Jovan Gardasevic[1]
Dusko Bjelica[1]
Ivan Vasiljevic[1]
Marin Corluka[2]
Fitim Arifi[3]
Sami Sermaxhaj[3]

DIFFERENCES IN BODY COMPOSITION BETWEEN YOUNG FOOTBALL PLAYERS OF FOOTBALL CLUBS IN MONTENEGRO, BOSNIA AND KOSOVO

RAZLIKE V TELESNI SESTAVI MLADIH NOGOMETAŠEV IZ NOGOMETNIH KLUBOV ČRNE GORE, BOSNE IN KOSOVA

ABSTRACT

The aim of this research was to determine the differences between the young football players (U19) in terms of anthropometric characteristics and body composition of three the most successful clubs in three countries of the southern region of the Balkan Peninsula. These are FC Sutjeska from Montenegro, CSC Zrinjski from Bosnia and Herzegovina and FC Prishtina from Kosovo. This survey involved a sample of fifty-three young football players. In Montenegro, the measures have been established for thirteen young football players of FC Sutjeska of the average age 17.62±.87, in Bosnia and Herzegovina for 27 players of CSC Zrinjski of the average age of 17.33±.78, and in Kosovo for 13 players of FC Prishtina of the average age 17.77±.59. Football players were tested immediately after the end of the competition season 2018/19. Anthropometric characteristics and the body composition were evaluated by a battery of 11 variables: body height, body weight, triceps skinfold, biceps skinfold, skinfold of the back, abdominal skinfold, upper leg skinfold, lower leg skinfold, body mass index, fat percentage and muscle mass. The significance of the differences between the young football players of the three the most successful football clubs in their countries in the anthropometric characteristics and variables for assessing body composition were determined by ANOVA test. ANOVA test found that the young football players of the three mentioned clubs don't have statistically significant differences by the variables.

Key words: anthropometric characteristics, body composition, young football players

[1]University of Montenegro, Faculty for Sport and Physical Education, Niksic, Montenegro

[2]University of Mostar, Faculty of Mathematics and Science Education, Mostar, Bosnia and Herzegovina

[3]Universe College, Department of Physical Culture, Sport and Recreation, Prishtina, Kosovo

IZVLEČEK

Cilj te raziskave je bil opredeliti razlike v antropometričnih značilnostih in telesni sestavi pri mladih nogometaših (U19) treh najuspešnejših klubov iz treh držav južnega Balkana. Ti klubi so NK Sutjeska iz Črne gore, HŠK Zrinjski iz Bosne in Hercegovine ter NK Priština s Kosova. Raziskava je bila opravljena na vzorcu 53 mladih nogometašev. V Črni gori so bile meritve opravljene pri 13 mladih nogometaših iz NK Sutjeska, katerih povprečna starost je bila 17,62 ± ,87, v Bosni in Hercegovini pri 27 igralcih HŠK Zrinjski, s povprečno starostjo 17,33 ± ,78, ter na Kosovu pri 13 igralcih NK Priština s povprečno starostjo 17,77 ± ,59. Nogometaši so bili vključeni v raziskavo takoj po zaključku tekmovalne sezone 2018/19. Antropometrične značilnosti in telesna sestava so bile ocenjene s testom z 11 spremenljivkami: telesna višina, telesna teža, tricepsova in bicepsova kožna guba, hrbtna in abdominalna kožna guba, stegenska in mečna kožna guba, indeks telesne mase, odstotek maščobnega tkiva in mišična masa. Statistično značilnost razlik med mladimi nogometaši treh najboljših nogometnih klubov v njihovih državah glede antropometričnih značilnosti in spremenljivk za ocenjevanje telesne sestave smo ugotavljali s testom ANOVA. Ta je pokazal, da med mladimi nogometaši treh omenjenih klubov ni statistično značilnih razlik v spremenljivkah.

Ključne besede: antropometrične značilnosti, telesna sestava, mladi nogometaši

Corresponding Author:
Jovan Gardasevic
University of Montenegro
Faculty for Sport and Physical Education
Narodne omladine bb, Niksic, Montenegro
Phone: +382 67 518 677
E-mail: jovan@ucg.ac.me

INTRODUCTION

Football is the most popular sport in the world, with up to 270 million participants (Akbari, Sahebozamani, Daneshjoo, & Amiri-Khorasani, 2018). A football game is said to be the most important secondary thing in the world, it gathers huge masses at stadiums and in front of TVs (Gardasevic, Bjelica, Vasiljevic, Arifi, & Sermaxhaj, 2019). It is a highly dynamic and fast team game which, with its richness of movement, falls under category of polystructural sports games (Bjelica, Gardasevic, Vasiljevic, Jeleskovic, & Covic, 2019). Football is a sport characterized by numerous and various complex and dynamic kinesiological activities which are then characterized by either cyclical or acyclical movement (Sermaxhaj, Popovic, Bjelica, Gardasevic, & Arifi, 2017). In football, top score can be achieved only under conditions of well-programmed training process. High quality management of the training process depends on the knowing of the structure of certain anthropological capabilities and player's characteristics, as well as their development. Various researches are to be done in order to establish certain principles and norms for the transformational processes of the anthropological characteristics important for football. However, in many places much more time is spent on increasing the physical fitness of athletes without taking into consideration the assessment of their body composition and their nutritional status (Triki et al., 2012). Findings regarding anthropometric characteristics and body composition are of crucial importance for complex sports games such as football. The anthropometric space is defined by the longitudinal dimension of the skeleton, the transversal dimensionality of the skeleton and the mass and volume of the body. The purpose of knowing anthropometric characteristics is to improve skills in many sports (Carter & Heath, 1990). The anthropometric status of top level athletes is relatively homogeneous, depending on the sport, and it can be defined as a model of athletic achievement. Research on anthropometric characteristics and body composition among athletes of different sports indicates that athletes of different sports have their own specific characteristics, mostly due to the reason that absolute size contributes a significant percentage of total variance associated with athletic success (Carvajal et al., 2012). Muscle mass improves performance in activities that require muscular strength and endurance, but also in those that require enviable aerobic ability (Ramadan & Byrd, 1987; Green, 1992; Rico-Sanz, 1998). The athlete's belonging to a certain sports branch gives to an athlete certain anthropometric characteristics and body compositions. It gives him the advantage of dealing with this sport in relation to others.

Today, football is certainly the number one sport in the world for its rating and popularity, and the same applies to the countries of the southern region of the Balkan Peninsula. These are the countries of the former Yugoslavia where football was the number one sport, and untill today it has maintained its primacy in Bosnia and Herzegovina, in Montenegro and in Kosovo. In all these countries a lot of work is being done to develop young football players. They all want to develop football players and sell them to the rich clubs in Europe. Mostly in this way football clubs in these countries provide their annual budgets. The three clubs that are at the top of the youth football of their countries are Socer Club Sutjeska (hereinafter FC Sutjeska) from Montenegro, Croatian Socer Club Zrinjski (hereinafter CSC Zrinjski) from Bosnia and Herzegovina and Socer Club Prishtina (hereinafter FC Prishtina) from Kosovo. It became interesting for researchers to determine the models of anthropometric characteristics and body composition of the football players who play for these clubs from three neighbour countries of the southern region of the Balkan Peninsula. Considering that the quality of football is very similar in this region, which is evident seeing the results of representative and club selections at the international level and

throughout mutural encounters, it is expected that there will be no significant differences in the analyzed variables.

The aim of this research was to analyze the differences in some anthropometric characteristics and body composition among young football players (U19), players of FC Sutjeska from Montenegro, CSC Zrinjski from Bosnia and Herzegovina and FC Prishtina from Kosovo.

MATERIALS AND METHODS

In terms of time constraint, the research is of transversal character, and it consists of one-off measurement of the corresponding anthropometric characteristics and body composition of the young football players (U19).

Sample of subjects

A sample of the subjects consists of a total of 53 young football players from three different countries. In Montenegro 13 young football players of FC Sutjeska of the average age 17.62±.87, in Bosnia and Herzegovina 27 players of CSC Zrinjski of the average age of 17.33±.78, and in Kosovo 13 players of FC Prishtina of the average age 17.77±.59 were tested. The football players were tested immediately after the season 2018/19 ended.

Sample of measures

Anthropometric research has been carried out with respect to the basic rules and principles related to the selection of measuring instruments and measurement techniques standardized in accordance with the International Biological Program guidelines. For the purpose of this study, eight anthropometric measures have been taken: body height, body weight, triceps skinfold, biceps skinfold, skinfold of the back, abdominal skinfold, upper leg skinfold and lower leg skinfold, and three body composition assessment variables: body mass index, fat percentage and muscle mass. Anthropometer, caliper, and measuring tape were used for anthropometric measurements. To evaluate the body composition, Tanita body fat scale - model BC-418MA, was used. The principle of this scale is based on indirect measurement of the body composition; a safe electrical signal is transmitted through the body via electrodes located in the standalone unit. The Tanita Scale, thanks to its athletics mode, enables athletes to closely monitor their body weight, health condition and form with all relevant parameters.

Method of data processing

The data obtained through the research were processed by descriptive and comparative statistical procedures. For each variable, central and dispersion parameters have been processed. The significance of the differences between the players of the three the most successful football clubs in the anthropometric characteristics and variables for assessing body composition was determined by ANOVA tests, with statistical significance of $p<0.05$.

RESULTS AND DISCUSSION

The variables for assessing anthropometric characteristics and body composition of young football players and ANOVA to identify significant differences between them are shown in Table 1.

Table 1. Descriptive data and ANOVA of 53 young football players, members of the three clubs

Variables	FC SUTJESKA	CSC ZRINSKI	FC PRISHTINA	ANOVA	
	Mean ± Standard Deviation			F	Sig.
body height (cm)	179.01±5.84	180.99±6.05	178.15±6.08	1.137	.329
body weight (kg)	69.58±5.95	73.65±7.62	70.34±3.68	2.196	.122
triceps skinfold (mm)	6.92±3.42	7.38±2.14	7.41±1.83	.181	.835
biceps skinfold (mm)	4.77±1.33	5.23±1.29	5.47±1.31	.988	.380
skinfold of the back (mm)	8.65±2.43	9.39±2.11	8.23±1.16	1.617	.209
abdominal skinfold (mm)	9.08±2.65	10.36±4.08	9.24±4.13	.668	.517
upper leg skinfold (mm)	10.18±4.27	10.84±3.55	11.23±3.79	.260	.772
lower leg skinfold (mm)	7.28±2.24	6.47±2.21	6.56±2.39	.590	.558
body mass index (kg/m^2)	21.68±1.52	22.35±1.64	22.13±.90	.911	.409
fat percentage (%)	9.88±3.47	9.65±4.42	8.66±3.08	.377	.688
muscle mass (kg)	35.45±2.54	37.61±3.72	36.36±1.89	2.281	.113

ANOVA test found that the young football players of the three mentioned clubs don't have statistically significant differences by the variables (Table 1).

Considering the basic descriptive statistical parameters, it can be concluded that we have examined selected young football players. It can be noticed that the football players of these three clubs are of the similar mean values of the variables analyzed, which is not surprising because these are the top three clubs in Montenegro, Bosnia and Herzegovina and Kosovo, where there is a concentration of the best young players. The ANOVA showed that the young football players of the three mentioned clubs don't have statistically significant differences by the variables.

The results of all analyzed young football players showed low fat percentages.It is wellknown that low fat percentage is desirable for high physical performance in all sports. Although, not every body composition characteristic is expected to play a role in optimal performance in football, lower levels of body fat (that are specific to each player) are desirable for optimal performance as body mass must be moved against gravity (Rienzi, Drust, Reilly, Carter, & Martin, 2000; Gil *et al.,* 2005). In other words, by achieving optimal levels of body fat and fat-free mass, the player can minimize the negative effects of excess body fat without sacrificing skill. these results were expected, because many of the previous research recognized football as a predominantly aerobic sport (Kemi, Hoff, Engen, & Wisloff, 2003). Furthermore, it is very important to football players to have a determined body fat percentage in order to perform well enough and achieve their full playing potential. The fat percentage football players of English Premier League vary from 9.9 percent to 12.9 percent, depending on the position (Sutton, Scott, Wallace, & Reilly, 2009), in Japan 8.5-13.7% depending on the position (Tahara et al., 2006), in Zimbabwe 9.2-11.2% depending on the position (Masocha & Katanha, 2014). However, these are just guidelines and the players would work together with their coaches to determine the individual body fat percentage to enhance their physical abilities and their health. The importance of body composition in sport performance is a primary concern in creating athlete profiles as well as conditioning programs throughout a season at all levels of competition (Silvestre et al., 2006), in that describing anthropometric characteristics and body compositions of athletes and detecting possible differences in relation to competition levels may give coaches a better working knowledge of the studied groups of athletes.

For other variables, some values are better for players of FC Prishtina, some for players of FC Sutjeska or CSC Zrinjski, although, insignificantly for statistics, which indicates that these players have very similar anthropometric parameters and body composition, which is again, not surprising, considering that these three clubs are among the best in their countries. All of them origin from the former common state Yugoslavia, which had a unique program of work that is still retained as a leading in these countries, so this is one of the reasons for the similarity of the analyzed players in these parameters. Given that the concentration of the best football players in these three member states of the southern region of the Balkan Peninsula is in these 3 clubs, the assumption is that the mean values of the analyzed variables in all of them should be the model values for the football players of other clubs.

As for average height of young footbal players in these three countries, that have not yet completed growth and development, comparing to all the participants in the 2018 World Football Championship in Rusia which was 181.70 centimeters, while the average height of all players from Croatia league was (183.60 cm), Germany (183.5 cm), Denmark (183.5 cm), Poland (183 cm), showed by an official statistical data proved, that young football players in these three countries are tall enough for their age.

CONCLUSIONS

The results obtained in this research may serve the coaches of other clubs in these countries to compare the players in their own clubs with the ones analyzed here. Also, based on this comparison, they can program their training process to improve all parameters they find not to be on expected level. That will surely make their football players even better and more successful. Also, football clubs in states of the southern region of the Balkan Peninsula should turn to other researches and check the functional-motoric status, psychological preparation as well as tactical training of their players and analyze whether there is a room for their improvement.

The recommendation of what should be done in the future is to check if there are differences in anthropometric characteristics and body composition between the players of the best placed and the lowest placed clubs in the competition tables in the countries of this region and thus determine whether this segment significantly affects the quality of their game and the competitive results.

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CONFLICTS OF INTEREST

All authors confirm - no potential conflict of interest exists for this study.

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