Effect of 8 weeks of core training on speed, agility and balance in 14–16 year old male footballers

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Abstract

The aim of this study is to examine the effect of 8-week core training on speed, agility and balance in male football players aged 14-16. Twenty-four players who were actively playing football at clubs at the age of 14-16 participated to the study voluntarily. The experimental group of the research consisted of 12 male footballers who practiced core training 3 days a week for 8 weeks in addition to football training. The control group of the research consisted of 12 male footballers who practiced regular football only. Before the training and after the 8-week training period, a set of strength, speed, agility and balance tests were applied to the football players in both groups and the effect of core training was examined independent sample t-test and dependent sample t-test were used to analyze the data. In the experimental group, while a statistically significant difference was found between the pretest and posttest values of sit-ups, push-ups, standing long jump, illinois agility, T-dril and Y balance tests in favor of the posttest, there was no significant difference between the pretest and posttest values of 30 m speed and 505 agility tests. In the control group, while there was a significant difference between the pretest and posttest values in the sit-up, push-up, standing long jump and illinois agility tests in favor of the posttests (p<0.05), there was no significant difference between pretest and posttest values of 30 m speed, 505 agility, t drill and y balance tests.

Keywords: Agility, balance, core training, football, speed

14-16 yaş grubu erkek futbolcularda 8 haftalık core antrenmanlarının sürat, çeviklik ve denge üzerine etkisi

Öz

Bu çalışmanın amacı, 14-16 yaş grubu erkek futbolcularda 8 haftalık core antrenmanların sürat, çeviklik ve denge üzerine etkisini incelemektir. Çalışmaya 14-16 yaşlarında kulüplerde aktif olarak futbol oynayan 24 futbolcu gönüllü olarak katıldı. Araştırmanın deney grubunu, futbol antrenmanlarına ek olarak 8 hafta boyunca haftada 3 gün core antrenmanları uygulanan 12 erkek futbolcu oluşturdu. Araştırmanın kontrol grubunu ise yalnızca düzenli futbol antrenmanı uygulanan 12 erkek futbolcu oluşturdu. Antrenmanlardan önce ve 8 haftalık antrenman sürecinden sonra her iki gruptaki futbolculara bir takım kuvvet, sürat, çeviklik ve denge testleri uygulanarak core antrenmanların etkisi incelendi. Verilerin çözümlenmesinde bağımsız örneklem t-testi ile bağımlı örneklem t-testi kullanıldı. Deney grubunda mekik, şınav, durarak uzun atlama, illinois çeviklik, T- dril ve Y denge testleri ön test ve son test değerleri arasında son testler lehine istatistiksel olarak anlamlı bir farklılık tespit edilirken,30 m sürat ve 505 çeviklik testi ön test ve son test değerleri arasında anlamlı bir farklılık bulunmadı Kontrol grubunda ise mekik, şınav, durarak uzun atlama ve illinois çeviklik testlerinde ön test ve son test değerleri arasında son testler lehine anlamlı bir farklılık tespit edilirken ;30 m sürat, 505 çeviklik, t dril ve y denge testleri ön test ve son test değerleri arasında anlamlı bir farklılık bulunmadı. (p>0,05).

Anahtar Kelimeler: Çeviklik, denge, core antrenman, futbol, sürat

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This study is based on a master's thesis.

INTRODUCTION

This interest is increasing day by day in our country as well as in the world. The need for groundwork has become even more important in order to meet the demand for football and to train quality football players (Boyacı, 2016). Especially in the last century, football has shown very rapid momentum in terms of development in our country as well as in the world. This momentum in football has gained a lot of importance in the sociocultural and economic sphere of life.

The purpose of the football trainings to be applied should be programmable and versatile. However, it should be aimed to improve the child's ability in sports by building a solid groundwork in young people as well as children in training. Football trainings applied in childhood and youth should be success oriented. Therefore, studies to be carried out at this age should not be short-processed only for winning competitions, as in older age groups (Günay & Yüce, 2008). Recently, core training activities have become the most applied working whole in fitness sports (Sarıkaya et al., 2023). Books, articles and thesis covering this study have been written. While core exercises are applied to increase the functional capacity of athletes, to increase their sporting skills, they are also recommended for individuals who do not actively exercise. Traditional endurance workouts have been redesigned to highlight core exercise. These reorganization processes involve on unbalanced surfaces instead of balanced surfaces, unseating instead of seating, one way-work instead of two-way work (Willardson, 2007).

While a strong core area will allow the athlete to load more, at the same time, give the athlete an advantage to use his/her technique more efficiently. Core region muscles constitute the strength motion of the body (Sarıkaya et al., 2023). The muscles in this area may not provide as much strength as some muscles in the other part of the body, but they have an important role in the correct transfer of the strength. Thus, core muscles take on the task of protecting other muscles in the body.

It is easier for an athlete with strong core muscles to adapt to heavy loads. Because when the core muscles are durable, it prevents damage to the other muscles. (Mcgill, 2010).

METHOD

Model of the research

Quantitative research method was used in the research. Pretest posttest control group pattern is preferred to obtain data. There are two groups as the experimental group and control group used in the research.

Universe and sample of the research

While the universe of the research consisted of male footballers aged 14-16 who played in TFF Local leagues, the sample of the research was of male footballers aged 14-16 in the Sahil Spor local league in Tatvan district of Bitlis province. Football players continue training for 3 years. Football players continue to train for 3 years and regularly train 3 days a week.

Design of the research

This research was applied to male footballers who do not have any health problems in the 14-16 age group who participate in training in the groundwork of Tatvan Sahil Sports Club. In addition, due to the Covid-19 pandemic, the disinfection of the training ground and changing rooms was carried out with the use of masks in accordance with the social distancing rules. In our research, 24 male athletes were randomly divided into two groups: control group and experimental group. The control group was given basic skills of football (conditioning, technique, tactics, passing trainings, shooting trainings) 3 days a week for 8 weeks, and the experimental group was given 20 minutes of core training in addition to basic football training 8 weeks and 3 days a week. In order to improve speed and agility, the footballers applied mutual scurre exercises, funnel exercises and jumping frame exercises in addition to conditioning exercises. Football players included mutual shooting and passing practices in basic football training.

Anthropometric and motoric test measurements of the athletes were performed and the following tests were applied. For speed; 30 meter speed test, for agility; T agility test, illinois test, 505 agility test for balance; Y balance test was applied and standing long jump, push-up and sit-up measurements were done. Y balance measurements were taken from the right and left legs.

Age: The ages of the male football players participating in the research are days, months and years.was written on the basis of the data form.

Height Measurement: The height of the athletes participating in the research; anatomical stance, bare feet, heels together, holding breath Measurement in 'cm' by measuring with a 0.01 cm precision tape measure after it is taken was measured.

Body weight measurement: The body weights of the athletes participating in the research; suitable sportswear, jewelry, etc. barefoot and anatomical It was measured in 'kg' by weighing with a scale with 0.1kg precision while standing.

30 m speed test: 30 meters speed test of the athletes participating in the research evaluated by running test. After the subjects made warm-up exercises for this test, taken later. 1 m from the starting line of the subjects at a distance of 30 m. to exit the distance standing up and finish the distance at the highest speed has been requested. Degrees were taken in seconds with an electronic photocell device. Each The athlete repeated the test twice, and the best result was evaluated (Sever, 2013).

Push-up-Shuttle measurement: The measurement of the test is done with straight sit-up motion and the athlete lies on his back, hands on the neck, his body is tense, his feet are together. held and told to straighten his trunk forward without support, and the number of times per second was recorded as the number of times it did. For the measurement of the push-up test in the push-up position of the athlete, the arms are bent at the elbows and the torso towards the floor bent and straightened and the number of times it was done in 30 seconds was recorded as a number. (Biçer et al., 2004).

Standing long jump: Place a stop in the area to be tested for the standing long jump by drawing a line forward from this line, a meter with a degree of precision of 0.01 has been placed. Athlete in a standing position, toes pointing to the line.it touches and jumps forward. Athlete's feet first stop where it touches and measure the distance from the line to the heels.cm. recorded in hhe standing long jump test was taken 2 times and the best grade was evaluated (Sevim, 1997).

505 agility test: One of the subjects participating in the study was a 10-meter after running in the area, going to a 5 meter area and returning again required. After the agility test is completed, the 5-meter line A photocell device is installed on both the beginning and the end sections to subjects

Small scale trial testing was allowed. The subjects are also After warming up, two rights were given and their best scores were recorded. (Hazir et al., 2010).

Illinois agility test: For the measurement of this agility test, the width is 5 meters, four rectangular cones at the corners of an area 10 meters long is left. The area is divided lengthwise in two (2.5 meters). 4 cones in the middle field is placed. The length between these 4 cones is 3.3 meters. with the start command the athlete starts at the test. Space between start and finish at maximum speedtries to complete. Each athlete is also given time to warm up. They were given one trial right to get to know the track. A right for all athletes and their degrees were recorded (Kızılet et al., 2010).

T-Dril Agility Test: 1. 2. 3. 4. funnels as shown in the figure is placed. Athletes start the test with the sound of the whistle. Athlete first from point 1 running at the highest level touches the 2nd point then slipping moves to the 3rd point and touches the 3rd point with his left hand. After the athlete he touches the 4th point with his right hand by sliding sideways. Later touches the 2nd point with the left hand and reaches the 1st point backwards T Drill test ends. 1. Funnel The distance between the 2nd funnel and the 2nd funnel is 9.14 meters. Between funnel 2 and funnel 3 and 4 The distance is 4.57 meters. Athletes are given two rights. The best score made is recorded (Karacabey, 2013).

Y Balance Test: Y balance test, the athlete's balance on one leg. while making it stand, it is possible to turn right, left and forward with the other foot. stretch as far. (Anterior, posterolateral and posteromedial). Therefore, this the test measured the athlete's strength, stability and balance in various directions. Y balance test composite score, sum of 3 directions of reach, and subscale of results asymmetry, right and left when calculated by normalizing to limb length extension access. Warm-up exercises before starting the test and each athlete was given a single right and their degrees were recorded (Ateş et al., 2017).

Analysis of data

The analysis of the data obtained within the scope of the research was carried out using the SPSS program. According to the results of the Shapiro-Wilk test, the data was determined to have a normal distribution. Sample t-test and dependent sample t-test, independent of parametric tests, were used to analyze the data. Statistical significance level was accepted as 0.05.

Ethics committee permission

The Ethics Committee Permission of The Research Was Taken by The Decision No. 2021/01-17 of The Social and Humanities Ethics Committee of Van Yüzüncü Yıl University.

FINDINGS

In the research, the effect of eight-week core training on strength, speed, agility and Y balance performance was tabulated using statistical methods. The findings of the test results are given in the tables below.

Table 1. Independent sample t-test results for identifying properties of groups

General Properties	Group	N	Avg.	S.S.	t	p
Age (Year)	Experimental Group	12	15.17	0.71	0.883	0.387
	Control Group	12	14.92	0.66		
Height (cm)	Experimental Group	12	171.67	3.60	1.094	0.286
	Control Group	12	170.17	3.10		
Body Weight (kg)	Experimental Group	12	60.68	5.02	0.561	0.581
	Control Group	12	59.73	3.04		
BMI (kg/m2)	Experimental Group	12	20.57	1.32	-0.108	0.915
	Control Group	12	20.61	0.49		

Avg. (Average)

When table 1 is examined, no significant difference was found between the experimental and control groups in the age, height, body weight and BMI values of the football players (p>0.05). The findings showed that the groups were similar in terms of descriptive properties.

Table 2. Independent sample t-test results for identifying properties of groups

Tests	Group	N	Avg.	S.S.	t	p
Sit-up (number)	Experimental Group	12	23.83	4.00	0.340	0.737
	Control Group	12	23.42	1.44		
Push-up (number)	Experimental Group	12	22.33	4.03	0.068	0.946
	Control Group	12	22.42	1.24		
30 M Speed Test (sec)	Experimental Group	12	4.77	0.22	0.150	0.882
	Control Group	12	4.78	0.08		
Standing Long Jump Test (cm)	Experimental Group	12	175.67	5.21	0.145	0.886
	Control Group	12	175.33	6.05		
Illinois Agility Test (sec)	Experimental Group	12	17.62	0.56	0.078	0.939
	Control Group	12	17.63	0.29		
T-Drill- Agility Test (sec)	Experimental Group	12	11.65	0.49	0.062	0.951
	Control Group	12	11.64	0.12		
505 Agility Test (sec)	Experimental Group	12	3.54	0.22	0.029	0.977
	Control Group	12	3.54	0.20		
Y Balance Test Right Leg A (cm)	Experimental Group	12	77.08	2.87	0.276	0.785
	Control Group	12	76.83	1.27		
Y Balance Test Right Leg PM (cm)	Experimental Group	12	88.75	2.49	0.494	0.626
	Control Group	12	88.17	3.24		
Y Balance Test Right Leg PL (cm)	Experimental Group	12	86.92	2.50	0.232	0.819
	Control Group	12	86.67	2.77		
Y Balance Test Left Leg A (cm)	Experimental Group	12	75.92	2.54	0.080	0.937
	Control Group	12	76.00	2.59		
Y Balance Test Left Leg PM (cm)	Experimental Group	12	87.75	1.36	0.547	0.590
	Control Group	12	87.17	3.43		
Y Balance Test Left Leg PL (cm)	Experimental Group	12	87.50	2.20	0.555	0.584
	Control Group	12	87.00	2.22		

A: (Anterior), P:(Posteromedial), PL:(Posterolateral), Avg:(Average)

The values were compared to determine the similarity of the pretest data of the football players in the experimental and control groups participating in the research. When table 2 was examined, no significant difference was detected between the groups in the pretest test data of the players (p>0.05).

Results, sit-ups, push-ups, 30 m speed test, standing long jump test, illinois agility test, t-dril agility test, 505 agility test, Y balance test right leg A, Y balance test, right leg PM, Y balance test right leg PL, Y balance test left leg A, Y balance test left leg PM and Y balance test left leg PL pre-test data showed that the experimental and control groups were similar to each other.

Table 3. Dependent sample t-test results for experimental group strength and speed tests

Parameters	Tests	N	Avg.	S.S.	t	P
Sit-up (number)	Pretest	12	23.83	4.00	-8.613	**0.001***
	Posttest	12	26.92	4.40		
Push-up (number)	Pretest	12	22.33	4.03	-8.775	**0.001***
	Posttest	12	25.83	4.34		
30 M Speed Test (sec)	Pretest	12	4.77	0.22	1.551	0.149
	Posttest	12	4.75	0.18		
Standing Long Jump Test (cm)	Pretest	12	175.67	5.21	-7.590	**0.001***
	Posttest	12	179.50	4.98		

*p<0.05, Avg:(Average)

According to table 3, while there was a significant difference between the pretest and posttest values of the experimental group in the sit-up, push-up and standing long jump tests in favor of the posttests (p<0.05), there was no significant difference between the 30m speed test pretest and posttest values (p>0.05).

Table 4. Dependent sample t-test results for experimental group strength and speed tests

Parameters	Tests	N	Avg.	S.S.	t	p
Illinois Agility Test (sec)	Pretest	12	17.62	0.56	4.367	**0.001***
	Posttest	12	17.29	0.39		
T-Drill- Agility Test (sec)	Pretest	12	11.65	0.49	14.287	**0.001***
	Posttest	12	11.29	0.47		
505 Agility Test (sec)	Pretest	12	3.54	0.22	0.771	0.457
	Posttest	12	3.53	0.22		

*p<0.05, Avg:(Average)

Considering table 4, while a significant difference was found between the illinosis and t-dril agility test pretest and posttest values of the experimental group in favor of the posttests (p<0.05), there was no significant difference between the 505 agility test pretest and posttest values (p>0.05).

Table 5. Dependent sample t-test results for experimental group strength and speed tests

Parameters	Tests	N	Avg.	S.S.	t	p
Y Balance Test Right Leg A (cm)	Pretest	12	77.08	2.87	-5.989	**0.001***
	Posttest	12	82.08	2.71		
Y Balance Test Right Leg PM (cm)	Pretest	12	88.75	2.49	-7.956	**0.001***
	Posttest	12	93.92	2.02		
Y Balance Test Right Leg PL (cm)	Pretest	12	86.92	2.50	-11.800	**0.001***
	Posttest	12	91.83	2.29		
Y Balance Test Left Leg A (cm)	Pretest	12	75.92	2.54	-16.316	**0.001***
	Posttest	12	79.58	2.71		
Y Balance Test Left Leg PM (cm)	Pretest	12	87.75	1.36	-6.639	**0.001***
	Posttest	12	92.33	2.39		
Y Balance Test Left Leg PL (cm)	Pretest	12	87.50	2.20	-9.267	**0.001***
	Posttest	12	91.17	2.44		

*$p<0.05$, A:(Anterior), P:(Posteromedial), PL:(Posterolateral), Avg:(Average)

When table 5 was examined, a significant difference was found in favor of post-tests between the balance test of the experimental group right leg A, Y balance test right leg PM, Y balance test right leg PL, Y balance test left leg A, Y balance test left leg PM and Y balance test left leg PL test pretest and posttest values ($p<0.05$).

Table 6. Dependent sample t-test results for control group strength and speed tests

Parameters	Tests	N	Avg.	S.S.	t	P
Sit-up (number)	Pretest	12	23.42	1.44	-8.000	**0.001***
	Posttest	12	26.08	1.73		
Push-up (number)	Pretest	12	22.42	1.24	-7.021	**0.001***
	Posttest	12	25.17	1.64		
30 M Speed Test (sec)	Pretest	12	4.78	0.08	1.393	0.191
	Posttest	12	4.77	0.08		
Standing Long Jump Test (cm)	Pretest	12	175.33	6.05	-4.959	**0.001***
	Posttest	12	178.92	6.64		

*$p<0.05$According to the results of table 6, while there was a significant difference between the pretest and posttest values of the control group in the sit-up, push-up and standing long jump tests in favor of the posttests ($p<0.05$), there was no significant difference between the 30m spedd test pretest and posttest values ($p>0.05$).

Table 7. Dependent sample t-test results for control group agility tests

Parameters	Tests	N	Avg.	S.S.	t	p
Illinois Agility Test (sec)	Pretest	12	17.63	0.29	6.894	**0.001***
	Posttest	12	17.38	0.25		
T-Drill- Agility Test (sec)	Pretest	12	11.64	0.12	1.517	0.158
	Posttest	12	11.61	0.14		
505 Agility Test (sec)	Pretest	12	3.54	0.20	0.239	0.815
	Posttest	12	3.54	0.20		

*p<0.05

When table 7 was examined, while a significant difference was found between the illinosis agility test pretest and posttest values of the control group in favor of the posttests (p<0.05), no significant difference was found between the t-dril and 505 agility test pretest and posttest values (p<0.05).

Table 8. Dependent sample t-test results of control group y balance test

Parameters	Tests	N	Avg.	S.S.	t	P
Y Balance Test Right Leg A (cm)	Pretest	12	76.83	1.27	-0.153	0.881
	Posttest	12	76.92	1.68		
Y Balance Test Right Leg PM (cm)	Pretest	12	88.17	3.24	-1.000	0.339
	Posttest	12	88.58	3.06		
Y Balance Test Right Leg PL (cm)	Pretest	12	86.67	2.77	-1.393	0.191
	Posttest	12	87.17	3.10		
Y Balance Test Left Leg A (cm)	Pretest	12	76.00	2.59	-1.239	0.241
	Posttest	12	76.42	2.71		
Y Balance Test Left Leg PM (cm)	Pretest	12	87.17	3.43	-1.542	0.151
	Posttest	12	87.83	3.83		
Y Balance Test Left Leg PL (cm)	Pretest	12	87.00	2.22	-1.170	0.267
	Posttest	12	87.75	2.86		

*p<0.05

Looking at table 8, no significant difference was found between pretest and posttest values of the control group's Y balance test right leg A, balance test right leg PM, Y balance test right leg PL, Y balance test left leg A, Y balance test left leg PM and Y balance test left leg PL test (p>0.05).

Table 9. Independent sample t-test results of the posttest values of the groups

Tests	Group	N	Avg.	S.S.	t	p
Sit-up (number)	Experimental Group	12	26.92	4.40	0.611	0.548
	Control Group	12	26.08	1.73		
Push-up (number)	Experimental Group	12	25.83	4.34	0.497	0.624
	Control Group	12	25.17	1.64		
30 M Speed Test (sec)	Experimental Group	12	4.75	0.18	-0.468	0.645
	Control Group	12	4.77	0.08		
Standing Long Jump Test (cm)	Experimental Group	12	179.50	4.98	0.243	0.810
	Control Group	12	178.92	6.64		
Illinois Agility Test (sec)	Experimental Group	12	17.29	0.39	-0.659	0.517
	Control Group	12	17.38	0.25		
T-Drill- Agility Test (sec)	Experimental Group	12	11.29	0.47	-2.282	0.033*
	Control Group	12	11.61	0.14		
505 Agility Test (sec)	Experimental Group	12	3.53	0.22	-0.038	0.970
	Control Group	12	3.54	0.20		
Y Balance Test Right Leg A (cm)	Experimental Group	12	82.08	2.71	5.613	**0.001***
	Control Group	12	76.92	1.68		
Y Balance Test Right Leg PM (cm)	Experimental Group	12	93.92	2.02	5.040	**0.001***
	Control Group	12	88.58	3.06		
Y Balance Test Right Leg PL (cm)	Experimental Group	12	91.83	2.29	4.195	**0.001***
	Control Group	12	87.17	3.10		
Y Balance Test Left Leg A (cm)	Experimental Group	12	79.58	2.71	2.860	0.009*
	Control Group	12	76.42	2.71		
Y Balance Test Left Leg PM (cm)	Experimental Group	12	92.33	2.39	3.452	0.002*
	Control Group	12	87.83	3.83		
Y Balance Test Left Leg PL (cm)	Experimental Group	12	91.17	2.44	3.144	0.005*
	Control Group	12	87.75	2.86		

*$p<0.05$

In the findings in table 9, no significant difference was determined in the test data of T-drill agility test and Y balance test right leg A, right leg PM, right leg PL, Y left leg A, left leg PM and left leg PL tests of the football players in the experimental and control groups in the favor of the experimental ($p<0.05$).

DISCUSSION AND **CONCLUSION**

In this part of our research, the findings obtained by examining the effects of core training on a number of strength, speed, agility and balance parameters applied to 24 male football players aged 14-16 years at Sahil Sports Club of Bitlis/Tatvan district were discussed in this section. The findings showed that the groups were similar in terms of descriptive properties. The values were compared to determine the similarity of the pretest data of the football players in the experimental and control groups participating in the research. No significant difference was detected between the groups in the pretest test data of the players ($p>0.05$). Results showed that the experimental and control groups were similar to each other in terms of sit-ups, push-ups, 30 m speed test, standing long jump test, illinois agility test, t-dril agility test, 505 agility test, Y balance test right leg A, Y balance test, right leg PM, Y balance test right leg PL, Y

balance test left leg A, Y balance test left leg PM and Y balance test left leg PL pretest data. While a significant difference was detected in favor of the posttests between sit-up, push-up and standing long jump test pretest and posttest values of the experimental group ($p<0.05$), no significant difference was found between the 30m sprint test pretest and posttest values ($p>0.05$). While a significant difference was found between the illinosis and T-dril agility test pretest and posttest values of the experimental group in favor of the posttests ($p<0.05$), no significant difference was found between the 505 agility test pretest and posttest values ($p>0.05$). A significant difference was found in favor of posttests between Y balance test right leg A, Y balance test right leg PM, Y balance test right leg PL, Y balance test left leg A, Y balance test left leg PM and Y balance test left leg PL test between pretest and posttest values of the experimental group ($p<0.05$). While a significant difference was found between the pretest and posttest values of the control group in the sit-up, push-up and standing long jump test in favor of the posttests ($p<0.05$), no significant difference was found between the pretest and posttest values of the 30 m speed test ($p<0.05$). While a significant difference was detected in favor of the final tests between the illinosis agility test pretest and posttest values of the control group ($p<0.05$), no significant difference was found between the T-drill and 505 agility test pretest and posttest values ($p>0.05$).

No significant difference was found between pretest and posttest values of Y balance test right leg A, Y balance test right leg PM, Y balance test right leg PL, Y balance test left leg A, Y balance test left leg PM and Y balance test left leg PL test in the control group ($p>0.05$).A significant difference was determined between the experimental and control groups in favor of the experimental group in T-drill agility test and Y balance test right leg A, right leg PM, right leg PL, Y left leg A, left leg PM and left leg PL tests posttest data of football players in the experimental and control groups ($p<0.05$). However, no significant difference was found between the groups in the posttest values of sit-up, push-up, 30 m speed, standing long jump, illinois agility and 505 agility tests ($p>0.05$).As professional football has evolved into a large sector, the importance of sporting performances has become increasingly important. In order to maximize efficiency in football, it is necessary to first apply efficient training methods that are suitable for our age and based on the scientific framework. Thus, the pleasure of watching football increases and football remains popular in the world. In parallel, it was stated that core trainings have positive contributions to sporting performance.

When we examine the studies on the Y balance test in the literature; the effect of core training on the static and dynamic balance characteristics was investigated, and as a result of the 12-week core training program applied to the sportspersons, it was observed that there was a statistically significant difference between the pretest and posttest of the core training average of the experimental group (Gür & Ersöz, 2017). When examining the effect of 8-week core training on ground hitting speeds and some motoric properties in 12-14 age group tennis players, it was observed that there was a significant difference in the static balance performance of the experimental group compared to the control group at the end of 8 weeks (Eren, 2019). Body parts where core exercises are heavily loaded are abdominal, back and hip muscles, it has been said that increasing the endurance of these muscles will positively affect the balance and strength of the body and reduce the risk of disability (Faries & Greenwood, 2007). In the stork balance test, 38 athletes participated and it was observed that the balance, push-up and sit-up performances of the sportspersons contributed positively as a result of 8 weeks of core exercise (Kean et al., 2006). When we look at this study, it is seen that it parallels with our research. In our study of male footballers aged 14 -16, it is seen that the 8-week core training applied to the experimental group was statistically a significant increase in the y balance test in favor of the final test between the pretest and the final test.

When the studies on agility tests were examined in the literature, 30 athletes participated in the study, which examined the effect of eight weeks of core training on balance and functional performance in young footballers. At the end of eight weeks of core training, agility test completion times decreased significantly (Aslan, 2014). This study; parallels with our work. When we look at the pretest and posttest statistics of the experimental group to the football players that I applied 8-week core training, it is seen that there is a significant difference in the agility test (illinois agility test, 505 agility test and T Drill test).

When the effects of core exercise on quickness and agility in football players were examined, it was seen that the agility performance of the athletes improved after 8 weeks (Ediz, 2019). When we examined the contribution of the core training we applied to the 14-16 age group male football players to the agility parameter; It was observed that there was a significant increase in agility (illinois test and T drill test) between the pretest-posttest statistics of the 8-week core training applied to the experimental group, but there was no significant increase in the 505 agility test. Atıcı and Bilgin stated that modified core exercise trainings have a positive effect on flexibility parameters in Alzheimer's patients over 55 years of age (Atıcı & Bilgin,

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2016). In another study, 40 volunteer sportspersons with an average age of 18 participated, and as a result of the 8-week core training applied, there was a statistically significant increase in all sports parameters as a result of the medicine ball throwing, plank, push-up-sit-up, vertical jump and speed performance statistics of the experimental group (Afyon & Boyacı, 2016). In research similar to our research, the effect of 10-week core training applied to football players in the 11-13 age category on physical performance was examined, and as a result of the research, it was observed that there was a significant increase in the standing long jump tests of the experimental group (Boyacı & Bıyıklı, 2018). The effect of core exercise applied to volleyball players on balance and anaerobic performance was investigated, and no statistically significant increase was observed in the standing long jump test. In the research, explosive leg strength and double-leg standing long jump test of female volleyball players were evaluated. According to the statistics of the research, at the end of the 6-week core exercise program, an increase was observed in the standing long jump performance of the sportspersons between the pretest and the posttest, but this increase was not statistically significant (Tortum, 2017). When we examined the pretest-posttest statistics of core training applied to the experimental group of male football players aged 14-16 for 8 weeks, it was observed that there was a significant increase in the standing long jump test.

When the studies on the sit-up and push-up tests in the literature are examined; The effect of the core training program on football players and volleyball players on physical fitness and performance was examined, and it was observed that there was a significant improvement in the sit-up and push-up statistics of the football players after the pretest and posttest (Bilgin, 2017). In similar research, they examined the relationship between selected motoric features in children. In determining the performance-related motoric characteristics of the sportspersons; 30 meters speed, standing long jump, 30 seconds push-ups and sit-ups, flexibility statistics were taken. As a result of the research, it was seen that there was an opposite relationship between 30 meters speed, standing long jump, 30 seconds push-ups and sit-ups (Taşkın et al., 2015). The effect of 8-week core training of 16 female football players on different vertical jumps was examined and it was observed that it had a positive effect on springing jump and static jump values (Göktepe et al., 2019).

It is seen that there is a significant change in the performances of standing long jump, vertical jump, 20 m speed, back strength and leg strength with the selected core training (sit-

ups, push-ups, plank, etc.) applied to the experimental group for 10 weeks (Boyacı & Bıyıklı, 2013).

The effect of core training on some parameters of adolescence male students was investigated, and it was observed that there was a positive development between the groups in the standing long jump parameters of the experimental group and the control group (Dedecan, 2016). In the study that investigated the effect of 8-week core training on some physical and physiological parameters of football players, it was observed that statistics such as body composition, back strength, leg strength, vertical jump, 20 m speed, flexibility of the experimental group increased positively as a result of the eight-week core training program (Doğan et al., 2016). In our research, when the pretest and posttest of the core training sit-up and push-up test applied to the experimental group of male football players in the 14-16 age group are analyzed statistically, it is seen that there is a significant increase for the experimental group. When the studies on the 30 m speed test in the literature are examined; In the study conducted with 14-year-old football players, there was a significant difference in favor of the experimental group in the mean of 30 m speed test, but no significant difference was found in favor of the control group (Atacan, 2010).

In another research, they examined the relationship between age-related acceleration, maximum speed and agility in footballers. It has been determined that the agility, acceleration and maximum speed measurement times of the sportspersons decrease with age. It has also been observed that there is a strong relationship between agility and speed and acceleration (Sever & Arslanoglu, 2016).

As a result of the 12-week core training exercise applied to the players in the 12-14 age category, it was said that a positive increase in the development of the 20 m speed motor test was achieved (Boyacı, 2016). When we do a literature review, it is seen that core trainings do not contribute positively to the 30 m speed test. When we examined the posttest statistics of the experimental group of 8-week core training applied to male players aged 14-16 years, there was no significant increase in the 30 m speed test.

In summary, it can be said that the 8-week core training applied to male footballers aged 14-16 years is similar to other studies. When we examined the pretest posttest statistics of the experimental group, which was seen to contribute to the development of many parameters in football players, it supports the view that core training has a positive effect, with a significant difference between most parameters.

Since the improvement of the agility, strength and balance parameters of the core training will contribute to the development of other motor skills, it is thought that the core training that the coaches will apply by considering the development levels and readiness levels of the football players will play an important role in the development of the football players.

As a result, it can be said that 8 weeks of core training improves the parameters of strength, agility and balance.

GENİŞLETİLMİŞ ÖZET

GİRİŞ

Spor, çocukların fiziksel, kişilik ve ruh sağlığı gelişimini destekleyerek büyümelerinde çok önemli bir rol oynar. Futbol, dünya çapında artan bir ilgiyle en popüler spordur. Kaliteli futbolculara olan talebi karşılamak ve altyapıyı korumak için kaliteli tesislere yatırım yapmak şarttır (Boyacı, 2016).

Özellikle son yüzyılda dünyada olduğu gibi ülkemizde de futbol gelişim açısından çok hızlı ivme göstermiştir. Futboldaki bu ivme hayatın sosyokültürel ve ekonomik alanında fazla önem kazanmıştır. Uygulanmak istenen futbol antrenmanlarının amacı, programlı ve çok yönlü olmalıdır. Bununla birlikte antrenmanlarda çocuklarda olduğu gibi gençlerde sağlam bir altyapı oluşturarak çocuğun spordaki yeteneğinin geliştirilmesi amaçlanmalıdır. Çocukluk ve gençlik dönemlerinde uygulanan futbol antrenmanları başarı odaklı olmalıdır. Bu nedenle, bu yaşlarda yapılacak çalışmalar büyük yaş grupların da olduğu gibi sadece müsabaka kazanmaya yönelik kısa süreçli olmamalıdır (Günay & Yüce, 2008). Son zamanlarda core antrenman çalışmaları fitness sporu içerisinde en fazla uygulanan çalışma bütünü halini almıştır. Tamamen bu çalışmayı kapsayan kitaplar, makaleler ve tezler yazılmıştır. Core egzersizleri sporcuların fonksiyonel kapasitesini artırmak, sportif becerilerini artırmak için uygulanırken, aktif spor yapmayan bireylere de tavsiye edilir. Geleneksel dayanıklılık antrenmanları, core egzersizi ön planda tutmak için yeni bir yöntem olarak tasarlanmıştır (Willardson, 2007). Kuvvetlendirilmiş olan core bölgesi sporcunun daha fazla yüklenmesine olanak sağlarken, aynı zamanda sporcunun tekniğini amaca uygun olarak kullanması için avantaj sağlayacaktır. Core bölgesindeki kaslar vücudun diğer bölgesinde bulunan kaslar kadar istenilen kuvveti sağlamayabilir ancak kuvvetin elde edilmesi kısmında önemli bir görevi vardır. Böylece core kasları vücutta bulunan diğer kasların koruma görevini üstlenmektedirler. Core kasları kuvvetli bir sporcunun maruz kaldığı yüklenmelere adaptasyon sağlaması daha kolaydır. (Mcgill, 2010).

YÖNTEM

Bu çalışmanın amacı, 14-16 yaş grubu erkek futbolcularda 8 haftalık core antrenmanların sürat, çeviklik ve denge üzerine etkisini incelemektir. Çalışmaya 14-16 yaşlarında kulüplerde aktif olarak futbol oynayan 24 futbolcu gönüllü olarak katıldı. Araştırmanın deney grubunu, futbol antrenmanlarına ek olarak 8 hafta boyunca haftada 3 gün core antrenmanları uygulanan 12 erkek futbolcu oluşturdu.

Araştırmanın kontrol grubunu ise yalnızca düzenli futbol antrenmanı uygulanan 12 erkek futbolcu oluşturdu. Antrenmanlardan önce ve 8 haftalık antrenman sürecinden sonra her iki gruptaki futbolculara bir takım kuvvet, sürat, çeviklik ve denge testleri uygulanarak core antrenmanların etkisi incelendi. Araştırma kapsamında elde edilen verilerin analizi SPSS programı kullanılarak gerçekleştirildi. Verilerin normallik düzeyi Shapiro-Wilk testi ile belirlendi. Verilerin çözümlenmesinde bağımsız örneklem t-testi ile bağımlı örneklem t-testi kullanıldı. Deney grubunda mekik, şınav, durarak uzun atlama, illinois çeviklik, T- dril ve Y denge testleri ön test ve son test değerleri arasında son testler lehine istatistiksel olarak anlamlı bir farklılık tespit edilirken (p<0,05), 30 m sürat ve 505 çeviklik testi ön test ve son test değerleri arasında anlamlı bir farklılık bulunmadı (p>0,05). Kontrol grubunda ise mekik, şınav, durarak uzun atlama ve illinois çeviklik testlerinde ön test ve son test değerleri arasında son testler lehine anlamlı bir farklılık tespit edilirken (p<0,05) 30 m sürat, 505 çeviklik, t dril ve y denge testleri ön test ve son test değerleri arasında anlamlı bir farklılık bulunmadı (p>0,05).

Core antrenmanın; çeviklik, kuvvet ve denge parametrelerinin geliştirilmesini diğer motorik becerilerinin gelişimine de katkı sağlayacağından dolayı antrenörlerin, futbolcularının gelişim düzeyleri ve hazır bulunuşluk düzeylerini göz önünde bulundurularak uygulayacakları core antrenmanın futbolcuların gelişmesinde önemli bir rol oynayacağı düşünülmektedir. Sonuç olarak 14-16 yaşlarındaki erkek futbolculara uygulanan 8 haftalık core antrenmanlarının kuvvet, çeviklik ve denge parametrelerini geliştirdiği söylenebilir.

TARTIŞMA VE SONUÇ

Literatürde Y denge testi ile ilgili yapılan çalışmaları incelediğimizde; core antrenmanın statik ve dinamik denge özellikleri üzerindeki etkisini araştırılmış olup sporculara uygulanan 12 haftalık core çalışma programı sonucunda deney grubunun core antrenman ortalaması ön test ile son test arasında istatistiksel olarak anlamlı fark olduğu görülmüştür (Gür & Ersöz, 2017). 12-14 yaş grubu tenisçilerde 8 haftalık core antrenmanın yer vuruş hızlarına ve bazı motorik özelliklere etkisini incelediğinde, 8 hafta sonunda deney gurubunun, kontrol gurubuna göre statik denge performansında anlamlı bir fark olduğu görülmüştür (Eren, 2019). Core egzersizlerinin yoğunlukla yüklendiği bölgeler; karın, sırt ve kalça kaslarının olduğunu bu kasların dayanıklılığının artırılması vücudun denge ve kuvvetine olumlu etkileyeceğini ve sakatlık riskinin azalacağını söylemiştir (Faries & Greenwood, 2007). Stork balance testiyle yapmış olduğu çalışmada 38 sporcu katılmış olup 8 haftalık core egzersiz sonucunda sporcuların denge, şınav ve mekik performanslarının olumlu yönde katkı sağlandığı görülmüştür (Kean ve ark., 2006). Bu çalışmaya baktığımızda araştırmamız ile paralellik gösterdiği görülmektedir. 14-16 yaş grubu erkek futbolcularda yapmış olduğumuz çalışmada deney grubuna uygulanan 8 haftalık core antrenmanların y denge testine istatistiksel olarak ön test-son test arasında son test lehine anlamlı bir artış olduğu görülmektedir. Literatürde çeviklik testleri ile ilgili yapılan çalışmalar incelendiğinde; genç futbolcularda sekiz haftalık core antrenmanın denge ve fonksiyonel performans üzerine etkisini

incelendiği çalışmada 30 sporcu katılmıştır. Sekiz haftalık core antrenmanın sonunda çeviklik testi tamamlama sürelerinin anlamlı düzeyde azaldığı görülmüştür (Aslan, 2014). Yapılan araştırma; çalışmamız ile paralellik göstermektedir.

Deney grubunda mekik, şınav, durarak uzun atlama, illinois çeviklik, t dril ve y denge testleri ön test ve son test değerleri arasında son testler lehine istatistiksel olarak anlamlı bir farklılık tespit edilirken (p<0,05) 30 m sürat ve 505 çeviklik testi ön test ve son test değerleri arasında anlamlı bir farklılık bulunmadı (p>0,05). Kontrol grubunda ise mekik, şınav, durarak uzun atlama ve illinois çeviklik testlerinde ön test ve son test değerleri arasında son testler lehine anlamlı bir farklılık tespit edilirken (p<0,05) 30 m sürat, 505 çeviklik, t dril ve y denge testleri ön test ve son test değerleri arasında anlamlı bir farklılık bulunmadı (p>0,05). Sonuç olarak 8 haftalık core antrenmanlarının kuvvet, çeviklik ve denge parametrelerini geliştirdiği söylenebilir.

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KATKI ORANI *CONTRIBUTION RATE*	AÇIKLAMA *EXPLANATION*	KATKIDA BULUNANLAR *CONTRIBUTORS*
Fikir ve Kavramsal Örgü *Idea or Notion*	Araştırma hipotezini veya fikrini oluşturmak *Form the research hypothesis or idea*	Adem KARABABA Hilal KILINÇ BOZ
Tasarım *Design*	Yöntem ve araştırma desenini tasarlamak *To design the method and research design.*	Adem KARABABA Hilal KILINÇ BOZ
Literatür Tarama *Literature Review*	Çalışma için gerekli literatürü taramak *Review the literature required for the study*	Adem KARABABA Hilal KILINÇ BOZ
Veri Toplama ve İşleme *Data Collecting and Processing*	Verileri toplamak, düzenlemek ve raporlaştırmak *Collecting, organizing and reporting data*	Adem KARABABA Hilal KILINÇ BOZ
Tartışma ve Yorum *Discussion and Commentary*	Elde edilen bulguların değerlendirilmesi *Evaluation of the obtained finding*	Adem KARABABA Hilal KILINÇ BOZ

Çatışma Beyanı/ *Statement of Conflict*

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Etik Kurul Beyanı/ *Statement of Ethics Committee*

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