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## THE RELATION OF SOME MORPHOLOGICAL CHARACTERISTICS vs. MOTOR ABILITIES IN BASKETBALL

### Introduction

The aim of this study is to determine whether there are differences present in anthropometric characteristics and motor abilities between junior basketball club players and their peers from high school in regard to the environment in which they reside and coaching influence. Based on scientific knowledge and scientific research so far conducted mainly by foreign researchers in the field of basketball game and relying on the scope of this paper it was expected (anticipated) the study will show differences in morphological, motor and motor situational variables specific to the basketball game. Basketball is a relatively multifaceted and complex team game combining cyclic and acyclic movement structures, which mainly consist of fast and dynamic movements with the ball and without it (Erčulj, 1998). Play is characterised by many explosive movements such as short sprints, abrupt stops, fast changes in direction, acceleration, different vertical jumps as well as shots with and passes of the ball (Zwierko & Lesiakowski, 2007; Erčulj, Dežman, & Vučković, 2004). The successful and efficient execution of all these movements and, consequently, the playing performance of basketball players of different age categories mainly depend on several motor factors (explosive strength of the legs, strength of the arms and shoulder girdle, agility with the ball and without it, co-ordination, speed of single and alternate movements) (Brack, 1985; Erčulj, 1998; Stone, 2007; Erčulj & Bračić, 2007); physiological factors (anaerobic lactate and alactate capacities) (Jukić, Milanović & Vuleta, 2005; Stone, 2007) and also morphological factors (especially length dimensions) (Erčulj, 1998; Trinić, Dizdar & Dežman, 2000; Karpowitz, 2006). Motor and motor specific abilities are very important skills to every sportmen, especially basketball players; as this could help to prepare themselves when they are facing different complex situations in a training sessions and games and it is also directly related to the athletes' performance and achievement. Therefore, it is important to acknowledge the role of anthropometric and motor abilities and its influence in the achievement of the basketball team.

### Objectives of the Study

1. To compare the anthropometric characteristics, motor and situational specific abilities between players of junior Basketball Club "Skenderaj", in Skenderaj municipality and students of Economics Secondary High School, in Mitrovica. Goals and objectives of the research are:
  1. Analysis and comparison of results obtained from anthropometric measurements
  2. Analysis and comparison of results obtained from motor parameters.

3. Analysis and comparison of the results obtained from specific situational tasks.

Relying on the scope of this research and based on knowledge gained from similar research works done in basketball, relevant hypotheses are:

H 1 - There are significant differences in the morphological characteristics between tested groups.

H 2 - There are significant differences in the motor abilities between tested groups.

H 3 - There are significant differences in the specific to basketball situational tasks between tested groups.

### **Methods**

**Participants:** The sample of the research was composed of (N=24) in total, (N=12) young adults (male, 15-18 years; mean age  $16.91 \pm 1.16$ ), players of Basketball Club (B.C). “Skenderaj”, and their peers (N=12) mean age,  $17.00 \pm 1.20$ ), male students of Economics Secondary High School from Mitrovica; randomly selected during the fall semester of 2013/2014 school year.

All participants of the research were naïve about the purpose of the study and have no history of pathologies. The exclusion criteria for taking part in the research were: (1) not fitting into one of the age groups, (2) having injuries/pathology and/or the uptake of medication (s) that could affect the behavioural consequences of the research participants. All basketball players of B.C. “Skenderaj”, (subjects of the research) representing team in First Kosova National League, held their training sessions on weekly basis (twice/weekly) in Sports Gym of Gymnasium in Skenderaj. They represent the best quality of sport in the Skenderaj town. The entire measurement process was carried out by visits to basketball club venue, (Gymnasium Gym) where, in agreement with school directors and team coaches, the set assignments were realized. To get the relevant data, the system of variables consists of (14 items in total), (5) variables were used to assess morphological characteristics, (5) basic motor variables and (4) motor situational specific to basketball variables.

**Procedure:** Half an hour after the beginning of the training session, participants were instructed to perform tasks that consists of morphologic measurements (5) variables; motor area (4) variables and 4-four situational motor specific to basketball variables(1-(see. Table 1.), Before the start of data recording, the subjects received 2 min of practice trials, sufficient to familiarize the task (tested variable). Subjects were asked to perform the task(s) as well as possible and were instructed to concentrate as much as they can to give their best. Each participant underwent three trial sessions of each test either basketball players or high school students. Tests were monitored visually by two experimenters (Physical Education Teachers) to confirm accuracy of data recording of the results. The details of morphologic and motor variables, tests and units of measurement are displayed in Table 1. To achieve the results after the collection of data, Descriptive statistics such as the mean and standard deviation, min./max., skewnes, and kurtosis were calculated of all variables. To seek for statistically significance between

groups on selected variables the T-test discriminative analysis was used. The level of significance was set at ( $p < 0.05$ ) level. Results are processed with the help of statistical package, SPSS version 21 for Windows

## Results

Table 1. shows basic descriptive statistics data of all the variables (morphologic and motoric ) tested in this research, (n=12 junior basketball players)

**Table 1.** Basic descriptive statistics (n=12) Basketball players

Variable	Min	Max	Mean	SD.	Skew	Kurt
APT	52.00	100.00	72.83	12.48	.509	1.082
ALT	154.00	190.00	175.66	9.80	-.590	1.043
AGJSHD	17.00	20.00	18.50	1.00	.000	-.764
AGJKR	150.00	190.00	176.16	11.42	-.975	1.196
AGJKER	37.00	48.00	43.66	3.20	-.735	.107
MKGJV	140.00	240.00	207.50	28.95	-1.289	1.536
MKLV	35.00	50.00	41.16	4.44	.351	-.091
MV20M	3.03	4.07	3.14	.29	3.438	11.871
MTAPD	39.00	52.00	45.58	3.67	-.258	-.244
MHMED	380.00	598.00	472.00	66.52	.503	-.624
SGJK	4.00	8.00	5.58	1.16	.588	.362
SGJKM	5.00	10.00	7.08	1.31	.690	1.159
SGJKD	2.00	8.00	4.16	1.94	1.407	1.059
SGJKM	3.00	7.00	4.83	1.40	.351	-1.097

Table.1. Morphologic variables APT-body mass, ALT-body high, AGJASHD- palm length, AGJKR-arm length, AGJKER- knee high, motor variables; MKGJV-standing long jump, MKLV-standing vertical jump, MV20M- 20 m. running, MTAPD, sitting hand tapping MHMED-medicine ball throwing), situational motoric variables ;SGJK-free throws, SGJKM-free throws in target (square in wall), SGJKDJ-free throws right wing, SGJKMA-free throws left wing.

The results expressed the basic statistical data basketball players juniors, mean and standard deviation of all selected morphologic and motor measures are: Age ( $16.95 \pm 1.16$ ), height 175.66 cm), weight (72.83 kg), palm length (18.50 cm), arm span (176.16 cm), knee height (43.66 cm), basic motoric; standing long jump (207.50 cm), standing vertical jump (41.16 cm), 20m running (3.14s.), hand tapping (45.58), medicine ball throwing (472 cm), situational motoric variables ; free throws (5.58.p), free throws in target (square in wall) (7.08) free throws right wing (4.16p.), free throws left wing 4.83p.

The rest of data of secondary high school students are displayed in Table.2.

**Table 2.** Basic descriptive statistics (n=12) Secondary High school students

Variable	Min	Max	Mean	SD.	Skew.	Kurt.
APT	53.00	87.00	68.83	8.95	.664	1.242
ALT	166.00	193.00	180.75	7.68	.011	.061
AGJSHD	18.00	20.00	19.08	.90	-.185	-1.865
AGJKR	169.00	192.00	180.75	7.68	-.061	-.928
AGJKER	39.00	50.00	43.41	3.23	.635	-.145
MKGJV	200.00	245.00	226.50	14.92	-.560	-.837
MKLV	36.00	58.00	43.91	6.58	.761	.159
MV20M	3.03	4.04	3.46	.49	.385	-2.255
MTAPD	23.00	47.00	36.83	7.28	-.536	-.476
MHMED	340.00	510.00	454.91	57.48	-.697	-.668
SGJK	1.00	7.00	3.58	1.97	.531	-1.151
SGJKM	4.00	10.00	6.16	2.03	.659	-.703
SGJKD	2.00	8.00	4.16	1.94	.875	-.259
SGJKM	2.00	8.00	5.25	1.76	-.335	-.474

Table.2. Morphologic variables APT-body mass, ALT-body high, AGJASHD- palm length, AGJKR-arm length, AGJKER- knee high, motor variables ; MKGJV-standing long jump, MKLV-standing vertical jump, MV20M- 20 m. running, MTAPD, sitting hand tapping MHMED-medicine ball throwing), situational motoric variables ;SGJK-free throws, SGJKM-free throws in target (square in wall), SGJKDJ-free throws right wing, SGJKMA- free throws left wing.

The results expressed the basic statistical data basketball players juniors, mean and standard deviation of all selected morphologic and motor measures are: Age (16.95±1.16), height 180.75cm), weight (68.83kg), palm length (19.08cm), arm span (180.75cm), knee height (43.41cm), basic motoric; standing long jump (226.50 cm), standing vertical jump (43.91cm), 20m running (3.46 s.), hand tapping (36.83), medicine ball throwing (454.91 cm), situational motoric variables ; free throws (3.58.p), free throws in target (square in wall) (6.16 p.) free throws right wing (4.16p.), free throws left wing 5.25 p.

	Group	N	Mean	SD	Std. Error Mean
APT	Students	12	68.83	8.95	2.58
	Basket.players	12	72.83	12.48	3.60
ALT	Students	12	180.75	7.68	2.219
	Basket.players	12	175.66	9.80	2.82
AGJSHD	Students	12	19.08	.90	.25
	Basket.players	12	18.50	1.00	.28
AGJKR	Students	12	180.75	7.68	2.21
	Basket.players	12	176.16	11.42	3.29
AGJKER	Students	12	43.41	3.23	.93
	Basket.players	12	43.66	3.20	.92

MKGJV	Students	12	226.50	14.92	4.30
	Basket.players	12	207.50	28.95	8.35
MKLV	Students	12	43.91	6.58	1.90
	Basket.players	12	41.16	4.44	1.28
MV20M	Students	12	3.46	.49	.14
	Basket.players	12	3.14	.29	.08
MTAPD	Students	12	36.83	7.28	2.10
	Basket.players	12	45.58	3.67	1.06
MHMED	Students	12	454.91	57.48	16.59
	Basket.players	12	472.00	66.52	19.20
SGJK	Students	12	3.58	1.97	.57
	Basketball players	12	5.58	1.16	.33
SGJKM	Students	12	6.16	2.03	.58
	Basket.players	12	7.08	1.31	.37
SGJKD	Students	12	4.16	1.94	.56
	Basket.players	12	4.16	1.94	.56
SGJKM	Students	12	5.25	1.76	.50
	Basket.players	12	4.83	1.40	.40

T-test,  $p=0.99$ . the statistically significance was set  $.01$

The only one variable designed as a statistically significant, that was hand tapping. This shows that the only variable we have statistically significant differences between the groups, while the other variables have no statistical significance. The explanation of this difference might be due to the fact that basketball players spend more time on working with ball, hand manipulation they have to perform their coach instructions during training sessions and games, fulfilling the technical and tactical roles and responsibilities. Based on research findings the effect of coaching and training is statistically non-significant.  $p=0.99$

### Discussion

In spite of the large number of works being developed, sometimes the information is highly dispersed and there is some difficulty in getting a common language between people of different background concerned with the problematic of morphological characteristics and motor /motor specific abilities in athletes vs non athletes mainly in junior group ages. We have no much evidence of researches done and published papers of local researchers on group differences in regard to morphologic and motoric characteristics in youngster (basketball players vs Secondary High school students). Various studies have examined the morphological characteristics and their differences due to the specifics of each player position of elite and successful teams in basketball of both male (Dežman, Trninić, & Dizdar, 2001; Erčulj, 1998; Jeličić, Sekulić, & Marinović, 2002; Trninić, Dizdar, & Fressl, 1999) and female basketball players (Ackland, Schreiner, & Kerr, 1997; Bale, 1986; Carter et al., 2005, Erčulj, F., & Bračić, M. (2010)). The FIBA changes in rules of 2000 may have contributed to modifying the

morphological and physiological profile of basketball players, by generally increasing their level of fitness (Cormery, Marcil, & Bouvard, 2008). Morphologic and physiological profiling can contribute to selection procedures in junior basketball; however, determinants of success are multi-factorial (Hoare, 2000). So far these concerns have been lacking in Kosovo basketball, due to the fact that Kosovo Basketball Federation is not recognized by FIBA yet, and is not recognized as a member of that association. According to the findings obtained from the research, it was seen that there was not any statistically significant difference between morphologic characteristics, motoric abilities, and situational specific to basketball skills scores of the participant sample group (n=24) (young basketball players vs high school students. The fact that there was not any significant difference in terms of motor specific situational skills variables may be attributed to the fact that, unprofessional coaches are not following basics of basketball coaching; there is no any talent identification of prospective basketball players, there is no any selection process basketball team structure of players, they are using old coaching methodologies. According to (Stanković, V. et al. 2009) findings obtained after the comparison of the morphologic characteristics among top handball, basketball and football players on sample of 158 top sportmen of male gender (51 handball players, 51 basketball players and 56 football players) basketball players have the highest values of the variables of longitudinal and transversal dimension of the skeleton. it can be concluded that there are various morphological structures of the sportmen according to the sports We can say that there are different findings about young athletes and non athletes ,these different findings may be resulting from the differences of coach qualities and competencies, also due to absence of initial selection process of prospective basketball players and unknown characteristics of the sample groups (small number of tested subjects)..We consider that statistically non-significant results observed among the groups which could be attributed to genetic influences reflect the “variability” in the morphological characteristics of basketball players and their peers from secondary high school. In this research it was found out that the players of both teams had similar results also in motor and motor specific to basketball abilities, its very interesting and surprising result, and its matter of the “influence” of training. Surprisingly, these results obtained from tested groups shows that there is no any statistically significance projected in the motoric and specific to basketball situational motor abilities between basketball players and students non athletes. One single method is not sufficient to determine the relation of morphologic, motor and situational motor specific to basketball abilities. Ability selection and orientation is necessary for sport conception directed to high performance. In conclusion, we can say that the current situation in which kosovar basketball today is not what we are looking for, because it must be admitted that the neuralgic point is the lack of expertise and competencies of professional staff (coaches-trainers) to administer and manage their duties and responsibilities correctly. So, some possible recommendations for the development of Kosovo's basketball in the right direction can be:

- Developing a national basketball strategy in accordance with the advanced international standards of modern basketball.

- Implementation in practice of that national basketball strategy, (organizing basketball summer schools, sport clinics, workshops with invited international experts ) that will have a positive effect for public health in general, especially for majority of young population in particular.
- There is a need for strong cooperation between the Faculty of Sport Sciences (the only one Public University in country – Prishtina University) and National Olympic Committee to establish as soon as possible and make it work Kosovo's National Sport Coaching Academy.

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#### THE RELATION OF SOME MORPHOLOGICAL CHARACTERISTICS vs. MOTOR ABILITIES IN BASKETBALL

*The main purpose of the present study was to give a try for clarifying if there is difference present and how the level of differences is in morphologic characteristics and motor abilities (basic and situational specific to basketball abilities) between junior basketball club players and their peers –students from secondary high school and to examine some of the properties(causes) reasons of the difference. According to the findings obtained from the research, there was not found any statistically significant difference between scores of the participant sample group (n=24) (young basketball players (12) vs high school students (12). According to the study results obtained, basketball coaches should follow the new strategies and developments of modern basketball if they want to fulfill the goals and objectives of every single team. The lack of expertise and competencies of professional staff (coaches-trainers) to fulfill their duties and responsibilities correctly is evident in Kosovo's Junior Basketball League.*

**Key words:** morphological characteristics, motor abilities, basketball, difference