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Uzun Süreli Egzersiz Eğitiminin 12–15 Yaş Çocuklarında Bazı Fiziksel ve Fizyolojik Parametreleri Üzerine Etkisinin İncelenmesi

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Özet

Toplumların temel amaçlarından birisi de fiziksel ve ruhsal açıdan sağlıklı bireyler yetiştirmektir. Doğumdan itibaren ergenliğin sonuna kadar hızlı bir süreç olan büyüme ve gelişmenin, beslenme ve fiziksel aktivite ile yakından ilişkili olduğu bilinmektedir. Değişen yaşam tarzıyla beraber fiziksel aktivitenin günlük yaşantımızdaki önemi gün geçtikçe artmaktadır. Bu nedenle sportif alışkanlıkların da diğer birçok alışkanlıklar gibi küçük yaşta edinilmesi ve çocuklara yaşamları boyunca kullanabilecekleri fiziksel becerilerin kazandırılması gerekmektedir. Bu çalışmanın amacı 12–15 yaş grubu erkek öğrencilerin eurofit testleri ile bazı fiziksel ve fizyolojik parametrelerinin araştırılmasıdır. Araştırmaya İzmir İli, Karabağlar, Buca ve Konak Bölgesi İlköğretim okullarında eğitim gören 12–15 yaşlarındaki 1002 erkek öğrenci gönüllü olarak katılmıştır. Öğrencilere boy uzunluğu, vücut ağırlığı, vücut yağ yüzdesi, dikey sıçrama, 20 m. sprint, pençe, bacak ve sırt kuvvetleri ile maxVO2, FVC ve FEV 1 testleri uygulanmıştır. Araştırmada 15 ay süreyle haftada 3 kez, birer gün arayla, 120 dk düzenli olarak, öğrencilerin gelişim dönemleri de göz önünde bulundurularak, temel ve yardımcı biyomotor yetileri geliştirici antrenmanlar yaptırılmıştır. Deney ve kontrol grubunun ön test değerleri karşılaştırıldığında, sadece maxVO2 değerlerinde anlamlı fark olduğu görülmüş, son test değerleri karşılaştırıldığında ise; 20 m. sprint, dikey sıçrama, vücut yağ yüzdesi, pençe ve sırt kuvvetleri ile FVC, FEV1 değerlerinde anlamlı fark varken, boy uzunluğu, vücut ağırlığı, bacak kuvveti ve maxVO2, değerlerinde anlamlı bir fark bulunmamıştır. 15 aylık düzenli egzersiz eğitiminin 12–15 yaş grubu erkek çocuklarının bazı fiziksel ve fizyolojik parametreleri üzerinde olumlu etkileri olduğu söylenebilir.

Anahtar Sözcükler: eurofit testleri, fiziksel uygunluk, fiziksel ve fizyolojik parametreler

Examining the Effects of Long Term Exercise Training on Some Physical and Physiological Parameters of 12-15 Years Old Children

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Abstract

The aim of this study is to make a determination about the case, by searching physical and physiological parameters with Eurofit tests of boy students at İzmir. The research was made on the age group of 12-15 years old, volunteer 1002 boy students who are studying at primary schools; those were chosen randomly in Karabağlar, Konak and Buca boroughs in İzmir. Height and weight, body fat percentage, vertical bounce, 20 m. shuttle run test test, max VO2, grip strength, leg strength, back strength, FVC and FEV1 tests were applied to these students. In conclusion, there were significant differences between test group and control group.

Key Words: Eurofit tests, physical fitness, physical parameters

Introduction

The aim of sports applications and exercises is to develop physically and mentally healthy societies. The importance of physical activities on daily life is getting higher by the changes of life styles. Thus, sports activities must be fell into as a habit by children at the early ages and physical abilities, which are gained at the time interval of elementary school ages to university ages, are very important to develop performance sports players.

There are physical and physiological tests are developed to examine how children can be trained at the puberty ages and to evaluate the effects on growth, development and health of persons by doing ordinary physical activities. Those tests specify the chronic and acute adaptation of many exercise levels on children (Pekel et al., 2006). Therefore, according to results of studies on children, low level of physical activity causes decreasing on flexibility, strength and speed level and insufficiency on cardiovascular endurance (Houwen, 2006). In this study, researching some physical and physiological values at long term regular exercise training on 12-15 ages of males is aimed.

Materials and Methods

1002 male children, whom are between 12-15 ages and study in Buca, Konak and Karabağlar territory elementary schools in İzmir are chosen as test subjects. The mean of ages of experimental group is 13,511 ± 0.81 (n=512); and the mean of ages of control group is 13.18 ± 0.81 (n=490). By considering their developing ages, there were trainings applied, which develop the basic and secondary biyomotor abilities, to the children on experimental group 2 hours per a day, 3 days for a week by 1 day break for 15 months. Trainings were designed as 8 weeks trainings (2 mesocycles) and started with the exercises which develop aerobic endurance. At the further stages strength and flexibility trainings are started and after those speed trainings were applied. From the beginning of sixth month, specific studies, which were include parameters and exist on test batteries, begun and measurements of height, weight, 20 m. shuttle run test test, vertical bounce, Max VO_2, body fat percentage, grip, leg, back strength with Forced Vital Capacity (FVC) and Forced Expiration Volume (FEV1) were recorded.

Data Collecting Tools

Test subjects weights were measured when their feet were naked and when they were wearing short pants. Heights are measured while they were standing still. Grip, back and leg strength measures taken by Takkei branded back and lift dynamometer. On 20 m. shuttle run test measurement, after test subjects had warming training for 15 minutes, by using chronometers with photocells, the values were recorded in "seconds" unit. For the vertical bounce test, electronic jump-meter was used to record the values. Anaerobic strength of sportsmen were calculated by the Lewis formula which is P=4.9 x Body weight x D (Özer, 2001). Maximal Oxygen usage (Max VO_2) is measured by the 20 meter shuttle run test. Lung functions were measured by Microlab ML3300 branded spirometer. Spirometer measurement was done by the following procedures; subjects nose were hold by a ratchet, after a deep inspiration and strong expiration, the value written on spirometer's digital screen was recorded. All measurements were replied for 3 times and best values were recorded. Body fat percentage was measured by using Skinfold Caliper with the following formula;

Body Fat % = 2,662566 x 0.5819738 X_1+ 0.2770687 X_2

X_1= Abdominal skinfold measurement (mm)

X_2= Thigh skinfold measurement (mm) (Doğu, 1981).

Analysis of Data

SPSS 17.0 is used to perform analyzes. Means and standard deviations of all variables calculated. Independent Samples T-Test is performed to find out if significant difference exists between experimental and control group. Paired Samples T-Test performed to find out if significant difference exists between the first and the last tests of either experimental or control group.

Results

Table 1. First and Last Tests of Control Group

Variables	Tests	$\overline{X}$	SD	T-Test
Height (cm)	First	153,03	12,45	20,237**
	Last	158,87	12,42	
Weight (kg)	First	43,17	11,16	1,839
	Last	47,13	11,16	
Grip Strength (kg)	First	20,58	8,32	1,422
	Last	21,30	8,32	
Leg Strength (kg)	First	76,99	26,68	1,428
	Last	78,04	26,79	
Back Strength (kg)	First	62,11	16,79	-1,746
	Last	62,86	16,85	
20 meter Shuttle Run (sec)	First	4,21	0,32	1,767
	Last	4,11	0,32	
Vertical Bounce (cm)	First	37,46	6,10	-1,683
	Last	38,48	6,11	
Max VO_2	First	32,97	4,12	-1,012
	Last	32,93	4,11	
Body Fat Percentage (%)	First	9,28	2,72	0,246
	Last	9,43	2,73	
FVC (lt)	First	3,46	0,60	0,924
	Last	3,04	0,61	
FEV1 (lt)	First	2,91	0,54	-1,167
	Last	2,91	0,54	

*(P<0.01) ** (P<0.05)

Table 2. First and Last Tests of Experimental Group

Variables	Tests	$\overline{X}$	SD	T-Test
Height (cm)	First	154,09	11,43	20,164**
	Last	160,23	11,43	
Weight (kg)	First	42,84	11,66	0,712
	Last	45,72	11,73	
Grip Strength (kg)	First	20,79	7,27	9,121**
	Last	23,80	7,50	
Leg Strength (kg)	First	74,93	23,34	15,289**
	Last	83,17	23,20	
Back Strength (kg)	First	64,34	17,63	19,659**
	Last	73,19	17,99	
20 meter Shuttle Run	First	4,02	0,30	7,782**
	Last	3,87	0,24	
Vertical Bounce (cm)	First	40,77	5,83	7,953**
	Last	43,13	4,22	
Max VO2	First	30,98	4,13	14,114**
	Last	33,76	4,33	
Body Fat Percentage (%)	First	8,34	0,58	18,571**
	Last	8,02	0,60	
FVC (lt)	First	3,17	0,51	17,203**
	Last	3,4	0,51	
FEV1 (lt)	First	3,03	2,27	4,306**
	Last	3,23	2,24	

*(P<0.01) ** (P<0.05)

Table 3. First Tests of Experimental and Control Group.

Variables	Groups	$\overline{X}$	SD	T-Test
Height (cm)	Experimental	154,09	11,43	1,146
	Control	153,03	12,45	
Weight (kg)	Experimental	42,84	11,66	0,768
	Control	43,17	11,16	
Grip Strength(kg)	Experimental	20,79	7,27	1,892
	Control	20,58	8,32	
Leg Strength(kg)	Experimental	74,93	23,33	1,368
	Control	76,99	26,68	
Back Strength(kg)	Experimental	64,34	17,63	0,139
	Control	62,11	16,79	
20 meter Shuttle Run (sec)	Experimental	4,02	0,30	0,472
	Control	4,21	0,32	
Vertical Bounce(cm)	Experimental	40,77	5,82	1,503
	Control	37,46	6,10	
Max VO_2	Experimental	30,98	4,13	3,261**
	Control	32,97	4,11	
Body Fat Percentage (%)	Experimental	8,34	2,27	-2,348*
	Control	9,28	2,71	
FVC (lt)	Experimental	3,17	0,58	1,341
	Control	3,46	6,10	
FEV1 (lt)	Experimental	3,03	0,51	1,544
	Control	2,91	0,54	

*(P<0.01) ** (P<0.05)

Table 4. Last Tests of Experimental and Control Group

Variables	Groups	$\bar{X}$	SD	T-Test
Height (cm)	Experimental	160,23	11,43	1,172
	Control	158,87	12,42	
Weight(kg)	Experimental	45,72	11,73	0,764
	Control	47,13	11,16	
Grip Strength(kg)	Experimental	23,80	7,50	2,734**
	Control	21,3	8,32	
Leg Strength(kg)	Experimental	83,17	23,20	0,845
	Control	78,04	26,79	
Back Strength(kg)	Experimental	73,19	17,99	4,289**
	Control	62,86	16,84	
20 meter Shuttle Run(sec)	Experimental	3,87	0,24	7,297**
	Control	4,11	0,31	
Vertical Bounce(cm)	Experimental	43,13	4,22	5,892**
	Control	38,48	6,11	
Max VO_2	Experimental	33,76	4,33	1,273
	Control	32,93	4,11	
Body Fat Percentage (%)	Experimental	8,02	2,23	-2,611*
	Control	9,43	2,73	
FVC (lt)	Experimental	3,4	0,60	3,927**
	Control	3,04	0,61	
FEV1 (lt)	Experimental	2,91	2,23	-2,604**
	Control	3,23	2,73	

*(P<0.01) ** (P<0.05)

Discussion and Conclusion

According to the results of the first and last tests of control group, there were no changes on variables except height ones. When we compare the first and last tests of experimental group, we found positive changes between all variables except weight ones. On the result of the first tests of experimental and control group, there were similar values were recorded but Max VO2 variables of control group were slightly higher than experimental group's variables. However, when we look at the results of the last tests of experimental and control group, there were insignificant difference on height, weight, leg strength and Max VO2 variables; but there were significant differences on the values of grip strength, 20 m. shuttle run test, vertical bounce, body fat percentage, FVC, FEV1 variables.

Saygin et al. (2005) and Şenel (1998) reported in their study, those took 10-14 years old children as test subjects, that there was a difference on grip strength variables between experimental and control group ($p<0.01$).

Kuter et al. (1992) indicated in their study, which included basketball team at the age average 14.5, leg strength average of the team was 105±19.5 kg. Savaş et al. (1992) indicated in their study, which included basketball players with the ages of 14-16 as test subjects, leg strength average of test subject was 88.7 kg. Çimen et al. (1997) indicated in their study, which

included juvenile national table tennis players with age average 16.4, thattheirrelative leg strength average of test subject was 1,687 kg.

Zorba et al. (2000) indicated in their study, which included 13 Turkish national female handball players and 10 national Azerbaijani national handball players with the age of 15-17 as test subjects, back strength average of Turkish national handball team was 80.19±14.76 kg and of the Azerbaijani national teams' was 86.82±10.86 kg.. Kuter et al. (1992) indicated in their study, which included female basketball team with theage average 14.5 as test subjects; that theirback strength average of test subjects was 103±19.7 kg.

Cicioğlu (2000) had a study on 14-16 years old female handball players and applied 8 weeks training on experimental group. Analyzes show that averages of first and last 20 meters shuttle run test of experimental groupwere 3.99±0.27 and 3.60±0.23 sec respectively and 20 meters shuttle run test average of either first and last tests of control group was 4.04±0.34 sec. The results are as similar as the literature data.

Saygın et al. (2005) indicated in their study, which included 202 male children at the ages of 10-12 as test subjects, that vertical bounce averages of first and last test of experimental group were 28.47±4.82 cm and 31.30±5.60 cm respectively and vertical bounce averages of first and last test of control group were 27.38±5.07 cm and 28.72±5.87 cm.

Saygın et al. (2005) indicated in their study, which included 202 male children that max VO2 averages had significant difference between first and last test of experimental group but there weren't any increase between first and last test of control group.

Erol et al. (1999) indicated in their study, which included 24 male basketball players at the ages of 13-14 as test subjects, that body fat percentages of experimental group subjects were decreased after the trainings.

Akdur et al. (2001) indicated in their study, which included sportswomen as test subjects from several sport branches, that FVC averages of athletes, handball players and volleyball players were 3.18±0.45 lt, 3.32±0.28 lt and 3.40±0.34 lt respectively and the averages of FEV1 of athletes, handball players and volleyball players were 2.96±0.29 lt, 3.17±0.28 lt and 3.29±0.34 lt respectively. Biçer et al. (2006), Taşgın (2006) and Gökdemir et al. (2000) compared the differences on FVC and FEV1 variables between before and after the specific trainings and indicated that the variables taken after the exercise are higher than the variables that taken before the exercise.

In conclusion, training program, which was applied for 15 months, had positive effects on physical and physiological parameters.Most of the researchers study results, those achieved by using the eurofit test batteries on different age categories, support our study. Beside that, having different results on experimental group could be caused by personal differences such as environmental factors, training strength level and time length, test subjects' feeding habits, psychological and inheritance features.

REFERENCES

Akdur H et al. (2001). Farklı branşlardaki bayan sporcuların fiziksel ve fizyolojik özelliklerinin karşılaştırılması. Gazi Beden Eğitimi ve Spor Bilimleri Dergisi, 6, 2: 3–11.

Alpar R (2000). Spor bilimlerinde uygulamalı istatistik. Ankara: GSGM Yayınları, 151:178–179.

Biçer M, Akıl M (2006). The investigation of the effects of exercises at high-altitude on the respiratory parameters of female climber, Ichper. SD Anniversary World Congress: 452-454; November, 9-13, 2005.

Cicioğlu İ (2000). Müsabaka döneminde uygulanan 8 haftalık antrenman programının 14–16 yaş grubu bayan hentbolcuların fiziksel ve fizyolojik parametreleri üzerine etkisi. Gazi Beden Eğitimi ve Spor Kongresi Bildiriler: 40–41.

Çimen O et al. (1997). Erkek ve Bayan Türk genç milli masa tenisçilerin fiziksel ve fizyolojik profilleri. Gazi Beden Eğitimi ve Spor Bilimleri Dergisi, 2, 4: 7–12.

Doğu G (1981). Development of an equation to predict the percent body fat of 18-25 years old Turkish males trough skinfold testing. Unpublished doctorate dissertation, Oklahoma.

Erol E et al. (1999). 13–14 yaş grubu erkek basketbolculara yönelik dayanıklılık antrenmanının vücut kompozisyonu ile bazı fiziksel ve fizyolojik ve kan parametreleri üzerine etkisi. Gazi Beden Eğitimi ve Spor Dergisi 4: 12–20.

Gökdemir K, Koç H (2000). Hentbolcularda genel kuvvet antrenman programının bazı fizyolojik parametrelere etkisi.1.Gazi Beden Eğitimi ve Spor Bilimleri Kongresi.

Houwen S (2006). Test- retests reliability of EUROFIT physical fitness items for children with visual impairments. Pediatric Exercise Science, 18: 300-313.

Kuter M, Öztürk F (1992). Türkiye şampiyonu bir küçük yıldız basketbol takımının fiziksel ve fizyolojik profilinin dereceye girmemiş bir takım ile karşılaştırılması. Spor Bilimleri 2. Ulusal Kongresi.

Özer K (2001). Fiziksel Uygunluk. Ankara: Nobel Yayın Dağıtım: 61–194.

Pekel H et al. (2006). Spor yapan çocuklarda performansla ilgili fiziksel uygunluk test sonuçlarıyla antropometrik özellikler arasındaki ilişkilerin değerlendirilmesi. Kastamonu Eğitim Dergisi, 14, 1: 299–308.

Savaş S, Sevim Y (1992). 14–16 Yaş grubu kız basketbolcularda dairesel antrenman metodunun genel kuvvet gelişimine etkileri. Spor Bilimleri Dergisi, 3, 4: 40–47.

Savucu Y et al. (2004). Alt yapıdaki küçük, yıldız ve genç basketbolcuların bazı fiziksel uygunluk parametrelerinin incelenmesi. Fırat Üniversitesi Sağlık Bilimleri Dergisi 18, 4: 2005–200.

Saygın Ö et al. (2005). Çocuklarda Hareket Eğitiminin Fiziksel Uygunluk ve Özelliklerine Etkisi. Fırat Üniversitesi Sağlık Bilimleri Dergisi, 19, 3: 205–212.

Şenel Ö (1998). ilköğretim beden eğitimi dersi müfredat programına entegre edilen fiziksel uygunluk aktivitelerinin öğrencilerin fiziksel ve fizyolojik parametreleri üzerine etkileri. Gazi Beden Eğitimi ve Spor Dergisi, 3, 4: 27–34.

Taşgın E (2006). 10–16 Yaş grubu çocuklara uygulanan egzersiz programının solunum parametreleri üzerine etkisi. Selçuk Üniversitesi Sağlık Bilimleri Enstitüsü Fizyoloji Anabilim Dalı, Yayınlanmamış Yüksek Lisans Tezi, Konya.

Zorba E et al. (2000). Türkiye ve Azerbaycan bayan hentbol milli takımlarının fiziksel uygunluk ve antropometrik değerlerinin karşılaştırılması. Gazi Beden Eğitimi ve Spor Bilimleri 1.Kongresi, 1: 135–144