Berisha Ajvaz, Berisha Kushtrim, Koca Afrim. Body weight and body height assessment in female high school seniors. Journal of Education, Health and Sport. 2019;9(4):101-109. eISNN 2391-8306. DOI http://dx.doi.org/10.5281/zenodo.2621091
http://ojs.ukw.edu.pl/index.php/johs/article/view/6766

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part B item 1223 (26/01/2017).
1223 Journal of Education, Health and Sport eISSN 2391-8306 7

The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 01.03.2019. Revised: 15.03.2019. Accepted: 02.04.2019.

Body weight and body height assessment in female high school seniors

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Abstract

The purpose of this research was to be evaluated the body weight and body height in female high school seniors. A total measured samples participated in this research was 129 out of who had an average age of 18.34 ± 0.63. (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 female high school senior showed that the average of Body weight are 57.86±7.04 kg and the body height average of 165.67±5.12 centimeters.

The results have shown that body weight is estimated as a reliable indicator of body height evaluation, the female 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, female, 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, (Agnihotri et al. 2008; Uhrova et al. 2015; Kanchan et al. 2008; Rastogi et al. 2008; Sanli al. 2005), knee height (Fatmah 2005; Hickson and Frost 2003; Fogal et al. 2015; Karadag et al. 2012;) 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 and specially girls have achieved high scores at the international level in Judo with Olympic gold medal, 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 anthropometric measurements consisted of female students, a total of 19 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 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 females. The arithmetic average (MEAN) of the body weight is 57.86 ± 7.04 kg with a minimum value of 40.00 kg centimeters and a maximum of 79.00 kg, while the body length in females is 165.67±5.12 centimeters, with a minimum value of 146.42 centimeters and with a maximum value from 180.70 centimeters.

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

Variables	N	Min.	Max.	Mean±SD	Skews	Kurt
Body Weight	129	40.00	79.00	57.86±7.04	.672	.643
Body Height	129	146.42	180.70	165.67±5.12	-.048	1.339

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 (0.282), meaning body height predicts the weight in high school seniors (female, $t = 3.314$, $p < 0.001$), with the multiplication correlation coefficient of ordinary female variables ($R^2 = 80$), and 20% 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 female 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	,282[a]	,080	,072	6,77862

Table 3: The results of linear regression analysis anova

ANOVA[a]

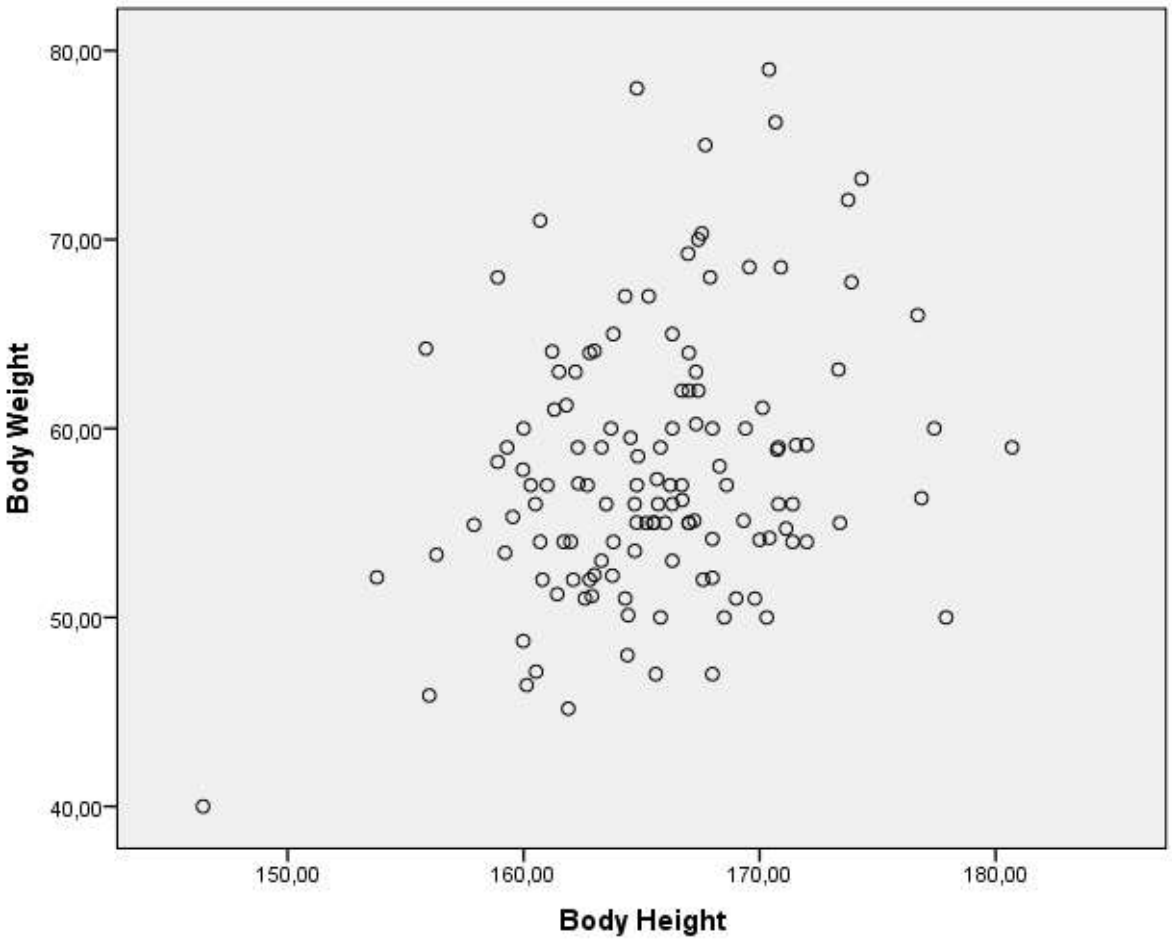
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	504,497	1	504,497	10,979	,001[b]
	Residual	5835,610	127	45,950		
	Total	6340,107	128			

Table 4: The results of linear regression analysis coefficients

Coefficients[a]

Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	-6,538	19,446		-,336	,737	-45,018	31,941
	alart	,389	,117	,282	3,314	,001	,157	,621

Figure 1. Scatter diagram between body weight and body height variables in female 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 female high school seniors aged 18.34 ± 0.63 in Gjakova, the arithmetic average body weight was 57.86 ± 7.04, compared with the researches, 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 (62kg) in Germany, Denmark (64kg), Poland (58kg), Bulgaria (56kg), Turkey (55kg), Lithuania (62kg) and Spain (58kg).

The height of the body of the subject measured in this paper has the arithmetic average of 165.67 ± 5.12 of the age 18.34 ± 0.63 years old. 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 in Gjakova in countries as follows; Germany (169.00cm), Denmark (168.00cm), Poland (166.00cm), Bulgaria (167.00cm) and Lithuania (171.00cm) while the seniors measured in our research have a bigger height than the subjects coming from countries as follows: Turkey (165.00cm) and Spain (165.00cm).

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 0.01 in female 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 females turns to be a solid correlation in value of, $r = 0.282$, which confirms the relation between body weight and body height. As well we have proved that these two variables have correlation between them to male seniors, (Berisha and Koca, 2018) who finds a high correlation in the value of $r = 0.46$.

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 female.

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