, and throughout the day a strong feeling of hunger that occurs tends to encourage the intake of larger amounts of food (rich in fats and simple carbohydrates) [13]. Thus, skipping breakfast may lead to weight gain in adolescents [14]. Breakfast, as the most important meal of the day, contributes to a better mood, attention, and better results.

More than 80% of students from medicine and pharmacy, 75% from gastronomy, and only 45% from

![Figure 1. Number of meals taken during the day considering the enrolled study program.](image1)

![Figure 2. Frequency of breakfast consumption considering the enrolled study program.](image2)
food biotechnology have lunch at home (Figure 3). Below 11% of students in the medical faculties eat lunch in the student canteen, while this percentage is higher among non-medical faculty students (20% of students from gastronomy and 53% of students from food biotechnology), indicating that the distance from students’ canteen to the faculty can play an important role. Medical faculties do not have students’ canteen in their neighborhood luncheon, while non-medical faculties have. There was a statistically significant difference (p < 0.01) in places of lunch consumption compared to the enrolled study program, and also between medical and non-medical faculties (p < 0.01). Students from non-medical faculties often had dinner in a student canteen (32% of students from food biotechnology and 11% from gastronomy) compared to students of medical faculties (5-6%), because, as mentioned, the canteen is near to those non-medical faculties.

It was surprising that the students from medical faculties consumed fast food daily (medicine 5.5%, pharmacy 4%) in a significantly higher percentage compared to non-medical faculties (1% gastronomy, 2% food biotechnology). Students from non-medical faculties occasionally eat or never eat fast food in more than 70%, and students from medical faculties in about 60% (Figure 4).

The frequency of fruit and vegetable consumption has been noted to a greater extent among students from medical faculties, which may be related to their knowledge about nutritional needs of the body (Figures 5 and 6). 36-39% of students from medical faculties and 28-30% from non-medical faculties eat fruits every day or several times a day, while 45-48% of students from medical faculties and 40-41% of non-medical faculties eat vegetables every day or several times a day. There was a statistically significant difference (p < 0.01) in the consumption of vegetables compared to the enrolled study program.

Girls skip meals very often and eat smaller and nutritionally poorer meals compared to boys [15]. Research has shown that adolescents who have regular meals at home eat more fruits, vegetables, grains, and calcium-rich foods and drink less sweetened soft drinks than those who rarely eat with their families [2]. Teenagers who skip meals often consume snacks. Snacks are consumed in front of the TV and computer, and on the way to school [16]. It is a worrying fact that usually one-quarter of an adolescent's energy intake...
comes from snacks. Favorite snacks consumed by adolescents are rich in sugar, saturated fat, and sodium, and low in dietary fiber [2]. Too much sugar adversely affects body weight and the development of dental caries and interferes with the intake of more nutritious foods [14].

Sufficient fluid intake is very important for normal functioning of the heart, kidneys, and whole organism, as well as for ensuring sufficient oxygen in the body. Consumption of over two liters of fluid improves memory and reduces the feeling of fatigue and stress. It is best to consume plain water and unsweetened herbal teas, as well as diluted squeezed juices. About one-quarter of students in all study programs drink less than 1 L of liquid during the day, half of them drink between 1 and 2 L, and only one-quarter drink more than 2 L (Figure 7). Students from pharmacy and food biotechnology consume more water compared to students from medicine and gastronomy, and the statistically significant difference (p < 0.05) was observed. It is positive that more than 80% of students in all modules choose water as the most common drink during the day, and then students usually drink coffee (5-6%), sodas (3-5%), and natural juices (1.5-3, 5%).
Physical activity longer than 1 hour per day is more common among non-medical students (43-54%) compared to students from medical faculties (38-42%). Physically inactive are 7.75% of pharmacy students, 15% of medicine students, 11% of gastronomy students, and 18% of food biotechnology students. Students from all faculties (over 40%) usually choose walking as a physical activity. Over 20% of students from the medical faculties train at the gym, while this percentage is slightly lower among non-medical faculties (12-18%) (Figure 8).

More than 30% of pharmacy and biotechnology students and about 25% of medicine and gastronomy students spend up to 1 hour, while the others spent more than 1h in front of the mobile phone, television, or computer (Figure 9). There was a statistically significant difference (p < 0.01) in the time spent in front of TV or computer compared to the enrolled study program.

More than 70% of students from medicine, pharmacy, and gastronomy and about 60% of students from food biotechnology studies were not smoking at all, which is a very positive result. 20% of students from food biotechnology occasionally smoked, while this percentage was lower in other modules (7-12%). About 4% of students from non-medical faculties and 1-2% of students from medical faculties were smoking more than 20 cigarettes per day (Figure 10).

Students in the medical faculties (medicine and pharmacy) do not consume alcohol at a high percentage (23-29%) compared with students from medical faculties (10-16%). 64% of pharmacy students, 73% of medicine students, 81% of gastronomy students and 61% of food biotechnology students consumed alcohol sometimes or during the weekends. Less than 1% of medical students drink alcohol every day or several times a day, while this percentage is considerably higher among non-medical students (2-4.5%). There was a statistically significant difference (p < 0.01) in the consumption of alcoholic beverages compared to the enrolled study program, and also between the medical and non-medical faculties (p < 0.05) (Figure 11).

Medical students used dietary supplements more frequently (22-34%) than those in non-medical faculties (16-17%), which may be related to the number of subjects that include knowledge of dietary supple-
ments for the benefit of the body (Figure 12). All students, who take dietary supplements usually choose minerals and/or vitamins. There was a statistically significant difference (p < 0.01) in the dietary intake compared to the enrolled study program as well as between the medical and non-medical faculties (p < 0.01).

![Figure 10. Frequency of cigarette consumption during the day considering the enrolled study program.](image1)

![Figure 11. Alcohol consumption considering the enrolled study program.](image2)

![Figure 12. Frequency of use of dietary supplements considering the enrolled study program.](image3)
CONCLUSION

Based on the results obtained in this research, it can be concluded that students of different study programs have different eating habits. More than half of the students start the day with breakfast. Three-quarters of students eat lunch at home and usually eat a cooked meal for lunch. The difference in the frequency and place of lunch consumption is statistically significant considering the enrolled study program, and the location of lunch consumption by study programs also differs significantly. Less than one-tenth of students eat enough vegetables and fruits during the day, and it differs significantly depending on the enrolled study program. Less than one-third of students drink more than 2 L of fluid during the day. The difference in total fluid intake is statistically significant considering the enrolled study program. Water is the most common drink that students consume during the day. Less than half of students spend more than 1 hour in some physical activity, and only a third of students spend up to 2 hours a day in front of a monitor. Statistically significantly more time in front of the monitor is spent by students of medicine and gastronomy compared to students of pharmacy and food engineering. 70% of students do not smoke, and only 21% do not consume alcohol. A statistically significant difference is observed with regard to the enrolled study program, where there are more non-consumers among students of medicine and pharmacy in relation to gastronomy and food engineering. Three-quarters of students do not take dietary supplements, and the most common dietary supplements are vitamins or minerals. Nutritional supplements are statistically significantly more often taken by medical and pharmaceutical students compared to gastronomy and food engineering students.

Overall, results of the survey conducted on the student population in Novi Sad indicate a lack of information among students and the need to promote proper nutrition and familiarity with healthy lifestyles.

REFERENCES

Razlike u ishrani i životnim navikama na medicinskim i nemedicinskim fakultetima u Novom Sadu

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Kratak sadržaj

Tokom studentskog perioda mogu se razviti neadekvatne navike u ishrani kao što su preskakanje doručka, nedovoljna konzumacija voća, povrća i mlečnih proizvoda i prekomerna konzumacija brze hrane. Razumevanje nepoželjnih obrazaca ishrane kod adolescenata je jedna od mera u prevenziji mnogih bolesti. Cilj ovog istraživanja bio je da se procene razlike u navikama u ishrani studenata medicinskih i nemedicinskih fakulteta Univerziteta u Novom Sadu. Istraživanje je sprovedeno tokom maja 2018. godine i obuhvatio je 514 studenata uzrasta od 19 do 24 godine (133 muškog i 381 ženskog pola) sa 4 fakulteta (Medicinski fakultet, smer Medicina, Medicinski fakultet, smer Farmacija, Prirodno-matematički fakultet, smer Gastronomija i Tehnološki fakultet, smer Prehrambeno inženjerstvo) čiji studijski programi sadrže predmete o namirnicama. Korišćen je originalni anonimni upitnik. Statistička obrada je urađena u SPSS20. Rezultati su pokazali da 50% učenika ima 3 obroka, a samo 10% ima svih 5 obroka u toku dana. Studenti Prehrambenog inženjerstva u velikom procentu (12%) stalno grickaju tokom dana u poređenju sa drugim fakultetima (4-5%). Polovina učenika doručkuje svaki dan, dok nešto manje od 5% nikada ne doručkuje. Samo 5% ispitanika konzumira povrće, a samo 6% konzumira voće više od jednom dnevno sa statističkom značajnošću između fakulteta (p < 0,01). 92% učesnika konzumira meso nekoliko puta nedeljno, a 77% učesnika konzumira rižu najmanje jednom nedeljno. Unos preko 2 L vode ima samo jedna trećina studenata (razlike na fakultetu su bile statistički značajne p < 0,05), iako je 85 % učesnika navelo vodu kao svoj prvi izbor pića. Rezultati ukazuju na postojanje razlika u prehrambenim navikama kod studenata sa različitih fakulteta. Neophodnost edukacije treba da bude direktno usmerena na povećanje pravilnih navika u ishrani kod studenata, posebno na studijskim programima koji sadrže predmete o namirnicama i zdravim navikama.

Ključne reči: studenti; ishrana; način života; medicinski fakulteti; nemedicinski fakulteti.