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Comparison of some physical parameters of professional and regional amateur league footballers according to leagues and positions

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ABSTRACT

The aim of this study is to compare some physical parameters of professional and regional amateur footballers according to their positions. Totally 100 volunteer football players playing in the professional and regional amateur league participated in the study. Anthropometric measurements (height, body weight, body fat ratio) were performed first in evaluating the physical parameters of football players. Second, anaerobic capacity (flexibility, vertical jumping, speed) and third one is aerobic capacity (yo-yo IR1) measurements were completed. Kolmogorov Smirnow test was used for normality testing of the data used in the study. Thus, it is understood that the data show normal distribution, one-way analysis of variance (one way ANOVA), which is one of the parametric tests, was also used in cases where more than two groups were compared. The statistical analysis used in the study was performed at 0.005 error levels in 95% confidence interval. SPSS 22.0 package program is applied for statistical analysis of the data. As a result, it is observed that the football players participating in the study have statistically difference between the flexibility, vertical jumping and 30 m speed values according to the leagues, and height, body weight and body fat percentage values according to the positions ($p < 0.05$). Having the flexibility, vertical jumping and 30 m speed works to improve the parameters of the players with meaningful differences can be made to the players who play in all leagues and positions can contribute to the increase in performance.

Keywords: Football, physical and physiological capacity, position.

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INTRODUCTION

Football is one of the most popular sports in the world as in Turkey today. Due to the interest in football and playing with great pleasure in all societies, it has cost large masses and has become the center of attention in millions of people. One of the reasons for being the center of attention is due to it being a safe sport for children and young people. Football is played faster and at a higher pace than before. Thus, the importance of physical and physiological features increases. The importance of these features has increased the interest in scientific studies in the field of sports, and today's football has gained a place under the light of science.

Performance evaluation of success in football is determined by many tactical, biomechanical, mental and physiological parameters. The main purpose of the studies that take days, weeks, months and sometimes years before the competition in football is to improve the performance level of the athletes and to bring them to the highest level, and to maintain the highest level of efficiency during the competition with the continuity of this level. There is no doubt in football that when the basic factors of success are examined, it is necessary to elaborate a little more on the ability, strength, speed, flexibility, and endurance feature, which are among the basic motoric features. While doing training programs, it is necessary to test the different training methods to

determine the most correct program and to reach the highest efficiency in the studies.

Football has made great progress in recent years with scientific and systematic studies, and this progress has clearly manifested itself in the technical, tactical and condition characteristics of footballers. It can be said that football science interaction has an effect on improving the working conditions of football players, training and match performances, renewal of training programs, being more conscious about the footballers, and having more pleasure than watching football.

As in all sports branches, the basis of success in football consists of increasing the performance of athletes at the highest level and maintaining this level of performance for a long time. The main determining factors of the level of performance in football are talent, health, strength, endurance, speed, flexibility, balance, as well as technical and tactical competence (Schiff, 2007).

The anticipation in today's world football is that the players of all positions develop their physical and physiological responsibilities at the highest level. Due to the fact that the game of football is played in a wide area and the differences of the tasks assigned to the players, it makes it mandatory to evaluate it locally depending on its physical and physiological needs (Marancı and Müniroğlu, 2001). Football may differ not only in other sports but also in the positions it is in and played in. In the course of the game, all the players play very important different roles. The increase of all functions due to the ever-changing roles in the game, both physical and physiological needs of each player on the field increase (Göral et al., 2012).

In the examinations according to positions, it is monitored that midfielder players have fixed, stable, low and more violent movements and more distance, they perform more often and for longer periods than footballers in other positions (Blazevich, 1997). Wing position players and strikers are known to sprint more than other positions during the entire match (Eniseler, 2010). It has been reached that strikers perform more sprints for longer periods than midfielders and defense players (Cerrah et al., 2011). In football, elite athletes must have the physical features required by high-level competitions (Günay et al., 1994). Football is a team and contact sport that requires performance and control such as endurance, strength, flexibility, speed, quickness, strategy (Köklü et al., 2009). These features can be determined by measurements made under football-specific conditions during matches and training, as well as by tests that can be performed in the field and exercise laboratory (İşleğen, 2002).

After the statistical procedures of the data obtained with tests and measurements in football, it is one of the most important parts of the training programs to develop the measured and tested features of football players and to eliminate their deficiencies, and to cooperate with the trainers and other responsible staff (Pyne et al., 2006).

There is a relationship between the positions of football players, anthropometric and physical fitness parameters. Players should be guided to their positions based on their individual characteristics, body size and physical fitness levels, so that players can expect maximum performance (Arnason et al., 2004).

It is possible to reach the height, weight and body fat percentage, body mass index rates of football players in many studies. Studies say that anthropometric features vary depending on the location. So, in order to reveal the physiological power of the athlete, it must have features suitable for its position. If this physical structure is not suitable, it cannot perform completely.

For example, in tall players, it can be considered an advantage for football. Therefore, taller players are more common in positions (goalkeeper, stopper, striker) where this advantage is used.

It is also normal for athletes playing in the same regions to be heavier as the weight will increase with height (Bangsbo et al., 2000). Although football players, both short and tall, have a chance to succeed, especially players who play in certain positions (goalkeeper, striker) are at average. This will also affect performance positively (Küçük et al., 2009).

On the other hand, there is a high relationship between the development of football and its scientificness. Developments in science and technique required a rapid change of football. It is the development of conditional features with high performance technical and tactical preparation, with effective and correct methods suitable for the purpose. While an optimal speed does not occur with a muscle system devoid of strength, the importance of endurance in sports disciplines cannot be denied. The high level of aerobic capacity is positively transferred to anaerobic capacity. As a result, the contribution of scientific studies to football is also an inevitable fact (Kaya and Günay, 2000).

The expectation in today's world football is to develop the physical and physiological responsibilities of the players in every position at the highest level. Football may differ not only in other sports but also in the positions it is in and played in. In the course of the game, all the players play very different important roles. Due to the increase of all functions due to the ever-changing roles in the game, both physical and physiological needs of each player on the field increase (Göral et al., 2012).

When the studies are analyzed, it is observed that there are differences in terms of the distance traveled by the players, the movements they perform, and the local positions they play in terms of the frequency of the movements. Therefore, it requires players who play in all positions, including the goalkeeper, to have all the motor features (Larcom, 2013).

The difference between professional and amateur footballers in our study is that a professional footballer by Turkey Football Federation definition is a footballer who is in an active club, who had made contracts in writing

and a greater amount of the payment of the player is from activities related to his football. Amateur players, on the other hand, require no accommodation and mandatory expenditures to participate in football activities, including insurance and materials; he is a footballer who is not paid any fee (TFF, 2016).

Football, which is a professional sports branch, has become a sector with great budget possibilities in our country. The teams put their masses of thousands of fans into sporting success expectations. Teams need to improve their physical, psychological, physiological, motoric, technical-tactical levels to meet this expectation. This requirement affects the quality and structure of the training sessions. The time allocated for training has also increased with the change in the intensity, intensity and volume of the training. As a result, the bio-motor abilities of football players have approached their limit values for professional football players. This development in professional footballers caused amateur teams, especially those aiming to rise to professional leagues, to try to get rid of their amateur identities with works equipped with high-level training methods and content (Aslan and Koç, 2015).

The purpose of this study is to compare the body composition and motor characteristics of footballers who are training five days a week with the PTT 1st League, 2nd League, 3rd League professional football players who are training five days a week, and regional amateur league level championships. It is aimed to determine whether the state of being and its status according to the positions make a difference in terms of the measured features.

MATERIALS AND METHODS

This study consists of the Turkey Football Federation 2018-2019 season, three different professional leagues (PTT 1st League, 2nd League and 3rd League), wherein composed of athletes (n = 75) and Ankara Regional Amateur League (n = 25) in total (n = 100). The football players voluntarily participated in the study.

Primarily, body composition measurements were made to determine the physical properties of the participants. Body composition measurements were measured on an empty stomach in the morning, with only shorts on football players, without any extra material (jewelry, etc.), without shoes and socks, with bare feet on the device and according to standard techniques (Sassi et al., 2011).

Length measurements of the participants were measured with a portable Holtain Stadiometer (Holtain Ltd. U.K.), which can measure with an accuracy of ±1 mm (Sassi et al., 2011).

Inbody 270 (Japan) brand body fat analyzer with 20 and 100 kHz was used to determine the body weight (kg) of the participants and the percentage of body fat (%). Measurements were made while the participants were wearing shorts and T-shirts. The "Athletic" mode in the information section of the analyzer has been selected and the players' clothing has been reduced to 0.5 kg.

Besides, the age and height of the players were also entered in the information part.

If we briefly touch on the energy systems used in exercise in football based on physical parameters, aerobic capacity is the capacity of large striped muscle groups to adapt to the job using the energy obtained by aerobic metabolism. The value of aerobic capacity per unit time is called aerobic power. During the gradually increasing exercise test, the highest oxygen volume value used by skeletal muscles is defined as the maximum oxygen volume (VO_2max). VO_2max is a good indicator of aerobic capacity and is considered physiologically an indicator of the integration of pulmonary, cardiovascular and neuromuscular functions. Anaerobic threshold and VO_2max values are important for the evaluation of the person's aerobic condition, as well as the training programs in athletes and the determination of the intensity of the exercise in prescribing in the clinic. Anaerobic capacity is the capacity of the muscles to adapt to work in very short-term, maximal and supramaximal physical activities. The value of anaerobic capacity per unit time is called anaerobic power. It is important to evaluate anaerobic power in sports with activities such as lifting weights, weightlifting, disc throwing, 100 m speed run, fast exits in games such as basketball and football (Scott, 2005). In this context; Anaerobic and aerobic capacity-based tests are as follows:

In the flexibility test measurements, the sit-and-reach flexibility table (Lafayette sit and reach measurement device, USA) was used for flexibility measurement. Participants sit on the ground after a certain warm-up, bare feet, lying flat on the test bench, lie forward as much as they can lie with their hands in front of their body without bending their body forward and bending their knees, after waiting for 1-2 seconds, the test is completed. The participants repeated the test 3 times and their best scores were recorded (Tamer, 2000).

The athletes jumped upwards on their knees after jumping over the jump meter mat for the vertical jumping test. Participants were released to speed up the knees for jumping, to collapse and to use time. They attempted to fall into the rectangular plastic area (mat) on the ground connected to the jump meter after landing on the ground after the jump. In case of falling out of the plastic field or taking forward/backward steps after landing on the ground, the leap was repeated as invalid. The measurements were repeated twice and the good grade was taken into account. Results are recorded as "cm" (Reilly et al., 2000a). Digital splash mat system with Fusion Atmos Smart Speed (Australia) Digital Atmospheric system with sensitivity of 0.01 seconds was used in the measurements.

For football players' speed test, 30 m speed characteristics 0.01 sec. Sensitive Fusion Sport Smart Speed (Australia) measured with integrated system consisting of photocell doors with Digital Atmospheric system. The participants were warmed for 10 to 15 min before starting the test. Footballers started whenever they wanted from the starting line, which is one meter behind the starting photocell. Two measurements were taken at 3-min rest intervals and the good degree was evaluated (Gökhan et al., 2015).

For the Yo-Yo Intermittent Recovery Level 1 Test of footballers, the Yo-Yo IR1 intermittent recovery level 1 test, designed by Bangsbo as a field test, was applied. This test involves 2 × 20 meter shuttle runs at gradually increasing speeds, interspersed with an active recovery period of walking or jog, controlled by automatic signals of 10 s. 5 meters behind the starting line represents the active recovery zone. When an athlete fails to reach the finish line or until he runs out of power twice, the test is terminated for that athlete (Sezgin, 2011).

In order to provide information about the football players participating in the study, the frequency distributions of the footballers according to the leagues and positions, their averages regarding some physiological and motor features, statistical analysis, standard deviations, the smallest and the greatest values were calculated. Kolmogorov Smirnov test was used to test the normality of the data used in the study. Thus, it is understood that the data show normal distribution, in cases where more than two groups are compared, one-way ANOVA, which is one of the parametric tests, was used. The statistical analyzes used in the study were carried out in the 95% confidence interval at 0.05 and 0.01 error levels. SPSS 20.0 package program was applied in the statistical analysis of the data.

RESULTS

Descriptive statistics of the positions of football players participating in the study are shown in Table 1.

Descriptive statistics of the leagues of football players participating in the study are shown in Table 2.

Descriptive statistics of the height, weight, and BFP values of football players participating in the study are shown in Table 3a. Descriptive statistics about some flexibility, vertical jumping, 30 m speed values are shown in Table 3b. Descriptive statistics about some VO_2 distance and VO_2 max values are shown in Table 3c.

As in Table 4, when the data on the lengths of the football players participating in the study are examined, there is a significant difference between the goalkeeper and midfielder players (goalkeeper = 1.83 cm, midfield = 1.77 cm); while in the goalkeeper and striker players (goalkeeper = 1.83 cm, striker = 1.80 cm) significant difference was found in favor of the goalkeeper ($p < 0.05$); also, there is a significant difference between the defense players and the midfielder players (defense = 1.89 cm, midfield = 1.77 cm) in favor of the defender, the defense players and the footballers playing in the defense (defense = 1.89 cm, striker = 1.80 cm) are significant in favor of the defense players. It is understood from Table 3a that there is a difference ($p < 0.05$).

Table 1. Descriptive statistics about positions of football players.

Variances		n	%	Total
Positions	Goalkeeper	12	12	100
	Defense	35	35	
	Midfielder	43	43	
	Striker	10	10	

When the data of the body weights of the football players participating in the study are examined, there is a significant difference between the goalkeeper and the players playing in the midfield (goalkeeper = 72.79 kg, midfield = 67.94 kg), while there is a significant difference between the defense and the midfield players (defender = 70.79 kg, midfield = 67.94 kg). Table 3a shows that there is a significant difference in favor of the midfield ($P < 0.05$). When the data on the Body Fat Percentages of the football players participating in the study are analyzed, there is a significant difference between the defense players and the players playing in the midfield (defender = 9.89%, midfielder = 7.75%), while the goalkeeper and the striker = 9.30%, striker = 9.11 %). It is understood from Table 3a that there is a significant difference in favor of striker players ($p < 0.05$).

When Table 5 is examined, it is understood that there is a significant difference between the defense and goalkeeper (defender = 3.72 s, goalkeeper = 3.89 s) in favor of the defender ($p < 0.05$). There was no significant difference in flexibility and vertical jump values according to their positions.

When Table 6 is examined, there is no significant difference in the data of the VO_2 distance, VO_2 max values of the football players participating in the study.

Descriptive statistics related to height, weight, VAG values of football players according to leagues is shown in Table 7.

Descriptive statistics related to flexibility, vertical jumping and speed values according to the leagues is shown in Table 8.

Descriptive statistics related to VO_2 distance, VO_2 max values according to leagues is shown in Table 9.

In Table 10, when data related to height, weight, BFP values of the leagues played by the football players participating in the study were examined, no significant difference was found according to their positions ($p < 0.05$).

As shown in Table 11, the data on the flexibility values of the football players participating in the study are analyzed, there is a significant difference between the players playing in the PTT 1st league and the players playing in the 3rd league (PTT 1st League = 23.40 cm,

Table 2. Descriptive statistics about leagues football players.

Variances		Goalkeeper	Defense	Midfield	Striker	N	Total
Leagues	PTT 1st League	3	8	10	3	25	100
	2nd League	3	8	11	2	25	
	3rd League	3	9	11	2	25	
	RAL	3	10	11	3	25	

RAL: Regional Amateur League.

Table 3a. Descriptive statistics related to the height, weight, BFP values of football players according to their positions.

Variances	Position	Shortest	Tallest	x̄	Ss
Height (cm)	Goalkeeper	1.71	1.91	1.83	5.73
	Defense	1.72	1.96	1.89	4.26
	Midfielder	1.70	1.87	1.77	4.15
	Striker	1.68	1.89	1.80	6.31
Weight (kg)	Goalkeeper	65	81.50	72.79	5.04
	Defense	60	82.50	70,79	5.12
	Goalkeeper	60	75	67.94	4.05
	Striker	61	75	69.60	4.618
BFP (%)	Goalkeeper	4.20	12.20	9.30	2.18
	Defense	4.10	24.10	9.89	3.23
	Midfielder	5.20	13.10	7.75	1.97
	Striker	5.30	12.00	9.11	1.80

Table 3b. Descriptive statistics about some flexibility, vertical jumping, 30 m speed values according to football players' positions.

Variances	Position	Smallest	Biggest	x̄	Ss
Flexibility (cm)	Goalkeeper	12.20	31.10	19.93	5.02
	Defense	12.80	29.89	21.37	4.50
	Midfielder	14.20	33.60	23.13	4.50
	Striker	14.20	30.00	24.23	4.08
Vertical jump (cm)	Goalkeeper	38.12	51.00	42.77	4.43
	Defense	32.85	46.20	39.70	3.92
	Midfielder	32.30	50.01	41.08	4.10
	Striker	32.30	51.52	41.82	6.19
30 m Speed	Goalkeeper	3.12	4.02	3.98	.28
	Defense	3.66	4.40	3.72	.15
	Midfielder	3.22	4.90	3.83	.37
	Striker	3.42	4.90	3.82	.37

3rd League = 19.59 cm) in favor of the players playing in the PTT 1st league; there was a significant difference between the players playing in the 2nd league and the players playing in the 3rd league (2nd League = 24.86 cm, 3rd League = 19.59 cm) in favor of the players playing in the 2nd league ($p < 0.05$). It was also seen in Table 8 that there was a significant difference between the players playing in the 3rd league and the players playing in the regional amateur league (RAL = 21.12 cm, 3.Lig = 19.59 cm) in favor of the players playing in the

Table 3c. Descriptive statistics about some VO_2 distance and VO_2 max values according to the players' positions.

Variances	Positions	Shortest	Longest	x̄	Ss
VO_2 distance	Goalkeeper	1550	2980	2307	459.5
	Defense	1630	3200	2589	408.3
	Midfielder	1600	3200	2541	410.4
	Striker	1720	3200	2520	259.4
VO_2 max	Goalkeeper	46.50	66.52	57.10	6.43
	Defense	47.62	69.60	61.05	5.71
	Midfielder	47.20	69.60	60.37	5.74
	Striker	48.88	69.60	60.08	3.63

Table 4. Descriptive statistics related to height length, weight, BFP values according to the players' positions.

Variances	Changing resource	Squares total	SD	Squares total	F	P	Difference
Height (cm)	Intergroup	4.41	3	1.47	6.841	.000	1-3
	In-Group	2.06	96	2.15			1-4
	Total	2.50	99				2-3
							2-4
Weight (kg)	Intergroup	288.9	3	96.315	4.496	.005	1-3, 2-3
	In-Group	2056	96	21.424			
	Total	2345	99				
BFP (%)	Intergroup	2166.3	3	13.897	2.216	.91	2-3
	In-Group	41.69	96	6.271			4-1
	Total	601.9	99				

Note: 1) Goalkeeper; 2) Defense; 3) Midfielder; 4) Striker. * $p < 0.05$.

Table 5. Descriptive statistics related to flexibility, vertical jumping, 30 m speed values according to the players' positions.

Variances	Changing resource	Squares total	SD	Squares average	F	P	Difference
Flexiblity (cm)	Intergroup	165.14	3	55.05	2.68	.051	
	In-Group	1969.6	96	20.51			
	Total	2134.8	99				
Vertical jump (cm)	Intergroup	102.54	3	34.181	1.82	.147	
	In-Group	1793.74	96	18.685			
	Total	1896.28	99				
30 m speed (sn)	Intergroup	.780	3	.260	2.82	.043	
	In-Group	8.850	96	.092			2-1
	Total	9.630	99				

Note: 1-Goalkeeper; 2 – Defense; 3- Midfielder; 4- Striker; * $p < 0.05$.

regional amateur league ($p < 0.05$).

When the data on vertical jump values are analyzed, there is a significant difference between the players playing in the 1st league of PTT and the players playing in the 3rd league (PTT 1st League = 41.85 cm, 3rd League = 37.29 cm) in favor of the players playing in the 1st League; there was a significant difference between the players playing in the 2nd league and the players playing in the 3rd league (2nd League = 41.85 cm, 3rd League = 37.29 cm) in favor of the players playing the

Table 6. Descriptive statistics related to some VO_2 distance and VO_2 max values according to players' positions.

Variances	Changing resource	Squares Total	SD	Squares average	F	P	Difference
VO_2 speed	Intergroup	723870.15	3	241290.050	1.47	.226	
	In-Group	15676329	96	163295.103			
	Total	1640020.0	99				
VO_2 max	Intergroup	141.82	3	47.27	1.47	.226	
	In-Group	3072.3	96	32.00			
	Total	3214.1	99	47.27			

Note: 1 – Goalkeeper; 2 – Defense; 3 – Midfielder; 4 – Striker. * p<0.05.

Table 7. Descriptive statistics related to height, weight, VAG values of football players according to leagues.

Variances	League	Shortest	Tallest	x̄	Ss
Height (cm)	PTT 1st League	1.68	1.91	1.78	5.11
	2nd League	1.71	1.89	1.79	4.43
	3rd League	1.70	1.89	1.78	4.17
	RAL	1.71	1.96	1.81	6.02
Weight (kg)	PTT 1st League	60.90	81.50	70.53	6.07
	2nd League	60.20	77.80	67.90	4.38
	3rd League	60.02	78.80	69.25	4.52
	RAL	62.10	82.50	71.06	3.85
BFP (%)	PTT 1st League	7.01	15.10	9.77	2.10
	2nd League	4.20	24.10	8.84	3.80
	3rd League	6.00	12.00	9.14	1.86
	RAL	4.10	12.30	9.46	1.98

Table 8. Descriptive statistics related to flexibility, vertical jumping and speed values according to the leagues**.**

Variances	League	Smallest	Biggest	x̄	Ss
Flexibility (cm)	PTT 1st League	16.60	31.10	23.40	3.93
	2nd League	14.50	33.60	24.86	4.73
	3rd League	15.25	25.36	19.59	2.44
	RAL	12.20	30.00	21.12	5.27
Vertical jump (cm)	PTT 1st League	33.84	49.90	41.85	3.75
	2nd League	34.47	51.52	41.58	4.57
	3rd League	32.30	43.89	37.29	3.25
	RAL	34.50	51.00	42.76	3.84
30 m speed	PTT 1st League	3.22	4.03	3.68	.245
	2nd League	3.52	4.05	3.81	.160
	3rd League	3.66	4.90	4.20	.309
	RAL	3.22	4.03	3.68	.245

2nd league ($p < 0.05$); it is also seen in Table 8 that there is a significant difference between the players playing in the 3rd league and the players playing in the regional amateur league (3rd League = 37.29, RAL = 42.76 cm) in favor of the players playing in the regional amateur league ($p < 0.05$).

When the data related to speed values are reviewed, there is a significant difference between the players

Table 9. Descriptive statistics related to VO_2 distance and VO_2 max values according to leagues.

Variances	League	Shortest	Longest	x̄	Ss
VO_2 distance	PTT 1st League	1870	3040	2604	324.6
	2nd League	1600	3200	2606	472.1
	3rd League	1550	3040	2370	390.1
	RAL	1720	3200	2531	405.8
VO_2 max	PTT 1st League	51.00	67.36	61.25	4.54
	2nd League	47.20	69.60	61.28	6.60
	3rd League	46.50	67.36	57.99	5.46
	RAL	48.88	69.60	60.23	5.68

Table 10. Descriptive statistics related to height length, weight, BFP values according to the leagues.

Variances	Changing resource	Squares total	SD	Squares average	F	P	Difference
Height (cm)	Intergroup	116.1	3	38.7	1.556	.205	
	In-Group	2389.5	96	24.8			
	Total	2505.7	99				
Weight (kg)	Intergroup	148.9	3	49.6	2.170	.097	
	In-Group	2196.7	96	22.8			
	Total	2345.6	99				
BFP (%)	Intergroup	12.24	3	4.08	.621	.603	
	In-Group	631.4	96	6.57			
	Total	643.6	99				

Note: 1 - Goal Keeper; 2 – Defensive; 3 – Midfield; 4- Striker; * $p < 0.05$.

Table 11. Descriptive statistics regarding flexibility, vertical jumping and speed values according to the leagues.

Variances	Changing resource	Squares total	SD	Squares average	F	P	Difference
Flexibility (cm)	Intergroup	4.13	3	137.7	7.685	.000	1-3, 2-3 2-4
	In-Group	17.21	96	17.9			
	Total	21.34	99				
Vertical Jump (cm)	Intergroup	446.1	3	148.7	9.844	.000	1-3, 2-3 3-4
	In-Group	1450.1	96	15.1			
	Total	1896.2	99				
30 m speed (sn)	Intergroup	3.826	3	1.275	21.096	.000	1-3, 2-3 3-4
	In-Group	5.804	96	.060			
	Total	9.630	99				

Note: 1 - PTT 1st League; 2 - 2nd League; 3 - 3rd League; 4 - Regional Amateur (RAL). * $p < 0.05$.

playing in the 1st league of PTT and the players playing in the 3rd league (PTT 1st League = 3.68 s, 3rd League = 4.20 s) in favor of the players playing in the 3rd division; there was significant difference between the players playing in the 2nd league and the players playing in the 3rd league (2nd League = 3.81 s, 3rd League = 4.20 s) in favor of the players playing in the 3rd League ($p < 0.05$). In addition, it is seen in Table 8 that there is a significant difference between the players playing in the 3rd league and the players playing in the regional amateur league (3.Lig = 4.20 s, RAL = 3.68 s) in favor of the 3rd league players ($p < 0.05$).

When the data related to the VO_2 distance and VO_2 max values of the leagues played by the football players

Table 12. Descriptive statistics related to VO_2 distance and VO_2 max values according to the leagues played by players.

Variances	Changing resource	Squares total	SD	Squares average	F	P	Difference
VO_2 distance	Intergroup	9145	3	3048	1.890	.136	
	In-Group	15485	96	1613			
	Total	1640	99				
VO_2 max	Intergroup	179.3	3	59.7	1.891	.136	
	In-Group	3034.7	96	31.6			
	Total	3214.1	99				

Note: 1 - PTT 1st League; 2 - 2nd League; 3 - 3rd League; 4 - Regional Amateur (RAL). *p < 0.05.

participating in the study in Table 12 were examined, there was no significant difference found according to their positions (p < 0.05).

DISCUSSION

When comparing some physical parameters of football players according to their ranks: height (cm), there is significant difference between goalkeeper and midfielder players in favor of goalkeeper, there is significant difference between goalkeeper and striker players in favor of goalkeeper, there is significant difference between defender and midfielder players in favor of defender and defender players); body weights (kg), there is significant difference between the goalkeeper and midfielder players in favor of midfielders and there is significant difference between the defenders and midfielders in favor of midfielders); and body fat percentage (%) values, there is significant difference between the goal keepers and the striker players in favor of the striker players, there is a significant difference between the defense and midfielder players in favor of the midfielder players; speed (sec) feature, there is a significant difference between the goalkeeper and the defenders in favor of the defenders (p < 0.05); there was no significant difference in flexibility, vertical jump, VO_2 distance, VO_2 max performances (p > 0.05).

Considering the literature, it is seen that there is a clear football player structure. In this structure, height was observed as a value between 180 cm, proportional body weight and body fat percentage between 7 and 14% (Rıco-Sanz, 1998). In particular, the low fat percentage gives the player an advantage both in running and jumping (Strudwick et al., 2002).

In a study conducted with 18 football players in one of the 2nd league teams, it is stated that the body fat rate of football players is 9.66 ± 1.10 to 11.52 ± 1.05% (Koç et al., 2000). For this reason, in this study, some physical parameters of football players playing in different leagues are compared according to different positions, the height length of football players is 1.79 cm, 70.28 kg of body weights, 9.16% of body fat percentages, 33.83 seconds of speed, 22.16 cm of their elasticity, 41.34 cm of vertical jump, VO_2 distance performances 24289 m and VO_2max performances are 59.65 (Table 3a, b, c). When a large number of studies conducted to evaluate the motoric and physiological characteristics of footballers playing in different positions are examined, it is possible to come across studies supporting this study.

This is a situation that depends on the characteristics of the positions they play; midfield players have a feature that runs very much in the field in terms of position, while defense players mostly, as it is stated are tall because they have to fight and interfere with the air balls and this will provide an advantage over the striking elements of the opposing team (Tourney-Chollet and Leroy, 2002).

In studies performed in high-level football players, it was found that the athletes with low body fat rates have shortened sprint times; in other words, an increase in their speed (Turgay et al., 2003). According to Usgu, 33 football players in his work on the football league in Turkey had an average height of 179 cm, and average body weight of 75 kg (Usgu, 2007). In the study by Akçınar (2009), the average height of the football players' defense group was 181.92 ± 5.12 cm, and the average of the offensive group was 178.75 ± 5.91 cm, averaging 180.33 ± 5.64 cm, 76.58 ± 5.53 kg, the offense group was 74.83 ± 5.37 kg, in total 75.71 ± 5.40 kg (Akçınar, 2009).

In their study, Kızılet et al. (2004) found a significant difference between goalkeepers and middle defense players and other position players in inter-position BW parameters. Height is the most obvious and observable physical quality in the selection of BW football players. The importance of struggle has increased in today's football. Physically strong players survive. According to the study, differences can be seen in the height of the players and in BW and BFP. Excess BW can negatively affect physical performance. It is known that those with low BFP perform better than those with high (Kızılet et al., 2004).

Al-Hazza (2001) stated the body fat percentages of Saudi professional football players as 12.3%, and Ricosanz (1998) stated the body fat percentages of Spain elite players as 10%. In a study conducted on 20 footballers in one of the 3rd league teams in our country, the body fat percentage of football players was found to be 11.27 ± 2.29%, and in another study with 33

professional footballers in the 2nd league, the body fat rate was found to be 10.81 ± 0.27% (Kayatekin et al., 1993).

Young and Pryor (2007) in his study to determine the physical and functional characteristics of amateur football players and to compare whether they are related to non-elite groups and whether there is a relationship with physiological test results and competition levels, the average age of the footballers of team A is 24.30 ± 2.5 year, he found an average height of 181.8 ± 5.6 cm and VA average of 77.3 ± 5.8 kg (Young and Pryor, 2007).

Similar to our study, Aslan and Koç (2015) divided 70 amateur footballers, whose average age was 22.11 ± 2.71, according to their positions, and the body weight of the attackers (n = 76.71 ± 10.19), midfield (n = 70.48 ± 10.44), higher than the central defense (n = 75.56 ± 11.12) and edge defense (n = 68.18 ± 9.57) players (Aslan and Koç, 2015).

Accordingly, there is a difference between height, body weight and body fat percentage values. It can be said that the reason for the differences between the positions in terms of physical characteristics in football is due to the football starting ages, the applied training models and the performance characteristics of the professional-amateur category players. In addition, the physical and athletic structure differences between the defense and offensive players in football are eliminated. Today, players in all positions in a team (including the goalkeeper) must have all kinds of motoric features. Attackers should help defend when necessary, and defenders should also attack. Football players have duties such as carrying the ball, passing and dominating the opponent, so they need to be quick and agile. As it is known, in a football match, players perform 1000-1400 short-term activities ranging from 4 to 6 seconds. Approximately 220 of these movements involve activities based on anaerobic performance performed at high speed. The ability to perform such activities in good quality despite fatigue during match or training is indexed to the amount of anaerobic power and capacity (Köklü et al., 2009).

Accordingly, changes that eliminate the differences in every position in football should be considered normal. This is because footballers with high speed, strength, endurance and speed can only be confronted with footballers who have developed these features. On the other hand, there are anthropometric differences between positions; it was stated that defenders were taller and midfielder players had lower body weights.

In a study on speed values, the average of 30 m speed run values (4.07 ± 0.12 s) from the 1st league teams according to their positions, the average of 30 m speed run values of the 2nd league teams (4.10 ± 0.11 s), average of 30 m speed run values of 29 football players from 3rd league teams (4.13 ± 0.10 s) and average of 30 m speed run values of 29 football players from amateur league teams (4.16 ± 0.12 s) (Eniseler et al., 2000). In another study, the average of 30 m sprint measurement values of professional football players was determined as 4.28 ± 0.16 s (Kızılet et al., 2004). According to Turgay et al. (2003), 30 m speed rating was reported as 4.16 s in 1st league and 30 m speed rating for professional footballers as 4.15 s (Turgay et al., 2003). In the study of 77 footballers playing in the amateur league, goalkeepers have an average duration of 30 meters, 5.06 s, defense players 4.59 s, midfields 4.57 s, strikers 4.59 s. Goalkeepers formed the slowest group at the level of statistical significance (Franks et al., 1999). This study corresponds to our work. This difference has been trained in infrastructure and it can be said that the difference in football playing year also has an impact. In a similar study, the 30-meter sprint value was found in goalkeepers, defenders, midfielders and forwarders in the position groups consisting of 28 football players, respectively; It was found as 4.57, 4.28, 4.22 and 4.17 seconds. In terms of 30 meters, goalkeepers are statistically slower in defense players. This study shows parallelism with our study (Marancı, 1999).

In another study with elite football players, the midfielder players made the best score as offensive players within 30 meters (Franks et al., 1999). Considering the results of literature, it was observed that the goalkeepers formed the slowest group among the positions; this can be associated with the infrastructure training, training levels and frequency of the goalkeepers.

According to the leagues participating in this study, the flexibility values of the players (between the players playing in the PTT 1st league and the players playing in the 3rd league), there is a significant difference in favor of the players playing in the 1st league, between the players playing in the 2nd league and the players playing in the 3rd league; in favor of the players playing in the 2nd league. There is significant difference between the players playing in the 3rd league and the players playing in the regional amateur league. There are significant differences in favor of the players playing in the regional amateur league. For vertical jump performance values (the players playing in the PTT 1st league and the players playing in the 3rd league), there is a significant difference in favor of the players playing in the 2nd league and the players playing in the 3rd league and the players playing in the regional amateur league are significantly different in favor of the players playing in the regional amateur league; and regarding speed performance values (between the players playing in the PTT 1st league and the players playing in the 3rd place, there is a significant difference in favor of the players playing in the 3rd league, between the players playing in the 2nd league and the players playing in the 3rd league; while it was observed that there was a significant difference between the players playing in the 3rd league (there was a significant difference between the players playing in the 3rd league and the players playing in the regional amateur league) ($p > 0.05$). There was no significant difference found in height, body weight, body fat percentage ($p < 0.05$).

When many studies are conducted to evaluate the

physical performance of football players in different leagues are examined, it is possible to find studies supporting this study.

When the physical properties of the players are compared according to the league they play, there was a statistically significant difference in flexibility, vertical jump, sprint speed characteristics from 8 parameters measured. There was no significant difference between height, weight, BFP, VO_2 distance and VO_2 max values. Karakaş et al. (2011) and Akin et al. (2004) determined that there was significant difference between professional and amateur football players in terms of anthropometric structure and body composition. In 2003, Turgay performed a study to determine the physical and functional characteristics of amateur footballers and compare them with the non-elite group to determine whether there is a relationship with physiological test results and competition levels. He found height averages of 181.8 ± 5.6 cm and VA averages of 77.3 ± 5.8 kg (Turgay, 2003). The values obtained as a result of this study show compatibility with the literature in terms of physical properties.

When the differences between groups for physical properties are analyzed numerically, the tallest goalkeepers in length are the shortest midfielder. While strikers, goalkeepers and stoppers have higher values in body weight and fat ratios, midfield players have the lowest values.

In the studies conducted, they found the average height as 180.7 ± 1.5 cm in French footballers (Filaire et al., 2001), as reported as 178.75 cm in the MKE Ankaragücü football team and 176.4 ± 1.29 cm in the 3rd league. Studies show that the average body weight of footballers is between 70-80 kg and the average height is between 170 and 180 cm (Erkmen et al., 2001). In a study, the average body weights were 77.75 ± 2.81 kg for goalkeepers, 65.10 ± 6.22 kg for middle defense players, 72.33 ± 3.46 kg for edge defenders, 71.30 ± 4.45 kg for midfield players, and attackers 7 ± 4.88 kg. Height average for goalkeepers was determined as 1.83 ± 3.02 m, middle defense players 1.82 ± 4.96 m, edge defense players 1.77 ± 2.35 m, 1.77 ± 3.85 m for midfielders and 1.77 ± 4.35 m for attackers. In the same study, the height and body weight of goalkeepers and defenders were found to be significantly higher than the values of players in other positions (Kızılet et al., 2004). The results obtained in this study are in parallel with the results obtained in this study.

In another study, Christou et al. (2006) examined the effect of 8 and 16 weeks endurance training on physical capacity in amateur footballers; and the pre-study flexibility values of football players were measured with sit and reach test which revealed 42.1 ± 3.8 to 44.12 ± 1.1 cm (Christou, 2006). In a study conducted at the 2nd League level for Malatya Sports, Diyarbakır Sports and Siirt K.H., flexibility measurements in the sports 2nd League players were 30.4, 32.5 and 33.4 cm, respectively (Yamaner and Hacıcaferoğlu, 1997). 33.4 cm for Ankara University players, 31.4 cm for Hacettepe University players, 31.7 cm for METU players, 25.5 cm for Başkent University players; they found 32.0 cm in the Police Academy football players (Uğraş et al., 2002). In a study where the flexibility of amateur footballers was determined, the flexibility values were reported as 30.9 ± 5.5 before training.

Benítez Sillero et al. (2015) in their work with amateur footballers; Vertical Jump has been determined as 42.48 cm (Benitez et al., 2015). Abad et al. (2016) determined the jump values as 39.31 cm and 40.62 cm (Abad et al., 2016). Özdemir (2013) determined the active jump value as 40.00 cm in amateur footballers (Özdemir, 2013). Depending on the level of the league in football, the physical properties of football players also vary, and this situation also highlights the type of football player with high muscle mass (Eniseler et al., 2000). The vertical jump test average of sports players is 59 ± 6.94 cm, and the vertical jump test average of Siirt sports players is 62.13 ± 5.69 cm (Marangoz, 2008). In the study conducted by Ugras et al.; it was determined as 51 ± 0.04 cm (Uğraş et al., 2002).

Ostajic (2004) in the study of 30 professional football players, the vertical jump test average was found to be 49 ± 0.7 cm. According to Ek et al. (2007), the average of vertical jump test was determined as 53.65 ± 5.34 cm in the study conducted with 26 football players. According to Tamer et al. (1996) by the 3rd league professional football players, vertical jump test average was determined as 50.06 ± 6.04 cm. According to Dargatz (2002) vertical jump criteria values for male footballers of 40 cm and below were poor, 40-50 cm medium, 50-60 cm good, 60 cm and above were very good.

In this study, the vertical jump average obtained from professional footballers is classified as “good” in the criteria of Dargatz. Reilly et al. (2000) stated the vertical jump average as 58.00 ± 1.12 cm in their study with English league football players.

In the study by Ostajic (2004) of 30 professional football players, the vertical jump test average was determined as 0.49 ± 0.7 cm. In the study conducted by Ek et al. (2007) with 26 footballers, the vertical jump test average was determined as 53.65 ± 5.34 cm. According to Tamer et al. (1996), in the study of third league professional footballers, the vertical jump test average was determined as 50.06 ± 6.04 cm. In the study conducted by Duyul (2005), the vertical jump test average of the football players participating in the study was determined as 54.37 ± 6.72 cm. Similarities and differences are generally seen that the players have a jump performance of 50-60 cm in these studies. Again, as a result of our literature review, vertical leap values were found to be slightly higher in leagues of the 2nd league and below; therefore, it is thought that this is due to physical struggle and strength rather than technical and tactical play in these leagues.

When we consider the speed values, in the study conducted by Günay et al. (2006), the average of 30 m

speed run of amateur football players participating in the study was determined as 4.39 ± 0.1 s. According to Kizilet et al. (2004), the average of 30 m sprint measurement values of professional football players was determined as 4.28 ± 0.16 s. Eniseler et al. (2000) in their study found 30 m speed rating on 1st league athletes was 4.16 s. According to Turgay et al. (2003), 30 m speed rating of professional footballers was reported as 4.15 seconds. In a study conducted by Reilly et al. (2000), 30 m sprint values of non-elite football players were determined as 4.31 ± 0.14 s and 4.46 ± 0.21 s, respectively. Temoçin et al. (2004) determined the speed time of 59 athletes participating in the 30 m speed run as 4.26 ± 0.21 s. The following results obtained in this study, flexibility, vertical jump, 30 m speed average shows in parallel with the averages given above, there are similarities with our study.

In addition, Bompa (2003), Harre (1982) and Dick (1980) stated that the development can be delayed when the loading does not comply with the loading principles and is not done with the complex training sequence. In this study, it can be said that the development and difference between some features of the athletes according to the positions and leagues and the absence of them depend on the sequence of the training done during the preparation period.

As a result, in many studies conducted to evaluate the physical performance and parameters of football players playing in different leagues, this supports our study and it is possible to encounter studies in similar data and coincides with our study. Professional football, which is called elite football in modern football, is developing rapidly depending on the technology world of our age, has become a game that is much faster, much more tactical, more power based, and the level progresses day by day and there are more scientific developments in the sport sense. In order to keep up with this game, it is necessary to think much faster and act faster and to improve the performance of the player based on it. In this context, the goal of the professional leagues in professional football to reach such levels in our age football; subprofessional teams and amateur football teams (sub-league professional-amateur football players) were also affected, and they attempted to stand out from their identities as sub-league football players and amateur football players.

In this regard, it is recommended to implement a diet program to protect the body composition of athletes, as well as optimal training programs that will be organized for the deficiencies detected in the positions and leagues of football players instead of monotonous training in football. In addition, there is a close relationship between football players' league and positions and anthropometric and physical fitness parameters. Players should be guided by their individual characteristics, body size, and physical fitness levels, depending on their league and location. In this way, maximum performance can be anticipated from football players.

RECOMMENDATIONS

1. The annual training program should be prepared by strengthening the relationship between football and science, and monthly and daily training programs should be updated on the program in order to reach the specified goals.
2. The physiological and physical conditions and the training program should be prepared as a result of the tests made for professional and amateur football players.
3. In terms of the importance of determining the physical and physiological status of football players, the tests should be continued during the season and more planned studies of the season with the obtained data; and it should be arranged in accordance with training science.
4. Such studies may increase the number of subjects and conduct studies on professional and amateur teams in our country may produce more meaningful results.

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