

ORIGINAL SCIENTIFIC PAPER

The Impact of Morphological Characteristics and Motoric Skills in Young Football Players' Selection

Sami Sermahaj¹, Fitim Arifi², Iber Alaj³, Musa Selimi⁴

¹College "Universi", Physical Culture Sport and Recreation, Prishtina, Kosovo, ²Kosovo Olympic Academy, Prishtina, Kosovo, ³Director of Department of Sport, Prishtina, Kosovo, ⁴Faculty of Physical Education and Sport, University of Prishtina, Kosovo

Abstract

This research aims at showing the impact of basic morphological characteristics and specific motoric skills in the selection of young football players, specifically in showing the differences between FC Prishtina's U17 first and second teams. 30 football players participated in this study and were divided into two teams: a first team (n=15) and a second team (n=15). The competitive season performance of football players served as the selection criterion. It was always based on the eye of the coaches. The morphological measurements (body weight and height; BMI) and the assessment of specific motoric skills (speed, agility, and others) were done at the beginning of the competitive season. The research results through T-test analysis have proven differences between the first and second teams (in favor of the first team) in specific motoric skills: sprint 10 m, sprint 30m, specific endurance 300 m, agility without ball 20 m, agility with ball 20 m, but no significant differences between teams in morphological characteristics (body weight and height, BMI). So, based on this study, we can affirm that the selection of more qualitative football players (for the first team) is significantly influenced by specific motor skills (speed, agility, and specific endurance) but not by morphological characteristics (body weight and height, BMI).

Keywords: *football player selection, speed, agility, body weight, and height*

Introduction

The most popular sport in the world, football, offers the most opportunities to advance to the professional ranks. In order to overcome the challenges of modern football, players must be highly prepared, technically proficient, and tactically evolved (Bjelica et al., 2019; Sermahaj, 2021c).

Talent identification is one of the most important steps in the preparatory process of football players with a potential to play at high levels (Waldron & Worsfold, 2010; Hirose & Seki, 2015; Sarmiento et al., 2018). The talent preparation process (development) necessitates multidisciplinary knowledge of anthropologic status (morphologic, motoric, technical-tactic, functional, psychologic, etc.) from the selectionist, as well as continuous assessment knowledge during the growth and development period (Huijgen et al., 2014).

Regardless of age or maturity level, the majority of stud-

ies show that good players have advantages in technical, tactical, body construction, motoric, and psychological skills (Sarmiento et al., 2018). To prove the differences between levels, different morphologic status aspects of football players have been researched. Numerous studies have revealed insignificant differences among football players from various regions (Gardasevic et al., 2020; Sermahaj et al., 2021a). Young football players' morphological characteristics may influence their opportunities and competitive spirit as they strive to advance to higher levels (le Gall F, et al., 2010). Young football players' motoric and functional skill capacities vary fundamentally as a result of variations in morphologic status during growth and development (Vänttinen et al., 2011; Leão et al., 2017).

Conditional preparation is fundamental to the execution of all technical-tactical elements and is responsible for dis-



Correspondence:

Musa Selimi, Ph. D.
University of Prishtina, Faculty of Physical Education and Sport, Str. "Eqrem Qabej", no nr. 10000, Prishtina, Kosovo.
E-mail: musa.selimi@uni-pr.edu

tinguishing between higher and lower-level football players (Jovanovic et al., 2011; Sermaxhaj et al., 2015). Research done with the goal of selecting young football players has shown that running speed and technical demonstration were more important in the selection of U13 and U14 football players, whereas specific endurance (cardiovascular and respiratory system) was more important in the selection of U15 and U16 football players (Reilly et al., 2000). Speed with direction change and speed in linear direction can be used as assessments for identifying new football players' talents, whereas muscular force changes during the growth phase are not relevant in football player selection between the ages of 12 and 14 (Hirose & Seki, 2015). Motoric skills until the age of 12–14 are developed to a large extent as a result of the sensitive period. After the age of 14–15, a motoric skill progression happens as a result of rapid muscle development (Bugarski et al., 2013). According to research, motoric skills in general can develop until the age of 16–17, after which the space for motoric skill development is minimal (Bugarski et al., 2013).

Professional football players run 10 to 12 km during a game, with 89% of those km being low-to moderate-intensity runs and only 11% being high-intensity runs (Bradley et al., 2019). The success of high-intensity activities, football game success, and the distinction between professional and amateur football players all depend more on motoric skills such as speed, agility, and specific endurance (Gil et al., 2007; Gonaus & Muller, 2012; Sermaxhaj et al., 2015; Emmonds et al., 2016; Murr et al., 2018).

Football players are selected based on the coach's subjective opinion (coach's eye, motoric performance assessments, and multidimensional data) of which ones, after five years (from the ages of 14 to 19), will progress to the professional level and which ones will remain at the amateur level. The study has shown that the coach's eye has been more predictive than motoric performances and multidimensional assessments, but the three factors coach's eye, motoric and multidimensional assessments together have provided a greater prediction (Huijgen et al., 2014; Sieghartsleitner et al., 2019). In order to recognize the differences between high and low levels of football players based on direct motoric skills assessments, it is crucial for us as sports researchers to do research on the athletes' motoric skills, in this case, the motoric skills of football players.

Based on the abovementioned studies, the aim of this research is to prove the differences between the first team (Superior League) football players and the second team (Regional League) ones in morphological characteristics (body weight and height, BMI) and motoric skills (speed, agility, and specific endurance). Through this research, we will try to answer the question: why do a group of football players belong to the first team and the other group to the second team? We will try to find the answer through morphological characteristics (body weight and height) and motoric skills (speed, agility, and specific endurance) measurements of U17 football players of FC Prishtina club.

Methods

The research was conducted with U17 football players from FC Prishtina Academy. All participants in the research were preliminarily notified of the morphological and motoric skill measurement procedures. Before participating in the study, football players underwent a medical check-up at the

sports medicine center in Prishtina. The check-up cleared all the football players for participating in the study. In accordance with the Declaration of Helsinki, the local university ethics committee approved the study (1964).

Participants

The sample for this research included 30 U17 football players from FC Prishtina club. The football players' sample was divided into the first team (n=15) and the second team (n=15). Based on the performances the football players had shown during the preparatory time in the regular sessions and games, the coach's eye was the primary criterion for selecting players for the first and second teams. According to the coaches, the first team, which would compete in the Superior League for U17 Kosova, was selected after the preparatory period with more talented football players, while the second team, which would compete in regular matches in the Regional League for U17 for the municipality of Prishtina, was selected with less talented football players. The coaches at this age have consistently trained both teams four times per week during the preparatory period.

Morphological measurements

Morphological measurements were conducted in the college of sports "Universi" in Prishtina. Body weight and BMI (Body Mass Index = kg/m²) were measured and calculated electronically with "In Body 720" (InBody, Seoul, Korea) (Gil et al., 2007; Vanttinen et al., 2011; Sermaxhaj et al., 2021b), whereas body height was measured sequentially with a Martin anthropometer with an accuracy of 0.1 cm (Marfell-Jones et al., 2006).

Motor skills assessments

Variable assessments of specific motoric skills were conducted in the field with artificial grass of FC Prishtina Sport Center, where the U17 football players also conduct their regular training sessions. After 20 minutes of warm-up, all participants (players) in this study underwent testing variables of motoric skills: speed (10 m and 30 m), agility (20 m running zig-zag with and without the ball), and specific endurance (300 m shuttle tempo test).

The sprint tests (10 m and 30 m) consisted of a 30 m track with 10 m split time recording. The photocells were placed at starting positions at 10 m and 30 m in the finish line test. Testing was completed from a standing start, with the front foot placed 30 cm behind the photocell's starting line. The test was conducted with Powertimer 300 (Newtest Oy, Tyrnävä, Finland) photocells with a precise time of 0.01 sec. (Sander et al., 2013; Sermaxhaj et al., 2017; Sermaxhaj, 2022).

The agility test of 20 m running zig-zag with and without the ball was completed from a standing start, with the front foot placed 30 cm behind the photocells' starting line. The photocells were placed at the starting position and finish line test. This test was measured with the Powertimer 300 testing system (Newtest Oy, Tyrnävä, Finland), with an exact time of 0.01sec (Enoksen et al., 2009; Sermaxhaj et al., 2021b).

The specific endurance 300 m test was conducted by running the 1.20 m wide and 50 m long path. Players ran with a high tempo the distance of 2x10 m, 2x20 m, 2x30 m, 2x40 m, and 2x50 m going and coming (a total of 300 m). The time was measured from the moment of the departure signal until the runner crossed the target vertical line with his chest. The play-

ers made only one attempt, and they scored with an accuracy of 0.1 seconds (Verheijen, 1997; Sermaxhaj & Telai, 2014).

Statistical analysis

Data analyses were performed using SPSS version 22.0 (BMI, Armonk, USA). Minimal (Min), maximal (Max), arithmetic means (Mean), standard deviations (SD), results of morphological characteristics (body height, body weight, BMI), and motoric skills (speed 10 m, 30 m, agility 20 m zig zag with and without ball, specific endurance 300 m) were calculated for both teams. To determine the difference between the first team (Superior League) and second team (Regional Team) of U17 football players, each variable was independently examined using the T-test method. We highlight, using the T-Test method, how frequently the variance between arithmetic means exceeds their standard errors. The

level of significance was set at $p < 0.05$. A T-test with a value of $t > 1.96$ (equal or bigger) and a significant level $p < .05$ (smaller) shows that the difference between both groups is significant in a variable.

Results

The two tables below show the results that were achieved. The parameters of morphological variables are shown in Table 1, whereas those of specific motoric variables are shown in Table 2. It was shown from table No. 1 using the T-test method that there were no significant differences between the first team (Superior League) and second team (Regional League) of U17 football players in the three variables of morphological characteristics (weight, height, and BMI). This significant lack of morphological difference shows the team's homogeneity and membership in the same demographics, including age,

Table 1. Descriptive statistics (Minimal – maximal results and arithmetic means \pm Standard deviations) and T-Test (t = score, p =value) for all tests of morphological variables between the first team ($n=15$) and second team ($n=15$) football players aged U17.

Variable	Firs team U17 Min. – Max. (Mean \pm SD)	Second team U17 Min. – Max. (Mean \pm SD)	t	p
Body mass (kg)	57.00 - 79.00 (65.23 \pm 6.55)	52.00 - 74.00 (65.00 \pm 6.17)	-1.100	.921
Body height (cm)	169.00 - 189.00 (177.93 \pm 6.10)	160.00 - 183.00 (175.72 \pm 5.52)	-1.512	.242
BMI (Body mass index)	17.92 - 23.72 (20.59 \pm 1.64)	16.79 - 23.39 (21.30 \pm 1.93)	1.092	.284

Note: Min=minimal result, Max=maximal result, Mean=arithmetic mean, SD=Standard Deviation, t = score, p = p value

gender, nationality, and socioeconomic conditions.

Table No. 2 and the T-test method showed that there were statistically significant differences between the first team of U17 football players (Superior League) and the second team (Regional League) in all assessments (variables) of specific motoric skills, with the first team being statistically significant-

ly better. Sprint run 10 m ($p=.004$), sprint run 30m ($p=.008$), run of fast specific endurance 300 m ($p=.005$), run 20 m zig-zag ($p=.004$), run 20m zig-zag with ball ($p=.003$); The results of specific motoric variables in a football game favor the first team (Superior League) of FC Prishtina U17 football players over the second team (Regional League).

Table 2. Descriptive statistics (Minimal – maximal results and arithmetic means \pm Standard deviations) and T-Test (t =score, p =value) for all tests of motor specific skills between first the team ($n=15$) and second team ($n=15$) soccer players U17.

Variable	First team U17 Min. – Max. (Mean \pm SD)	Second team U17 Min. – Max. (Mean \pm SD)	t	p
Speed 10m	1.69 - 1.98 (1.84 \pm .06)	1.78 - 2.09 (1.93 \pm .09)	3.183	.004
Speed 30 m	4.25 - 4.66 (4.42 \pm .13)	4.32 - 5.22 (4.61 \pm .21)	2.871	.008
Agility 20m zig- zag	6.07 - 6.62 (6.25 \pm .14)	6.06 - 7.00 (6.51 \pm .26)	3.222	.004
Agility 20m zig- zag with ball	7.25 - 7.75 (7.47 \pm .13)	6.90 - 8.72 (7.86 \pm .45)	3.193	.003
Specific endurance 300m	55.78 - 61.13 (57.78 \pm 1.82)	56.00 - 66.06 (60.39 \pm 2.82)	1.892	.005

Note: Min=minimal result, Max=maximal result, Mean=arithmetic mean, SD=Standard Deviation, t = score, p = p value

Discussion

One of the most hotly debated topics, not only among football game professionals but also among the general public, is football player selection: which performances (determining factors) make the difference between professional and amateur football players, or even competition within a club where one football player is part of the first team and the other part of the second team (Murr et al., 2018; Sarmiento et al., 2018). The selection of football players in the first and second teams was conducted by the eye of the coach based on their performance during the preparatory phase (regular training sessions and testing games). This is consistent with the findings of this study, which reveals that U17 football players from FC

Prishtina's first team in the Superior League performed better on all motoric skill tests than players from the second team (Regional League).

The results of this research have proven that in morphological characteristics (body weight and height, BMI) between the first and second teams of U17 football players, there are no significant differences. Other authors have found similar results where insignificant differences in morphological aspects are shown (Jukic et al., 2019), as well as insignificant differences in morphological characteristics between football players from different places and ranges (Emmonds et al., 2016; Bjelica et al., 2019; Sermaxhaj et al., 2021a). Although numerous studies have been conducted to determine whether morphological charac-

teristics (weight and height) have an impact on football player selection, only a few have proven that morphological characteristics have an impact (le Gall et al., 2010; Murr et al., 2018).

This research has shown a significant difference in favor of the first team in motoric specific skills such as starting speed, accelerating speed, specific endurance and agility (the speed of acceleration and stopping with change of direction with or without the ball). There is similar research where the results of the research have proven that specific motoric skills were determined for football player selection (Waldron & Worsfold, 2010; Gonaus & Muller, 2012; Bidaurrazaga et al., 2015b; Murr et al., 2018). The collected data prove that football players of higher professional levels differ from those of lower levels, especially in specific skills of the football game (Waldron & Worsfold, 2010; Sermaxhaj et al., 2015).

Coaches are continuously searching for effective methods to improve the current practices in the identification and development of young football players with a promising potential to reach high levels of football. In this regard, there is a constant conflict between coaches and scientific researchers on the method of football player selection and talent development (Unnithan et al., 2012; Pankhurst & Collins, 2013). The research suggests to coaches and scouts that football player selection should be based on technical and tactical skills, as well as the evaluation of morphological and physiological factors proportionate to the player's age (Sarmiento et al., 2018). There

is a severe lack of research on the role of psychological and environmental factors in the identification and development of talents (Sarmiento et al., 2018).

Based on the findings of this study and with regard to the selection of football players, we can draw the conclusion that certain motoric skills have a significant impact on player selection. Football games are tests on tests, and the assessments made by coaches, scouts, and player action analysts during games through video recordings have a significant impact on the selection of football players. There were thus fewer selection errors when players were selected using the coach's eye, through video analysis of players' activities, and by multidimensional assessment of the anthropologic status of the football player.

This study shows that the young football players (U17) chosen from the coaches' eyes correspond with the positive outcomes that the football players of the first team have shown when compared to the second team in the specific motor skills (starting speed, accelerating speed, specific endurance), and agility (the speed of acceleration and stopping with change of direction with or without the ball). We propose that additional pertinent skills, like technical, tactical, and mental components, be examined in order to reduce the errors made during the selection of young football players. In this way, one may identify the factors that affect the selection of football players at various levels.

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Author contributions

Fitim Arifi, Musa Selimi, and Iber Alaj reviewed previous studies and discussed the findings; Sami Sermaxhaj collected the data, carried out statistical analyses, and produced the manuscript; Fitim Arifi designed the study, discussed the data, and revised the manuscript; whereas Jeton Havolli did the presentation of the results and discussed them.

Conflicts of interest

The authors declare that they have no financial or other conflicts of interest.

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