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RESEARCH ARTICLE
Sport Science

Examining the Relationship Between Leg Strength, Speed and Technical Skills in Amateur Football Players

Amatör Futbol Oyuncularında Bacak Gücü, Hız ve Teknik Beceriler Arasındaki İlişkinin İncelenmesi

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ABSTRACT

Aim: The aim of this study is to examine the anaerobic power, and speed on the technical skills of amateur football players. Methods: The study included 20 volunteer male athletes with an average age of 22.8±7.4 years, an average height of 179.7±5.8 cm, an average body weight of 76.4±11.2 kg, and an average sports age of 9.2±6.9 years. Anthropometric measurements were taken on the participants. The 30-meter sprint was conducted to determine speed, the standing long jump was performed to assess leg strength, and the Mor-Christian general football ability test was administered to evaluate football-specific technical skills. Results: The average anaerobic power score was 14265.8±1252.6 W, and the average power score was 6683.2±637.9 W. The average dribbling time was 14.60±1.11 seconds, average shooting scores were 64.50±16.20 points, and average pass scores were 5.65±1.72 points. A significant negative relationship between speed and anaerobic power was not found. However, a positive relationship between pass skill and anaerobic power was observed. When comparing dribbling skills based on position, it was found that goalkeepers had significantly lower dribbling skills than players in other positions ($p < 0.05$). Besides, study found that motor characteristics particularly the strong relationships between peak power, standing long jump, and average power, and their inverse relationship with speed. Conclusion: Encouraging further studies and comparing their results will be beneficial for new findings.

Anahtar kelimeler: Futbol, Teknik beceri, Anaerobik güç, Hız

ÖZET

Amaç: Bu çalışmanın amacı amatör futbolcuların teknik becerilerine anaerobik güç ve hızın etkisini incelemektir. Yöntemler: Çalışmaya yaş ortalamaları 22,8±7,4 yıl, boy ortalamaları 179,7±5,8 cm, vücut ağırlıkları ortalamaları 76,4±11,2 kg ve spor yaş ortalamaları 9,2±6,9 yıl olan 20 gönüllü erkek sporcu dahil edildi. Katılımcıların antropometrik ölçümleri alındı. Hızı belirlemek için 30 metre sprint, bacak kuvvetini değerlendirmek için durarak uzun atlama ve futbola özgü teknik becerileri değerlendirmek için Mor-Christian genel futbol yetenek testi uygulandı. Bulgular: Ortalama anaerobik güç skoru 14265,8±1252,6 W, ortalama güç skoru 6683,2±637,9 W olarak bulundu. Ortalama top sürme süresi 14,60±1,11 saniye, ortalama şut skoru 64,50±16,20 puan, ortalama pas skoru 5,65±1,72 puan olarak bulundu. Hız ile anaerobik güç arasında anlamlı negatif ilişki bulunmadı. Ancak pas becerisi ile anaerobik güç arasında pozitif ilişki gözlendi. Pozisyona göre top sürme becerileri karşılaştırıldığında, kalecilerin diğer pozisyonlardaki oyunculardan anlamlı olarak daha düşük top sürme becerisine sahip olduğu bulundu ($p<0,05$). Ayrıca, motor özellikler, özellikle tepe güç, durarak uzun atlama ve ortalama güç arasında güçlü ilişkiler ve hızla ters orantılı bir ilişki olduğu bulundu.Sonuç olarak; ileriki çalışmaların teşvik edilmesi ve sonuçlarının karşılaştırılması yeni bulgular için faydalı olacaktır.

Keywords: Football, Technical skill, Anaerobic power, Speed

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INTRODUCTION

While football is certainly a sport that blends physical power with technical talent, it is impossible to neglect the artistic aspects of the game. The leg strength and technical skill of a player are major contributing factors influencing a player's performance and closely interlink (Helgerud, Christian Engen, Wisløff, & Hoff, 2001). Leg power also determines how far the ball can be hit. Generally, games are played by players with strong legs who can send hard and powerful shots. However, a strong leg is not effective without technical skills, as supported by a scientific point of view (Bozkurt, Çoban, & Demircan, 2020). Whether a player will smash, slice, or adjust the ball (e.g., the length or height of a shot) is determined by how the player swings and places the ball. Therefore, leg strength is the basis of powerful shots, but it is possible to have powerful shots without correctly tensed muscles around the elbow joint.

Another important function is leg strength; shots and passes are much more powerful (Kellis & Katis, 2007; Manolopoulos, Papadopoulos, & Kellis, 2006), but technical ability is what places passes at intended targets and that will not be picked off by other team members. This is in regard to technical skills because these give direction to a player's capabilities in the areas of ball handling, beating opponents and making precise passes. Strength can be beneficial in getting past a defender or a player or when making a juke but for things like first touch, regaining the ball when marked, or dribbling, one needs proper technique. This leads to an improvement in the cases of force production of an athlete, an aspect that plays a critical role in aspects such as speed and agility of the legs. Thus,

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throwing off the force of gravitation and attaining speeds genetically interlinked with the human configuration of legs through the act of running. Still, this sharpness and speed may not adequately work if not backed up by a player's impact and ability to beat other players.

In football players, the application of force, therefore, muscle strength, must be regulated to complement technical strategies (Burhaein, Kanang Ibrahim, & Pavlovic, 2020). As positive factors: Leg strength may prove to be beneficial in enhancing the play-making abilities; however, leg strength alone does not meet the criteria of indispensability. Fundamental motor skills refer to the basic movements that are needed to execute technical capabilities of the sports like ball mastery, passing, dribbling and even scoring (Zago et al., 2016). Hence, for those interested in enhancement of football ability, there is need to do leg exercise as well as technical display.

Physical contact is inevitable on the football field. Leg strength can help players be more durable in physical confrontations. Strong legs can enable players to tackle the ball better and increase their power to push or block opposing players (Andersen, Lockie, & Dawes, 2018). However, in addition to these clashes, technical skills will determine their ability to protect and steal the ball. Leg strength can help a player be more effective in heading balls in the air. However, in this case, technical skills such as controlling the ball, timing, and positioning are of great importance. Technical skills are decisive in a player's ability to receive the ball, control it, and pass it quickly. Leg strength can help the player direct the ball over long distances better, but without technical skill, these passes may not be effective.

Improving leg strength may reduce the risk of injury. Strong legs can help players maintain better balance and muscle. This is important for long-term health and performance (Namazi, Zarei, Hovanloo, & Abbasi, 2019; Verrelst et al., 2014). For this reason, it is necessary to develop leg strength and technical skills together in football players. Strong legs can increase the physical superiority of players and be decisive in some situations, but technical skills provide the ability to better understand and apply the basic elements of football. Therefore, it is important for players who want to improve their football skills to work on and develop both their physical strength and technical abilities equally.

Speed and technical skill are important factors affecting performance in football (Unnithan, White, Georgiou, Iga, & Drust, 2012). Both skills are important for a football player, and they complement each other. Speed helps a player move faster when passing opposing players or carrying the ball. A fast player spends less time passing opponents and is more difficult to catch when using dribbling skills. However, if speed alone is not enough, it needs to be combined with dribbling ability (Sheppard & Young, 2006). A fast football player can quickly take positions in attack and gain an advantage to pass the opponent's defense. This can help create more scoring opportunities during fast breaks. For defensive players, speed is important for stealing the ball or blocking the attacks of opposing players. A fast defender can get behind attackers and use their skills to cut off opposing attacks more effectively.

Performance in football has evolved into a faster, more tactical, power-based game from the past to the present (Turner & Stewart, 2014). To keep up with this, it is necessary to think quickly, act quickly (Little & Williams, 2005), and be strong. Strength (Wisløff, Helgerud, & Hoff, 1998), speed (Murphy, Lockie, & Coutts, 2003), and technical skills are the cornerstones of football and must complement each other for the success of a football player. Research findings examining the effects of motoric features on technical performance in football are limited in the literature. However, motoric characteristics should also be taken into consideration when evaluating technical performance in football players. This study aimed to examine the effects of some motoric and coordinative features on football-specific technical skills in male football players.

METHOD

Twenty football players, aged between 15 and 25, who played football in sports clubs in Çanakkale province and had at least 2 years of sports experience, participated voluntarily in the study. Field measurement methods consisting of five stages, the validity and reliability of which have been tested in previous studies, were used for the participants.

Speed performance measurement:

Speed performance was measured between 0-30 meters on a flat artificial grass ground in windless weather conditions. A stopwatch was used for the measurement. Participants were given the opportunity to try a total of three times in the 30-meter speed test. The best score out of the three attempts was taken into consideration. The test values obtained were recorded in seconds (Murtagh, Mair, Aguiar, Tudor-Locke, & Murphy, 2021).

Standing long jump:

A Çelikler brand steel meter was used in this test. The participant stood at the beginning of a steel meter with the number 0 placed on a line between their feet. They were then asked to jump as far as possible. This test was conducted twice for reliability, and the best score was analyzed.

Anaerobic power measurement:

Peak and average power (watt) calculations were made using the following formula (Johnson & Bahamonde, 1996):

Peak Power (W) = 78.5 x jump distance (cm) + 60.6 x body weight (kg) – 15.3 x height (cm) – 1308

Average Power (W) = 41.4 x jumping distance (cm) + 31.2 x body weight (kg) – 13.9 x height (cm) + 431

Measuring technical skills specific to football:

The Mor-Christian General Football Ability Test was used to assess participants' technical abilities in this study (Kumaravelu, 2022). This test focuses on participants' shooting and passing accuracy levels, as well as dribbling performance.

Shooting skill test:

In the shooting skill test, four circular goals with a diameter of 1.21 m were placed in the goal. The line to strike the ball was marked 14.5 meters away from the goal and parallel to it. Participants hit stationary balls towards the goal from the shooting line. The ball could be placed anywhere along the shooting line. Participants made four shots at each of the four circular targets, totaling 16 shots. Ten points were awarded for shots hitting the correct target, and four points for shots hitting the wrong target. Shots that directly entered the target were considered successful, and no points were given for other shots. The result was based on the total points obtained from 16 attempts.

Passing Skill Test:

During the passing skill test, a station is set up with a goal measuring 91 cm in width and 45 cm in height, with a 1.21-meter goal line positioned behind it. Two cones are placed 13.5 meters away at a 45-degree angle to create a goal line, while a third cone is placed 13.5 meters away at a 90-degree angle to the goal line. The football player takes 12 shots, four from each of the three cone locations.

Dribbling Test:

The dribbling test involves a station with a diameter of 18 meters, where 12 cones (45 cm in height) are arranged in a circular pattern with 4.5-meter intervals. A starting line, 1 meter in length, is marked outside the circle. Upon receiving the start command, the athlete dribbles through the cones as quickly as possible with the ball and returns to the starting line. The athlete can choose to dribble in either a clockwise or counterclockwise direction. The best performance out of two attempts is recorded.

Limitations:

This study is restricted to 20 volunteer male amateur football players aged 15-25, who are members of sports clubs in Çanakkale province and have a minimum of 2 years of sports experience.

Statistical Analysis:

Data analysis was conducted using the SPSS statistical program. Descriptive statistics, including mean and standard deviation, were utilized to calculate the averages for age, height, weight, motor characteristics, and football skill scores of the participants. Group comparisons were made using Kruskal Wallis-H, and Freadman correlation analysis was employed to determine the relationships between participants' motor characteristics and football skill scores.

Ethical Approval Permission Information;

This study was approved by the Ethics Committee of Çanakkale Onsekiz Mart University Graduate School of Education with decision. Protocol number**:** 2021-08/55

RESULTS

Table 1: Demographic characteristics were compared based on playing position

Variable	Groups	f	$\bar{X}$	SD
Height (m)	Defense	7	1,79	0,08
	Forward	3	1,72	0,04
	Goalkeeper	2	1,88	0,09
	Midfield	8	1,78	0,04
	Total	**20**	1,79	0,07
Weight (kg)	Defense	7	77,7	6,1
	Forward	3	67,0	3,6
	Goalkeeper	2	77,5	2,1
	Midfield	8	70,2	9,1
	Total	**20**	73,1	7,9
Age (year)	Defense	7	23,4	5,3
	Forward	3	19,0	3,0
	Goalkeeper	2	26,0	1,4
	Midfield	8	20,7	3,6
	Total	**20**	21,9	4,4
Sport Experience (year)	Defense	7	9,7	7,2
	Forward	3	6,6	3,2
	Goalkeeper	2	9,5	2,1
	Midfield	8	7,6	3,1
	Total	**20**	8,4	4,7
BMI (kg/m2)	Defense	7	24,1	2,9
	Forward	3	22,6	2,2
	Goalkeeper	2	21,9	1,7
	Midfield	8	21,9	2,1
	Total	**20**	22,8	2,4

Demographic characteristics by playing position are presented in Table 1. A total of 20 athletes participating in the study had similar demographic characteristics, and as a result of the Kruskal-Wallis analysis comparing demographic characteristics according to positions, no significant difference was found

Table 2: Comparison of biomotor and technical skills based on playing position

Variable	Groups	n	x±sd	*Mean Rank*	Kruskal wallis -H	df	P value
Speed (sec)	Defense	7	4,5±0,5	11,50	4,363	3	0,225
	Forward	3	4,4±0,3	10,83			
	Goalkeeper	2	4,1±0,1	2,25			
	Midfield	8	4,4±0,3	11,56			
	Total	**20**	4,4±0,3				
Standing long jump	Defense	7	170,5±17,4	8,00	6,341	3	0,096
	Forward	3	170,3±9,1	7,17			
	Goalkeeper	2	195,5±7,7	18,50			
	Midfield	8	180,1±11,4	11,94			
	Total	**20**	176,8±14,1				
Anaerobic pic power(W)	Defense	7	14039,5±1415,2	9,57	4,678	3	0,197
	Forward	3	13486,6±596,2	6,67			
	Goalkeeper	2	15858,8±587,6	18,00			
	Midfield	8	14357,9±1159,9	10,88			
	Total	**20**	14265,8±1252,6				
Anaerobic average power(W)	Defense	7	6555,3±733,7	9,71	**4,612**	3	0,203
	Forward	3	6315,7±292,5	6,67			
	Goalkeeper	2	7467,5±250,5	18,00			
	Midfield	8	6736,8±597,1	10,75			
	Total	**20**	6683,2±637,9				
Pass	Defense	7	5,4±0,9	11,14	4,087	3	0,252
	Forward	3	5,3±2,5	10,00			
	Goalkeeper	2	7,5±0,7	17,50			
	Midfield	8	4,8±1,9	8,38			
	Total	**20**	5,4±1,7				
Shoot	Defense	7	62,1±19,7	9,43	4,524	3	0,210
	Forward	3	82,6±10,1	17,17			
	Goalkeeper	2	63,1±9,8	9,75			
	Midfield	8	60,2±12,9	9,13			
	Total	**20**	64,5±16,2				

Dribbling	Defense	7	14,6±1,1	10,86	3,416	3	0,332
	Forward	3	15,8±1,6	15,33			
	Goalkeeper	2	13,8±0,7	6,00			
	Midfield	8	14,3±0,7	9,50			
	Total	**20**	14,61±1,1				

The results of the Kruskal-Wallis analysis, which was conducted to compare the performance characteristics of a total of 20 athletes participating in the study according to their positions, are shown in Table 2. As a result of the analysis, the athletes had similar performance characteristics and no significant difference was found according to positions

Table 3: The relationship between technical skills and motor characteristics

		Pass	Shoot	Dribbling	Peak power	Standing Long jump	Average power	Speed
Pass	r	1,000	-,103	,157	**,519***	,426	**,539***	-,373
	p	.	,665	,508	**,019**	,061	**,014**	,105
Shoot	r	-,103	1,000	,101	-,271	-,233	-,278	,004
	p	,665	.	,671	,249	,323	,235	,986
Dribbing	r	,157	,101	1,000	-,247	-,260	-,232	,367
	p	,508	,671	.	,294	,267	,326	,111
Peak power	r	**,519***	-,271	-,247	1,000	**,928****	**,995****	**-,845****
	p	**,019**	,249	,294	.	**,000**	**,000**	**,000**
Standing Long Jump	r	,426	-,233	-,260	**,928****	1,000	**,917****	**-,837****
	p	,061	,323	,267	**,000**	.	**,000**	**,000**
Average power	r	**,539***	-,278	-,232	**,995****	**,917****	1,000	**-,837****
	p	**,014**	,235	,326	**,000**	**,000**	.	**,000**
Speed	r	-,373	,004	,367	**-,845****	**-,837****	**-,837****	1,000
	p	,105	,986	,111	**,000**	**,000**	**,000**	.

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

The analysis highlights the complex relationships between technical skills and motor characteristics in young individuals. Significant positive correlations between passing and both peak and average power suggest that individuals with higher power levels tend to be better passers. This might be due to the strength and explosive power required to execute precise and powerful passes. The lack of significant correlations between shooting and other variables suggests that shooting performance is influenced by factors not measured in this analysis, such as technique or accuracy. Dribbling ability appears to be independent of the measured motor characteristics, indicating that dribbling might rely more on coordination, agility, and fine motor skills. The strong correlations between peak power, standing long jump, and average power, along with their negative correlations with speed, suggest that individuals who excel in power-based tasks might not be the fastest runners. This highlights the trade-off between power and speed in physical performance

DISCUSSION

As a result of the study, when the relationship between football players' motor characteristics is evaluated, an increase in leg strength is found to improve speed performance. However, it was found that the increase in leg strength had a moderate effect on passing skills. Many studies have also concluded that athletes' physical characteristics influence sport-specific motor skills.

There are many studies in the literature that reveal the relationship between leg strength and speed performance (De Hoyo et al., 2016; Hammami et al., 2018; Stølen, Chamari, Castagna, & Wisløff, 2005; Turner & Stewart, 2014). In one of them, it was determined that there was a significant negative relationship between standing long jump performance and football players' 30 m sprint performance (Kamar et al., 2003). In another study on football players, it was determined that lower extremity explosive power, anaerobic power, and strength levels play a decisive role in football players' speed performances (Şahbaz, Güler, & Öztürk, 2003). The fundamental reason for the relationships between motor skills in football players is that each motor skill serves a supporting role in the application of other motor skills. For example, in a study on football players, it was found that football players with high aerobic endurance had better repeated sprint performances than those with low aerobic endurance. The basis for this is that athletes with high aerobic endurance recover faster between sprint repetitions than other football players (Mambwe, Silungwe, & Nkhata, 2023). It is also known that certain technical and motor skills differ based on the positions played by football players. For example, offensive players may have higher shooting skills, and defensive players

may have higher strength performance. In this study, it can be said that the fact that the football players participating in the research consisted of players in different positions caused no significant difference in the shot accuracy test.

In fact, football requires power to move fast, jump up and down, change direction and kick the ball. These skills, like kicking the ball with force and precision to sprint very fast and to evade your opponents, are essential qualities that make a player successful. According to the findings of Nurseto, Suwarli and Cahyadi (2019) during a study, it was found that there is a significant positive association between leg strength and kicking accuracy over the field. The stronger players impeded getting the ball to the target, no matter how accurate their kicks, while the weaker players with tightly held kicks achieved the targets. That is the reason why doing strength exercises must be on the performance list of footballers who wish to play on the pitch more effectively. As a major determining factor that favors the success in football, Myftiu and Dalip (2011) revealed that speed is a key factor in winning. Those with a higher sprinting capability to maneuver faster around the defenders in order to score and make longer touches during the match were often the players. This only highlights even more the fact that speed training for players is necessary so that it helps to give them an upper hand over their opponents. A study by Boone et al. (2017) examined the relationship between the bottom line speed and leg power of all matches. The findings clearly indicated that, among all players, those with above-average legs and speed had the highest sharpness in technical proficiency, decision-making ability, and fieldwork in general. This implies that the building of the thigh muscle is additionally linked to the football game; therefore, the player's speed and overall skill are improved as well. Leg strength is a fundamental component of a football player's performance. It directly influences the power and force of a potential tackle or shot. According to a study by Young and Rath (2011), six weeks of isokinetic strength training combined with skill training significantly improved football kicking performance. Another study by Bavli and Koç (2018) found that core exercises can improve leg strength, which in turn enhances explosive strength traits. Speed is a critical aspect of a football player's performance. It allows players to cover ground quickly, evade defenders, and reach the ball before their opponents. A study by Adil et al. (2018) found that speed has a direct effect on the football skills of players.

The findings reveal passing's direct association with peak power, with r=0. 519, and with average power, with r=0. 539, both at p<0. 05. Therefore, it can be concluded that peak and average power should be higher if passing skills should be better. Such results correspond with the previous studies showing that muscular strength and power are essential for the skill performance in sports. For instance, Wing, Turner and Bishop (2020) established that strength and power affected passing accuracy in soccer players. The lack of extreme relationship between passing and other factors like shooting, dribbling, and speed indicates that all these elements may not necessarily be as related to passing ability. It is therefore apparent that there are no relationships with shooting and the other variables obtained herein, suggesting that shooting could be the result of other aspects not measured in this study including, technique, accuracy or mental set. This confirmed the fact that the results of the analysis allowed them to conclude that there were no relations between dribbling and any other motor characteristic. This could be the reason why dribbling seems to be more a function of coordination, quick thinking, and use of the delicate muscles as opposed to the gross muscles that were assessed. The presented findings are encourage by the research of Padron-Cabo et al. (2020) focusing on the importance of agility and coordination abilities in dribbling achievements. Peak power demonstrated a moderate-to-strong significant positive relationship with standing LJ and AP; nevertheless, it demonstrated moderate-to-strong negative relationship with speeding. Therefore, these results suggest that, actually subjects with higher PP also show better SLJ performance and higher AP but are less fast. Accordingly, Marques et al. (2011) and Washif and Kok (2022) reported moderate to high correlation between the peak power and explosive performance indices such as vertical jump and sprinting.

Standing long jump performance demonstrated the positive relation with the peak power and average power respectively (r=0. 928, p=0. 000, r= 0. 917, p=0. 000) and inverse relation with the speed r=- 0. 837, p=0. 000. Standing long jump data indicates that the peak power and average power are positively predicted while the speed is negatively predicted for those high performers in standing long jump which is in accord with research reports on power and jump behavior (Alemdaroğlu, 2012). Mean power also shared the same degree of significance and direction of relationship with the dependent variables as the peak power; standing long jump (r = 0. 917, p = 0. 000) and speed (- 0. 837, p = 0. 000). This supports already established argumentation that power plays a vital role in explosive tasks and is inversely proportional to speed. In support of Wilson et al. (2014), there is evidence that demonstrates a compromise between the magnitude of the force and the rate of the movement in sports. The speed demonstrated a negative relationship with Peak Power, with the coefficient of determination equal to 0. 711 at p=0. 000, with Standing Long Jump it was -0. 706 at p=0. 000, and with Average Power equal to -0. 726 at p=0. This points that the faster people have a lesser level of force output and are less effective in power associated exercises such as the standing long jump. This inverse relationship of speed and power counters the general principles of power-speed relationship in athletic performance that has been written by Sekulic et al. (2013)and Nimphius et al. (2010). Strikingly, it has been noted that the research outcomes used to support this idea in the current study has

similarities to many other research works in the prior literature (Burhaein et al., 2020; D'Isanto, Di Domenico, D'Elia, Aliberti, & Esposito, 2021; Manolopoulos et al., 2006; Zambak, 2019). According to the research study, increase in strength exercises, plyometric exercises and other resistance matters relating to football activities can help in increasing the ball speed at maximum kick in a 10 weeks exercise regimen (Taiana, Grehaigne, & Cometti, 2003). Thus, when assessing the element of technique as specific technical skills, or motor qualities in football players, it is essential to look at characteristics holistically. For the enhancement of technique in football players, it is the necessity to develop multiple motor skills at definite stages and concurrently.

CONCLUSION

This study showed that there are relationships between technical skills and motor characteristics in young individuals. Significant positive correlations between passing and both peak and average power suggest that strength and power play crucial roles in passing ability. The lack of significant correlations for shooting and dribbling indicates that these skills may be influenced more by technical and psychological factors. The strong correlations between peak power, standing long jump, and average power, along with their negative correlations with speed, highlight the trade-offs between power and speed in physical performance.

In the evaluation of technical skills in football players, if there are deficiencies in the application of some technical skills, motor performance development exercises should be utilized. For example, working on exercises to improve leg strength can positively increase shooting performance. Strength training and speed drills should be incorporated into the training regimen of football players to improve their performance on the field. By focusing on developing these physical attributes, players can become more effective and successful in the sport of football

REFERENCES

Adil, A., Tangkudung, J., & Hanif, A. S. (2018). the Influence of Speed, Agility, Coordination of Foot, Balance and Motivation on Skill of Playing Football. *Journal of Indonesian Physical Education and Sport*, *4*(1), 19–34. https://doi.org/10.21009/jipes.041.02

Alemdaroğlu, U. (2012). The relationship between muscle strength, anaerobic performance, agility, sprint ability and vertical jump performance in professional basketball players. *Journal of Human Kinetics*, *31*(1), 149–158. https://doi.org/10.2478/V10078-012-0016-6

Andersen, E., Lockie, R. G., & Dawes, J. J. (2018). Relationship of Absolute and Relative Lower-Body Strength to Predictors of Athletic Performance in Collegiate Women Soccer Players. *Sports 2018, Vol. 6, Page 106*, *6*(4), 106. https://doi.org/10.3390/SPORTS6040106

Bavli, Ö., & Koç, C. B. (2018). Effect of Different Core Exercises Applied during the Season on Strength and Technical Skills of Young Footballers. *Journal of Education and Training Studies*, *6*(5), 72–76. https://doi.org/10.11114/jets.v6i5.3101

Boone, T., Board, R., Astorino, T., Baker, J., Brock, S., Dalleck, L., … Rinaldi, W. (2017). *Journal of Exercise Physiologyonline*. *20*.

Bozkurt, S., Çoban, M., & Demircan, U. (2020). The effect of football basic technical training using unilateral leg on bilateral leg transfer in male children. *Journal of Physical Education*, *31*(1), e-3164. https://doi.org/10.4025/jphyseduc.v31i1.3164

Burhaein, E., Kanang Ibrahim, B., & Pavlovic, R. (2020). The Relationship of Limb Muscle Power, Balance, and Coordination with Instep Shooting Ability: A Correlation Study in Under-18 Football Athletes. *International Journal of Human Movement and Sports Sciences*, *8*(5), 265–270. https://doi.org/10.13189/saj.2020.080515

D'Isanto, T., Di Domenico, F., D'Elia, F., Aliberti, S., & Esposito, G. (2021). The Effectiveness of Constraints-Led Training on Skill Development in Football. *International Journal of Human Movement and Sports Sciences*, *9*(6), 1344–1351. https://doi.org/10.13189/saj.2021.090630

De Hoyo, M., Gonzalo-Skok, O., Sanudo, B., Carrascal, C., Plaza-Armas, J. R., Camacho-Candil, F., & Otero-Esquina, C. (2016). Comparative effects of in-season full-back squat, resisted sprint training, and plyometric training on explosive performance in U-19 elite soccer players. *Journal of Strength and Conditioning Research*, *30*(2), 368–377. https://doi.org/10.1519/JSC.0000000000001094

Hammami, M., Negra, Y., Billaut, F., Hermassi, S., Shephard, R. J., & Chelly, M. S. (2018). Effects of lower-limb strength training on agility, repeated sprinting with changes of direction, leg peak power, and neuromuscular adaptations of soccer players. *Journal of Strength and Conditioning Research*, *32*(1), 37–47. https://doi.org/10.1519/JSC.0000000000001813

Helgerud, J., Christian Engen, L., Wisløff, U., & Hoff, J. (2001). Aerobic endurance training improves soccer performance. *Med. Sci. Sports Exerc*, *33*(11), 1925. Retrieved from http://www.acsm-msse.org

Johnson, D. L., & Bahamonde, R. (1996). Power Output Estimate in University Athletes. *The Journal of Strength & Conditioning Research*, *10*(3), 161–166. Retrieved from https://journals.lww.com/nsca-jscr/fulltext/1996/08000/power_output_estimate_in_university_athletes.6.aspx

Kamar, A., Güngördü, O., Yüceyılmaz, B., Ataman Yancı, H. B., Çavuşoğlu, B., & Şahin, M. (2003). Futbol Oyuncularına 35 Metre Maksimal Anaerobik Sprint ile Dikey Sıçrama ve Durarak Uzun Atlama Skorları Arasındaki İlişkinin İncelenmesi. *Journal*, *3*(11), 147–150.

Kellis, E., & Katis, A. (2007). The relationship between isokinetic knee extension and flexion strength with soccer kick kinematics: an electromyographic evaluation. *Journal of Sports Medicine and Physical Fitness*, *47*(4), 385–394.

Kumaravelu, P. (2022). Effect of sand training on selected skill performance-related variables football players. *Journal of Positive School Psychology*, *2022*(4), 6043–6046. Retrieved from https://mail.journalppw.com/index.php/jpsp/article/view/4408

Little, T., & Williams, A. G. (2005). Specificity of acceleration, maximum speed, and agility in professional soccer players. *The Journal of Strength & Conditioning Research*, *19*(1). Retrieved from https://journals.lww.com/nsca-jscr/fulltext/2005/02000/specificity_of_acceleration,maximum_speed,_and.13.aspx

Mambwe, R., Silungwe, L. M., & Nkhata, L. A. (2023). Loveness Anila Nkhata. Assessment of Football Players Aerobic Endurance Using the Footeval Test: A Quasi-experimental Study Design. *International Journal of Sports Science and Physical Education*, *8*(2), 15–21. https://doi.org/10.11648/j.ijsspe.20230802.12

Manolopoulos, E., Papadopoulos, C., & Kellis, E. (2006). Effects of combined strength and kick coordination training on soccer kick biomechanics in amateur players. *Scandinavian Journal of Medicine & Science in Sports*, *16*(2), 102–110. https://doi.org/10.1111/J.1600-0838.2005.00447.X

Marques, M. C., Gil, H., Ramos, R. J., Costa, A. M., & Marinho, D. A. (2011). Relationships between vertical jump strength metrics and 5 meters sprint time. *Journal of Human Kinetics*, *29*(1), 115–122. https://doi.org/10.2478/V10078-011-0045-6

Murphy, A. J., Lockie, R. G., & Coutts, A. J. (2003). Kinematic determinants of early acceleration in field sport athletes. *Journal of Sports Science and Medicine*, *2*(4), 144–150.

Murtagh, E. M., Mair, J. L., Aguiar, E., Tudor-Locke, C., & Murphy, M. H. (2021). Outdoor Walking Speeds of Apparently Healthy Adults: A Systematic Review and Meta-analysis. *Sports Medicine*, *51*(1), 125–141. https://doi.org/10.1007/S40279-020-01351-3/FIGURES/4

Myftiu, A., & Dalip, M. (2011). The relationship between play positions, vertical jump and sprinting speed in young football players. *International Journal of Sports Science*, *8*(15–16), 9–15. Retrieved from https://www.researchgate.net/publication/356127599

Namazi, P., Zarei, M., Hovanloo, F., & Abbasi, H. (2019). The association between the isokinetic muscle strength and lower extremity injuries in young male football players. *Physical Therapy in Sport*, *39*, 76–81. https://doi.org/10.1016/J.PTSP.2019.06.013

Nimphius, S., McGuigan, M. R., & Newton, R. U. (2010). Relationship between strength, power, speed, and change of direction performance of female softball players. *Journal of Strength and Conditioning Research*, *24*(4), 885–895. https://doi.org/10.1519/JSC.0B013E3181D4D41D

Nurseto, F., Suwarli, S., & Cahyadi, A. (2019). The Effect Of Balance And Strength Of Muscle Leg On The Accuracy Of Kicking A Ball Towards The Goal In The Student Football University Of Lampung. *Quality in Sport*, *5*(4), 13–20. https://doi.org/10.12775/QS.2019.020

Padrón-Cabo, A., Rey, E., Kalén, A., & Costa, P. B. (2020). Effects of Training with an Agility Ladder on Sprint, Agility, and Dribbling Performance in Youth Soccer Players. *Journal of Human Kinetics*, *73*(1), 219–228. https://doi.org/10.2478/HUKIN-2019-0146

Şahbaz, N., Güler, C., & Öztürk, M. (2003). Genç Futbol Oyuncularında İzokinetik Kuvvetin Sprint Süratine Etkisinin Araştırılması. *İstanbul Üniversitesi Spor Bilimleri Dergisi*, *3*(11), 157–161.

Sekulic, D., Spasic, M., Mirkov, D., Cavar, M., & Sattler, T. (2013). Gender-specific influences of balance, speed, and power on agility performance. *Journal of Strength and Conditioning Research*, *27*(3), 802–811.

https://doi.org/10.1519/JSC.0B013E31825C2CB0

Sheppard, J., & Young, W. (2006). Agility literature review: Classifications, training and testing. *Journal Of Sports Sciences*, *24*(9), 919–932. https://doi.org/10.1080/02640410500457109

Stølen, T., Chamari, K., Castagna, C., & Wisløff, U. (2005). Physiology of soccer: An update. *Sports Medicine*, *35*(6), 501–536. https://doi.org/10.2165/00007256-200535060-00004/FIGURES/2

Taiana, F., Grehaigne, J., & Cometti, G. (2003). The Influence Of Maximal Strength Training Of Lower Limbs Of Soccer Players On Their Physical And Kick Performances. *Science and Football II*, 98–102. https://doi.org/10.4324/9780203474235-21

Turner, A. N., & Stewart, P. F. (2014). Strength and conditioning for soccer players. *Strength and Conditioning Journal*, *36*(4), 1–13. https://doi.org/10.1519/SSC.0000000000000054

Unnithan, V., White, J., Georgiou, A., Iga, J., & Drust, B. (2012). Talent identification in youth soccer. *Journal of Sports Sciences*, *30*(15), 1719–1726. https://doi.org/10.1080/02640414.2012.731515

Verrelst, R., Willems, T. M., De Clercq, D., Roosen, P., Goossens, L., & Witvrouw, E. (2014). The role of hip abductor and external rotator muscle strength in the development of exertional medial tibial pain: a prospective study. *British Journal of Sports Medicine*, *48*(21), 1564–1569. https://doi.org/10.1136/BJSPORTS-2012-091710

Washif, J. A., & Kok, L. Y. (2022). Relationships Between Vertical Jump Metrics and Sprint Performance, and Qualities that Distinguish Between Faster and Slower Sprinters. *Journal of Science in Sport and Exercise*, *4*(2), 135–144. https://doi.org/10.1007/S42978-021-00122-4/TABLES/4

Wilson, R. S., Niehaus, A. C., David, G., Hunter, A., & Smith, M. (2014). Does individual quality mask the detection of performance trade-offs? A test using analyses of human physical performance. *Journal of Experimental Biology*, *217*(4), 545–551. https://doi.org/10.1242/JEB.092056

Wing, C. E., Turner, A. N., & Bishop, C. J. (2020). Importance of Strength and Power on Key Performance Indicators in Elite Youth Soccer. *Journal of Strength and Conditioning Research*, *34*(7), 2006–2014. https://doi.org/10.1519/JSC.0000000000002446

Wisløff, U., Helgerud, J., & Hoff, J. (1998). Strength and endurance of elite soccer players. *Medicine and Science in Sports and Exercise*, *30*(3), 462–467. https://doi.org/10.1097/00005768-199803000-00019

Young, W. B., & Rath, D. A. (2011). Enhancing foot velocity in football kicking: the role of strength training. *Journal of Strength and Conditioning Research*, *25*(2), 561–566. https://doi.org/10.1519/JSC.0B013E3181BF42EB

Zago, M., Piovan, A. G., Annoni, I., Ciprandi, D., Iaia, F. M., & Sforza, C. (2016). Dribbling determinants in sub-elite youth soccer players. *Journal of Sports Sciences*, *34*(5), 411–419. https://doi.org/10.1080/02640414.2015.1057210

Zambak, Ö. (2019). Evaluation of Maximum Aerobıc Power, Shoot Speed and 20-m Sprint Power of Football Players at Pre-Season and Mid-Season. *Int J Disabil Sports Health Sci*, *2*(2), 72–77. https://doi.org/10.33438/ijdshs.624026