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Body weight and body height assessment in male high school seniors

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Abstract

The purpose of this research was to be evaluated the body weight and body height in male high school seniors. A total measured samples participated in this research was 142 out of who had an average age of 18.27 ± 0.47. (range 18-20 years).

The anthropometric measurements of body weight and body height according to the protocol of the International Biological Society (IBP). The measurements were conducted by a group of experts of the Faculty of Physical Education and Sports in Prishtina. The results obtained from the measurements are processed with the SPSS program for windows 20.00. The data obtained were analyzed through the descriptive parameters (Minum and Maximum, Arithmetic Average, Standard deviation and Skewnews & Kurtosis). Relationships between body weight and body height were analyzed by Pearson correlation coefficient with an accuracy level of 95%. In order to predict the assessment of body weight results with the body's height variable, linear regression analysis method has been utilized. For all results the validity rate is $p < 0.5$. As a result anthropometric measurements for male high school senior showed that the average of Body weight are 73.98±11.20 kg and the body height average of 179.39±6.37centimeters.

The results have shown that body weight is estimated as a reliable indicator of body height evaluation, the male seniors from high school from the region of Gjakova population. This study also confirms the need for developing different height and weight models for each region in Kosovo.

Keywords: Measurements, high school, Seniors, weight and height

Introduction

Body height and body weight measurements have proved to be very important for many medical and nutritional science researches as well as important for determining the Body Mass Index (BMI) for a particular population or for any sport entity.

Various researches have shown the relationship between body height and body weight in relation to different specific measurements with other parts of the body such as head length, length of legs, length of hand etc. In such cases, body height estimation may have other reliable anthropometric indicators such as the length of the hand and ankle, (Uhrova et al. 2015; Agnihotri et al. 2008; Rastogi et al. 2008; Kanchan et al. 2008; Sanli al. 2005), knee height (Hickson and Frost 2003; Fatmah 2005; Karadag et al. 2012; Fogal et al. 2015) cranial sutures (Rao et al. 2009), skull (Bidmos and Asala 2005; Bidmos 2006;), facial measurements (Sahni et al. 2010).

Body height and body weight examinations have been the main goal of some of the recent researchers, and they have come to extract information that body height and body weight have been anthropometric variables that are directly determined by various factors such as: the genetic factor, environmental and socio-economic factor and other factors (Rexhepi,A., Brestovci,B. & Isufi,I 2018). However, these are two measurements that are highly related to several health conditions (Balode et al., 2015) such as some certain diseases or those with various deformities (Quanjer et al., 2014).

Dimensions of the body parts are used to explore and evaluate their importance in the motor space in terms of its functioning on energy expenditure and results in the achievement in many sports here in our country, and especially the martial sports in which Kosovo is very successful, considering that Kosovar athletes have achieved high scores at the international level in Judo, Karate and so on. The information gathered from anthropometric measurements can also serve to determine the status of a population, ethnic group or other group. Different researches in the past have been conducted to explore the relationships between body length and other body

parameters but there is not much research that assesses weight with the height of the body in a group of subjects who are high school seniors.

Material and method

The subject of the four antropometric measurements consisted of male students, a total of 142 pupils who had an average age of 18.27 ± 0.47. The selection of the tested entities was conducted in line with the purpose of this research with senior students in a high school in Gjakova, and by including all regular students who attended the classes. The criterion of entity selection was that the pupils do not have any defects whatsoever in the body. While school selection was done at random.

In this research were performed the anthropometric measurements of body weight and body height according to the protocol of the International Biological Society (IBP). The measurements were conducted by a group of experts of the Faculty of Physical Education and Sports in Prishtina and were made in the morning hours from 8.00 am to 11.00 am.

The height of the body and the length of the shoulders are measured by anthropometer according to Martin. The measurement of the body height is done in this way: The subject during the measurements is barefoot, equipped with sport clothing, and standing on flat and strong surface. The subject stands in the stand up position with relaxed body musculature. The head position lies in the position where the "Frankfurter Horizon" is reached, while the feet are joined in the back. The measurer stands on the left side and is placed behind the body of the subject, where with the right hand releases the metal ring with the horizontal pole until it meets the top of the head. The result can be read in the slide ring and then written on the subject's test sheet with 0.1 cm accuracy. The measuring of the body weight is conducted by digital measuring, which is measured in scale and in kg (± 1kg, with capacity up to 150 kg.)

The results obtained from the measurements are processed with the SPSS program for windows 20.00. The data obtained were analyzed through the basic statistical parameters of the descriptive analysis: Minum and Maximum (Min-Max), Arithmetic Average (MEAN) and Standard deviation (SD), and Asymmetry measures (Skewnews and Kurtosis). Relationships between body weight and body height were analyzed by Pearson correlation coefficient with an accuracy level of 95%.

In order to predict the assessment of body weight results with the body's height variable, linear regression analysis method has been utilized. For all results the validity rate is $p < 0.5$.

Results

Based on the results obtained in Table 1, the descriptive analysis gives the results of body weight and body height in males. The arithmetic average (MEAN) of the body weight is 73.98 ± 11.21 kg with a minimum value of 50.00 kg centimeters and a maximum of 113.00 kg, while the body length in males is 179.52 ± 6.37 centimeters, with a minimum value of 163.78 centimeters and with a maximum value from 197.40 centimeters.

Table 1: Descriptive analysis of body weight and body height in males

Variables	N	Min.	Max.	Mean±SD	Skews	Kurt
Body Weight	142	50.00	113.00	73.98±11.20	.764	1.044
Body Height	142	163.78	197.40	179.39±6.37	.257	-.035

Tables 2, 3 and 4 show the results of linear regression, indicating high average regression values and showing a positive correlation between body weight and body height (0.213), meaning body height predicts the weight in high school seniors (male, $t = 2.584$, $p < 0.011$), with the multiplication correlation coefficient of ordinary male variables ($R^2 = 46$), and 54% can be attributed to all other anthropological dimensions. The relationship between the two variables is also presented with the Scatter diagram between the body weight variables and the height of the body, the subject being male in Figure 1.

Table 2: The results of linear regression analysis between body height as a predictor of body weight model summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.213[a]	.046	.039	10.98621

Table 3: The results of linear regression analysis anova

ANOVA[a]

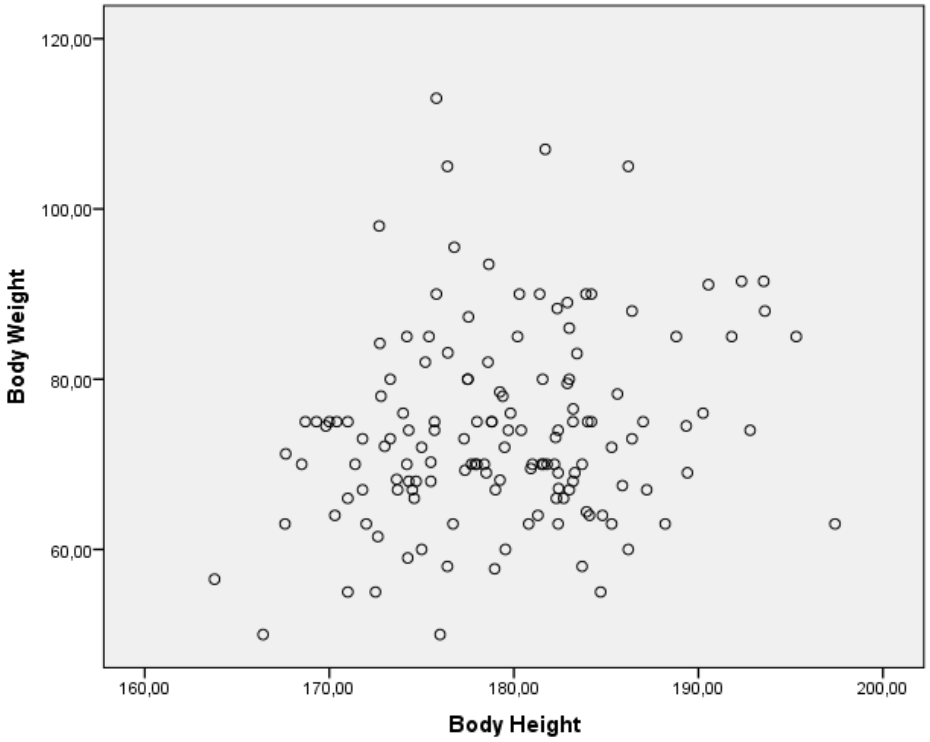
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	805.760	1	805.760	6.676	.011[b]
	Residual	16897.557	140	120.697		
	Total	17703.316	141			

Table 4: The results of linear regression analysis coefficients

Coefficients[a]

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	6.682	26.064		.256	.798	-44.848	58.211
	alart	.375	.145	.213	2.584	.011	.088	.662

Figure 1. Scatter diagram between body weight and body height variables in male subjects



DISCUSSION

Many researchers have dealt with the assessment of body height and body weight and other anthropometric parameters. In this current research conducted with male high school seniors aged 18.27 ± 0.47 in Gjakova, the arithmetic average body weight was 73.98 ± 11.20, compared with the researches published by Rexhepi et al. (2018) from selected athletes whose body weight average was 68.20 ± 8.70, which means that athletes have a smaller weight compared to high school seniors, which therefore indicates that obesity is more present in students, while similar findings have been presented in the research of (Mikolajczyk et al., 2010) in their measurements in seven European countries with the weight average being (79kg) in Germany, Denmark (79kg), Poland (73kg), Bulgaria (73kg), Turkey (71kg), Lithuania (71kg) and Spain (73kg).

The height of the body of the subject measured in this paper has the arithmetic average of 179.39 ± 6.37 of the age 18.27 ± 0.47 years old, compared to the Kosovar athletes presented

in the paper published by Rexhepi et al., (2018) where the average body height is 184.77, which means that athletes have a higher body height than high school seniors. While different values comparing some European countries give the results of the height of the body of the students of the age of 23, which were presented in the research of Mikolajczyk et al., 2010; when compared the body height average was bigger than the average height of the high school seniors in Gjakova in countries as follows; Germany (182.00cm), Denmark (182.00cm), Poland (180.00cm), Bulgaria (180.00cm), while the seniors measured in our research have a bigger height than the subjects coming from countries as follows: Turkey (177.00cm), Lithuania (179.00cm) and Spain (178.00cm).

Based on the results obtained with the linear regression formula, and the correlation coefficient we have utilized in this study, we can come to conclusion about the relationship between body weight and body height in the anthropometric field. In this research, through linear regression analysis, we have achieved a positive result of 0.11 in male subjects, which proves a direct relationship between body weight and body height. To verify the correlation between body height and foot length, we conducted the analysis according to Pearson with an accuracy level of 95% and in males turns to be a solid correlation in value of, $r = 0.213$, which confirms the relation between body weight and body height. Other researchers as well have proved that these two variables have correlation between them as for example Rexhepi et al., 2018 who finds a high correlation in the value of $r = 0.54$.

Through this research we can conclude that body height can be estimated by body weight by using linear regression analysis based on the achieved results. Finally, we can conclude that we have achieved our aim of verifying the assessment and relationship between body weight and body height which can be used as an example for comparison with other groups in the country, region and the world, or even different researches in the anthropometric field about body parts of high school seniors.

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