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PHYSICAL CONDITION EVALUATION OF STUDENTS BETWEEN 8-11 YEARS OF AGE BY EUROFIT TESTS

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SUMMARY

The aim of this study is to determine physical condition levels of students in the 8-11 age group, who follow PE courses two hours a week in two primary schools of Edirne, by means of the "Eurofit" test batteries. The study also seeks to contribute to prospective studies, as well as to provide data for creating national and geographical norms. With this purpose, a total of 160 students (n=80 boys, n=80 girls) were included in the research. There was no significant difference among schoolboys considering age, BMI, and flamingo, plate tapping, broad jumping, hand gripping and 10x5 m shuttle run tests ($p>0.05$). Heights, body weights ($p=0.026$ and $p=0.003$ respectively) sit-up and bent arm hang tests ($p=0.001$ for each) revealed significant differences between Conservatory (C) and Şehit Asım (ŞA) boys, with only the last parameter being in favor of the latter. Among girls from the two schools, there were no significant differences in age, height, broad jumping, hang gripping, and 10x5 m shuttle run tests ($p>0.05$). While BMI ($p=0.007$) and body weight ($p=0.001$) results were higher for C schoolgirls, and plate tapping favored them ($p=0.045$); flamingo ($p=0.022$), sit-up and bent arm hang tests ($p=0.001$ each) favored ŞA girls.

Key words: Eurofit, physical education, fitness, students, sports

ÖZET

ÖĞRENCİLERİN (8-11 YAŞ) FİZİKSEL UYGUNLUKLARININ EUROFIT TESTLERİ ARACILIĞINDA BELİRLENMESİ

Bu çalışmanın amacı, "Eurofit" test bataryaları aracılığında Edirne'de iki ilköğretim okulunda haftada iki saat beden eğitimi dersi gören 8-11 yaş grubu öğrencilerin fiziksel uygunluk düzeylerini belirlemekti. Böylelikle

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benzer yöndeki çalışmalara katkıda bulunmanın yanı sıra, bu alanda bölgesel ve ulusal ölçekte normların oluşturulmasına katkıda bulunacak bir veri tabanı da elde edilmiş olacaktır. Bu amaçla 80'i kız, 80'i erkek toplam 160 öğrenci çalışmaya dahil edildi. İki okulun erkek öğrencilerinin yaş, vücut kütle endeksi, flamingo, disklere dokunma, durarak uzun atlama, pençe kuvveti, 10x5 m mekik koşusu testlerinde anlamlı farklılık bulunmadı (p>0.05). Konservatuar İÖO (K) erkek öğrencilerin boyları (p=0.026) ve vücut ağırlıkları (p=0.003), Şehit Asım İÖO (ŞA) erkek öğrencilerinden yüksek; mekik ve bükülü kol asılma testleri sonuçları ise onlardan anlamlı düzeyde düşüktü (p=0.001). İki okulun kız öğrencilerinin yaş, boy, durarak uzun atlama, pençe kuvveti, 10x5 m mekik koşusu testlerinde anlamlı farklılık bulunmadı (p>0.05). K okulu kız öğrencilerinin vücut kütle endeksi (p=0.007) ve vücut ağırlıkları (p=0.001) ŞA öğrencilerine göre anlamlı düzeyde yüksek, disklere dokunma testi sonuçları çabuk (p=0.045) iken; ŞA kız öğrencilerinin flamingo (p=0.022), mekik ve bükülü kol asılma testleri (p=0.001) sonuçları anlamlı düzeyde daha iyiydi.

Anahtar sözcükler: *Eurofit, beden eğitimi, fiziksel uygunluk, öğrenci, spor*

INTRODUCTION

Studies related to healthy physical and psychological development of human beings have indicated that sport is a crucial constituent of creating a healthy society and increasing individual life standards (1,2,24). Participating in sports improves overall health of humans, who are the key elements of social, cultural and economical progress; facilitates their adaptation to the environment through gaining skills and talents; increases their strength to struggle and compete, and supports character development. It also secures solidarity, cohesion and peace among societies and nations (5-11,13,15,18,21,25,27). Sport, in current philosophy of life, is regarded as one of the most beneficial social activities and an inseparable part of quality life (11).

Although sport has specific features in each age group; between 8-11 years it has significantly different roles. The course of development and character formation can be favorably altered in this period. Applying Eurofit tests on children of different age groups can be beneficial for physical education teachers and trainers in determining their general health and diet conditions, in assessing their exercise habits and playing sports, in providing data on the anatomical and functional qualities of children, and in developing national norms and policies about children in physical education and sports (2,3-9,12-23,25,26,27).

Our aim in this study is to determine and compare fitness levels of students in the 8-11 age group, who take PE courses two hours a week at Şehit Asım Primary School (ŞA), and Trakya University State Conservatory School (C) by means of Eurofit test batteries. The following questions will be addressed:

Do ŞA or C students have better Eurofit test battery results when compared, and are there any gender differences among students of both schools in this respect?

Since physical norms of 8-11 age school children have not yet been formed as in other European countries, the data and results obtained will be the first one for Edirne province. Furthermore, these data and the results acquired will be used in similar studies, and will also contribute to practical applications.

MATERIAL and METHODS

Ethical approval was granted by the related commission for the contents and methods of this experimental research. It was carried out in connection to the Trakya University Health Sciences Institute, Physical Education and Sports Department. Results obtained from Eurofit test battery applications on 8-11 age students, who are educated in two schools of Edirne province centre, namely Şehit Asım Primary School (n=51 girls and 63 boys), and Trakya University State Conservatory Primary School (n=29 girls and n=17 boys) will be compared. A total of 160 students have completed all the tests successfully.

The stations and equipment to be used for the tests were prepared in accordance with the instructions indicated in Eurofit Test Batteries Handbook (3). The ages of the test subjects were recorded in years, based on birthdates in their school registration forms. For length measurements, a 1 m standard steel tape was used. A chronometer (RUN TEC 60330) sensitive to $1/100^{th}$ of a second was used for timed measurements in the tests. For the hand grip strength test, a dynamometer (Takei Physical Fitness Test Grip-D, Japan) was used. The testing equipment, the quality of testing and measurement methods are explained below.

Anthropometric tests: Height measurements of the subjects were made with a standard wall scale, to 0.1 cm sensitivity. Body weights of the subjects were recorded through a mid-sensitive electronic bathroom scale (Focus China), weighing 0-100kg at the nearest 0.1 kg.

Kinetic measurements (Eurofit test batteries): In the single leg balance test (Flamingo): the number of falls in 1 minute is recorded. In the limb movement test (plate tapping), the time in seconds is recorded. Standing broad jump is measured in cm. Bent arm hanging duration is registered in seconds. The number of sit-ups in 30 second is recorded. Hand dynamometry results are scored in kilograms. The 10x5 m shuttle run test scores are given in seconds (2,8,13,16,18,21,22,23,26).

Statistical analysis: The suitability of the data to normal variance was studied by the one-sample Kolmogorov-Smirnov test. In comparing data of students of both genders, t-test in independent groups was used for variables which displayed normal variance, and the Mann-Whitney U test was used for those which did not display. A packaged software (Statistica 7.0, serial No: 31NY6YUCV38) was used in the statistical analyses. The $p<0.05$ value was taken as the statistical significance limit.

RESULTS

Anthropometric measurements of the students: When age and body mass index (BMI) of boy students of the two schools were analyzed, no statistical significance was found ($p>0.05$). C schoolboys were taller and heavier ($p<0.05$) than their ŞA school counterparts (Table 1). In girl students, while there were no statistically significant differences for age and height ($p>0.05$), statistically significant differences ($p<0.05$) in body weight and BMI and was found in favor of C schoolgirls.

Table 1. Anthropometric measurements of the students (means ± SD)

Parameters	Boys			Girls		
	Conservatory P. S.	Şehit Asım P. S.	p	Conservatory P. S.	Şehit Asım P. S.	p
Age (yrs)	9.53 ± 1.20	9.62 ± 1.09	0.772	9.58 ± 1.08	9.45 ± 1.20	0.619
Height (m)	139.7 ± 19.3	135.1 ± 6.9	0.026	139.7 ± 11.8	135.2 ± 6.4	0.063
Weight (kg)	36.2 ± 7.4	30.8 ± 6.2	0.003	37.4 ± 9.4	30.4 ± 5.3	0.001
BMI ($kg.m^{-2}$)	18.6 ± 3.6	16.8 ± 2.4	0.070	19.2 ± 4.7	16.6 ± 2.3	0.007

Eurofit test scores of the students: Among the seven mobility test parameters assessed no statistically significant differences ($p>0.05$) were observed for the flamingo, plate tapping, standing broad jump, grip strength, and 10x5 m shuttle run tests between boys from the two schools. In contrast, sit-up and bent arm hang test results were significantly higher ($p<0.05$) in the ŞA schoolboys (Table 2).

Table 2. Eurofit test results of students of both schools by gender (means ± SD)

Eurofit tests	Boys			Girls		
	Conservatory P. S.	Şehit Asım P. S.	p	Conservatory P. S.	Şehit Asım P. S.	p
Flamingo (n)	10.7 ± 4.4 (n=9)	9.3 ± 4.7 (n=44)	0.433	12.1 ± 5.0 (n=21)	8.7 ± 5.6 (n=43)	0.022
Plate tapping (s)	12.4 ± 2.1 (n=17)	13.0 ± 1.6 (n=63)	0.212	12.3 ± 1.8 (n=29)	13.2 ± 1.9 (n=51)	0.045
SB jump (cm)	128 ± 29 (n=17)	136 ± 19 (n=63)	0.160	128 ± 28 (n=29)	124 ± 18 (n=51)	0.334
Hand grip (kg)	15.8 ± 3.3 (n=17)	14.7 ± 3.0 (n=63)	0.217	15.5 ± 3.2 (n=29)	14.5 ± 3.2 (n=51)	0.264
Sit-up (n)	15.8 ± 6.2 (n=16)	23.8 ± 3.7 (n=63)	0.001	17.2 ± 6.1 (n=27)	21.7 ± 3.7 (n=51)	0.001
Bent arm hanging (s)	3.73 ± 4.45 (n=11)	13.6 ± 8.0 (n=62)	0.001	2.93 ± 1.70 (n=17)	9.84±9.14 (n=51)	0.001
Shuttle run (10x5 m) (s)	22.0 ± 2.5 (n=29)	21.6 ± 2.0 (n=51)	0.441	21.9 ± 1.7 (n=29)	22.5 ± 1.7 (n=51)	0.183

When the girls' results were analyzed; there were no statistically significant differences ($p>0.05$) among the two schools for the standing broad jump, grip strength and 10x5 m shuttle run test. While flamingo, sit-up, and bent arm hanging test results proved to be significantly ($p<0.05$) better for the ŞA schoolgirls, the opposite was true for plate tapping.

DISCUSSION

This research was made on a total of 160 schoolboys and schoolgirls in the 8-11 age group, 114 of whom were randomly selected students who took two hours a week physical education courses at the Şehit Asım Primary School in the centre of Edirne province, in the 2007-2008 school year. Another 46 students who also took physical education courses two hours a week were selected from the Trakya University State Conservatory Primary School. Data acquired were compared with those of similar studies (Table 3).

Comparison of test results with those of similar studies: The arithmetic mean and standard deviation of test results from the present study and similar ones (8,18,21) are given in Table 3, according to gender. Accordingly, while stature measurements were higher than those of Tınazcı et al (21), body weight measurements proved to be lower than theirs. In the flamingo test, both schoolboys and schoolgirls in the present study performed better than their counterparts in the Pilianidis et al (18) and Tınazcı et al (21) studies.

Table 3. Test comparisons of various studies (means ± SD)

Eurofit tests	Chasan-Toksöz (8-11 yrs)		Tınazcı et al (21) (7-11 yrs)		Pilianidis et al (18) (8-11 yrs)		Demirel et al (8) (7-11 yrs)	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Height (m)	136.8 ± 8.9	136.1 ± 7.6	131.6 ± 5.4	131.6 ± 6.1				
Weight (kg)	33.0 ± 7.8	32.0 ± 6.8	33.1 ± 7.1	33.0 ± 7.5				
Flamingo (n)	10.0 ± 5.6	9.5 ± 4.7	12.7 ± 3.9	13.2 ± 2.6	12.5 ± 9.9	13.7 ± 9.1		
Plate tapping (s)	12.9 ± 1.9	12.9 ± 1.7	18.9 ± 3.5	18.7 ± 3.3	15.9 ± 2.8	15.4 ± 2.8	14.0 ± 1.7	14.3 ± 1.9
SB jump (cm)	126 ± 22	135 ± 22	102 ± 16	103 ± 16	140 ± 23	152 ± 21		
Hand grip (kg)	14.9 ± 3.2	15.0 ± 3.1	12.9 ± 2.3	13.5 ± 6.1	16.2 ± 5.1	17.8 ± 4.3	18.6 ± 4.1	22.3 ± 6.1
Sit-up (n)	20.1 ± 5.1	22.2 ± 5.4	16.5 ± 3.8	17.9 ± 3.6	17.0 ± 4.1	18.7 ± 4.8	14.2 ± 3.6	18.2 ± 3.0
Bent arm hanging (s)	8.11 ± 8.49	12.1 ± 8.3	3.26 ± 3.33	4.61 ± 5.21	4.92 ± 6.84	8.93 ± 8.75		
Shuttle run (10x5) (s)	22.3 ± 1.7	21.7 ± 2.1	26.1 ± 2.3	25.0 ± 1.9	22.7 ± 1.7	21.3 ± 1.8	25.2 ± 1.6	24.2 ± 1.8

Note: Blank cells indicate unapplied tests

The plate tapping test results of the present study were faster than those in all three studies (8,18,21). While standing broad jump findings acquired were higher than those of Tınazcı et al (21), they were lower than the research findings of Pilianidis and coworkers (18). While hand grip strength results proved to be higher than those in the Tınazcı et al (21) research, they were lower than those obtained in both other studies (8,18). The sit-up test findings of the present research were also higher than those obtained in the studies referred (8,18,21). Bent arm hanging test results were better than those in the studies compared (18,21). Shuttle run test results were faster than those of Demirel et al (8) and Tınazcı et al (21), and in parallel with the research findings of Pilianidis and coworkers (18).

The ŞA schoolboys and schoolgirls performed especially better in the sit-ups and bent arm hang tests ($p<0.001$). As the body weights of the conservatory students are higher in comparison with the students of the other school ($p<0.001$ for girls, $p<0.003$ for boys), it is possible to say that this may be a reason for their bent arm hang test results being poorer. Similar results obtained in both sexes put forward that body weight is a handicap for this test.

Some suggestions may be made as a result of the study. Physical education courses and sports activities are crucial for the development of qualities such as coordination, endurance, strength, speed and mobility in 8-11 age children who are primary school students. For that reason, the number of PE classes in these schools should be increased. So, the curriculum applied in schools can be reformed in such a way that it can improve the physical and motoric qualities of students. In this respect, parents should also be informed about the contribution of PE courses and sports to the health and growth of their children. The passtimes of school age students may thus be turned into good account efficiently, once they are guided to join sport activities.

By applying the Eurofit test batteries in the schools; the selection and guidance of students at the age of getting involved in a sport can be done in the right time, and important criteria can be checked in determining talented students. The Eurofit test batteries may be applied on more subjects in different age groups, as well as on sportspeople in various branches. The results of the present research may also be compared with similar ones carried out in different regions or provinces of our country, as well as abroad.

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