Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XVIII, ISSUE 2 Supplement, 2018, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

Science, Movement and Health, Vol. XVIII, ISSUE 2 Supplement, 2018
September 2018, 18 (2 supplement): 348 - 353
Original article

A COMPARISON OF MALE AND FEMALE ADOLESCENT TENNIS PLAYERS THROUGH SELECTED EUROFIT TEST BATTERY

MUSTAFA KAYA[1], NAZMI SARITAŞ[1] YAŞAR KÖROĞLU[2]

Abstract

Objectives. The objective of this study is to determine the physical characteristics of children of different genders between 10 and 12, who play and do not play tennis, through Eurofit test battery.

*Methods of the research***.** The study was carried out with the contribution of 20 male and 20 female volunteer students between 10 and 12 who go to secondary schools in Kayseri. The participants were divided into an experiment group of 10 male and 10 female students each of whom has tennis workouts for 4 days a week, and the control group of 10 male and 10 female students each of whom has no tennis workouts. The study included Flamingo balance test, plate tapping, sit and reach, handgrip test, bent arm test, standing long jump and sit-ups.

There was statistically significant difference in favor of male participants in experiment group following the flamingo balance test, bent arm hang, plate tapping, relative handgrip, sit-up, standing long jump and handgrip strength tests. There was a statistically significant difference between groups in terms of flexibility values.

Result. For female participants, there was a statistically significant difference on behalf of female participants in the experiment group following the flamingo balance, standing long jump and sit-up tests. There was not a statistically significant difference between groups in terms of flexibility values, bent arm hang, plate tapping, handgrip strength and relative handgrip tests.

Conclusion. As a consequence of the study it is considered that playing tennis has positive effects on physical characteristics of children between 10 and 12. With the help of long term workouts, there will be much more positive effects on their physical capabilities.

Keywords: Tennis, Eurofit test, Physical characteristic.

Objectives

Tennis, which spreads in the international area steadily and attracts great attention, is a sports branch which has millions of viewers and players around the world. This interest has made tennis common in schools and clubs in developed countries and in our country and led it to be a part of life.The necessity of the good performance in different characteristics in different sport games has become the focus of interest of researches for football and tennis which address the large masses (Koç et.al. 2006). World Health Organization defines health as a state of mental, social and physical well-being. From this point forth, it seems important to gain the habit of playing sport in childhood and early ages. For this reason, in the R (87) 9 numbered recommendation issued by The Committee of Ministers of the Council of Europe in 19 May 1987, member countries were recommended to use European Physical Fitness tests (EUROFIT) and to take measures related to this practice in order to assess and evaluate the physical fitness of the schoolchildren from the ages of 6-7 to 16-18 (Ziyagil et.al. 1996). Eurofit test battery is a test developed to evaluate the fitness related to health for children and adults. Generally it involves the evaluation of the fitness components related to health (Oja, 1995). Eurofit tests were considered to identify the personality of children and improve the sense of responsibility, and they were successfully practiced on the age group of 6-18 (Demir, 2001). Eurofit was preferred in our study since it can be benefitted in researches to identify and evaluate the physical skills of children and since it is a product of many researches that were coordinated at an international level in a field that requires an approach of developing efficient methods that can be practiced at schools (Çalış, 1993). Eurofit is an important component of physical skill, health and physical education. Physical education is one of the rare intramural activities that all children practice. As everyone accepts, a good physical coordination is one of the main elements in sports and physical education and it has a great contribution to a healthy and happy life. Tests related to playing sports can reveal the weak points of physical skills or general weakness, and, in this way, sport accidents can be avoided (Loğoğlu, 2002).

The purpose of this study is to evaluate and

[1]Physical Education and Sport College of Erciyes University, TURKEY
[2]Erciyes University Institute of Health Sciences TURKEY
Email: mkaya@erciyes.edu.tr

* the abstract was published in the 18th I.S.C. "Perspectives in Physical Education and Sport" - Ovidius University of Constanta, May 17-19, 2018, Romania
Received 18 march 2018 / Accepted 6 may 2018

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XVIII, ISSUE 2 Supplement, 2018, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST,
DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

reveal the physical characteristics of the children of different genders between the ages of 10-12 who play and do not play tennis by Eurofit test battery.

METHODS OF THE RESEARCH

Selection of the Volunteers

40 volunteers who studied at elementary schools in Kayseri and did not play tennis were included in the study. 20 male and female students between the ages of 10-12 participated in the study voluntarily. 10 male and 10 female students had tennis workout 4 days a week as the experimental group, and the other 10 male and 10 female students were the control group. The participants were informed before participating in the study, and approval forms were received from their parents. The effect of playing tennis on determining the physical differences were investigated through the selected eurofit test battery measurements in experimental and control groups.

Height and Body Weight Measurements

In the height measurements of the volunteers, a measuring tape with the 0.01 cm degree of precision was used. Measurements were obtained while the volunteers are barefoot.While the measurements were taken, the heads were upright position, soles were on the floor, knees were stiff, ankles were contiguous and bodies were upright position. The body weights were measured barefoot and with minimal clothes by using a bascule with 0.1 degree of precision.

Flamingo Balance Test

The test was performed to measure the general balance. Test content was expressed as balancing on a single leg on a specific beam. The participants were asked to balance on a metal or wooden beam with 50 cm long, 4 cm high and 3 cm wide that was covered with a material (the thickness of the material should be 5 mm at most). The beam was stabilized by supports with 15 cm long and 2 cm wide. A stopwatch was used for each beam. The participants tried to keep balance on the leg that they prefer. While they were balancing on the preferred leg, the free leg was flexed at the knee towards back and the foot of this leg was held, and the position was like a flamingo. The other hand could be used for balance. The participant could hold the instructor's hand to keep balance. The test started as the instructor's letting go of the participant's hand. The participant tried to keep balance in this position. When the participant lost his balance (by letting go of the foot being held) or a part of his body touched the ground, the test and stopwatch was stopped. After each falling, the same procedures were performed again up to 1 minute. Trying number for keeping balance on the beam in 1 minute was counted. The test required 1 minute of balance on the beam except fallings.

Plate Tapping Test

This test was performed to assess the movement speed of limb, and it was based on tapping two plates using one preferred hand. There can be a table with an appropriate height or a horse that is used in gyms. Two plastic discs with 20 cm diameter were placed horizontally on the table. The distance between the center points of the discs was 80 cm (60 cm from the edges). A 10x20 cm rectangle plate was placed equidistant between both discs. A stopwatch was used during the tests. It was the score of the test that was better than the two performance of it. The score was the time period when each disc was touched 25 times. The best score should have been recorded as 1/10 sec. For example, 103 score was obtained with 10, 3 sec. If the participant failed tapping, another try was permitted in order to reach 25 taps.

Sit and Reach Test

This test targets to measure the flexibility. The subject was asked to sit and reach forward as far as possible without bending his legs. There was a test table 35 cm long, 45 cm wide and 32 cm high, and the dimensions of the upper table that was placed on the test table were 55 cm long, 45 cm wide and 35 cm high. The upper table should have been placed as its edge being lain 15 cm beyond the place that the subject rested his feet. The surface of the upper table should have been divided from 0 cm to 50 cm in the direction of the subject. The best one of the two tryingswas recorded as the result.

Standing Long Jump Test

This test measures the explosive power, and the subject jumps forward from the place where he stands without gaining speed. The equipment in this test included two judo mats or similar mats placed longwise or side-by-side on a non-slip floor, chalk and a tape measure. The subject stood behind a line as his toes being before the line. The hands were extended (as being parallel to the floor) and the knees were bent. He was asked to jump as far as possible by bounding while lifting his hands. He wastold to try to land on as both feet adjoined and standing upright. The test was performed twice in order to get the best result. The best point was accepted as the score. The result was recorded as (cm) (Kızılaksam, 2006).

Sit-up Test

Sit-up test aims to measure the Body Force (the endurance of the abdominal muscles).Total number of the correctly performed sit-ups in 30 sec was recorded as the score. Two floor mats, a stopwatch and an assistant were needed to perform the test. The subject was asked to sit on the mat, lean towards back, interlock his fingers behind the neck and bend knees at 90^0 angle, with the feet flat on the floor. Then, he was asked to lie on the mat and the shoulders should have touched the floor. He raised to return the sitting position in order to touch the knees with elbows. While

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XVIII, ISSUE 2 Supplement, 2018, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST,
DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

doing these, the hands were always behind the neck. The subject was reminded to perform this exercise as fast as possible in 30 sec when he was ready. He did sit-ups until he was asked to stop. Sit-up test was performed once (Hasan, 2008).

Bent Arm Hang Test

The test targets functional endurance (the lifting power of arm and shoulder muscles). The subject was led to hang on a pull up bar by twisting arms. The equipment for this test included a round horizontal pull up bar with 2,5 cm diameter, a tool that enabled short subjects to hold the pull up bar without jumping (a chair or a box), a stopwatch, a mat under the pull up bar, cloth and chalk powder. The score was recorded as 1/10 of 1 second. For example, 17,4 seconds was 174 points (Saraç, 2012).

Handgrip Strength Test

A Grip-D hand dynamometer which could measure until 100 kg strength was used in hand dynamometer measurement method measurements. For handgrip strength measurement, dynamometers were selected according to the sizes of the objects' hands. The subject held the dynamometer using right hand as being his arm straight and having a 10-15 degree angle from the shoulder. The subject did two repetitions. Then two repetitions were done with the left hand and maximum strength was measured. The best values were recorded as measurement (İri, Başlamışlı and Göksu, 2003).

Statistical Analysis

The statistical assessment of the experimental and control groups was done by using IBM SPSS 20.0 package software. The normality of distributions was tested by Shapiro-Wilk test. It was seen that distributions were normal. The descriptor was showed by arithmetic mean and standard error statistically. Independent sample t-test was used in comparing groups. Significancy level was taken as 0.05.

RESULT

Table 1. The characteristic features of the males in the study

Variable	n	Group	$\bar{x} \pm s_x$	t	p
Age (Year)	10	Experimental	11.50±0.17	-1.406	.178
	10	Control	11.80 ± 0.13		
Body weight (kg)	10	Experimental	34.60 ± 0.72	-2.038	.065
	10	Control	38.60 ± 1.83		
Length (cm)	10	Experimental	141.90 ± 0.90	-1.742	.110
	10	Control	147.30 ± 2.97		
Body Mass Index (kg/m^2)	10	Experimental	17.19 ± 0.34	-.757	.459
	10	Control	17.89 ± 0.86		

There was not a statistical difference in the values of age, body weight, height and body mass index of the males in the experimental and control groups (p>0.05) (Table 1).

Table 2. The physiological features of the males in the study

Variable	n	Group	$\bar{x} \pm s_x$	t	p
Flamingo Balance Test	10	Experimental	7.60 ± 1.15	-3.997	0.001***
	10	Control	13.60 ± 0.97		
Standing long jump (cm)	10	Experimental	143.10 ± 5.25	2.291	0.034*
	10	Control	125.60 ± 5.55		
Plate tapping	10	Experimental	7.80 ± 0.18	-3.799	0.003**
	10	Control	9.71 ± 0.47		
Sit-up test (number)	10	Experimental	16.00 ± 0.98	3.393	0.003**
	10	Control	12.10 ± 0.60		
Flexibility (cm)	10	Experimental	23.70 ± 0.99	0.823	0.421
	10	Control	22.40 ± 1.23		
Handgrip strength (kg)	10	Experimental	17.10 ± 0.82	2.266	0.036*
	10	Control	14.70 ± 0.67		
Relative handgrip strength (kg)	10	Experimental	0.50 ± 0.02	3.612	0.002**
	10	Control	0.39 ± 0.02		

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XVIII, ISSUE 2 Supplement, 2018, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST,
DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

Bent arm hang (sec)	10	Experimental	22.19 ± 1.66	3.972	0.001***
	10	Control	11.41 ± 2.14		

*P<0.05, p<0.01**, p<0.001***

A statistically significant difference was found between experimental and control groups males in flamingo balance test, bent arm hang (p<0.001), plate tapping, sit-up test, relative handgrip strength (p<0.01), standing long jump and handgrip strength (p<0.05). The difference was in favor of the experimental group. There was not a statistical difference between the flexibility values of the groups (p>0.05) (Table 2).

Table 3. Characteristic features of the females in the study

Variable	n	Group	$\bar{x} \pm s_x$	t	p
Age (Year)	10	Experimental	11.90 ± 0.18	-0.557	0.591
	10	Control	12.00 ± 0.00		
Body weight (kg)	10	Experimental	36.30 ± 1.16	1.005	0.328
	10	Control	34.10 ± 1.85		
Length (cm)	10	Experimental	146.30 ± 1.76	0.978	0.341
	10	Control	143.70 ± 1.99		
Body Mass Index (kg/m^2)	10	Experimental	16.92 ± 0.29	0.544	0.597
	10	Control	16.49 ± 0.73		

There was not a statistical difference in the values of age, body weight, height and body mass index of the females in the experimental and control groups (p>0.05) (Table 3).

Table 4. The physiological features of the females in the study

Variable	n	Group	$\bar{x} \pm s_x$	t	p
Flamingo Balance Test	10	Experimental	6.20 ± 0.51	-4.802	**0.001*** **
	10	Control	12.40 ± 1.19		
Standing long jump (cm)	10	Experimental	151.20 ± 5.34	3.084	**0.006****
	10	Control	128.10 ± 5.25		
Plate tapping	10	Experimental	8.95 ± 0.42	-0.583	0.567
	10	Control	9.29 ± 0.41		
Sit-up test (number)	10	Experimental	16.90 ± 3.26	2.219	**0.040***
	10	Control	9.10 ± 1.30		
Flexibility (cm)	10	Experimental	26.80 ± 0.85	0.193	0.849
	10	Control	26.50 ± 1.30		
Handgrip strength (kg)	10	Experimental	16.00 ± 0.87	1.559	0.137
	10	Control	13.30 ± 1.50		
Relative handgrip strength (kg)	10	Experimental	0.44 ± 0.02	1.422	0.179
	10	Control	0.39 ± 0.03		
Bent arm hang (sec)	10	Experimental	14.34 ± 1.25	2.064	0.054
	10	Control	9.22 ± 2.14		

*P<0.05, p<0.01**, p<0.001***

A statistically significant difference was found between experimental and control groups females in flamingo balance test (p<0.001), standing long jump (p<0.01), and sit-up test values in favor of the experimental group. There was not a statistical difference between the bent arm hang, plate tapping, flexibility values, handgrip strength and relative handgrip strength of the groups (p>0.05) (Table 4).

DISCUSSION

It is seen in related studies that using eurofit tests in order to measure the physical fitness levels of children is appropriate (Resources). Physical fitness

testing studies should focus on pre-adolescence and adolescence, for this reason, 10-12 age group was chosen in our study.

In this study, a statistically significant difference is found between the groups of males and females that play and do not play tennis. The difference is in favor of the groups that play tennis. In the study conducted by Bağcı, a statistically significant difference was found between flamingo balance test values of the group of females at 10-12 age group who do gymnastics and that of who do not do any exercise at the same age group (Bağcı, 2009). This result is similar to our study's. It is thought that playing tennis has a positive effect to the balance skills of adolescences.

When plate tapping test in the study is examined, a significant result is found in favor of the male experimental group. It is revealed that this value is not significant in females. In the study conducted on 14-16 age group by Koç, when Plate Tapping Test parameter is examined, it is seen that there is a significant difference (Koç, 1996). The values coincide with the result in males. It is thought that playing tennis contributes the manual skills of the males in this age group.

In the sit and reach test, a statistically significant difference has not been found between the groups and genders. In the study conducted by Saraç, it was reported that there was no statistically significant difference in the sit and reach test measurements of the groups before and after the training (Saraç, 2012). It is thought that the result is insignificant due to the flexibility characteristics of the female and male adolescences because of their ages. It is observed that the values that Saraç had found are similar to those we found. It is reached the conclusion that playing tennis does not contribute flexibility.

In the study, it is revealed that standing long jump values are statistically significant for both males and females. In the study titled as "A comparison of Some Physical and Physiological Parameters of Male Athletes in the Age Group of 13-15 in Individual and Team Sports" that was conducted by Koç et.al, it was stated that a significant result had not found in standing long jump test (Koç et.al, 2010). It is thought that tennis trainings for increasing leg strength of adolescences playing tennis caused significant results in the experimental group of our study.

When bent arm test is examined, it is found that this value is insignificant for females while it is significant for males. In the study conducted by Çelebi, it was reported that there was no significant difference in bent arm hang test measurements (Çelebi, 2000). It is thought that the significant resultof that males have more arm strength when compared to females is related to the increase in arm strength of the males who play tennis.

As for the values of sit-up and handgrip strength values, in this study sit-up and handgrip strength values revealed statistically significant results in favor of males, but only sit-up test values were significant in favor of females. According to the reports of the study that compared AAHPERD and NCYFS norms conducted by Erol, sit-up values of the children at the age group of 10 were between 33-34in AAHPERD and between 34-35 in NCFYS (Erol, 2011).

In his study, Mazlumoğluhas revealed that there is no statistically significant difference between the data obtained in the comparison of both group amongst themselves.Mazlumoğlu stated that the means of male groups and female groups were found close with each other (Mazlumoğlu 2015). Studies report that strength exercises do not effect strength improvement much in this age group (Loğoğlu, 2002). Although it is lower when compared to AAHPERD and NCFYS, short term tennis trainings create effect on these levels and it is thought that these values will increase with long term trainings.

Consequently, playing tennis affects flamingo balance test, bent arm hang, plate tapping, sit-up test, relative handgrip strength, standing long jump and handgrip strength positively in males and flamingo balance test, standing long jump and sit-up tests are affected positively in females. However, in females, no positive effect is observed in bent arm hang, plate tapping values, handgrip strength and relative handgrip strength. In addition, there is no positive effect on flexibility values in both males and females. As a consequence of the study, it is inferred that playing tennis can provide positive contribution to some selected eurofit test battery values.

REFERENCES

Bağcı E. 10 – 12 Yaş grubu ile aerobik jimnastik branşı ile uğrasan yarışmacı bayan sporcular ile aynı yaş grubu sedanter öğrencilerin bazı fiziksel özelliklerinin eurofit test bataryası ile karşılaştırılması. Doktora Tezi, Gazi Üniversitesi, Ankara, 2009; ss 40-49

Çalış M. Beden Eğitimi Dersine Katılan, Katılmayan ve Spor Yapan 15–16 Yas Grubu Erkek Öğrencilerin Fizyolojik Parametrelerinin Eurofit Test Bataryasıyla Mukayesesi. Sağlık Bilimleri Enstitüsü, Beden Eğitimi ve Spor Anabilim Dalı, Yüksek Lisans Tezi, Ankara: Gazi Üniversitesi, 1993.

Çelebi F. 12 – 14 Yaş Grubu Puberte Dönemi Spor Yapan ve Sedanter Öğrencilerin Posturel ve Biyomotor özelliklerinin karşılaştırılması. Yüksek Lisans Tezi, Muğla Üniversitesi, Sosyal Bilimler Enstitüsü, Muğla, 2000; ss 42-50

Demir İ. Beden Eğitimi ve Sporun Beceri, Yetenek gelişimlerine etkisi (11–13 yas grubunda Eurofit test değerlendirmesi). Sosyal Bilimler Enstitüsü, Beden Eğitimi ve Spor Öğretmenliği Anabilim Dalı. Yüksek Lisans Tezi, Sakarya: Sakarya Üniversitesi, 2001.

Erol K. Çocuklarda Fiziksel Uygunluk Düzeyini Belirlemede Kullanılan Eurofit ve Fitnessgram Test Bataryalarının Türk Çocuklarında Uygulanması. Sağlık Bilimleri Enstitüsü, Beden Eğitimi ve Spor Anabilim Dalı, Yüksek Lisans Tezi, İstanbul: Marmara Üniversitesi, 2011.

Hasan K. Şehit Asım İlköğretim okulu ve Trakya Üniversitesi Devlet Konservatuarı ilköğretim okulunda okuyan öğrencilerin eurofit testleri ile fiziksel kondisyonlarının değerlendirilmesi. Yüksek Lisans Tezi, Trakya Üniversitesi, Edirne, 2008; ss 80-85

İri R, Başlamışlı A, Göksu Ö.C. 18-21 Yaş Arası Erkek Hentbolcularda Hazırlık Döneminde Uygulanan Çabuk Kuvvet Antrenmanının Fiziksel Ve Motorik Özelliklerinin İncelenmesi, İ.Ü. Spor bilimleri Dergisi 2003-11;3 ÖS:47-52

Koç H. 14 – 16 Yas Grubu Hentbolcu ve Beden Eğitimi Dersi Alan Öğrencilerin Bazı Fiziksel ve Fizyolojik Parametrelerinin Eurofit Test Bataryasında Değerlendirilmesi. Yüksek Lisans Tezi, Gazi Üniversitesi, Sağlık Bilimleri Enstitüsü, Beden Eğitimi ve Spor Anabilim Dalı, Ankara, 1996; ss 25-49

Koç H. Coşkun B. Yılmaz E. Çoban O. Yıldız, K. Bireysel ve takım sporlardaki 13–15 yaş grubu erkek sporcuların bazı fiziksel ve fizyolojik parametrelerinin karşılaştırılması. Mustafa Kemal Üniversitesi Beden Eğitimi ve Spor Bilimleri Dergisi, 2010; 1: 26.

Koç H, Kaya M, Sarıtaş N, Çoksevim B. Futbolcularda ve Tenisçilerde Bazı Fiziksel Ve Fizyolojik Parametrelerin Karşılaştırılması, Sağlık Bilimleri Dergisi (Journal of Health Sciences) 15(3) 161-167, 2006

Kızılaksam E. Edirne İl Merkezi ilköğretim Okullarındaki 12-14 Yas Grubu Aktif Olarak Spor Yapan ve Yapmayan (Beden Eğitimi Dersine Giren) Öğrencilerin Eurofit Test Bataryaları Uygulama Sonuçlarının Karşılaştırılması. Yüksek Lisans Tezi Edirne Trakya Üniversitesi Sağlık Bilimleri Enstitüsü, Beden Eğitimi ve Spor Anabilim Dalı, Edirne, 2006; ss: 30-50)

Loğoğlu M. 12 yaş grubundaki okullu çocukların eurofit test bataryası ile Fiziksel uygunluklarının Değerlendirilmesi. Yüksek Lisans Tezi, Selçuk Üniversitesi, Sağlık Bilimler Enstitüsü, Beden Eğitimi ve Spor Anabilim Dalı, Konya, 2002; ss 38-60

Mazlumoğlu, B.: 10-12 Yaş Arası Spor Yapan ve Yapmayan Kız Ve Erkek Öğrencilerin Fiziksel Kondisyonlarının Eurofit Test Bataryasıyla Karşılaştırılması, Atatürk Üniversitesi Sağlık Bilimleri Enstitüsü, Beden Eğitimi ve Spor Anabilim Dalı Yüksek Lisans Tezi, 2015.

Oja P, Tuxworth B. Eurofit For Adults: Assesment of Health-Related Fitness. Finland, Council of Europe, 1995:5-104.

Saraç, H. Futbol Branşında 12-15 Yas Gurubu Erkek Çocukların Fiziksel Gelişiminin Eurofit Test Bataryasıyla Değerlendirilmesi, Erciyes Üniversitesi Sağlık Bilimleri Enstitüsü Yüksek Lisans Tezi Temmuz 2012

Ziyagil M.A. Tamer K, Zorba E, Uzuncan S, Uzuncan H. Eurofit Test Bataryası Vasıtasıyla 1012 Yaşları Arasındaki E R K E K İlkokul Öğrencilerinin Fiziksel Uygunluk Ve Antropometrik Özelliklerinin Yaş Gruplarına ve Spor Yapma Alışkanlıklarına Göre Değerlendirilmesi, Bed. Eğ. Spor Bil. Der. I (1996), 1: 20-28