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The Relation Between Some Motoric And Physiological Characteristics Of 13-15-Year-Old Female Volleyball Players According To Their Positions On The Field (Roles).

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ABSTRACT

The aim of this study is to determine the relation between some motoric and physiological characteristics of 13-15-year-old female volleyball players according to their positions on the field. A total of 120 volleyball players have participated voluntarily. 30 of the participants whose mean age value was 14±0,76 were setters; 30 of them were liberos with mean age value of 13,8±0,45; 30 of them were middle blockers with mean age value of 14±0,79; 30 of them were hitters with mean age value of 13.52±0,68. The age, height, body weight, right-left hand gripping strength, vertical jump, throwing medicine ball, standing long jump, 30-second speed and body fat percentage measurements of the volleyball players have been performed. In evaluating the data, the One Way Anova Analysis has been used. No statistically significant differences have been determined between the age, weight right hand gripping strength and body fat percentage measurement results according to the positions of the volleyball players, who participated in the study ($p>0.05$). On the other hand, it has been determined that there is a significant difference between the height, left hand gripping strength, throwing medicine ball, standing long jump, and speed values according to their positions ($p<0.05$). The results of the study could be beneficial to evaluate the motoric and physiological characteristics of the players according to their positions in establishing teams and in preparing training programs.

Key Words: Volleyball, female, position, motoric.

INTRODUCTION

Volleyball is a sports branch that attracts intense attention in terms of applicability and traceable among the team sports all over the world. Sustaining this status is directly related with the quality of the competitions; and therefore, with the play and the quality of the players.

Motoric and physiological profile plays important roles in physical performance of the volleyball players. Since there is a clockwise cycle in volleyball, each player has roles both in the front line and in the back line, and has specific responsibilities in terms of physical performance. Volleyball is a team sport that requires severe intensity with intervals; and activities of low intensity like stopping and walking at intervals. For this reason, players at a volleyball game show variable performances such as jumping, blocking, sprinting, and hitting (Malousaris, G.G. et al., 2008).

The performance improvement of volleyball players depend on technical, tactical, motoric and anthropometric factors. The players playing in various roles on the field have different capacities and characteristics and carry different responsibilities (Josè M. Et al., 2014).
Dragon et al. conducted a study in which 56 volleyball players participated with mean age values 16.28±1.32; and compared the jumping performances of the players according to their positions. No statistically significant differences in jumping values according to positions are found ($p>0.05$) (Dragon N. et al., 2013).
The aim of this study is to determine the relation between the roles of the female volleyball players whose mean age value is 13-15, and some of their motoric and physiological characteristics. Due to our knowledge, there are not any studies in the literature conducted on this age group in this field in our country and in the world. Therefore the results of the study could be beneficial to evaluate the motoric and physiological characteristics of the players according to their positions in establishing teams and in preparing training programs.

MATERIAL AND METHOD

120 female volleyball players, who played in various clubs between the ages 13-15 and participated voluntarily to the study (Table.1). The tests applied to the players were performed twice, and the best values were determined. Before applying the tests to the players, information regarding the use of any medicine and whether they had any injuries or not were asked and reported. The players, who participated in the study, been informed before the study, and each test separately shown in an applicable manner. In order to ensure their participation at the required level, their motivation levels were increased.

Table.1. Definitive statistics of the volleyball player

Position	n	%
Setter	30	25%
Libero	30	25%
Middle Blocker	30	25%
Hitter	30	25%
Total	120	100%

The ages of the players were determined as years according to the official registers recorded during interviews. Measurement of the body heights of the players were measured with Statiometer (SECA, Germany) and the body weights of them were measured with electronic bascule (SECA, Germany). The Handgrip Strength measurements were performed by using a Holtain-Brand hand dynamometer. The purpose of the test was to measure the strength of forearm flexor muscles. The vertical jump tests were performed by using the jumping platform (Newtest, Finland) on which the flight and contact to the ground times were measured. The results of the players were recorded; and after two trials, the best result was chosen. Throwing medicine ball Test the test was performed with a medicine ball weighing 2 kg. Two trials were made with a few minutes' intervals and the best results were recorded. In order to perform standing long jump test, a steel meter with the brand "Celikler" was used. The 30-m sprinting measurements were made with Newtest, Finland-brand photocell. Body fat percentage measurement of the players were made a Holtain-brand skinfold caliper, which applied 10 g/sqmm pressure at every angle and which had 0,2mm levels, was used. .The Siri Formula was applied in measuring the body fat percentage (Tamer K, 2000). The height of the players was recorded as "m", the body weight as "kg", the 30-meter sprint as "sn", the standing long jump as "m", the vertical jump as "cm", the throwing weight ball as "m", vertical jump left as "cm", and the hand grip strength measurement was recorded as ''kg'' (5).

RESULTS

Table.2. Descriptive Statistics of Some Motoric and Physiological Characteristics of the Volleyball Players according to their Positions.

	Position	N	Mean	Std. Deviation	Minimum	Maximum
Age	Setter	30	14	0,76	13	15
	Libero	30	13,8	0,45	13	14
	Middle Blocker	30	14	0,79	13	15
	Hitter	30	13,52	0,68	13	15
Height	Setter	30	168,19	5,89	158,3	175,6
	Libero	30	161,06	4,24	155,6	165,7
	Middle Blocker	30	170,89	5,06	158,4	179,4
	Hitter	30	168,44	4,7	158,6	177,4
Weight	Setter	8	61,56	3,55	56,5	65,3
	Libero	5	55,22	5,15	49,5	61,3
	Middle Blocker	30	61,02	6,94	49,85	75,41
	Hitter	31	59,12	5,63	48,24	70,58
Right hand grip strength	Setter	30	32,92	2,05	29,92	36,81
	Libero	30	27,13	1,18	25,24	28,34
	Middle Blocker	30	30,27	2,29	25,96	34,15
	Hitter	30	31,6	2,45	25,5	35,29
Left hand grip strength	Setter	30	31,35	1,24	28,84	32,71
	Libero	30	26,64	0,88	25,13	27,34
	Middle Blocker	30	29,04	2,4	24,16	33,15
	Hitter	30	29,67	2,31	24,18	34,17
Vertical Jump	Setter	30	27,79	3,7	21,9	33,5
	Libero	30	24,7	2,73	22,4	28,2
	Middle Blocker	30	32,27	2,9	26,8	36,1
	Hitter	30	34,86	3,23	28,2	41,2
Throwing medicine ball	Setter	30	4,7	0,14	4,44	4,86
	Libero	30	4,5	0,21	4,58	4,91
	Middle Blocker	30	4,5	0,23	3,75	4,8
	Hitter	30	4,1	0,08	4,15	4,8
Standing long jump	Setter	30	159,3	8,14	148	170
	Libero	30	173,8	2,78	171	178
	Middle Blocker	30	174,03	13,09	145	193
	Hitter	30	174,81	11,68	146	191
Speed	Setter	30	5,04	0,1	4,92	5,18
	Libero	30	4,97	0,1	4,85	5,1
	Middle Blocker	30	5,26	0,35	4,75	6,03
	Hitter	30	5,03	0,12	4,75	5,22
Body fat	Setter	30	23,3	1,68	20,1	25,3
	Libero	30	23,34	1,54	21,4	25,1

percentage	Middle Blocker	30	22,21	1,56	19,4	25,2
	Hitter	30	22,89	1,15	21,1	25,5

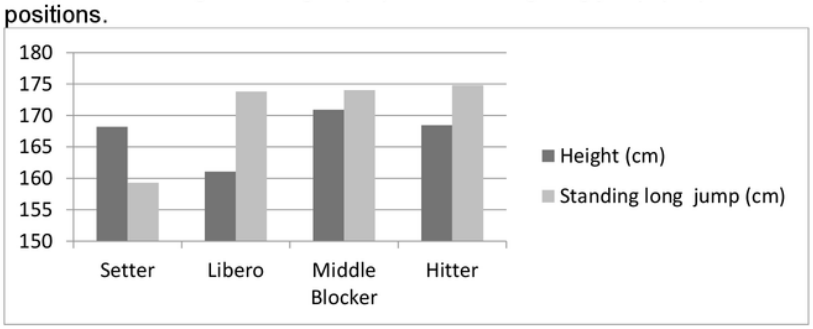
Table.3. Comparison of the Players in terms of Some Motoric and Physiological Characteristics according to their Positions in the Field .

	Position	N	Mean	Std. Deviation	F	Sig.	Diff.
Age	Setter	30	14	0,76			
	Libero	30	13,8	0,45	2,553	0,062	
	Middle Blocker	30	14	0,79			
	Hitter	30	13,52	0,68			
Height	Setter	30	168,19	5,89			
	Libero	30	161,06	4,24	5,916	0,001*	2-3
	Middle Blocker	30	170,89	5,06			2-4
	Hitter	30	168,44	4,7			
Weight	Setter	30	61,56	3,55			
	Libero	30	55,22	5,15	1,725	0,17	
	Middle Blocker	30	61,02	6,94			
	Hitter	30	59,12	5,63			
Right hand grip strength	Setter	30	61,56	3,55			
	Libero	30	55,22	5,15	1,725	0,17	
	Middle Blocker	30	61,02	6,94			
	Hitter	30	59,12	5,63			
Left hand grip strength	Setter	30	32,92	2,05			1-2
	Libero	30	27,13	1,18	8,305	0,000*	1-3
	Middle Blocker	30	30,27	2,29			2-3
	Hitter	30	31,6	2,45			2-4
Vertical Jump	Setter	30	31,35	1,24			1-2
	Libero	30	26,64	0,88	5,129	0,002*	1-3
	Middle Blocker	30	29,04	2,4			2-3
	Hitter	30	29,67	2,31			2-4
Throwing medicine ball	Setter	30	27,79	3,7			1-3
	Libero	30	24,7	2,73	22,377	0.000*	1-4
	Middle Blocker	30	32,27	2,9			2-3
	Hitter	30	34,86	3,23			2-4/3-4
Standing long jump	Setter	30	4,7	0,14			1-3
	Libero	30	4,5	0,21	3,582	0,018*	1-4
	Middle Blocker	30	4,5	0,23			4-3
	Hitter	31	4,71	0,08			4-2
Speed	Setter	30	159,3	8,14			
	Libero	30	173,8	2,78	4,015	0,010*	1-3
	Middle Blocker	30	174,03	13,09			1-4
	Hitter	30	174,81	11,68			
Body fat percentage	Setter	30	23,3	1,68			
	Libero	30	23,34	1,54	2,201	0,096	
	Middle Blocker	30	22,21	1,56			

	Hitter	30	22,89	1,15			

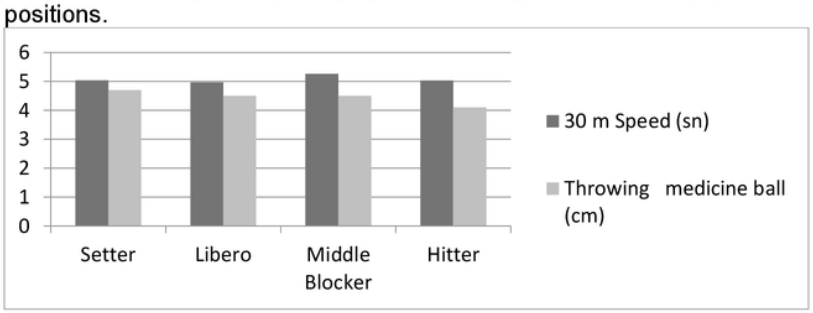
When the results of the volleyball players, who participated in the study, are examined; it is observed that the average heights of the Liberos are shorter than the Middle Blocker and Hitters; and there is a statistically significant difference between them ($p<0.05$). According to the standing long jump measurement results, there is a statistically significant difference in favor of the Hitters and Middle Blockers.

Graphic 1. Avarages of height (cm) and standing long jump (cm) values according to positions.



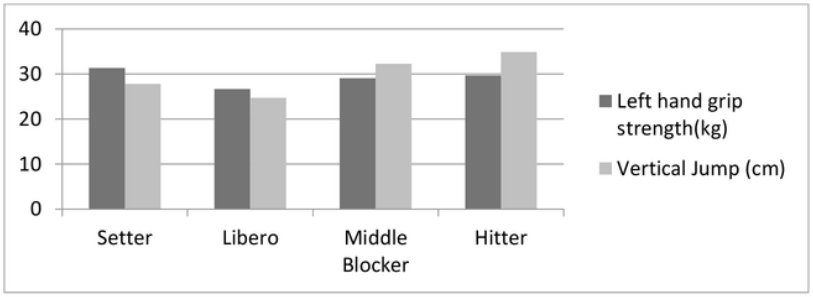
It has been determined that there is a statistically significant difference between the players in favor of the Liberos in Speed values when compared with the players from other positions ($p<0.05$). When the throwing medicine ball measurement results are examined it is observed that there is a statistically significant difference in favor of the Setter and Hitters ($p<0.05$).

Graphic 2. Avarages of speed (sn) and throwing medicine ball (m) values according to positions.



According to the findings obtained with the measurements conducted to determine left hand grip strength, a statistically significant difference is observed in favor of the Setters when compared with the players from the other positions ($p<0.05$). The vertical jump measurement average values of the Hitters were found to be higher than the Setters, Liberos and Middle Blockers, and it has been understood that there is a statistically significant difference ($p<0.05$).

Graphic 3. Avarages of left hand grip strength (kg) and vertical jump (cm) values according to positions



In addition, no statistically significant differences were determined between the age, weight, right hand grip strength and body fat percentage measurement results of the players according to their positions ($p>0.05$).

DISCUSSION

Volleyball is a sport that requires having various roles in different positions for special tactical performance (Afonso, Mesquita, Marcelino, & Da Silva, 2010). The players must have some physical and physiological features in order to play these roles. Generally, the players are classified as middle blocker, hitter, setter and liberos (Malousaris G. G. et al., 2008,). For a successful performance, the players playing at different positions need technical, tactical, physical and physiological differences (Carvajal W. et al., 2012). For example, height is more important for middle blockers because they have the responsibility of blocking the ball when compared with the other positions and the hitters must jump higher than the setters in order to turn the most difficult balls into efficient attacks and to perform blocking (Schaal, et al., 2013).

The average heights of the volleyball players, who played as setters, have been found to be 168,19±5,89 cm; the average heights of the liberos were found as 161,06±4,24 cm, the middle blockers, as 170,89±5,06 cm, the hitters, 168,44±4,70 cm. G. Helveci (2005), found that average height and weight of young female players are 172 cm and 58.04 kg , P. Demirel (2005), found that average height of young female players is 170 cm and 62.56 kg. F. Kılınç, et al (2006), determined that young female national team players average height is 182 cm while their average weight is 67.6 kg. Kılıç ve Binboğa(2012), found that average height and weight of young female players (15-17 ages) are 167 cm and 57.86 kg. In his study about adolescence period (9-14 ages) of children volleyball players, E. Sönmez (2006), determined that female volleyball players' average height value is 144 cm, while this value for male players is 147 cm. Average weight of female players is 36.4 kg. E. Kutlay, et al (2003), determined 13-15 age group female volleyball players' average height in the middle of season is 167cm, while these value is 170 cm at the end of season. The averages height and weight of the players Pantelis et al. (n=62, aged 15.6±1.1 years) conducted a study and reported that the average heights of the middle blockers and hitters were higher than those of the liberos and Juan et al. conducted a study and reported that the average height values of the middle blockers were higher (186.5±1.4 cm), and those of the liberos were shorter (166.7±8.1 cm). These results are consistent with the results of the present study. The right hand grip strength test average points of the volleyball players, who are setters, have been found to be 32,92±2,05 kg; and those of the liberos have been found as 27,13±1,18 kg; those of the middle blockers have been found as 30,27±2,29 kg; those of the hitters have been found as 31,60±2,45 kg and the left hand grip strength test average points of the volleyball players, who are setters, have been found to be 31,35±1,24 kg; those of liberos have been found as 26,64±0,88 kg; those of the middle blockers have been found as 29,0±2,40 kg; those of the hitters have been found as 29,67±2,31 kg. The difference between the middle blockers and hitters has been found to be statistically significant in favor of the setters; and the difference between the liberos and the other players has also been

found to be statistically significant in favor of the middle blockers and hitters (p<0.05). In his study (Kılıç ve Binboğa(2012, right hand grasping strength of female volleyball players were found to be 29.03 kg, while left hand grasping strength of volleyball players were found to be 28.23 kg. Young female volleyball players' right hand grasping strength was found to be 28.10 kg while their left hand grasping strength was found to be 27.08 kg by P. Demirel (2005). Pantelis et al. conducted a study and reported that there was no significant difference between the positions of the players (p>0.05).

The vertical jump test average points of the volleyball players, who played as setters, have been found as 27,79±3,70 cm; those of the liberos have been found as 24,7±2,73 cm; those of the middle blockers have been found as 32,27±2,9 cm; those of the hitters have been found as 34,86±3,23 cm. the vertical jump average points of the hitters have been found higher than those of the setters, liberos and middle blockers, and there is difference between them in favor of the hitters (p<0.05). H.U. Önder (2007), elite female volleyball players' linear jumping height was determined to be 27.0 cm; M. Thissen, et al (1991), found that this value for female volleyball players in high schools are 43.6 cm. Dragan et al. (16.28±1.32 years and n-56) conducted a study and did not report any differences between the vertical jump values of the volleyball players according to the positions. They reported that these results stemmed from the fact that the height and body weights of the players were very close to each other, which was very important for vertical jump. Pantelis et al. (2015) reported that the vertical jump average points of the players were higher than those of the hitters, setters, middle blockers and liberos (hitters (31.0±5.0 cm); middle blockers (26.4±3.3cm); setters (30.5±4.4cm); liberos (30.0±7.2cm)). The results show parallelism with the results of the present study. The throwing medicine ball test average results of the players who played as setters have been found as 4,70±0,14 m; those of the liberos, as 4,50±0,21 m; those of the middle blockers, as 4,50±0,23m; those of the hitters, as 4,71±0,08 m. A statistically significant difference has been found between the values of the middle blocker and hitters in favor of the setters and liberos (p<0.05). The reasons of it is considered to be that the throwing medicine ball test results, which measured the blasting force of the arm muscles, have been found higher because the setters apply passing techniques, which are very important for hitters and setters, more than the other players.

The standing long jump test average points of the players, who played as Setters, have been found as 159,3±8,14 cm; those of the liberos have been found as 173,8±2,78 cm; those of the middle blockers, as 174,03±13,09 cm, those of the hitters, as 174,81±11,68 cm. A statistically significant difference has been found between the values of the setters and liberos in favor of the middle blockers and hitters (p<0.05). It is considered that the middle blockers and hitters perform jumping more than the other players during the trainings and competitions, and therefore, these values have been determined to be higher.

The speed test average results of the volleyball players, who played as setters, have been found as 5,04±0,10 s; those of the liberos have been found as 4,97±0,10 s; those of the middle blockers, as 5,26±0,35 s; those of the hitters, as 5,03±0,12 s. When the speed values are considered, it has been observed that the players who have the lowest average values are the liberos, and those who have the highest values are the middle blockers. A statistically significant difference has been determined between the values of the middle blockers in favor of the setters, liberos and hitters (p<0.05). The liberos are defense players, and they have to be quick, fast, active and they have to possess a good reaction time. In addition, it is considered that the speed values of the middle blockers are determined to be lower due to their physical features.

No statistically significant differences have been determined between the age, weight, right hand strength and body fat percentage measurement results of the volleyball players according to their positions (p>0.05).

CONCLUSION

The relation between some motoric and physiological features of 13-15-year-old female volleyball players have been investigated in this study. There are significant differences in this age group among the height, right-left hand grip strength, vertical jump, throwing medicine ball, standing long jump, speed, and positions. According to the results, height is important for the middle blockers, the hitters must jump well, and the setters and libero players must have speed because of their responsibilities in the field. It has been observed in the study that the body weight, age, and body fat percentage are important factors in this age group. When the motoric features are considered, the jumping strength is an important factor in the hitters; they have to have high girls' jumping strength and values in order to perform their duties in the field (hitting, blocking, attacking to difficult balls by jumping, attacking from the back field, etc.).

According to the results of the speed test, which is another motoric property, the values of the liberos, setters and hitters have been found to be higher than those of the middle blockers. The middle blockers must distribute passes in order to turn the coming balls into attacks, the liberos must meet the most difficult balls in the defense, the Hitters must catch middle block after reaching the balls; and attacking require that these players must have high speed features. It is considered that the height of the middle blockers being more than the other players is a disadvantage in terms of speed.

As it is observed in the Standing long jump test results, the values of the middle blockers and hitters are high, and they have significant differences between the other players. It is considered that these values are high because they are the players who jump the most during training or a competition (blocking, hitting, jumping and servicing, etc.).

The throwing medicine ball average values of the setters and hitters have been found to be high and significant when compared with the players of other positions.

The setters apply the finger-pass technique more than the other players, and work their shoulder, finger and arm muscles equally. The throwing medicine ball and grip strength values being higher in these players is significant.

As a conclusion, the relation between some physical and physiological features of 13-15-year-old female volleyball players and their positions in the field has been investigated in this study. It is considered that this study will be a beneficial resource for trainers and sports scientists in determining the positions by considering the motoric features of the players and in organizing training programs.

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ORIJINALLIK RAPORU

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BENZERLIK ENDEKSI	İNTERNET KAYNAKLARI	YAYINLAR	ÖĞRENCI ÖDEVLERI

BIRINCIL KAYNAKLAR

1	www.analefefs.ro İnternet Kaynağı	%7
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