

# THE RELATIONSHIP BETWEEN STUDENTS' NUTRITIONAL STATUS AND THEIR PHYSICAL ACTIVITY

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**Abstract:** The research was carried out on a sample of 1000 (500 male and 500 female) students randomly selected from several faculties within the AAB College in Prishtina, Kosovo. Respondents were treated in accordance with the Declaration of Helsinki. For the assessment of physical activity, the international questionnaire (International Physical Activity Questionnaire IPAQ). To assess the state of nutrition, morphological parameters were applied: body height, body weight and body mass index. Descriptive analysis, non-parametric technique of difference within the group as well as regression analysis were applied to process the results.

The obtained results show that the average height of the student population is Mean = 174.74±8.6; body weight, mean = 70.88±12.7; body mass index, Mean = 23.1±3.3. The prevalence of overweight is 26.1%, while obesity is 2.8%. The results obtained are almost the same as the countries in the region. The survey for the assessment of physical activity indicates an insufficient involvement of students in physical activities that corresponds to the prevalence of overweight. When asked how much time you usually spend sitting during a working day, the prevalence of 2-7 hours is 84.6%. Regression analysis shows a correlation between inactivity during the day and body mass index.

The data show a trend towards increasing obesity in the student population and this is an extremely powerful reason for: the Ministry of Youth, Culture and Sports, for the Ministry of Education, for Universities and Colleges, to create conditions for the highest possible participation of students in sports and recreational activities.

**Keywords:** Students, morphological parameters, physical activity, prevalence, IPAQ.

## INTRODUCTION

Physical activity plays a very important role in the health and well-being of children and adolescents. It contributes to psychological, social, emotional and physical development. Also, physical activity promotes the independence and healthy growth of children and adolescents (The European health report 2002). Physical activity is one of the most important factors affecting energy balance. Participating in physical activities is part of a healthy lifestyle as it also affects the prevention of chronic diseases and obesity (Goran, & Treuth, 2001). Regular participation of young people in physical activities is important as it improves health and reduces the risk of developing several chronic diseases, including cardiovascular disease, hypertension, overweight and obesity, osteoporosis, diabetes and some types of cancer. Participating in physical activity is also related to the psychological side of young people, improving symptoms of anxiety or depression in them. Also, participation in these activities helps young people to adopt other health behaviors such as: not smoking, alcohol or drugs (Epstein, & Goldfield, 1999).

Today's late teens participate in many activities that require little or no energy. Sedentary life and unhealthy lifestyles often develop in adolescence (Amisola and Jacobson, 2003). The development of technology in the last decade, as well as the easy access to electronic media (television, video games, internet), have made the leisure activities of teenagers to change substantially, increasing the time they spend in front of electronic media. Watching TV can affect obesity in two ways: by cutting off young people's participation in physical activity, in which they would spend energy, and on the other hand by increasing the energy received (eating), watching TV or from advertising, different food (Christakis, with bp., 2004).

Given that many factors from the social and physical environments determine the choices of individuals, then the prevention of obesity requires a multisectoral and multidisciplinary approach that combines the promotion of healthy lifestyles with activity that act on socio-economic determinants, as well as on the physical environment.

In the Republic of Kosovo, there is a lack of such research, especially with large research samples that would provide information on the prevalence of overweight (obesity), as well as their impact on the health of students.

Therefore, the main purpose of this research is to prove the level of nutrition among the students of the Republic of Kosovo and the connection between nutrition and physical activity.

The validation of these reports is important from both a scientific and a practical point of view, mainly to understand the impact of physical activity on the body mass index. At the same time, through this research and its results, I aim to help prevent obesity; in preventing the increase in the number of obese people. Such research aims to bring complete information regarding obesity in Kosovo.

## **METHODS**

In order to obtain qualitative data, the student population was selected for ethical reasons. Also, at this age, since growth is intense, there are even more health consequences due to obesity. This age was selected because individuals are productive at work, in studies, are sexually active, have opportunities to engage in physical activity, etc. Likewise, the age after puberty is estimated to be the age at which premature deaths often occur, from coronary heart disease, cancer and heart attack as a result of inactivity and obesity.

### ***Sample of respondents***

The research was conducted on a sample of 1000 randomly selected respondents from several faculties within the AAB College. The sample consists of 500 (50%) male respondents (male students) and 500 (50%) female respondents (female students). The average age of respondents of both sexes was 21.59 years. The survey was carried out in the amphitheater using the appropriate work organization, which is typical for such research. Respondents were treated in accordance with the Declaration of Helsinki.

### ***Sample variables***

Some of the data were collected by survey method using structured questionnaire. The variables are defined in two groups: Categorical variables (criterion variables): Gender and Level of physical activity. To assess the state of nutrition, I will use these morphological parameters: Body height, Body weight and IMT: body mass index, which shows the ratio of body weight and body height.

### ***Description of measuring instruments***

#### **Physical Activity Questionnaire (IPAQ)**

For the assessment of physical activity, a questionnaire (P1) from the questionnaire was used International Physical Activity Questionnaire (IPAQ) ( according to Hagströmer, Oja , Sjöström, 2006). The structure of the questionnaire allows us an overview of the intensity of some activities that are carried out in any of the three categories mentioned above. In addition, the structure of cells (items) allows to calculate the result of consumption (energy consumption), during walking, during physical activity with moderate intensity and physical activity with high intensity for each category separately. The calculation of the total result means the sum of the duration (in minutes) and frequencies (in days), for all types of activities and for each separate category. It is also possible to calculate the results for each category separately. Craiga and colleagues (Craiga et al. 2003), investigated reliability in 12 countries. Spearman's correlation with the test-retest method also ranged from 0.46 to 0.96, but most often it was 0.80, indicating that the instrument had good reliability.

### ***Statistical analysis***

For all quantitative variables, the basic descriptive statistical parameters were calculated and the following: arithmetic mean (Ma), standard deviation (DS), median (ME), quartile range (RQ), skewness (KURT), distribution asymmetry (SKEW), analysis regression and analysis of variance. For all qualitative variables, frequencies, relative frequencies and percentages of individual responses were calculated and the  $\chi^2$  test and regression analysis were applied. Data were analyzed using SPSS version 23.0 (SPSS, Chicago, IL, USA).

## RESULTS

The results obtained from the statistical processing are presented in 4 tables which clarify the distribution of the results according to the stated purpose.

**Table 1.** Classification of results according to body mass index for adults (taken from: World Health Organization, & World Health Organization (1998). Obesity: preventing and managing the global epidemic: report of a WHO consultation. WHO technical report series, 894, 253)

	MALE		Females		in total	
	Frequency	%	Frequency	%	Frequency	%
Malnutrition 16.00 - 18.50	16	3.2	48	9.6	64	4.6
Normal body weight 18.50 - 24.99	312	62.4	335	67.0	647	64.7
Overweight 25.00 – 29.99	160	32.0	101	20.2	261	26.1
Obesity ≥ 30.00	12	2.4	16	3.2	28	2.8
in total	500	100	500	100	1000	100

The frequencies of male respondents and female respondents are presented in table 1. Malnutrition values of 16.00–18.50 for males show that 16 respondents or 3.2% of them belong to this level, while for females they belong 48 respondents or 9.6% of them, a total of 64 respondents or 4.6%. At the normal body mass level, 312 respondents or 62.4% of them belong to men, 335 respondents or 67.0% of them belong to women, a total of 647 respondents or 64.7%. At the level of overweight body mass, 160 respondents or 32.0% of them belong to men, 101 respondents or 20.2% of them belong to women, a total of 261 respondents or 26.1%. At the level of body mass with obesity, 12 respondents or 24% of them belong to men, 16 respondents or 3.2% of them belong to women, a total of 28 respondents or 2.8%.

**Table 2.** Frequency of respondents for both genders for question Q1

Q1	Frequency	%
30 minutes a day	30	3.0
1 hour a day	124	12.4
2 hours a day	169	16.9
3 hours a day	261	26.1
4 hours a day	193	19.3
5 hours a day	92	9.2
6 hours a day	78	7.8
7 hours a day	47	4.7
½ hour a day	6	0.6
Total	1000	100%
Chi square test	Ash =503.0; df: 8; P = 0.00	1000

Legend: Q1 - During 7 days, how much time did you usually spend sitting during a working day?

The frequencies of the respondents for the two genders in question Q1 are presented in table 2. In the question: Over the course of 7 days, how much time did you usually sit during a working day?, for the option 30 minutes a day, 30 or 3.0% of the respondents declared, 1 hour a day was declared by 124 or 12.4% of the respondents, 2 hours a

day were declared by 169 or 16.9% of the respondents, 3 hours a day are declared 161 or 16.1% of the respondents, 4 hours a day were declared 193 or 19.3% of the respondents, 5 hours a day were declared 92 or 9.2% of the respondents, 6 hours a day were declared 78 or 7.8% of the respondents , 7 hours a day were declared by 47 or 4.7% of the respondents, ½ hour a day were declared by 6 or 0.6% of the respondents. The Chi square test shows that there is a significant statistical difference within the group in the answer given by the respondents of both genders to this question because:  $\chi^2 = 503.0$ ;  $df = 8$ ;  $P = 0.00$ .

The basic statistical and distribution parameters of the morphological variables and the calendar age of the students of both sexes are presented in table 3. From this table we see that the anthropometric measurements are symmetrical because the coefficients of asymmetry (Skewness) are below the zero value (0). calendar age was an exception because the participation of students in the research was different, namely from 17 to 30 years old. All the applied anthropometric variables have coefficients of positive epicurtic asymmetry (+), which means that the arithmetic means tend towards the highest results, while most of the results are below the arithmetic mean. Only the calendar age has a pronounced asymmetry because most of the tested are leaning towards the younger age. In the kurtosis column, the anthropometric variables, body height, body weight and body mass index have the sign (-) which means that their curve is flat (platokurtic) and the variable, calendar age has the sign (+) which it means that its curve is normal (mesokurtic).

**Table 3.** Basic statistical parameters of morphological variables in students of both sexes

Total	N	Min	the Max	Mean	Std. Dev.	Skew	Kurt
AGE	1000	17.00	31.00	21.59	3.01108	1.199	.708
ABH	1000	142.00	199.00	174.74	8.64417	.064	-.290
ABW	1000	45.00	108.00	70.89	12.72659	.332	-.568
ABMI	1000	17.10	32.99	23.13	3.28387	.377	-.440
P1	1000	1	8	4.30	1.69837	.300	-.430

**Table 4.** Correlation of anthropometric predictor variables with the criterion variable for sedentary life in the question: During 7 days, how much time did you usually spend sitting during a working day?

Pattern	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	595.249	44.4		13.407	0.00
AGE	0.152	0.104	0.041	1,459	0.14
1 ABH	-3.141	0.255	-2.412	-12.329	0.00
ABW	4.09	0.311	4.625	13.166	0.00
ABMI	-11.182	0.949	-3.262	-11,784	0.00

a. Dependent variable: P1 During the 7 days, how much time did you usually spend sitting during a working day?

$$R = 0.541; R \text{ Square} = 0.293; F = 103.161; Sig. = 0.000$$

By means of regression analysis among students of both sexes (table 4), the value of the correlation between the group of independent predictor variables (anthropometric variables) and the criterion dependent variable (sedentary life) was determined with the question: During 7 days, How much time do you usually spend sitting down during a work day?The correlation of the entire system of independent predictor anthropometric variables: body weight, body weight and body mass index as well as calendar age with the criterion dependent variable: During 7 days, how much time did you usually spend sitting during a working day,there is a multiple correlation coefficient (multiple) with a value of  $R = 0.541$ , which explains the common variability between the system and the criterion variable of about 29% ( $R \text{ Square} = 0.293$ ). The coefficient of the F-test that was obtained is high (103.161) and it is confirmed with the height of significance ( $Sig = 0.000$ ), which shows that there is a statistically significant multiple correlation between

the two calculated systems. The obtained results show that between the anthropometric parameters and the sedentary life expressed by the question: During 7 days, how much time did you usually spend sitting during a working day? there is a significant statistical correlation that conditions each other.

## DISCUSSION

The characteristics of the sample as well as the results of the empirical part of the research show a possible conclusion that a small part of the population of young age (after adolescence) in the Republic of Kosovo regularly engages in physical activities, which can be characterized as exercises regular physical. If we know that one of the most important goals of physical and health education is the adoption of healthy habits that make regular physical exercises, then the question is how much this has become part of their daily life. Bearing in mind that research on the physical activities of young people in the Republic of Kosovo has not been carried out before and that the sports and recreational habits of our young people were not known, as well as their quality of life in in general, both at the territorial level and at the national level, the results of our research can provide a good basis for further research, which will be more exploratory and comprehensive. Since they are based on the self-assessment of the respondents, of some important indicators, on the basis of which the “in-depth” identification of the needs and interests of citizens in the field of physical exercises and with it a lifestyle of healthy.

Important factors for students are: success in studies, interpersonal relationships, going out and socializing with friends. So, it is assumed that due to these factors, students are already satisfied enough with life and that physical activity does not have a significant impact on quality of life. Students who engage in physical activity are more likely to engage in it because they enjoy it, and those who do not engage in it have other hobbies and interests that enhance their quality of life in their own way. Another answer to the existing result can be found in the results obtained in the subscales of the individual domains of quality of life, in which the students achieved the highest result in the health subscale, which is not surprising for the student population. Students, being a younger population, are certainly not characterized by major health problems compared to older people. On the other hand, since physical activity has a significant impact on health (Pate et al., 1995; Heimer et al., 2004), the positive contribution of physical activity to the quality of life of patients and the elderly is certainly more highlighted, as observed in most studies that focused on the relationship between the mentioned variables (Anokye et al., 2012; Phillips et al., 2013). Thus, some aspects of life, such as physical activity, are not equally important for everyone. For the students, since they are already satisfied with their health, physical activity does not have any additional impact on them, and consequently not even on the quality of life. With this research, an attempt has been made to establish a connection between physical activity and overweight in young women and men, respectively in students.

The study used body mass index to determine the prevalence of obesity, which is the most widely used indicator of nutritional status at the level of broad population masses, although there is a drawback to measurements at the individual level (Flegal et al., 2009). Some researchers question the use of BMI as an indicator of body fat deposits, believing that it should be replaced by other indicators (Kragelund, & Omland, 2005). Misclassification of nutrition based on BMI can occur in the elderly, who due to the aging process lose muscle mass and increase the content of adipose tissue in the body, and BMI can underestimate body fat stores. The problem may also exist in people with developed muscles who may have a high BMI even though they are not obese (Kragelund, & Omland, 2005). Despite these shortcomings of BMI, several studies have confirmed that BMI is a good indicator of body fat stores (Hu, 2008), so BMI has been accepted as a reliable and valid measure to identify individuals at risk. increasing obesity-related mortality and morbidity (Flegal et al., 2009). The prevalence of obesity in our research, 2.4% in men and 3.25% in women, is lower than the prevalence of obesity in the world in 1975, where it was 3% in men and 6% in women, to reach 11% in men and 15% in women in 2014 (NCD-RisC, 2016). The prevalence of overweight in the countries of the European region varies between 32-79% in men and 28-78% in women, which is almost equal to our research 32% in men and 20.2% in women. The prevalence of obesity varies between 5-23% in men and 7-36% in women, which is higher than in the sample studied in Kosovo, in men 2.4% and in women 3.25% (Branca, et al., 2007). Body mass index that shows normal body weight 18. 50–24. 99 was found in men 62.4% and in women 67.0%, which corresponds to data from other authors (Rouzitalab, 2015).

## CONCUION

The results of our research show a moderately high prevalence rate in overweight students and a lower prevalence in obese students. Students who have been identified as overweight are distinguished as a group with an increased relative risk of occurrence and development of diseases related to excessive eating and insufficient daily physical activity. Students during their studies often do not pay attention to the way of nutrition to the extent that is recommended and their main diet consists of fast foods, then they consume a lot of sweets, coffee and energy drinks. Students do not take enough care of their health or healthy lifestyle, neglecting physical activity and healthy eating, but giving more priority to the obligations in the faculty as well as entertainment. We can conclude that physical activity, regardless of age and gender, plays a very important role in preventing overweight. Regardless of the stage of overweight, systematically controlled physical activity contributes to maintaining optimal health. It is very important to create habits and influence the change of lifestyle by increasing the daily time for physical activities, as a preventive measure for increasing body weight and thus influencing the quality of life. The data show a trend towards increasing obesity in the student population and this is an extremely powerful reason for: the Ministry of Youth, Culture and Sports, for the Ministry of Education, for Universities and Colleges to create conditions for participation as higher of students in recreational sports activities.

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