EXAMINATION OF SOME PHYSICAL FITNESS CHARACTERISTICS IN 13-14 YEARS OLD FOOTBALLERS

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ABSTRACT

The objective of this study is to examine some physical fitness characteristics of 13-14 years old male football players. A total of 74 children were included in the study who participated in FCBescola, Kartepe 2013 football camp. 46 of them are licensed active male football players, (n=22) 13-year-olds and (n=24) 14-year-olds who are playing in different sports clubs. 28 of them are sedentary males, (n=13) 13-year-olds and (n=15) 14-year-olds, who are living in Children Welfare Homes. Measurements of height, weight, body mass index, Illinois agility test and 30-meter sprint, flamingo balance test, grip strength and sit and reach test were carried out. The data obtained were recorded with SPSS 20 program. Independent t test was used to find out the differences between groups, while Pearson Correlation test was used to analyze the associations between the variables and the level of significance was taken as p<0.05. For 13-year-old footballer and sedentary groups the results were found as follows, respectively: body mass index (18,80±1.20 and 20,09±1,76) Illionis agility test (18,92±2,01 and 21,23±2,07 sec), 30 meter sprint (5,22±1,35 and 5,96±1,86 sec), balance (4,50±3,07 and 4,12±2,75), right hand grip (21,2±3,0 and 16,3±1,8 kg), left hand grip (17,3±3,2 and 13,9±1,2 kg), sit and reach test (22,12±3,42 and 21,76±2,96 cm), while the results were found as follows for 14-year-old footballer and sedentary groups, respectively: body mass index (19,20±1,4 and 19,56±2,19), Illionis agility test (17,75±1,85±21,20±2,02 sec), 30 meter sprint (4,99±1,12 and 5,95±1,43 sec), balance (4,20±2,87 and 4,48±2,25), right hand grip (26,3±3,2 and 17,3±1,9 kg), left hand grip 24,0±2,5 and 15,2±2,1 kg) sit and reach test (22,12±3,42 and 22,23±3,75 cm). Statistically significant differences were found between athletes and sedentary group and between 13-year-olds and 14-year-olds in terms of Illinois agility test, 30-meter sprint, right and left hand grip strength values (p<0.05). Differences were found between some physical fitness characteristics of 13 and 14 years old male football players.

Keywords*: Football, Physical Fitness, Child*

INTRODUCTION

Physical fitness, which influences productivity and success in daily life and sportive activities, includes elements related with both health and skills (Gokmen

et al., 1995). Physical fitness expresses performing activities correctly and also the body's present state of condition about physical endurance. Physical structure unites with other performance variables such as strength, power, flexibility, endurance and speed and influences performance positively (Acikada and Ergen, 1990; Kirandi and Sahin, 2016; Cimen, 2017; Biyikli and Cimen, 2017; Kirandi, 2017). For success in sport, the athlete has to show top level performance in terms of physiological and motoric characteristics (Eniseler, 1995). The important factors of success in young footballers are coordination, explosiveness, speed and endurance (Figueiredo et al., 2009). Thus, reaching these levels in football is possible only through long, regular and scientific based correct training methods. While deciding for these methods, in all age groups and especially in young footballers, activities suitable for their physical and physiological structures should be prepared.

In childhood and adolescence, physical and physiological changes based on age and gender differ instantly and these sudden changes continue until the age of 15-17. No sudden changes occur after the age of 18 and change becomes regular. Normally in women and men strength, power, flexibility and other physical-physiological characteristics reach their maximum between the ages of 20 and 30 and functional decline becomes evident after the age of 30 (Aslan et al. 2011). A great number of scientists in the field of sport state that the most sensitive period of learning skills is between the ages of 9 and 12 (Borms 1986). The Ghent Youth Soccer Project is a mixed-longitudinal study of a combined sample of elite, sub-elite and non-elite players aged 10–16 years. The estimated mean age at peak height velocity for 33 players was 13.8 ± 0.8 years. It is somewhat earlier than estimates for samples of Welsh (Bell, 1993) and Danish (Froberg *et al*., 1991) youth soccer players (i.e. 14.2 ± 0.9 years), but is well within the range of estimated ages at peak height velocity for samples of European boys (13.8 – 14.2 years; Malina *et al*., 2004) (Philippaerts et al. 2006).

It is important to find out physical fitness levels between the ages of 13 and 14, in which the speed of development peaks, as stated in the existing literature. While it is important to find out the physical fitness levels and differences of footballers at the ages of 13-14 in terms of being able to observe their growth and development periods, it is predicted that age differences in mixed groups, even being born in different months of the same year can have negative influences on these children's showing their actual performances. The objective of this study is to examine some physical fitness characteristics of 13-14 years old male footballers playing actively in clubs.

METHODOLOGY

The research group of this study consists of a total of 46 licensed active male football players, aged 13-year-old (n=22) and 14-year-old (n=24) playing in different sports clubs of Turkey, who participated in FCBescola, Kartepe 2013 football camp and a total of 28 males who did not do any sports, aged 13-year-old (n=13) and 14-year-old (n=15), who were living in Children Welfare Homes in Istanbul.

The participants' weights were measured with an electronic scale of 0.1 kg precision, while their heights were measured with digital stadiometer of 0.01 cm precision.

Body Mass Index: Weight (kg) / Height (m^2) formula was used (Tamer, 2000).

Illinois Agility Test: Illionis agility test was conducted according to standards in literature (Roozen 2008). Cones were placed to the corners of a 5m.x10m area and the course was specified. The short side of the course (5m) was divided into two and 4 cones were placed right in the middle of this short side with distances of 3.3 meters. The subjects waited at the start line lying on their front and on command they got up and started running. In order to find out the time of completing the test, electronic and telemetric chronometer, which can record one-hundredth of a second, was used.

30 Meter Sprint Test: The test was conducted on a tartan track by specifying the start and finish lines and by using electronic and telemetric chronometer, which can record one-hundredth of a second in an area of 30 meters; the test was conducted with two repeats including a resting break and the best result was recorded (Ozkara,2002).

Flamingo Balance Test: The participants were made to stand on a 50 cm long, 4 cm high and 3 cm wide wooden balancing beam with their dominant leg and stand in balance without closing their eyes. The participants flexed the other leg at the knee, pulled the foot of this leg to the hip and held with the hand on the same side. When the research group was in balance like this with one foot, timing was started and the time was stopped when the balance was lost. When the research group got on the beam and kept in balance again, timing continued from where it left. In this test which continued like this for a minute, each fall was recorded and the number of falls was recorded as the test score (Sundstrup et al. 2010).

Hand Grip Strength: It was measured with Jamar hydraulic dynamometer (Sammons Preston, USA). By starting from the dominant side, the measurement was conducted when the athlete was in sitting position and the forearm was 90^o flexed (without taking support from the body). The measurement was repeated successively for three times and average value was used. The values were recorded in kg (Evcik and Kizilay 2001).

Sit and reach test: The surface of a 32 cm. high, 35 cm. long and 45 cm. wide box was divided into centimeters and measurements. The participants sat down, stretched out their legs and placed the soles of their feet to the box without shoes. Without bending the knees from the body (waist and hips), the participants reached forward over the box as much as possible and waited for two seconds at that position. The furthest points the finger reached were measured in cm. and the best degree at the end of two repeats was taken (Tamer 1995).

RESULTS

Average age (years) of the athlete groups was found as 13,45±1.3, while the average age of the sedentary groups was found as 13.72±1.1; average sportive experience (years) of the athlete group was found as 4.8±1.2. The other measurement results are given below.

Table 1. *Height, weight and body mass index values of the athletes and the sedentary in the same age groups and the comparison of these values*

Parameters	Groups	n	$\bar{x}$	sd	p
Height(cm)	13 year old athlete	22	154,12	8,22	p>0.05
	13 year old sedentary	13	152,22	7,23	
	14 year old athlete	24	157,03	8,34	p>0.05
	14 year old sedentary	15	154,88	8,88	
Weight (kg)	13 year old athlete	22	44,55	8,22	p>0.05
	13 year old sedentary	13	46,55	8,48	
	14 year old athlete	24	47,23	8,91	p>0.05
	14 year old sedentary	15	46,75	5,56	
BMI (kg/m²)	13 year old athlete	22	18,80	2,72	p>0.05
	13 year old sedentary	13	20,09	1,76	
	14 year old athlete	24	19,56	2,85	p>0.05
	14 year old sedentary	15	19,56	2,19	

*p<0.05**

No statistically significant difference was found between the heights, weights and body mass indexes of athletes and sedentary groups of the same age (p>0.05).

Table 2. *Comparison of height, weight and body mass index values of athletes and sedentary in different age groups in terms of their state of doing sport*

Parameters	Groups	n	$\bar{x}$	sd	p
Height (cm)	13 year old athlete	22	154,12	8,22	p>0.05
	14 year old athlete	24	157,03	8,34	
	13 year old sedentary	13	152,22	7,23	p>0.05
	14 year old sedentary	15	154,88	8,88	
Weight (kg)	13 year old athlete	22	44,55	8,22	p>0.05
	14 year old athlete	24	47,23	8,91	
	13 year old sedentary	13	46,55	8,48	p>0.05
	14 year old sedentary	15	46,75	5,56	
BMI (kg/m²)	13 year old athlete	22	18,80	1,20	p>0.05
	14 year old athlete	24	19,20	1,40	
	13 year old sedentary	13	20,09	1,76	p>0.05
	14 year old sedentary	15	19,56	2,19	

*p<0.05**

No statistically significant difference was found between the heights, weights and body mass indexes of subjects in different age groups in terms of their state of doing sport (p>0.05).

Table 3. *Comparison of physical test results of athletes and sedentary in the same age groups*

Parameters	Groups	n	$\bar{x}$	sd	p
Illinois Agility (sec)	13 year old athlete	22	18,92	2,01	**p<0.05***
	13 year old sedentary	13	21,23	2,07	
Illinois Agility (sec)	14 year old athlete	24	17,75	1,85	**p<0.05***
	14 year old sedentary	15	21,20	2,02	
30 Meter Sprint (sec)	13 year old athlete	22	5,22	1,35	**p<0.05***
	13 year old sedentary	13	5,96	1,86	
30 Meter Sprint (sec)	14 year old athlete	24	4,99	1,12	**p<0.05***
	14 year old sedentary	15	5,95	1,43	
Flamingo Balance (sec)	13 year old athlete	22	4,50	3,07	p>0.05
	13 year old sedentary	13	4,12	2,75	
Flamingo Balance (sec)	14 year old athlete	24	4,20	2,87	p>0.05
	14 year old sedentary	15	4,48	2,25	
Grip strength right (kg)	13 year old athlete	22	21,2	3,0	**p<0.05***
	13 year old sedentary	13	16,3	1,8	
Grip strength right (kg)	14 year old athlete	24	26,3	3,2	**p<0.05***
	14 year old sedentary	15	17,3	1,9	
Grip strength left (kg)	13 year old athlete	22	17,3	3,2	**p<0.05***
	13 year old sedentary	13	13,9	1,2	
Grip strength left (kg)	14 year old athlete	24	24,0	2,5	**p<0.05***
	14 year old sedentary	15	15,2	2,1	
Sit and reach (cm)	13 year old athlete	22	22,12	3,42	p>0.05
	13 year old sedentary	13	21,76	2,96	
Sit and reach (cm)	14 year old athlete	24	22,12	3,42	p>0.05
	14 year old sedentary	15	22,23	3,75	

*p<0.05**

Statistically significant difference was found in Illinois, 30 meter sprint, right and left hand grip strength of both 13 year old and 14 year old athletes and sedentary groups (p<0.05).

Table 4. *Comparison of physical test results of athletes and sedentary in different age groups in terms of state of doing sport*

Parameters	Groups	n	$\bar{x}$	sd	p
Illinois Agility (sec)	13 year old athlete	22	18,92	2,01	**p<0.05***
	14 year old athlete	24	17,75	1,85	
Illinois Agility (sec)	13 year old sedentary	13	21,23	2,07	p>0.05
	14 year old sedentary	15	21,20	2,02	
30 Meter Sprint (sec)	13 year old athlete	22	5,22	1,35	**p<0.05***
	14 year old athlete	24	4,99	1,12	
30 Meter Sprint (sec)	13 year old sedentary	13	5,96	1,86	p>0.05
	14 year old sedentary	15	5,95	1,43	
Flamingo Balance (sec)	13 year old athlete	22	4,50	3,07	p>0.05
	14 year old athlete	24	4,20	2,87	
Flamingo Balance (sec)	13 year old sedentary	13	4,12	2,75	p>0.05
	14 year old sedentary	15	4,48	2,25	
Grip Strength Right (kg)	13 year old athlete	22	21,2	3,0	**p<0.05***
	14 year old athlete	24	26,3	3,2	
Grip Strength Right (kg)	13 year old sedentary	13	16,3	1,8	p>0.05
	14 year old sedentary	15	17,3	1,9	
Grip Strength Left (kg)	13 year old athlete	22	17,3	3,2	**p<0.05***
	14 year old athlete	24	24,0	2,5	
Grip Strength Left (kg)	13 year old sedentary	13	13,9	1,2	p>0.05
	14 year old sedentary	15	15,2	2,1	
Sit and Reach (cm)	13 year old athlete	22	22,12	3,42	p>0.05
	14 year old athlete	24	22,12	3,42	
Sit and Reach (cm)	13 year old sedentary	13	21,76	2,96	p>0.05
	14 year old sedentary	15	22,23	3,75	

*p<0.05**

When the physical test results of different age groups of athletes and sedentary were compared in terms of the state of doing sport, statistically significant difference was found only between athlete groups in 13-year-old and 14-year-old Illinois, 30-meter sprint, right and left hand grip results (p<0.05).

DISCUSSION

In our study, some physical parameters of 13 and 14-year-old active football players were assessed.

In the study, the average height (cm) of 13-year-old athletes was 154,12 and the average height of 14-year-old athletes was 157,03; average weight (kg) of 13-year-old athletes was 44,55 and the average weight of 14-year-old athletes was 47,23; average body mass-index (kg/m$^{2)}$ of 13-year-old athletes was 18,80 and the average BMI of 14-year-old athletes was 19,20. For the 13-year-old control group these data were 152,22 cm, 46,55 kg, 20,09 kg/m^2, respectively; while they were found as 154,88 cm, 46,75 kg, 19,56 kg/m^2 for the 14-year-old control group.

When the heights, weights and body mass indexes of the athletes and the sedentary in the same age group were compared in terms of their state of doing sport, no statistically significant difference was found between groups ($p>0.05$). In the results of both the athlete and the control group, the increases in heights showed a positive correlation with the increase in age. The difference between athlete and non-athlete groups is very slight; however, in terms of body mass index, the values are more positive in favor of the athlete group, which is an expected result.

In the study, the Illinois agility test average of the football players was found as 18,30 sec., while the average of the non-athlete group was found as 21,21 sec. In their study they conducted on 12-14 year-old athletes and sedentary, Gunay et al. (2011) found that the Illinois agility test average (sec.) of the athletes was 19,82±1,30, while the average of the sedentary group was 20,90±1,10. Kizilet et al. (2010) found the Illinois agility test average of 24 male basketball players with an average age of 13,00±0,95 years and average training age of 3±1years as 18,50 sec. Statistically significant difference was found between the 13-year- old athlete group and the non-athlete group and 14-year-old athlete and non-athlete group in terms of Illinois agility test averages ($p<0.05$). Football players had better results than the non-athlete group. According to these results, it can be said that in this age group, agility develops significantly with training and this emphasizes the significance of training for increasing psychomotor skills in the rapid development period. This thought is supported by the fact that statistically significant difference was found between the Illinois agility test values of the 13-year-old athlete group and the 14-year-old athlete group, while no significant difference was found between the non-athlete groups.

In our study, 30-meter sprint test average was found as 5,22±1,35 sec. in 13-year-old footballers and as 4.99±1.12 sec. in 14-year-old footballers. Eyuboglu and Aslan (2016) found the 30 m. average as 4,50±0,20 sec. in U15 footballers. According to these results, it can be said that the speed characteristics of athletes in the growth and development period improve with age and training.

In the study, the flamingo balance test averages (sec) of 13-year-old footballers and sedentary were found as 4,50±3,07, 4,12±2,75, respectively, while the flamingo balance test averages (sec) of 14-year-old footballers and sedentary were found as 4,20±2.87, 4,48±2.25, respectively. No statistically significant difference was found between the groups in terms of flamingo balance test

averages. In a study conducted on footballers and sedentary in the puberty period, Akin (1999) found that there were no statistically significant differences between the flamingo balance test averages between groups (p>0.05). In their study they conducted on 12-14 year-old athletes and sedentary students, Gunay et al. (20111) found the balance (flamingo) test averages (sec.) of 13-year-old athletes as 2,82±1,72 and 13-year-old sedentary as 6,75 ±4,37. This result shows that the physiological system which provides balance has a better control in 14-year-old athletes than 13-year-olds. It can be said that our 14-year-old results were better than the results of other studies and the results of our 13-year-old group and that the trainings had a positive effect on development.

In our study, right hand grip strength (kg) 13 and 14-year-old average values were 21,2±±3,0, 26,3±3,2, respectively; while the left hand grip strength (kg) 13 and 14-year-old average values were 17,3±3,2 kg, 24,2 ±2,5 kg, respectively. While a statistically significant difference was found between athlete groups, no significant difference was found between the sedentary groups in terms of right and left hand grip strength. Both right hand and left hand grip strength comparisons of athlete groups were found to be in favor of the 14-year-old group, while the comparison of the athlete and non-athlete groups showed that the results of athlete groups were significantly higher. In their study, Polat et al. (2016) found that 16-year-old teenagers who were involved in football had better hand grip strength than the sedentary teenagers of the same age. According to the results of the study, the fact that the teenagers who played football had higher hand grip strength when compared with both footballers in younger age groups and the sedentary shows that football training has a positive effect on hand grip strength. Considering the fact that hand grip strength is accepted to be an indicator of the individual's muscle strength (Lagerstrom and Nordgren, 1998), football trainings can be said to be useful for this development.

In the presented study, no statistically significant difference was found between the footballer and sedentary groups in terms of flexibility test averages (p>0.05). Erceg et al. (2008) found that football trainings did not contribute to flexibility values in children and the existing values were found to be close to the values of the control groups (Polat et al. 2003). In their study they conducted on 12-14 year-old athletes and sedentary students, Gunay et al. (2011) found that the sit and reach test averages (cm) of athletes was 27,14±4,65, while the sit and reach test averages (cm) of the sedentary was 27,17±4,65. According to these results, it can be said that the existing football trainings do not have an influence on flexibility. This result can be associated with the training methods preferred in the study groups, in addition, it can also mean that exercises which can develop flexibility are not done sufficiently in the trainings of this athlete group.

As a conclusion, it was found that 13-14 year-old footballers had higher results in Illinois agility test, 30 meter sprint, right and left hand grip strength than the sedentary group and at the same time 14-year-old footballers were found to be better in basic skills used in football. These data obtained emphasize the development of especially agility, speed and strength. These data show the positive effect of football on psychomotor development. In this age intervals in which there

is a fast process of development, it can be said that differences in years, even in months, can create negative effects in terms of performance.

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