Anthropometric measurements of students athletes in relation to physically inactive students

Namik Trtak*, Eldad Kaljić, Amila Jaganjac

Faculty of Health Studies, University of Sarajevo, Bolnička 25, Sarajevo, Bosnia and Herzegovina

Abstract

Introduction: Anthropometry is a method of anthropology that refers to the measuring and testing the human body and to the relationship between the size of its individual parts.The task of anthropometry is as accurately as possible quantitatively characterize the morphological features of the human body.Measurements are made due to the anthropometric points which can be: fixed (standard on the site of prominence) and virtual (change due to the bodyposition).

Goals of research: To evaluate the impact of basketball on the growth and development of seventeen years old adolescents and prevention of deformities of the spinal column and chest.

Methods: The study included 40 respondents. Criteria for inclusion: male respondents aged 17 years who played basketball for more than one year, male respondents aged 17 years who are physically inactive. Criteria for exclusion: female respondents, respondents who played basketball for less than one year, respondents who are engaged in some other sport professionally or recreationally, respondents younger and older than 17 years. In the study,there were made measurements of thorax scope in the axillary and mamilar level, measurements of body weight and height and measurements of Body mass index.

Results of research: Out of 40 respondents 20 are basketball players and 20 physically inactive. Compared to the average value between the two groups of respondents certain differences were observed, which are most noticeable in body weight (basketball players had more weigh about, 5 kg on average) and height (basketball players are taller, about 7 cm on average). During the anthropometric measurements of thorax deformities of the spinal column have been observed which affect the deformation of the thorax. Of the 20 players one has a deformity of the spinal column, and out of the same number of physically inactive students even 12 have deformed spine.

Conclusion: Basketball has a positive effect on the proper growth and development of adolescents.

Keywords: Anthropometry, athletes, physically inactive.

Introduction

Anthropometry is a method of anthropology that refers to the measuring and testing the human body and to the relationship between the size of its individual parts. Measures are the distance between some points on the body (motor measurement) and the angles produced by a certain planes and the lines of the body (goniometric measurement). The task of anthropometry is as accurately as possible quantitatively characterize the morphological features of the human body (1-3). Types of variables in the anthropometric measurements are: a) Static anthropometric variables, b) dynamic anthropometric variables, c) mesostabile anthropometric variables, d) mesolabile anthropometric variables. Static anthropometric variables are parameters of static anthropometry, which measures all dimensions of the body at rest. Dynamic anthropometric variables are parameters of dynamic anthropometry, which mea-

* Corresponding author: Namik Trtak
Faculty of Health Studies, University of Sarajevo,
Bolnička 25, Sarajevo, Bosnia and Herzegovina
Phone: +387 61 84 15 77
E-mail: namiktrtak@yahoo.com

Submitted 4. April 2012/ Accepted 25. April 2012

sures all dimensions of the body in motion. Unlike static anthropometry, dynamic anthropometry is based on biomechanics, ie on the application of mechanics in biological systems. Mesostable anthropometric variables are the parameters for which the law of the relatively uniform growth applies which allows to predict a series of different dimensions in relation to body height. Mesolabile anthropometric variables are the parameters where the law of the relatively uniform growth does not apply, because they are substantially influenced by the external environment (3 -5). Anthropometric point must be the standard. We distinguish between fixed and virtual anthropometric points. Fixed anthropometric points are the ones that are always on the same body part. They are located on bone prominences and there fore are clearly visible. Their position is also determined by using some clearly detectable morphological characteristics of the soft parts of the body. Virtual points are changing in relation to body position. Depend on the plane on which the respondent stands during measurement, because this plane is considered as the starting point from which we measure. Anthropometric points can be an indicator of the presence of deformities of the chest, spinal column and other parts of the locomotor system (6-8). Body dimensions are changing during the life, but also their interpersonal relationship. An infant has a relatively large head, short limbs and long torso which makes up about 70% of its total length. During development of the organism to adulthood that situation is changing and completely different ratios perform. Thus, in an adult man torso takes up about 50% of the total length. Highest growth rate in boys is approximately in fourteenth year and according to some estimates, ends in about twentieth year of age. According to the opinion of some authors growth in men finally stops in about thirtieth year of age.Influence on the development of the organism have: genetic factors and environmental factors (9). BMI is an anthropometric measure that shows the ratio between body weight and height, however it does not consider the individual's physique, so its use is restricted. BMI can not illustrate the percentage of body fat compared to muscle or bone mass which are the main criteria for assessing whether a person is obese or skinny. Individuals with high body mass and high BMI index can not be automatically categorized as obese; for example, in bodybuilders and hugely built men the proportion of muscle and bone mass in relation to height is large, but that does not mean they are obese. Therefore, BMI can not be a criterion for assessing health or obesity, but it is used as a good statistical measure of nutrition. Human nutritional status can be ranked with index from 15 to 40 and more (4). Aims of research are to evaluate the impact of practicing basketball on the growth and development of seventeen years old adolescents and determine the impact of basketball on prevention of deformity development of the spinal column and chest.

Methods

Respondents

The study was conducted in the period from 13.09.2009. to 05.10.2009. year. The research included 40 respondents, half of them are practicing basketball in the basketball club Spars, and the other half are physically inactive students from the Secondary Dental School in Sarajevo. Criteria for inclusion of respondents in the study were male respondents aged 17 years who played basketball for more than one year and male respondents aged 17 years who are physically inactive. Criteria for exclusion of respondents from the study were female, respondents who played basketball for less than one year, respondents who are engaged in some other sport professionally or recreationally, respondents younger or older than 17 years.

Research methods

Research method is descriptive, analytic, nonexperimental with control group. In the study, there were made measurements of thorax scope in the axillary and mamilar level, measurements of body weight and height and measurements of Body mass index.

Statistical analysis

The obtained data were statistically analyzed, average values were calculated and compared between the two groups of respondents.

Results

The results are shown in Tables.

TABLE 1. Comparison of average values of anthropometric measurements of thorax scope in adolescent basketball players and physically inactive adolescents.

	Comparison of average values of anthropometric measurements of thorax scope	Mean value (mg/L)	Sd (mg/L)	CV (%)
	Basketball players	Physically inactive	Difference	4.3
Mammillary thorax scope during guiet brething	91. 04 cm	90. 04 cm	1 cm	2.6
Mammillary thorax scope during max. inspiration	92. 27 cm	91. 69 cm	0. 58 cm	2.1
Mammillary thorax scope during max. expiration	89. 32 cm	87. 85 cm	1. 47 cm	
Axillary thorax scope during guiet brething	95. 19 cm	93. 46 cm	1. 73 cm	
Axillary thorax scope during max. inspiration	96. 26 cm	94. 75 cm	1. 51 cm	
Axillary thorax scope during max. expiration	93. 45 cm	90. 85 cm	2. 60 cm	

TABLE 2. Comparison of average values of anthropometric measurements of weight, height and Body mass index in adolescent basketball players and physically inactive adolescents.

	Comparison of average values of anthropometric measurements of weight, height and Body mass index	Mean value (mg/L)	Sd (mg/L)	CV (%)
	Basketball players	Physically inactive	Difference	4.3
Body Height	188. 95 cm	181 .80cm	7. 15 cm	2.6
Body Weight	76. 61 kg	71. 66 kg	4. 95 kg	2.1
Body Mass Index	20. 31	19. 90	0. 41	

TABLE 3. Comparison of the number of spinal deformities in adolescent basketball players and physically inactive adolescents.

	Scoliosis	Kyphosis
Adolescents who practice basketball		1
Physically inactive adolescents	8	4
Total number of respondents	20	20

Discussion

By the analysis of data obtained in the study we can see that the average values of all measurements of thorax scope are 1.48 centimeters higher in basketball players, compared to the teenagers who are physically inactive.(Table No.1) If we consider the fact that the exercises for muscle trophic begin to intensively practice with sixteen years, we can assume that the difference in the coming years will be even bigger. Teenagers who are engaged in basketball are on average 7.15 centimeters taller and 4.95 kg heavier than the physically inactive teenagers. The average value of Body Mass Index was 0.41 higher in basketball players.(Table No.2) The reason why the basketball players are taller is that the sport in which someone will be engaged is chosen according to the physical qualities , and the difference in weight and Body mass index is present because the basketball players have some more muscle mass. Of the 20 respondents who practice basketball one has a deformity of the spinal column, and out of the same number of respondents in physically inactive adolescents even 12 have deformed spine.(Table No.3) Deformities were confirmed visually, but not accessed for further diagnosis.

Conclusions

Based on these data we can conclude that practicing basketball has a positive impact on growth and development of seventeen years old adolescents and that long-term practicing basketball has a significant impact on prevention of deformity development of the spinal column and chest.

Competing interests

Anthropometric measurements, which were the subject of this research, were conducted by graduate physiotherapist without any financial compensation. The basketball club and high school in which measurements were performed were selected by random method, and the research was conducted anonymously, with the consent of representatives of institutions and respondents.

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