COMPARISON OF MORPHOLOGICAL, MOTOR AND EXPLOSIVE STRENGTH CHARACTERISTICS BETWEEN VOLLEYBALL PLAYERS AND NON-VOLLEYBALL PLAYERS AGED 16-17

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Abstract

Through this research, a distinction has been made between morphological, motor and explosive parameters, between students and sportspersons, i.e. volleyball players. The aim was to see the differences in these parameters and the importance of sport which affects the improvement of these parameters in young people.

The research was conducted with young people aged 16-17, in total there were 120 participants, 60 students and 60 volleyball players, and the measurements were conducted in collaboration with volleyball teachers and coaches.

The research results show that there are significant differences between students and volleyball players, in terms of morphological, motor, and explosive parameters and these differences show a clear favoring of volleyball players, compared to students. The differences are clearly presented and with this we conclude that the sportspersons, more precisely the volleyball players have positive and high parameters, compared to students. Correlations between morphological and motor and explosive parameters are also observed, which explain the influence of morphological factors on motor as well as explosive ones.

Data were analyzed using SPSS program (version 25), while the Independent Sample t-test and Pearson correlation were used to confirm the hypothesis, while the parameters of mean values, skewness and kurtosis were used to present descriptive data.

In the end we can conclude that in all cases, volleyball players have shown advantages in all morphological, motor and explosive parameters compared to students.

Keywords: Morphological, motor, explosive characteristics, volleyball players, students.

1. Introduction

Through this research, the importance of sport as a physical activity has been presented, namely volleyball in improving the morphological and motor parameters, as well as the explosive ones in relation to the group of students who do not engage in physical activities. The elements of the game of volleyball intertwine combined and quite complex tasks between motor skills with different and fast movements and actions, high jumps and various duels in the air (over the net) with opponents both in attack and in protection. Through the game, changes are achieved in anthropological features, such as those that build the intellectual knowledge of the will, especially the motor ones.

2. Research hypotheses

To prove the differences and correlations between groups of variables, the following hypotheses have been set up which will give us a realistic picture of the research.

H01. There are significant differences between students and sportspersons in terms of morphological parameters.

H02. There are significant differences between students and sportspersons in terms of motor and explosive parameters.

H03. There are significant correlations between body mass, body height and arm length as morphological and motor and explosive parameters in students and volleyball players.

H04. There are significant correlations between chest perimeter, leg length, hand length and foot length as morphological and motor parameters, explosive in students and volleyball players.

H05. There are significant correlations between thigh perimeter and under-thigh perimeter as morphological and explosive motor parameters in students and volleyball players.

H06. There are significant correlations between the diameter of the wrist, the diameter of the ankle, the diameter of the knee joint as morphological parameters and those of explosive motor in students and volleyball players.

H07. There are significant correlations between suprailiac adipose tissue, subknee adipose tissue and thigh adipose tissue as morphological parameters and explosive motor ones in students and volleyball players.

3. Research methodology

Based on the hypotheses presented and having in mind the purpose of the research we have selected statistical methods which enable us sufficient information in achieving the objectives in this paper.

The following statistical methods have been applied for the processing of the results:

1. Descriptive methods: Arithmetic mean, standard deviation
2. Results distribution test: skewness test, kurtosis test
3. Correlation method
4. Method of T0 - test.

a. Entities sample

In this project are treated young volleyball players aged 16-17 years where the total number will be defined by 60 volleyball players who belong to the volleyball school KV "Ylli" from Prishtina, and 60 students of the primary school "7 Shtatori" from the same city.

– The first group G1 includes half of this research which is defined by young people of KV "YLLI" volleyball school, participants in championship competitions during the 2014-2015 season.

– The second group G2 includes the same number of young people who are full-time students of the primary school "7 Shtatori" and do physical activity only in physical education classes, twice a week for 45 minutes. The sample which is studied in this paper in both groups are the young people of the city of Prishtina.

b. Variables sample

In this research, a total of 21 variables were applied, of which 15 variables for the evaluation of morphological characteristics, 4 variables for the evaluation of motor variables and 2 variables for the evaluation of explosive characteristics.

4. Research results

4.1. Comparison of morphological results between students and sportspersons: In this part the values of the parameters of the two groups are analyzed, presenting the differences between them. The average body weight of students is 76.20, while in sportspersons it is 72.20, while the standard deviation is higher in sportspersons of 10.74, while in students it is 9.12. Body height in students is 1.72 average and standard deviation of 0.11, while in sportspersons we have an average body height of 1.80 and standard deviation of 0.07. The arm length in students has an average of 72.86 and standard deviation of 5.93, while in sportspersons we have an average of 79.05 and standard deviation of 6.19. The average chest perimeter in students is 96.55, with a standard

deviation of 11.69, while in sportspersons it is 87.95 the average, while the standard deviation is 9.91. The average length of the leg is 93.01, while in sportspersons it is 103, while the average length of the hand in students is 20.27, while in sportspersons it is 22.52.

The average hand length in students is 24.50, while in sportspersons it is 23.50. The average thigh perimeter in students is 56.38, while in sportspersons it is 50.62. The average perimeter of the subthigh in students is 47.65, while in sportspersons it is 42.72. The average diameter of the wrist in students is 64.48, while in sportspersons it is 59, while the average diameter of the ankle in students is 75.10, while in sportspersons it is 69.20. The average diameter of the knee joint in students is 101.28, while in sportspersons it is 97.80, while the suprailiac adipose tissue on average in students is 15.45, while in sportspersons it is 9.75. The average subknee adipose tissue in students is 11.03, while in sportspersons it is 8.85, while the average thigh adipose tissue in students is 18.05, while in sportspersons it is 11.70.

Table: 1. Comparison of morphological results between students and sportsmen

Descriptive Statistics

Groups		N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
		Statistics	Statistics	Statistics	Statistics	Statistics	Statistics	Std. Error	Statistics	Std. Error
Students	Body weight	60	59.00	96.00	76.2033	9.12222	0.760	0.309	0.086	0.608
	Body height	60	1.54	1.89	1.7253	0.11248	-0.068	0.309	-1.213	0.608
	Arm length	60	65.00	86.00	72.8600	5.93268	0.612	0.309	-0.620	0.608
	Chest perimeter	60	78.00	114.00	96.5500	11.69155	-0.123	0.309	-1.340	0.608
	Leg length	60	86.00	108.09	93.0115	5.71753	0.858	0.309	0.114	0.608
	Hand length	60	16.50	22.30	20.2783	1.61666	-0.498	0.309	-0.876	0.608
	Foot length	60	22	27	24.50	1.642	0.048	0.309	-1.165	0.608
	Thigh perimeter	60	50.00	65.00	56.3833	4.14909	0.276	0.309	-0.748	0.608
	Subthigh perimeter	60	40	54	47.65	3.781	-0.114	0.309	-0.997	0.608
	Wrist diameter	60	52	75	64.48	6.811	-0.275	0.309	-1.152	0.608
	Ankle diameter	60	65	82	75.10	5.535	-0.394	0.309	-1.349	0.608
	Knee joint diameter	60	95.00	107.00	101.2833	3.60833	-0.050	0.309	-1.039	0.608
	Suprailiac adipose tissue	60	4.80	30.00	15.4550	6.98408	0.168	0.309	-0.808	0.608
	Subknee adipose tissue	60	4	18	11.03	4.202	0.054	0.309	-1.082	0.608
	Thigh adipose tissue	60	6	30	18.05	6.944	-0.072	0.309	-1.034	0.608
	Valid N (listwise)	60								
Sportspersons	Body weight	60	56.00	92.50	72.2083	10.74703	0.869	0.309	-0.616	0.608
	Body height	60	1.70	1.93	1.8057	0.07823	0.187	0.309	-1.421	0.608
	Arm length	60	70.00	92.00	79.0533	6.19813	0.455	0.309	-0.634	0.608
	Chest perimeter	60	74.00	106.00	87.9500	9.91220	0.254	0.309	-1.243	0.608
	Leg length	60	92.00	115.00	103.4583	7.02073	0.070	0.309	-1.317	0.608
	Hand length	60	18.50	26.00	22.5250	2.45430	-0.080	0.309	-1.280	0.608
	Foot length	60	22	26	23.50	1.384	0.417	0.309	-1.150	0.608
	Thigh perimeter	60	42.00	62.50	50.6267	6.26802	0.559	0.309	-0.929	0.608
	Subthigh perimeter	60	38	48	42.72	3.043	0.051	0.309	-1.233	0.608
	Wrist diameter	60	50	68	59.00	4.951	0.064	0.309	-0.798	0.608

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						Skewness		Kurtosis	
Ankle diameter	60	54	76	69.20	4.079	-0.757	0.309	1.910	0.608
Knee joint diameter	60	88.00	105.00	97.8000	5.29086	-0.415	0.309	-1.059	0.608
Suprailiac adipose tissue	60	4.00	18.60	9.7533	4.10512	0.355	0.309	-0.812	0.608
Subknee adipose tissue	60	4	12	8.85	2.510	-0.463	0.309	-0.889	0.608
Thigh adipose tissue	60	4	22	11.70	4.938	0.459	0.309	-0.642	0.608
Valid N (listwise)	60								

4.2. Comparison of motor scores between students and sportsmen: In terms of motor parameters, we see that in 30 seconds of lifting the trunk from the abdomen, in students we have an average of 17.25, while in sportsmen 20.35, while lifting the trunk from the back on average students have 36.55, while sportsmen on average have 41.67.

We have an average run of 20 meters from the high start with 3.87 for students, while for sportsmen we have 3.24, while hand tapping for students is on average 40.88, for sportsmen it is 47.05. The average standing long jump in students is 206.43, while in the sportsmen it is 248.61, while the standing high jump from with two hands in students is 0.44, while in sportsmen it is 0.54.

Table: 2. Comparison of motor results between students and sportsmen

Descriptive Statistics

		N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
Groups		Statistics	Statistics	Statistics	Statistics	Statistics	Statistics	Std. Error	Statistics	Std. Error
Students	Lifting the trunk lying on the abdomen (30sec)	60	13	22	17.25	2.653	0.093	0.309	-0.960	0.608
	Raising the trunk from lying on your back (30sec)	60	26	42	36.55	4.862	-0.677	0.309	-0.912	0.608
	Running at 20 meters from the high start	60	3.10	4.68	3.8782	0.49395	-0.152	0.309	-1.228	0.608
	Hand tapping	60	28	49	40.88	6.613	-0.587	0.309	-0.811	0.608
	Standing long jump	60	142.00	260.00	206.4333	32.04413	-0.339	0.309	-0.558	0.608

		N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Standing high jump with both hands (height capture during blocking)	60	0.30	0.58	0.4493	0.09100	-0.039	0.309	-1.422	0.608
	Valid N (listwise)	60								
Sportspersons	Lifting the trunk lying on the abdomen (30sec)	60	16	26	20.35	2.609	0.147	0.309	-0.982	0.608
	Raising the trunk from lying on your back (30sec)	60	34	50	41.67	5.177	0.189	0.309	-1.294	0.608
	Running at 20 meters from the high start	60	3.04	3.59	3.2418	0.17942	0.563	0.309	-1.168	0.608
	Hand tapping	60	36	54	47.05	5.838	-0.410	0.309	-1.364	0.608
	Standing long jump	60	200.00	286.00	248.6167	23.74661	-0.216	0.309	-0.892	0.608
	Standing high jump with both hands (height capture during blocking)	60	0.42	0.65	0.5492	0.07790	-0.300	0.309	-1.352	0.608
	Valid N (listwise)	60								

5. Conclusion

The results show that there are large differences in terms of volleyball players and students, in relation to morphological, motor and explosive parameters. In the confirmation of the hypotheses we see that in the first hypothesis in all parameters there are significant differences in 0.01% and 0.05% of the level of reliability, between students and volleyball players, which shows that sportsmen have more favorable parameters and which consequently affect positively in their health, compared to students who present negative levels of these parameters.

The second hypothesis is tested and the difference is made in the motor and explosive parameters, where we see that in all parameters there are differences in 0.01% of the level of reliability. Even in this case we see that volleyball players are more positive and these parameters are in their favor, compared to students who are low level and negative parameters.

In the third hypothesis, the correlations between morphological parameters are analyzed, namely body height, weight, arm length in relation to motor and explosive parameters. The results showed that the hypothesis was partially confirmed and we say that there are significant correlations between body height and arm length as morphological and motor and explosive parameters in students and volleyball players, while there is no significant relationship between body weight and motor parameters.

The fourth hypothesis has partially confirmed the hypothesis and we say that there are significant correlations between body height and arm length as morphological and explosive motor parameters in students and volleyball players, while there is no significant relationship between body weight and motor parameters.

In the fifth hypothesis we have proved that there are significant correlations between the diameter of the hand, the diameter of the ankle, the diameter of the knee joint as morphological parameters and those of explosive motor in students and volleyball players.

In the sixth hypothesis, it is proved that there are significant correlations between the diameter of the wrist, the diameter of the ankle, the diameter of the knee joint as morphological parameters and the explosive motor parameters in students and volleyball players.

In the seventh hypothesis we have proved that there are significant correlations between chest circumference, leg length, hand length and foot length as morphological and explosive motor parameters in students and volleyball players.

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