Orginal Article **Journal of Athletic Performance and Nutrition**

Volume: 9 Issue:2 pp:9-21 2022

A Study on Amateur Football Players' Performance Parameters in Relation to Their Positions

Ömer Fatih KOÇ[1], Mehmet Fatih YÜKSEL [2*]

Received Date: 17.05.2022
Accepted Date: 23.11.2022

Abstract

Objectives: This study was carried out to examine the performance parameters of amateur football players according to the positions they play.

Methods: A total of 55 male amateur football players, including nine goalkeepers (19.05 ± 1.93 years), 15 defenders (20.07 ± 2.43 years), 16 midfielders (19.63 ± 2.96 years), and 15 forwards (19.05 ± 1.75 years) who competed in the super amateur league of Konya/Turkey in the 2019/2020 season, participated in the research. In order to examine the performance parameters of football players, age, height, body weight, body mass index, flexibility, hand grip strength, standing long jump, balance, sprint, agility, 30-second sit-up, 30-second push-up, countermovement jump, anaerobic power, Yo-yo Intermittent recovery test level 1 and maximum oxygen consumption values were recorded. SPSS 21.0 package program was used in the analysis of the data. ANOVA test was utilized for comparisons between groups. In addition, Tukey and Tamhane T2 tests were used to identify from which groups the significant difference originated. The significance level was accepted as $P<0.05$.

Results: As a result of the study, height and body weight parameters were in favor of goalkeepers between goalkeepers and midfielders, body mass index and anaerobic power parameters were between defenders and midfielders in favor of defenders, 30-second sit-up, 30-second push-up parameters were between goalkeepers and defenders. Furthermore, statistically significant differences were determined in favor of defenders between defenders, goalkeepers, and midfielders in the Yo-yo intermittent recovery parameter. In addition, there were no statistically significant differences between positions in six of the twelve parameters (flexibility, 30-meter sprint, agility, countermovement jump, hand grip strength, and standing long jump).

Conclusion: As a result, it can be asserted that the physical performance differences between positions are gradually decreasing in modern football.

***Key Words**: Amateur footballer, Position, Physical performance*

[1]Republic of Turkey Ministry of Youth and Sports, Konya Youth and Sports City Management, 42030, Konya/Turkey;
E-mail; omerfatihkoc@gmail.com; http://orcid.org/0000-0001-6481-5098

[*]**Corresponding author:**
[2*]Department of Physical Education and Sports, Faculty of Education, Necmettin Erbakan University, 42090, Konya/Turkey;
E-mail: yukselmehmetfatih@gmail.com; http://orcid.org/0000-0001-6481-5098

Introduction

Physical and physiological adaptation are very important in football, which is a sport that attracts large crowds. During a football match, which is a game that requires a struggle, there are a lot of actions such as shooting, aerial ball struggling, jumping, sudden turns, sprints, running with and without the ball, dribbling past, controlling the ball under pressure, running at different intensities. Therefore, the high-level performance of a football player is directly related to both aerobic and anaerobic metabolism (Açıkada, Hazır, Aşçı, Turnagöl & Özkara, 1998; Eniseler, 2017; Kafkas et al., 2018; Cordero-Vargas et al., 2019).

The position is the location of each player on the field of play when they enter the competition. Moreover, it should not be forgotten that the concept of position, which is divided into four main groups, such as the goalkeeper, defender, midfielder, and forward, also diversifies with football player types with specific characteristics within these main groups. Since the day football became a game with rules, a wide variety of game systems and formation variations have been developed based on the players' positions. In football, which is known as the "game of mistakes," each player is responsible for fully carrying out the duties of the position he plays, making as few mistakes as possible on an individual level, and reaching the highest possible values for the performance characteristics that fit his position (Günay & Yüce, 2008).

Every football player has to demonstrate the best performance in their position. In parallel with the development of football, the physical performance demanded of football players also develops and diversifies (Aslan, 2015; Yüksel, Koç, Işık, & Erdağı, 2021). In the past, midfielders whose distance covered in the match and running pace were far below the team average could find a place in football teams thanks to their technical capacities and special skills. Nonetheless, due to modern football systems' defense and attack principles, such players cannot find a place in football teams today. In today's modern football, where players are grouped as center-side, defensive, and offensive, technical directors, football coaches, and athletic performance coaches want maximum performance from the football players group they train in the highly competitive football arena. Therefore, it is vital to take the necessary measures by applying the performance tests to the positions and analyzing the results in the best way to evaluate which part of the field the footballers are best at (Böge, Kaplan & Taşkın, 2021).

The football field corresponds to a large area. Because each player on the field is placed in a different part of this large area based on the coach's tactic, it is important to evaluate

the physical and physiological needs of the players based on their position and the different tasks they have to do (Marancı & Müniroğlu, 2001).

This study was carried out to examine the performance parameters of amateur football players according to the positions they play.

Method

Participants

The study group of the research consists of a total of 55 healthy male amateur football players grouped in four main positions, nine goalkeepers (average age: 19.05), 15 defenders (average age; 20.07), 16 midfielders (average age: 19.63) and 15 strikers (average age: 19.05) playing in the Turkish Football Federation (TFF) Konya Super Amateur League in the 2019/2020 season. Furthermore, it was ensured that the football players forming the study group consisted of players who trained at least four or more times a week.

Data Collection

First, the Necmettin Erbakan University Social and Human Sciences Scientific Research Ethics Committee approved the project with a decision ID 2021/15. In addition, interviews were held with the relevant club administrators and trainers regarding the purpose and objectives of the study, and the athletes were provided with the opportunity to fill in the voluntary participation form.

It was paid attention to perform the tests and measurements at the same time of the day. It was ensured that the participants participated in the tests and measurements in sportswear (shorts, t-shirt, sports shoes, etc.). They were prohibited from wearing sneakers or crampons for height and body weight measurements. Before the execution of the sports performance tests, the participants were warmed up for 15 minutes by the researchers.

The participants' height, body weight, body mass index (BMI), and 30-second sit-up test were determined according to the method reported by Zorba and Saygın (2009). For the flamingo balance test, the measurement method reported by Tsigilis, Douda and Tokmakidis (2002) was used. The length of the standing long jump was determined using the recipe devised by Baikolu and Kandemir (2020). The sit and reach test and hand grip strength were performed exactly as Günay, Tamer and Cicioğlu (2013) described. For the Illinois test, the method reported by Mackenzie (2005) was used. The countermovement jump test was based on the criteria that Greene, McGuine, Leverson and Best (1998) determined. The Sayers formula determined Anaerobic power (Sayers, Harackiewicz, Harman, Frykman & Rosenstein, 1999). For the Yo-yo Intermittent Recovery Test (Level 1), the methodology reported by Krustrup et

al. (2003) was applied, and the maximum oxygen consumption capacity as a result of this test was determined by the formula explained by Bangsbo, Laia and Krustrup (2008).

Statistical analysis

The SPSS 17 package program was used for data analysis in the research. A normality test was performed in order to determine whether the data showed a normal distribution. When the skewness and kurtosis values of the data were taken as reference, it was determined that the data showed a normal distribution. One-way analysis of variance (ANOVA) test was used to compare the variables according to the players' positions. In order to determine which groups caused the difference in the variables in which a significant difference was detected as a result of the Anova test, from complementary post hoc tests, Tukey tests were chosen when the variances were homogeneous. The Tamhane T2 tests were selected when the variances were not. This study's significance level was accepted as (p)≤.05.

RESULTS

Table 1. Frequency and percentage values of football players according to positions

Position	N	%
Goalkeeper	9	16,4
Defender	15	27,3
Midfielder	16	29,1
Forward	15	27,3
Total	55	100.0

As seen in Table 1, 9 (16.4%) of the football players are goalkeepers, 15 (27.3%) are defenders, 16 (29.1%) are midfielders, and finally, 15 (27.3%) play in the forward position.

Table 2. Anthropometric characteristics of football players according to positions

Parameters	A-B-C-D	Positions	N	X	Sd.	F	p	Difference
	A	Goalkeeper	9	19,6	1,9			
	B	Defender	15	20,0	2,4	,242	,867	
Age	C	Midfielder	16	19,6	2,9			
	D	Forward	15	19,3	1,7			
	A	Goalkeeper	9	181,1	4,5			
Height	B	Defender	15	175,0	6,4	3,055	,037*	A>C
(cm)	C	Midfielder	16	173,4	5,9			
	D	Forward	15	176,5	7,1			
Body	A	Goalkeeper	9	72,9	7,3			
weight (kg)	B	Defender	15	71,9	8,2	2,989	,040*	A>C
	C	Midfielder	16	65,3	7,8			
	D	Forward	15	69,3	4,9			
	A	Goalkeeper	9	22,2	1,9			
BMI	B	Defender	15	23,4	1,9	2,832	,047*	B>C
(kg/m^2)	C	Midfielder	16	21,6	1,6			
	D	Forward	15	22,2	1,3			

*p≤0.05 **p≤0.01

When Table 2 is examined, it is discovered that the ages of football players do not differ significantly (F=.242; p=.867>0.05). However, there is a significant difference in height and body weight between goalkeepers and midfielders and between defenders and midfielders in terms of BMI.

Table 3. Biomotor characteristics of football players according to positions

Parameters	A-B-C-D	Positions	N	X	Sd.	F	p	Dif.
	A	Goalkeeper	9	39,1	4,9			
Sit and reach	B	Defender	15	37,0	6,2	1,334	,274	
(cm)	C	Midfielder	16	36,9	4,3			
	D	Forward	15	34,6	6,0			
Hand grip	A	Goalkeeper	9	43,9	5,3			
strength	B	Defender	15	48,3	9,4	2,268	,092	
(kg)	C	Midfielder	16	41,2	5,5			
	D	Forward	15	46,1	9,3			
Standing long	A	Goalkeeper	9	213,4	29,7			
jump	B	Defender	15	234,4	27,5	1,269	,295	
(cm)	C	Midfielder	16	219,9	28,1			
	D	Forward	15	224,6	26,0			
Flamingo	A	Goalkeeper	9	3,5	0,88			
balance	B	Defender	15	2,9	1,4	5,225	,003*	B<C, D
(number)	C	Midfielder	16	4,5	1,6			
	D	Forward	15	4,8	1,4			
30-meter	A	Goalkeeper	9	4,2	0,16			
sprint	B	Defender	15	4,3	0,22	,774	,531	
(sec)	C	Midfielder	16	4,2	0,30			
	D	Forward	15	4,2	0,32			
30-second	A	Goalkeeper	9	21,5	5,9			
push-up	B	Defender	15	29,2	9,8	2,742	,053*	B>A
(number)	C	Midfielder	16	26,0	5,1			
	D	Forward	15	28,0	4,3			
Illinois agility	A	Goalkeeper	9	16,1	1,0			
(sec)	B	Defender	15	16,2	0,62	,779	,511	
	C	Midfielder	16	16,2	1,0			
	D	Forward	15	15,8	0,66			
30-second sit-	A	Goalkeeper	9	23,8	3,9			
up	B	Defender	15	30,6	9,2	2,820	,048*	B>A
(number)	C	Midfielder	16	26,1	4,2			
	D	Forward	15	24,9	6,5			
Counter	A	Goalkeeper	9	43,1	4,4			
movement	B	Defender	15	44,0	4,9	1,562	,210	
jump (cm)	C	Midfielder	16	40,3	6,4			
	D	Forward	15	43,9	5,1			
Anaerobic	A	Goalkeeper	9	3867,8	448,0			
power (watt)	B	Defender	15	3875,2	552,5	3,676	,018*	B>C
	C	Midfielder	16	3355,2	521,0			
	D	Forward	15	3752,7	406,0			
Yo-yo	A	Goalkeeper	9	1691,1	148,3			
intermittent	B	Defender	15	2512,0	482,8	7,611	,000**	B>C, A
recovery (m)	C	Midfielder	16	2095,0	358,1			
	D	Forward	15	2133,3	491,0			
VO_{2maks}	A	Goalkeeper	9	50,6	1,2			
(ml/kg/dk)	B	Defender	15	57,5	4,0	7,611	,000**	A<B,C,D
	C	Midfielder	16	53,9	3,0			
	D	Forward	15	54,3	4,1			

*p≤0,05 **p≤0,01

As highlighted in Table 3, according to the bio-motor characteristics of the football player positions, it was determined that there was no significant difference in the sit-reach (flexibility) (F=1.334; p=0.274>0.05), hand grip strength (F=1.334; p=0.274>0.05), standing long jump (F=1,269; p=0.295), 30 m sprint (F=.774; p=0.531>0.05), Illinois agility (F=.779; p=.511>.05), and vertical jump (F=1.562; p=0.210>0.05) parameters. In addition, a significant difference was found between the defenders, midfielders, and forwards based on the Flamingo Balance test variable, between the defenders and the goalkeepers according to the 30-second sit-up test variable, between the defenders and the goalkeepers based on the 30-second push-up test variable, between the defenders and the midfielders according to the anaerobic power variable, between the defenders, the goalkeepers, and the midfielders based on the Yo-Yo IR test (level 1) variable, and between the goalkeeper, the defender, the midfielder and the forward players according to the MaxVO_2 variable.

DISCUSSION

This study was carried out to examine the performance parameters of amateur football players according to the positions they play.

There was no significant difference between the positions in our study's mean values of age, sit-reach (flexibility), hand grip strength, standing long jump, 30-meter sprint, agility, and counter movement jump test of 55 football players. When the studies in the literature in which these parameters are measured are examined, there are studies in which the values obtained in some parameters overlap with our study (Taşkın, 2006; Aslan & Koç, 2015; Yapıcı, Aydın, Çelik & Başkaya, 2016; Kızılet, Erdem, Karagözoğlu, Topsakal & Çalışkan, 2004; Nalbant, Gözen, Özbek & Erceylan, 2017; Böge et al., 2021) but there are also studies in which the values obtained in some parameters do not overlap (Kartal, Kartal & Babayiğit İrez, 2016; Karakulak, Eyuboğlu & Aslan, 2019; Göral, Saygın & Babayiğit İrez, 2012; Köklü, Özkan & Ersöz, 2009; Karakaş, Yıldız, Köse, Temoçin & Kızılkaya, 2011). In the studies that do not overlap with the current research, it is striking that the level of the league played by the participant footballers is different, and the numerical distribution of the footballers subjected to the tests according to their positions and the age scale of the sample group is wide. It can be argued that the resulting differences are due to these factors. The fact that there is no difference between the positions in the two most basic performance parameters for football, especially speed and agility, can be considered as an indication that the principles of defense and offense are tried to be made as a team in today's football. In the modern football game concept, all positions are expected to take on roles other than their specific duties. In today's football, it is

expected that all positions will act following the team strategy, whether attacking or defending. In the football game system, it is one of the most basic tactics to win the ball by making the opponent misplace the pass. For this to happen, it is very important to narrow the area where football is played, that is, to place all position groups according to the point where the ball is located. The joint action of all the players, as if they were connected to each other by an invisible rope, causes all the players to cover close running distances during the match.

In our study, it is seen that goalkeepers are heavier than other positions. Moreover, the difference in weight between goalkeepers and midfielders is significant. This result can be considered normal since the goalkeepers are taller in terms of their physical structure and in weight, which is proportional to their height. Kizilet et al. (2004) also reached results that support our research. On the other hand, the height of the footballers participating in our research in the midfield position is lower than in the other positions. This difference is significant in favor of goalkeepers between goalkeepers and midfielders. Göral et al. (2012), in their study, reported that the average height of the goalkeepers was 182.8 cm, the average height of the defenders was 176.4 cm, the average height of the midfielders was 171.3 cm, and the average height of the forwards was 177.9 cm. Sever (2016) recorded the height of the goalkeepers as 185.63 cm, the height of the defenders as 178.11 cm, and the height of the strikers as 177 cm in his study on 77 football players playing in the Kütahya Super Amateur League. The same study noted that midfielders (174.39 cm) were significantly shorter than other positions. Kartal et al. (2016) confirmed similar results to our study in their study, in which they compared some motoric features of football players according to positions.

In our study, the flamingo balance test determined the participants' balance performance. It was determined that the balance values of the defenders were statistically significantly different (in favor of the defenders) from those of the midfielders and forwards. In their study, Güler and Eniseler (2017) reported that six-week static and dynamic balance training improved the speed and power performance of young football players (n=32) and that balance training to be applied in addition to football training was necessary. However, contrary to the present findings, Kartal et al. (2016) stated that there was no statistically significant difference in the balance scores between the positions of the football players. It is thought that this may be because the flamingo balance test is not measured with precision test devices such as time or strength indicators. Therefore, the obtained values might depend on the error assessment with the observer's attention.

When the average values of the 30-second sit-up and 30-second push-up tests of the football players participating in the study were examined, it was discovered that there was a

statistically significant difference between the defenders and the goalkeepers in both parameters in favor of the defenders. Nalbant et al. (2017) evaluated the physical and conditional characteristics of football players according to positions in their research. In the study, positions were divided into groups as goalkeeper (n=9), defender (n=14), back (n=20), midfielder (n=13), wing player (n=16) and forward (n=13). The 30-second sit-up and 30-second push-up test scores of the positions were found in goalkeepers (sit-ups: 35.86, push-ups: 26.89), defenders (sit-ups: 35.61, push-ups: 26.53), backs (sit-ups: 35.45, push-ups: 26.91, midfielders (squats: 36.46, push-ups: 27.83), wing players (squats: 35.81, push-ups: 25.53) and forward players (sit-ups: 35.98, push-ups: 26.94). Ergün and Arıkan (2019) examined the development of some motoric parameters before and after the 8-week preparation period in which 20 football players who played in the U19 team participated, and they found that the test results of 30-second sit-ups and 30-seconds push-ups showed a significant increase. Arısoy and Kılınç (2017) examined the importance of football player performances while determining the team rosters during the preparation period in the study, in which a total of 68 football players from 2 professional 3rd League teams and one regional amateur league team participated. In this study, while the 30-second sit-up test result of the football players who entered the team squad was 26.9, it was reported as 25.8 for the football players who were excluded from the squad. It is understood that the 30-second sit-up test values do not cause a statistically significant result in the case of football players being in or out of the squad. It can be argued that the available literature results are similar to the results obtained in our study.

The peak anaerobic power values of the players participating in our research, calculated with the help of the Sayers formula, were determined as 3867.83 w for goalkeepers; 3875.29 w for defenders; 3355.28 w for midfielders; and 3752.79 w for forwards, according to their positions. When the anaerobic power values of the football players are examined, it is discovered that the anaerobic power values of the defenders are statistically significantly higher than the midfielders. Güldal (2013), in his study examining the relationship between aerobic and anaerobic capacity in professional football players, did not record a statistical difference between the positions of the football players between their maximal oxygen utilization capacity (VO_2max) and anaerobic power (AnP). Erkmen, Kaplan and Taşkın (2005) examined the changes in football players' physical and physiological parameters with league differences before and after the preparatory season. They involved 35 professional football players competing in the 2nd and 3rd leagues. They found that the anaerobic power parameter (in favor of the team playing in the higher league) was statistically different between the teams. At the same time, it was highlighted that the values of the teams' anaerobic power were higher for the

team in the upper league before and after the preparation period. Aslan, Eyuboğlu and Karakulak (2018) reported the average anaerobic power value of professional football players as 131.89 kgm/sec and the average anaerobic power value of amateur footballers as 118.64 kgm/sec in the study in which 30 professional football players at the super league level and 30 football players who had championships in the super amateur leagues participated. Aslan and Koç (2015) state that the anaerobic power values of defenders, forwards, and goalkeepers are higher than wing players in their study on amateur football players. Karakulak et al. (2019) revealed that the anaerobic power values of the center players (backstop, central midfielder, and forward) are higher than those of the side players (back, side midfielder, and wing) in a study of 55 amateur male football players. When the existing literature is examined, it can be said that our research largely overlaps with other studies in terms of anaerobic power parameters.

In our study, Yo-Yo Intermittent Recovery Test Level 1 (IRT-1) values were determined as 1691 m for goalkeepers, 2512 m for defenders, 2095 m for midfielders, and 2133 m for forwards. It has been determined that there is a statistically significant difference in favor of the defenders among the defenders, the goalkeepers, and the midfielders. Söyler (2020) stated that the "run - turn - run - stop - recover - run" format in Yo-Yo IRT-1 is suitable for the game dynamics of football. Yapıcı et al. (2016) reported the Yo-Yo Intermittent Recovery Test Level 1 values of defender, midfielder, and forward players as 2346 m, 2838 m, and 2813 m, respectively, in their research involving 36 young football players between the ages of 18 and 22. In light of these results, the Yo-Yo IRT-1 values of the midfielders participating in the research are significantly higher than the defenders. While Rampinini, Impellizzeri, Castagna, Azzalin and Wisloff (2008) found the running distances of the Yo-Yo IRT-1 to be 2231 m for professional male football players and 1827 m for amateur male football players, Dupont et al. (2010) determined it to be 2034 m for amateur male football players. Although our research is consistent with previous research when the distance traveled parameter is considered, it contradicts prior research when the spatial evaluation is performed. We think this situation is due to the performance of the side-back players. In the distance traveled parameter, they are evaluated in the defensive position among the players participating in our research.

The MaxVO_2 values of the players who participated in our study revealed a statistically significant difference between goalkeepers and defenders, midfielders, and forward players. In addition, it was found that the goalkeepers and defenders had the biggest disparity among the positions, favoring the defenders. Aerobic power capacity is an important factor affecting the physical performance of football players. It has been reported in many studies in the literature

that football players run between 9 and 14 km at different intensities depending on the league level and the quality of the football played in a football match and that these runs depend on physical condition (Marcos, Koulla & Anthos, 2018; Barros et al., 2007; Da Silva, Bloomfield & Marins, 2008; Mohr, Krustrup & Bangsbo, 2003). In addition, it is stated that $MaxVO_2$, which significantly affects physical condition, is the only parameter that makes sense of the aerobic condition and endurance system in football players (Helgerud, Engen, Wisloff & Hoff, 2001; Stolen, Chamari, Castagna & Wisloff, 2005). In the study conducted by Kizilet et al. (2004), in which a total of 63 football players with an average age of 25.15 years participated, the $MaxVO_2$ values according to the positions were reported as: 50.62 ml/kg/min for goalkeepers, 54.28 ml/kg/min for middle defense players, 55.87 ml/kg/min for edge defense players. 55.32 ml/kg/min for midfielders and 54.34 ml/kg/min for forwards. The study reported that the MaxVO2 values of the goalkeepers were significantly lower than the side defenders (backs), middle defenders (stoppers), and midfielders. It can be said that the current research results are compatible because the $MaxVO_2$ values of the goalkeepers are lower than those of the other positions.

CONLUSIONS

As a result, no statistically significant difference was found between positions in six of the twelve parameters (flexibility, 30 m sprint, agility, vertical jump, hand grip strength, and standing long jump) examined to evaluate amateur football performance parameters of players. This situation supports the opinion that the physical performance differences between positions have gradually decreased in modern football. Therefore, it is suggested that football coaches and sports scientists should plan the physical requirements for today's football by taking into account the differences between the positions while preparing their training programs.

ACKNOWLEDGEMENTS

There has been no financial assistance with this research.

REFERENCES

Açıkada, C., Hazır, T., Aşçı, A., Turnagöl, H., & Özkara, A. (1998). Physical and physiological profiles of a second league division soccer team during preparation period. *Hacettepe J of Sport Sciences*, *9*(1), 3-14.

Arısoy, A., & Kılınç, F. (2017). The role of performance analysis in forming the main match football team during preparation period. *Journal of Sportive Performance Researches*, *1*(1), 51-63.

Aslan, C. (2015). Comparing selected physical, physiological and technical characteristics of a group of Turkish amateur soccer players according to playing positions. *Journal of Athletic Performance and Nutrition*, *2*(2), 1-13.

Aslan, C. S., & Koç, H. (2015). Comparing selected physical and motoric characteristics of Turkish amateur soccer players according to playing positions. *CBU Journal of Physical Education and Sport Sciences*, *10*(1), 56-65.

Aslan, C. S., Eyuboğlu, E., & Karakulak, İ. (2018). Comparison of selected motor skills and body composition characteristics of professional and amateur football players. *Sportive Sight: Journal of Sports and Education, 5*(SI1), 86-95.

Baikoğlu, S., & Kandemir, S. N. (2020). Examining the effects of imagery on standing long jump technique. *Journal of Sports Education, 4*(1), 100-106.

Bangsbo, J., Laia, F. M., & Krustrup, P. (2008). The Yo-Yo ıntermittent recovery test, a useful tool for evaluation of physical performance in ıntermittent sport. *Sports Medicine, 38*(1), 37-51.

Barros, R. M., Misuta, M. S., Menezes, R. P., Figueroa, P. J., Moura, F. A., Cunha, S. A., Anido, R., & Leite, N. J. (2007). Analysis of the distances covered by first division brazilian soccer players obtained with an automatic tracking method. *Journal of Sports Science & Medicine, 6*(2), 233.

Böge, V., Kaplan, T., & Taşkın, H. (2021). Investigation of agility performance in some anthropometric variables for young male soccer players. *Turkish Journal of Sport and Exercise, 23*(2), 216-222.

Cordero-Vargas, M., Sojo-Rodríguez, N., Chinnock, A., Chacón-Araya, Y., & Moncada-Jiménez, J. (2019). Nutritional and body composition assessment in Costa rican college soccer players aged 18 to 21 years old. *Journal of Athletic Performance and Nutrition*, *6*(2), 1-12.

Da Silva, C. D., Bloomfield, J., & Marins, J. C. B. (2008). A Review of stature, body mass and maximal oxygen uptake profiles of U17, U20 and first division players in Brazilian soccer. *Journal of Sports Science & Medicine, 7*(3), 309.

Dupont, G., Defontaine, M., Bosquet, L., Blondel, N., Moalla, W., & Berthoin, S. (2010). Yo-Yo ıntermittent recovery test versus the universite de montreal track test: Relation with a high-intensity intermittent exercise. *Journal of Science and Medicine in Sport, 13*(1), 146-150.

Eniseler, N. (2017). *Football Training in the Light of Science.* (2nd ed). İzmir: Bassaray Matbaası.

Erkmen, N, Kaplan, T, & Taşkın, H. (2005). Professional soccer player's pre-season physical and physiological parameters: Comparison and determination. *Spormetre The Journal of Physical Education and Sport Sciences, 3*(4), 137-144.

Ergün, G., & Arıkan, Ş. (2019). The effect of preparatory period trainings on some motoric parameters on soccer players. *Kilis 7 Aralık University Journal of Physical Education and Sports Sciences, 3*(2), 8-15.

Göral, K., Saygın, Ö., & Babayiğit İrez, G. (2012). Examining of reaction time of professional soccer players according to their playing positions. *Selçuk Unıversity Journal of Physical Education and Sport Science, 14*(1), 5-11.

Greene, J. J., McGuine, T. A., Leverson, G., & Best, T. M. (1998). Anthropometric and performance measures for high school basketball players. *Journal of Athletic Training,* 33(3), 229-232.

Güldal, Y. K. (2013). *Professional Soccer Players Aerobic and Anaerobic Capacity of the Relationship between the Players Position*. Unpublished Master's Thesis, Kırıkkale University Health Sciences Institute, Kırıkkale

Güler, Ö., & Eniseler, N. (2017). The effects of soccer specific balance training on agility and vertical jump performances in young soccer players. *Niğde Ömer Halisdemir University Journal of Physical Education and Sports Sciences, 11*(3), 259-267.

Günay, M., & Yüce, A. İ. (2008). *Scientific Foundations of Football Training.* (3rd ed). Ankara: Gazi Publications.

Günay, M., Tamer, K., & Cicioğlu, İ. (2013). *Sports Physiology and Performance Measurement.* (3rd ed). Ankara: Gazi Publications.

Helgerud, J., Engen, L. C., Wisloff, U., & Hoff, J. (2001). Aerobic endurance training improves soccer performance. *Medicine and Science In Sports and Exercise*, *33*(11), 1925-1931.

Kafkas, M. E., Kızılay, E., Kafkas, A. Ş., Kızılay, F., Durmuş, B., & Pulur, A. (2018). Ultrasound characteristics of patellar tendon and femoral condylar cartilage thickness in football and basketball players. *Journal of Athletic Performance and Nutrition*, *5*(1), 1-13.

Karakaş, S., Yıldız, Y., Köse, H., Temoçin, S., & Kızılkaya, K. (2011). The effects of team, position and physical feature factors on body composition in professional and amateur soccer players. *ADÜ Journal of the Faculty of Medicine*, *12*(1), 63-69.

Karakulak, İ., Eyuboğlu, E., & Aslan, C. S. (2019). Comparison of physical and motor characteristics of central and winger players in soccer. *Spormetre The Journal of Physical Education and Sport Sciences*, *17*(2), 126-131.

Kartal, A., Kartal, R., & Babayiğit İrez G. (2016). Investigate of some motor functions according to soccer players playing positions. *CBU Journal of Physical Education and Sport Sciences*, *11*(1), 55-62.

Kızılet, A., Erdem, K., Karagözoğlu, C., Topsakal, N., & Çalışkan, E. (2004). Evaluation of some physical and physiological profiles of soccer players according to playing position. *Gazi Journal of Physical Education and Sport Sciences*, *9*(3), 67-78.

Köklü, Y., Özkan, A., & Ersöz, G. (2009). Assessment and improvement of endurance performance in soccer. *CBU Journal of Physical Education and Sport Sciences*, *4*(3), 142-150.

Krustrup, P., Mohr, M., Amstrup, T., Rysgaard, T., Johansen, J., Steensberg, A., Pedersen P. K., & Bangsbo, J. (2003). The Yo-Yo intermittent recovery test: Physiological response, reliability, and validity. *Medicine & Science in Sports & Exercise*, *35*(4), 697-705.

Mackenzie, B. (2005). *101 Performance Evaluation Tests.* Electric Word plc. London: 96.

Marancı, B., & Müniroğlu, S. (2001). Comparison of goalkeepers' motoric features, reaction times and body fat percentage with other soccer field players. *Gazi Journal of Physical Education and Sport Sciences*, *6*(3), 13-26.

Marcos, M. A., Koulla, P. M., & Anthos, Z. I. (2018). Preseason maximal aerobic power in professional soccer players among different divisions. *The Journal of Strength & Conditioning Research*, *32*(2), 356-363.

Mohr, M., Krustrup, P., & Bangsbo, J. (2003). Match performance of high-standard soccer players with special reference to development of fatigue. *Journal of Sports Sciences*, *21*(7), 519-528.

Nalbant, Ö., Gözen, O., Özbek, M., & Erceylan, C. (2017). Evaluation of physical and contitioning features acording to position in football. *İstanbul University Journal of Sports Sciences*, *7*(2), 38-49.

Rampinini, E., Impellizzeri, F. M., Castagna, C., Azzalin, A., & Wisloff, U. (2008). Effect of match-related fatigue on short-passing ability in young soccer players. *Medicine and Science in Sports and Exercise*, *40*(5), 934-942.

Sayers, S. P., Harackiewicz, D. V., Harman, E. A., Frykman, P. N., & Rosenstein, M. T. (1999). Cross-validation of three jump power equations. *Medicine and Science in Sports and Exercise*, *31*(4), 572-577.

Söyler, M. (2020). *Investigation of the Seasonal Changes of some Physical and Technical Parameters according to the Positions of Regional Amateur League Soccer Players.* Unpublished Doctoral Thesis, Gazi University Health Sciences Institute, Ankara.

Stolen, T., Chamari, K., Castagna, C., & Wisloff, U. (2005). Physiology of soccer. *Sports Medicine*, *35*(6), 501-536.

Taşkın, H. (2006). Investigation some physical parameters and 30 meter sprint capabilities of professional soccer players' according to their playing positions. *Spormetre The Journal of Physical Education and Sport Sciences*, *4*(2), 49-54.

Tsigilis, N., Douda, H., & Tokmakidis, S. P. (2002). Test-retest reliability of the eurofit test battery administered to university students. *Perceptual and Motor Skills*, (95), 1295-1300.

Yapıcı, A., Aydın, E., Çelik, E., & Başkaya, G. (2016). The comparison of motoric characteristics of young soccer players according to their playing positions. *Sportive Sight: Journal of Sports and Education*, *3*(1), 49-60.

Yüksel, M. F., Koç, Ö. F., Işık, B., & Erdağı, K. (2021). The Effect on performance of detraining during Covid-19 pandemic period in amateur soccer players. *Progress in Nutrition*, 23(4), e2021219.

Zorba, E., & Saygın, Ö. (2009). *Physical Activity and Physical Fitness.* (2nd ed). İstanbul: İnceler Ofset.