Examining the Relationship of Some Performance Tests Applied to Young Soccer Players

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Abstract

Soccer is a team sport that requires complex and high levels of tactical, technical and physical ability to be successful. In a soccer match, various combinations of technical and tactical parameters, as well as power and explosiveness are displayed intermittently for 90 minutes. From this point of view, the aim of this study was to examine the relationship between different performance tests applied in young soccer players.

21 male soccer players (16.33± 0.66 years, height; 172± 6.05 cm, body weight; 57.00± 8.81 kg) from an amateur soccer team in Konya voluntarily participated in the study. In the study, anthropometric measurements, two legged vertical jumping, yo-yo intermittent recovery 1 and 2 test, 30m sprint test and agility t test parameters were measured. The data were analyzed using the SPSS 24 package program, and the Pearson Correlation test was used in the analysis of the obtained data.

As a result of analysis of data; a negative correlation was found between two legged vertical jumping data and 30m speed and agility t test. A significant positive correlation was found between 30m sprint test and agility t test. Again, a negative correlation was found between agility t test and yo-yo 1 and 2 tests. In addition, there was also a positive correlation between the yo-yo 2 test and the yo-yo 1 test.
As a result, it has been observed that different performance tests applied to young soccer players in determining their basic motoric characteristics have both negative and positive correlations with each other.

Keywords: Agility, soccer, speed, yo-yo.

Genç Futbolculara Uygulanan Bazı Performans Testlerinin İlişkisinin İncelenmesi

Futbol, başarılı olabilmek için karmaşık ve yüksek seviyelerde taktik, teknik ve fiziksel yeteneği içinde barındıran bir takım sporudur. Bir futbol müsabakasında teknik ve taktik parametrelerin yanı sıra güç ve patlayıcılık gerektiren çeşitli kombinasyonlar aralıklı olarak 90 dakika boyunca sergilenmektedir. Bu noktadan hareketle, yapılan çalışmada genç futbolcularda uygulanan farklı performans testlerinin birbiri ile olan ilişkisine bakılması amaçlanmıştır.

Yapılan çalışmaya Konya ilinde yer alan bir amatör futbol takımından 21 erkek futbolcu (16.33± 0.66 yıl, boy uzunluğu; 172± 6.05 cm, vücut ağırlığı; 57.00± 8.81 kg) gönüllü olarak katılmıştır. Çalışmada antropometrik ölçümler, dikey sıçrama testi, yo-yo aralıklı toparlanma 1 ve 2 testi, 30m sürat testi ve çeviklik t testi parametreleri

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ölçülmüştür. Veriler SPSS 24 paket programı kullanılarak analiz edilmiş olup, elde edilen verilerin analizinde Pearson Korelasyon testi kullanılmıştır.

Verilerin analizi neticesinde; dikey sıçrama verileri ile 30m sürat ve çeviklik t testi arasında negatif yönlü bir ilişki tespit edilmiştir. 30m sürat testi ve çeviklik t testi ile pozitif yönde anlamlı bir ilişki bulunmuştur. Yine, çeviklik t testi ile yo-yo 1 ve 2 testleri arasında negatif yönlü anlamlı bir ilişki tespit edilmiştir. Ayrıca, yo-yo 2 testi ile yo-yo 1 testi arasında da pozitif yönde anlamlı bir ilişki görülmüştür.

Sonuç olarak, temel motorik özelliklerinin belirlenmesinde genç futbolcularda uygulanan farklı performans testlerinin birbiri ile hem negatif yönde hem de pozitif yönde bir ilişki içerisinde olduğu gözlemlenmiştir.

Anahtar Kelimeler: Çeviklik, futbol, sürat, yo-yo.

INTRODUCTION

Soccer is one of the most popular sports in the world with its spectators, media, sponsors, technical staff and all other components (3). An official soccer competition consists of two halves of 45 minutes each, with a 15-minute break between halves. In general terms, soccer is a team sport that requires complex and high levels of tactical, technical and physical ability to be successful. Moreover, various combinations of technical and tactical parameters, as well as power and explosiveness, are intermittently displayed for 90 minutes (3, 10, 27).

In professional soccer, intense training is necessary to reach peak performance and improve performance (6, 19). The intensity and duration of training is the main point in determining the training load. The optimal training load varies among players due to individual differences such as training history, school exams and injuries (6, 13). For this reason, performance tests are important for designing training plans and determining the current status of players (7). In the light of the data obtained from these tests, players' performance outputs are obtained, players are monitored and training planning is designed according to the results of these performance tests (7, 13).

In order to build a successful professional sports career, the young players must achieve adequate development in various aspects (11). Many soccer clubs and soccer federations invest most of their investments in the development, identification and classification of talented young soccer players in order to ensure their training conditions and high quality training (1, 5, 12, 20).

In the light of the above-mentioned information, it is known that soccer demands a multifaceted development and in this direction, information on the performance data of young soccer players is a key factor in the development of players. At this point, performance tests are important for planning the training of young soccer players and choosing the right training method. With this study, it was aimed to determine the different performance tests applied in young soccer players and to examine the relationship between these tests and each other.

MATERIAL and METHOD

Participants

The study was conducted with 21 male soccer players who were actively training in an amateur soccer team in Konya province and had played soccer for at least 2 years. The criterion was that the participants did not have any health problems and sportive injuries.

Table 1. Descriptive statistics for participants

Parameters	Mean± SD
Age (years)	16.33± 0.66
Height (m)	1.72± 6.05
Weight (kg)	57.00± 8.81

The height, weight and age of the participants were first determined. The participants performed the test(s) after a standard warm-up (15 minutes) on each test day. The participants performed agility t-test on the first day, vertical jump test and 30m sprint test on the second day, yo-yo intermittent recovery 1 test on the

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third day, the fourth day was determined as a rest day with no test, and yo-yo intermittent recovery 2 test was performed on the fifth day.

Written informed consent forms were obtained from the participants and the study was approved by the non-interventional ethics committee of Selcuk University Faculty of Sport Sciences (E-40990478-0.50.99-75471).

**Anthropomeric measurements**

Height and Body Weight Measurements

The height of the volunteer athletes was measured with a wall-mounted Stadiometer (Holtain Ltd, UK) with an accuracy of ±0.1 mm. Scales were used to determine the body weight and body fat percentage of the volunteers. Measurements were made by ensuring that both feet were equal on the scale while the volunteers were standing upright and motionless (17).

Vertical jump (Two-legged vertical jump)

The aim of the test is to determine the distance of double leg standing jump. The subjects were asked to reach the highest distance they could reach on the wall by standing straight with their faces and the tips of their feet facing the wall and the soles of their feet fully on the ground, and the top point was marked and recorded in cm. Then, the subjects made 3 attempts by jumping to the highest distance they could reach with both feet. The highest value obtained was determined and the difference between the values obtained by standing and jumping was recorded with a precision of 0.5 cm unit (25).

Yo-Yo intermittent recovery 1 and 2 test

The run was done by going from point B to point C in a 20-meter area and then coming back to point B at the beginning. When reaching B, the participants jogged between points B and A and waited at the starting point B until the signal sounded again. The running speed increased according to the test protocol and the participants were given a warning about their pace with the audio recording of the protocol. If the athlete did not catch the signal for the first time when he/she arrived at B, he/she received an error and the test was terminated if he/she was not at B when the signal sounded for the second time in a row. Each time the athlete reached point B, the test distance was marked on the test paper and recorded. Yo-yo IR1 and IR2 test have the same course but level 2 (Yo-yo IR2) has done at higher speed at the begining. The test started at a running speed of 10 km/h in Yo-yo IR1. At the end of every 40 meters, running speed increased by 0.5 km/h or 1 km/h depending on the test protocol (2, 8). Starting at 13 km.h-1, the Yo-yo 2 test increases by 2 km.h-1 after the first stage and increases by 1 km.h-1 after each second stage. In the following process, the speed increase of 0.5 km.h-1 after each stage continues until the person's exhaustion point (15).


From **A to B**:5 meters   From **B to C**: 20 meters
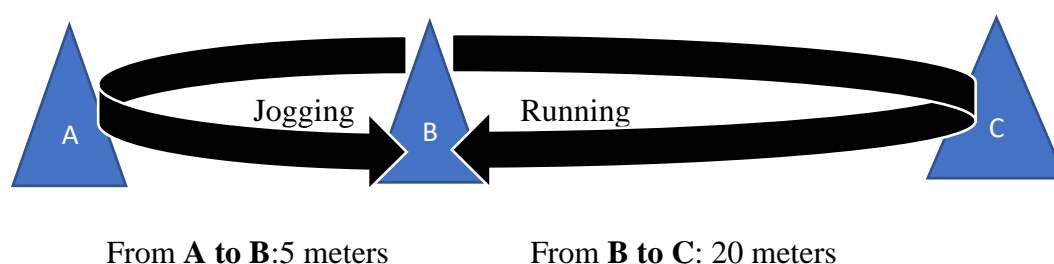
Form 1. Yo-yo IR1 and IR2 test course

30 m sprint test

A 30-meter sprint test was applied to determine the sprint performance of the soccer players. The photocells in the Newtest 300 (Finland) test battery were placed at distances of 0 and 30 meters, and the soccer players were ensured to be within 1 meter before the test start line. After the first measurement, the subjects were given enough rest time to recover, they repeated the test twice and their best times were recorded.

Agility t-test

The 3 funnels were placed in alignment with a distance of 4.57 meters between them. Funnel A was also placed at a distance of 9.14 meters from funnel B in the middle. The participants were first asked to touch the funnel at point B with their right hand starting from point A. Then, they were asked to move from funnel B to funnel C with sliding steps and touch it with their left hand. Afterwards, the test was completed by going from funnel C to funnel D with sideways sliding steps, touching it with the right hand, and then running backwards to point A after touching funnel B with the left hand. The participants' time to finish the test was measured with a stopwatch. Each subject repeated the test twice and the best time was recorded in seconds as the person's rank.
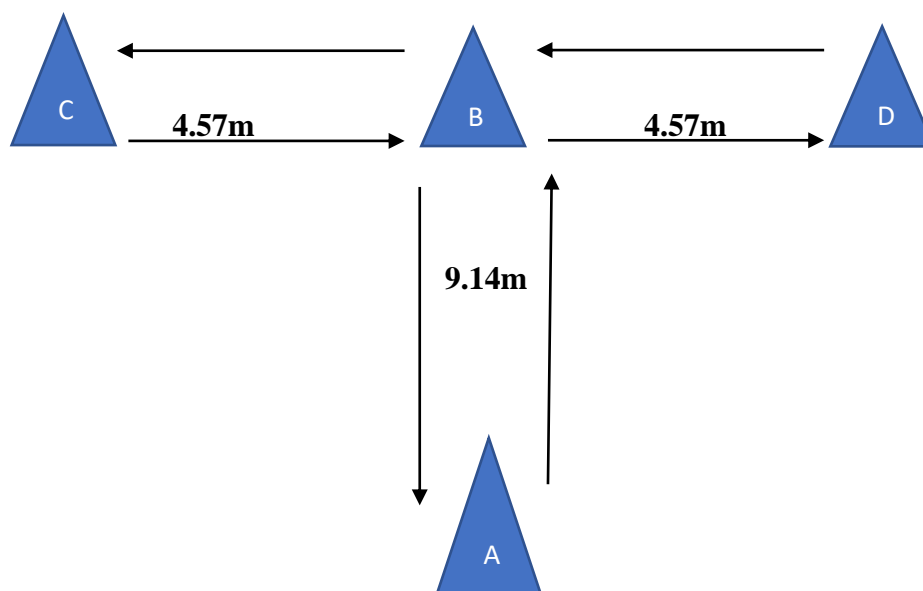
Form 2. Agility T test course

RESULTS

The grades of the tests applied to the soccer players participating in the study are presented in detail in Table 2.

Table 2. Descriptive statistics for variables

Parameters	Mean± SD
Two legged vertical jumped(cm)	45.86± 5.51
30 m sprint test (sec)	4.43± 0.23
Agility t test (sec)	9.84± 0.43
Yo-yo IR-1 (mL/kg/dk)	46.64± 4.68
Yo-yo IR-2 (mL/kg/dk)	56.71± 3.76

When the findings of the participants were examined, the vertical jump data were found to be 45.86± 5.51cm on average. Thirty-meter sprint data was 4.43± 0.23 seconds, while T test data was 9.84± 0.43 seconds. Yo-yo IR-1 test data applied to determine the VO2max values of the athletes were found to be 46.64± 4.68 mL/kg/min, while Yo-yo IR-1 test data were found to be 56.71± 3.76 mL/kg/min.

Table 3. The relationship between various tests applied to soccer players

Pearson Correlation (n:21)	(1)	(2)	(3)	(4)	(5)
Two legged vertical jumped (1)	-				
30m sprint (2)	-,621* 0,003	-			
Agility T test (3)	-,560* 0,008	0,629* 0,002	-		
Yo-yo IR-1 (4)	0,159 0,492	-,275 0,227	-,489* 0,024	-	

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Yo-yo IR-2 (5)	0,343	**-,471***	**-,710***	**,615***	-
	0,128	**0,031**	**0,00**	**0,003**	

As a result of the analysis of the data; a significant negative correlation was observed between vertical jump data and 30m sprint (r= -0,62, p<0.05), and a similar situation was found between vertical jump data and agility t-test (r= -0,56, p<0.05).

In addition, a significant positive correlation was found between the 30m sprint test and agility t-test (r= 0.62, p<0.05). Again, a significant negative correlation was found between agility t-test and yo-yo IR-1 test (r=-0.49, p<0.05), and a similar situation was observed between agility t-test and yo-yo IR-1 test (r=-0.71, p<0.05). Finally, a significant positive correlation was observed between the yo-yo IR-2 test and the yo-yo IR-1 test (r= 0.62, p<0.05).

DISCUSSION AND CONCLUSION

With this study, it was aimed to examine the relationship between different performance tests applied in young soccer players. In a similar study, Taşkın et al. (26) examined the relationship between some motoric characteristics in young soccer players and stated that this relationship is important.

Vertical jump, which is a physical characteristic that should be taken into consideration for high-level performance, varies in importance depending on the positions in soccer. Explosive strength, which is associated with high level performance, is important in sports such as soccer (24). In this context, in the findings of our study, the average vertical jump test data was found to be 45.86± 5.51 cm. In a similar study in the literature, the vertical jump data of 40 soccer players with an average age of 14,40± 1,74 years were determined as 38,62± 7,48 cm (26). In another study conducted in 2044 male students between the ages of 7-14 years, the vertical jump data of the students were determined as 41,7± 9,3 cm (29). In another study, the average vertical jump values measured in 36 soccer players in the same age group (16 years) were reported as 39±0.13 cm (14). It is thought that the difference between the vertical jump data of our study and these two studies may be due to the age difference of young soccer players in the developmental period.

Agility, which is based on the ability to quickly change the body's position, is the result of a combination of strength, speed, balance and coordination (18). When we look at the relationship between these combinations, a negative relationship was found between vertical jump data and 30m sprint and agility t-test data in our study. In other words, the speed and agility performances of young soccer players who improve their vertical jumping ability also improve. It is known that plyometric training combined with maximal strength and heavy resistance exercises significantly improves sprint performance (22). In another study, it was determined that 6-week plyometric exercises applied to basketball players improved their vertical jump and 30m sprint performance (4). The studies show that in parallel with the development of strength parameters, speed and sprint performances also improve. These results show that this study gives results compatible with some studies in the literature. When the relationship between reactive strength and agility is examined in other studies, there are studies that show that there are significant relationships between reactive strength and agility (28) and studies that show that there are insignificant relationships between reactive strength and agility (23).

Acceleration, speed and agility parameters have been found to have a highly statistically significant relationship with each other, and it is known that every discipline related to speed contributes to success (16). In this study, a significant positive correlation was found between 30m sprint test and agility t-test. In other words, improvement in agility performance was also observed with the improvement in sprint performance. And also, while the 30m sprint performance obtained by Köklü et al. (14) in their study in the same age category was found to be 4.2±0.1 second on average, an average value of 4.43±0.23 second was obtained in our study. Although a positive relationship was found between speed and agility in our study, the need for specific studies on these two variables was emphasized in a study in the literature; in the study, it was concluded that each of the agility and speed training methods is specific and therefore limited transfer of one to the other is provided (28)

In studies conducted on soccer players, it was found that soccer players Yo-yo IR1 (1810m) who trained with low frequency (8, 15, 21). In a study conducted on soccer players, Yo-yo IR-2 (840 m) was found in

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amateur soccer players (2). In another study, Ceylan (9) reported that the average distances measured at the end of the season in 16 age category soccer players are 2090 m for yo-yo IR-1. And also, the VO2max values of soccer players were reported as 51.65 mL/min/kg at the pre-season and 53.51 mL/min/kg at the end of the season (9). The VO2max values obtained in the study (yoyo IR-1 and 2 mean 51.67mL/min/kg) are similar to this study conducted in the same age group. In our study, these distances were 1280m on average for yo-yo IR-1, while this average was 840m for yo-yo IR-2. There was also a significant positive correlation between the yo-yo IR -2 test and the yo-yo IR-1 test.

In conclusion, when we examined the relationships between the tests, which are vital for determining the appropriate training load and updating the training programs for soccer players in the developmental period, based on the findings of the study, it can be said that speed and agility parameters also develop with strength development. In addition, it can be said that speed and agility values show a parallel development, but optimal development can be achieved by training the two characteristics separately.

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