

DIFFERENCE IN BODY MASS INDEX AND DIETARY HABITS OF STUDENTS OF FACULTY OF SPORT AND PHYSICAL EDUCATION

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The modern way of life and technology development is often associated with negative factors that result in reduced physical activity, improper diet, and obesity. This is especially true for students who are exposed to a sedentary lifestyle, which in the sensitive period of adolescence has a significant impact on health. The goal of this research is to determine the difference between body mass index and dietary habits of students of the Faculty of Sport and Physical Education. The sample of examinees consisted of 41 students of both sexes who attend the third and fourth year of studies at the Faculty of Sport and Physical Education in Leposavić. Body mass index was determined by using the device InBody™ 720, while the questionnaire was used for the assessment of eating habits. The data were processed with the SPSS statistical package 20 by applying the t-test for independent samples and χ^2 test. No statistically significant difference ($p < 0.05$) of body mass index nor dietary habits between the groups of students were determined. Also, a positive trend of eating habits was noticed, where the presence of fruits and vegetables in the diet, as well as a regular meal intake, was observed in both groups of students. The presented results indicate that the third and fourth-year students at the Faculty of Sport and Physical Education have good eating habits, the influence of which is reflected in the body mass index, which can be interpreted as the result of their sport and academic education and activities.

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Introduction

Obesity and physical inactivity are considered the most important risk factors for chronic non-infectious diseases, which are the leading public health problems in the world and in our country (1). According to National data related to the obesity epidemic in Serbia, 40 % of people have normal body weight, 3.2 % are undernourished, 35 % are in the pre-obese state, and 21 % are obese (2). One of the leading factors with a negative influence on the human organism is hypokinesia, with daily exposure to the effects of numerous forms of stress. Nutrition of children and adolescents is one of the important indicators of youth health, their psycho-physical abilities and potential for normal and healthy growth and development. The research on the nutritional

habits of young people in Serbia indicates a widespread distribution of irregular patterns related to nutrition, such as skipping snacks, insufficient consumption of milk, fruit, and vegetables, consuming white flour bread, insufficient fish consumption and other (3).

When considering students of the Faculty of Sport and Physical Education, having in mind their program of study, we eliminate insufficient movement as a cause of possible obesity. Bad eating habits remain as a risk factor, which is, in the young population, largely based on fast food and use of energy and fizzy drinks. Having in mind that they're future pedagogues of physical culture, we consider their state of nourishment, as well as their knowledge and respect for principles of healthy eating a very influential factor to the state of broad layers of the population to work with.

According to the attitude of the World Health Organization, a body mass index (BMI) can be used (4) in order to estimate the prevalence of obesity. Numerous studies indicate the correlation between BMI and pathological changes on blood vessels, cholesterol levels, arterial pressure increase, physical inactivity (5, 6).

Incorrect diet, along with hypokinesia, is an equally important causative factor of spreading obesity epidemic. Proper planning, good habits, choos-

ing quality food are inevitabilities of proper growth and development of children and youth, as well as adults' health protection. The modern way of life, along with the fast tempo, brought new demands for fast, irregular, poor quality food containing saturated fats, refined sugars, emulsifiers, salts. Thus, it is necessary, even within the family environment, and then during schooling and personal engagement, to influence the gaining of proper information and good eating habits.

Aim of paper

The goal of research is to determine differences between BMI and diet habits of students of the Faculty of Sport and Physical Education.

Material and methods

The sample size consisted of 41 students of both sexes. Students of the third and fourth year of basic academic studies at the Faculty of Sport and Physical Education in Leposavić were examined. They were divided into two groups, according to the currently attended year of studies. The condition was regular attendance of both theory and practice classes. The sample of variables for obesity condition assessment consisted of body height, body mass and body mass index (BMI). The categories of body mass index limit values of the sample size were determined in accordance with the World Health Organiza-

tion criteria. Morphological variables were measured by using InBody™ 720 device in accordance with standards of the International Biological Program (IBP).

For eating habits assessment a questionnaire was used applied in a few studies dealing with similar issues (7-9) and it consisted of 12 closed-ended questions. The first six questions related to the number of main meals during the working week and weekends, while questions 7-12 determined the frequency of intake of fruits, vegetables, sweet drinks, and alcohol during the working week.

The data were processed using a statistical package SPSS 20 (SPSS Inc., Chicago, IL.), in which t-test for independent samples and χ^2 test with significance level of $p < 0.05$ in both tests were applied

Results

The results of the basic morphological characteristics of the sample size show that there is no statistically significant difference between students of the third and the fourth year (Table 1). This is in accordance with the previous researches, as well as with the assumed theoretical models since it is a group being selected by the same standards while enrolling at the studies. It is also noticed that the value of the height variable is very close to the one statistically significant ($p = 0.55$).

Table 1. Differences of students' morphological characteristics

Variable	Min	Max	AS	SD	p
Height	158.9	205.6	179.5	10.4	.055
Weight	51.2	97.0	75.9	10.8	.676
BMI	19	29.0	23.5	2.3	.073

Legend: Min - minimum, Max - maximum, AS - Mean, SD - standard deviation, p - statistical significance

When eating habits in the questionnaire are concerned it was shown that most students have healthy eating habits. More than 60 % of students regularly consume all three meals, both during working week and weekends. A great number of students consumes fruits (53.7 %) and vegetables (41.5 %) twice to four times a week, but also consume sweets (39 %). The reason for the increased consumption of sweets is the increased need for energy, caused by activities that students are exposed to during studies and sports activities. It is also encouraging that sweet drinks are consumed by a large number of students only once a week (34.1 %), while most of them (68.3 %) consume alcohol once or less than once a week. The cause of proper habits can be found in the fact that the respondents had regular subjects during studies concerning the issue of adequate nutrition.

On the basis of this, it can be concluded that the proper education of young people about healthy eating habits is very important and contributes to manifesting changes in the quality of their lives. Supporting this fact, the determined BMI results show that as many as 68.3 % of respondents are in the optimal range of values for this population.

Examining differences in eating habits by using the χ^2 test (Table 2) indicates that there are no statistically significant differences in eating habits between groups of samples. The conclusion is that the third and fourth - year students at the Faculty of Sport and Physical Education have stable health habits when it comes to nutrition, which is a product of knowledge gained during academic studies and sports careers.

Table 2. Differences in eating habits of students

Question 1	Value	p	Question 2	Value	p	Question 3	Value	p
χ^2	4.92	.179	χ^2	.81	.369	χ^2	.40	.941
Kendall tau	.074	.624	Kendall tau	-.140	.390	Kendall tau	-.094	.539
Question 4	Value	p	Question 5	Value	P	Question 6	Value	P
χ^2	.13	.715	χ^2	2.50	.645	χ^2	1.72	.633
Kendall tau	-.057	.722	Kendall tau	-.076	.611	Kendall tau	.094	.537
Question 7	Value	p	Question 8	Value	P	Question 9	Value	P
χ^2	3.22	.666	χ^2	3.29	.771	χ^2	5.64	.465
Kendall tau	-.144	.313	Kendall tau	.006	.967	Kendall tau	.054	.703
Question 10	Value	P	Question 11	Value	p	Question 12	Value	P
χ^2	1.49	.960	χ^2	5.15	.398	χ^2	.50	.778
Kendall tau	-.002	.989	Kendall tau	.228	.105	Kendall tau	.077	.605

Legend: p - statistical significance, χ^2 - Chi square test

Discussion

Physical activity has positive effects on numerous changes in the human organism. The essence of these changes is reflected in the increase of functional, motoric abilities of organic systems, as well as the resistance of the human organism, and at the basis of functional abilities improvement, there are the structural changes of organs and systems (10).

The biggest problem with obesity is registered in the US territory with even 25 % overweight female student population (11). A worrying rise in obesity is also registered in research of Australian National Center for Epidemiology and Human Health among students of the University of Bangkok, with focus on factors such as unhealthy diet and physical inactivity. Test results in European countries also show an increase in the prevalence of obesity among students (12).

Student population entering the Faculty of Sport and Physical Education is heterogeneous, and their growth and development are influenced by numerous endogenous and exogenous factors (13). Physical exercise as an exogenous factor plays an important role in forming body matter and obesity prevention. The balance of BMI with the third and fourth - year students determined by this study is considered to be the result of uniform physical exercises, which lead to gradually less manifestation of differences among students. Similar results were gained in an analysis of anthropological characteristics of the third year students of the Faculty of Sport and Physical Education in Novi Sad. The results showed a favourable anthropometric profile in the majority of students (14).

In the same way, as the overweight has a great negative impact on all aspects of life and vital functions, the ideal body weight makes it possible to develop quality morphological and functional parameters. Normal distribution of BMI values with the third and fourth - year students of the Faculty of Sport and Physical Education represents a positive interaction with their mental, motor and functional abilities. A similar conclusion about better results of respiratory, motor and dynamic functions of students

with BMI in normal frames was deduced by the researchers at the Beijing University of Sport (15).

Along with regular physical activity as the first precondition, proper nutrition with adequate participation of macro and micronutrients is another prerequisite for proper growth and development, preservation of health and prevention of cardiovascular, endocrine, digestive, rheumatic, carcinogenic diseases. Modern lifestyle contributes to quantitative and qualitative eating disorders. Fast food, especially popular among young people as a tasty, quick, simple diet, is considered as one of the main culprits for spreading epidemic of obesity.

The period of studying inevitably brings changes in nutrition due to separation from parent's home, changes in dynamics of taking meals, altered material status. Proper and timely information is important part of forming healthy habits. It is obtained first in the family, then during schooling, as well as on internet portals. Researches on the level of knowledge about principles of proper nutrition showed satisfactory results among students of the Faculty of Sport in Leposavić. They provide information on proper nutrition through the programme of studies in the first and second year, so there is no statistically significant difference considering adopted habits between students of the third and fourth year. Similarly, positive results on the level of knowledge about principles of proper nutrition were gained in researches among students of the Faculties of Sport in Italy (66.7 %) and those in Serbia (63 %) (16).

Regular meals consumption is an inevitable condition for proper development and functioning of children and young people. The survey shows that 60 % of students at the Faculty of Sports regularly consume at least three meals a day; a large part of them consumes fruits and vegetables at least twice to four times a week. Also, majority of student population in Serbia and the world show good eating habits considering number of meals, which is not the case when it comes to consuming fruits and vegetables (17-19).

Consumption of alcohol is also a factor that affects physical, mental and social health, and contributes to increased calories intake with the ten-

dency of BMI increase. 68.3 % of students of the Faculty of Sport in Leposavić consume alcohol at most once a week, which is in positive correlation with normal BMI. In contrast to these results, researches at US colleges show a worrying presence of alcohol consumption among students, and even among active athletes in colleges, with the tendency of increased consumption during competition period (20). A similar situation is found in European area. During researches at the Faculty of Sport in Timisoara, positive results of alcohol screenings were found mostly in the first - year students (16.39 %), and the majority of them (11.48 %) were male (21).

Conclusion

The results show that there is no statistically significant difference between the third and fourth-year students at the Faculty of Sport and Physical Education, at the level of examined morphological characteristics and eating habits. It was also found out that respondents developed good eating habits, which is interpreted as a result of their sports and academic education and activities.

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RAZLIKE U INDEKSU TELESNE MASE I NAVIKAMA U ISHRANI STUDENATA FAKULTETA ZA SPORT I FIZIČKO VASPITANJE

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Savremeni način života i razvoj tehnologije često je povezan sa negativnim faktorima koji za posledicu imaju smanjenu fizičku aktivnost, nepravilnu ishranu i gojaznost. Ovo je posebno izraženo kod studenata koji su izloženi sedentarnom načinu života, što se u osetljivom periodu adolescencije značajno odražava na zdravlje. Cilj rada je utvrđivanje razlika indeksa telesne mase i navika u ishrani studenata Fakulteta za sport i fizičko vaspitanje. Uzorak ispitanika sastojao se od 41 studenta oba pola treće i četvrte godine studija na Fakultetu za sport i fizičko vaspitanje u Leposaviću. Indeks telesne mase utvrđen je upotrebom uređaja InBody™ 720, dok je za procenu navika u ishrani korišćen anketni upitnik. Podaci su obrađeni u okviru statističkog paketa SPSS 20 primenom t-testa za nezavisne uzorke i χ^2 testa. Utvrđeno je da ne postoje statistički značajne razlike ($p < 0,05$) između grupa studenata na nivou indeksa telesne težine, kao i u navikama u ishrani. Takođe, primećen je pozitivan trend u navikama u ishrani, gde je zastupljenost voća i povrća u ishrani, kao i redovnost obroka registrovana kod obe grupe studenata. Prikazani rezultati ukazuju na činjenicu da studenti treće i četvrte godine studija Fakulteta za sport i fizičko vaspitanje imaju dobre navike u ishrani, čiji se uticaj reflektuje i na indeks telesne mase, što se može tumačiti rezultatom njihove sportske i akademske edukacije i aktivnosti.

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Ključne reči: indeks telesne mase, navike u ishrani, studenti