8-12 YAŞ GRUBU İLKOKUL VE ORTAOKUL ÖĞRENCİLERİNİN PERFORMANSLA İLGİLİ FİZİKSEL UYGUNLUKLARININ DEĞERLENDİRİLMESİ

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ÖZET

Amaç: Bu çalışmanın amacı 8-12 yaş arası ilkokul ve ortaokul öğrencilerinin performansla ilgili fiziksel uygunluk düzeylerinin yaş gruplarına ve cinsiyetlerine göre tespit edilmesi ve değerlendirilmesidir.

Yöntem: Araştırmaya Gaziantep ilindeki ilkokul ve ortaokullardan 118 öğrenci katılmıştır. Deneklerin boy uzunluğu vücut ağırlığı ölçülerek vücut kitle indeksi, deri kıvrım ölçümleri alınarak vücut yağ yüzdesi hesaplandı. Performansla ilgili fiziksel uygunluğun tespitinde; otur-uzan, 20 m mekik koşu testi, el kavrama kuvveti, sırt kuvveti ve dikey sıçrama testleri uygulandı. İstatistiksel analizde SPSS 16.0 programı kullanılmıştır. İkili gruplar için Independent Samples T testi, çoklu gruplar için One Way ANOVA ve Scheffe testleri kullanılmıştır.

Bulgular: Cinsiyet değişkenine göre vücut ağırlığı, vücut kitle indeksi, 20 m mekik koşu testi, sağ ve sol el kavrama kuvveti ve sırt kuvveti parametrelerinde anlamlılık tespit edilmiştir ($p<0.05$).Yaş değişkenine göre boy uzunluğu, vücut ağırlığı, 20 m mekik koşu testi, dikey sıçrama test sonuçlarına göre anlamlılık tespit edilmiştir ($p<0.05$).

Sonuç: Sonuç olarak, fiziksel uygunluk parametrelerinin yaş ile paralel bir gelişim sergilediği ve gelişim dönemi özellikleri gereği kız öğrencilerin erkek öğrencilere oranla, bu dönemde daha hızlı büyüme ve gelişmelerinden dolayı, daha yüksek sonuçlara sahip olduğu söylenebilir.

Anahtar Kelimeler: İlkokul, Ortaokul, Performans, Fiziksel Uygunluk

THE EVALUATION OF PHYSICAL FITNESS RELATED TO THE PERFORMANCE OF THE PRIMARY AND SECONDARY SCHOOLS STUDENTS IN 8-12 AGE GROUP

ABSTRACT

Aim: Purpose of this study was comparison of physical fitness parameters that related to performance such as aerobic power, anaerobic power, flexibility, and strength, of primary and secondary school students who were 8-12 years old according to gender and age.

Method: Students (n=118) who were from primary and secondary schools in Gaziantep participated in this study. Body mass index calculated from height and weight, body fat percentage calculated from skinfold measure. Measurements about of performance related physical fitness parameters were applied such as sit and reach, 20m shuttle run, hand grip strength, back strength, vertical jump. SPSS 16.0 program used for statistical analysis. Independent Samples T test was used for binary groups, One Way ANOVA and Scheffe tests used for multiple groups.

Results: According to gender variable, significance was found in height, weight, body mass index, $MaxVO_2$, right and left hand grip strength, back strength parameters ($p<0.05$). According to age variable, significance was found in height, weight, $MaxVO_2$, vertical jump and anaerobic power ($p<0.05$).

Conclusion: As a result, it can be said that physical fitness parameters have shown parallel development with age; and female students had higher results than male students because of female students have faster growth and development in this development period.

Key Words: Primary School, Secondary School, Performance, Physical Fitness

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INTRODUCTION

One of the basic features of childhood period is the growth and development process experienced in this period. Examining the child physical features independently from the growth and development periods can lead to misleading results (15). The physical development of a child is also the problem of the developed country as well as the problem of the developing country .Therefore, the researches containing the comparisions and deternination of physcal performance and physical fitnesses of the children in various age group are considered as important (9, 22).

The physical fitness includes the elements related to both health and skill. While the physical fitness components related to health are accepted as cardiovascular endurance, muscular strength and endurance, body composition and flexibility, the pyhsical fitness components related to the performance include also agility, strength, speed and balance components (4, 6, 10). It could be hypothesized that the physical fitness parameters could be differ according to gender, and could be positively different with increasing age. Purpose of this study was determine and evaluate to physical fitness parameters, related to performance such as aerobic power, anaerobic power, flexibility, and strength, of primary and secondary school students who are 8-12 years old according to gender and age.

MATERIAL AND METHOD

This study was made in the primary and secondary schools connected with Gaziantep Province Directorate for National Education. The population of the research consists of the children between 8-12 age in the Gaziantep province center. The measurements were made on total 118 children for the research. All the subjects were informed about the working plan and purpose, and a written voluntary consent. For this study, measurements were taken in the primary and secondary schools specified in advance by taking the necessary permits from the Directorate of Province National Education and Gaziantep University Clinical Researches Ethics Committee. Body mass index (BMI) was calculated by measuring the height and body weight of the subjects, body fat percentage (BFP) was calculated by measuring the skinfold (3). On the determination of the physical fitness related to the performance; flexibility (11) was determined by the sit-reach test (11), $MaxVO_2$ (26) was determined by 20m shuttle run test, aneorobic power (3) features were determined by vertical jump test, and rigth-left hand grip strength (20), back strength (30) testes were applied. The obtained data were evaluated in terms of gender and age group variables.

Table 1. Age and gender distribution of research group

Variable	Groups	Frequency	Percentage
Gender	Male	69	58.5
	Female	49	41.5
Age	8 age group	22	18.64
	9 age group	22	18.64
	10 age group	24	20.34
	11 age group	24	20.34
	12 age group	26	22.04

N=118

The Analysis of the Data: The statistical analysis of this study were made by using the program of SPSS 16.0 statistic program. Before the statistical processes, normal distribution was controlled. Independent sample t test was used in the comparision of dual groups, One Way ANOVA was used in the comparison of the multiple groups and Scheffe test was used in order to determine among group differences. Significant level was set 0.05.

RESULTS

Table 2. Comparison of the data in accordance with gender

Variable	Groups	N	Mean	S.D.	t	p
Age (year)	Male	69	10.84	0.93	0.778	0.439
	Female	49	10.67	1.28		
Body Length (cm)	Male	69	154.61	10.19	-0.996	0.322
	Female	49	156.20	7.22		
Body Weight (kg)	Male	69	46.38	12.11	-2.056	**0.042**
	Female	49	51.00	11.86		
BMI (kg/m^2)	Male	69	19.27	4.09	-1.988	**0.049**
	Female	49	20.81	4.20		
Flexibility (cm)	Male	69	15.46	7.55	-1.602	0.112
	Female	49	17.59	6.51		
BFP (%)	Male	69	11.63	2.75	-1.008	0.316
	Female	49	12.05	1.71		
MaxVO$_2$ (ml/kg/dk)	Male	69	33.00	5.08	5.354	**0.000**
	Female	49	29.32	2.20		
Right Hand Grip Strength (kg)	Male	69	22.59	5.33	2.235	**0.027**
	Female	49	20.40	5.12		
Left Hand Grip Strength (kg)	Male	69	18.46	4.12	2.194	**0.035**
	Female	49	16.14	3.96		
Back Strength (kg)	Male	69	59.57	17.96	5.331	**0.000**
	Female	49	43.36	13.52		
Vertical jump (cm)	Male	69	25.70	7.51	1.488	0.140
	Female	49	23.48	8.59		
Aneorobic power (kg.m/sec)	Male	69	51.73	15.85	-0.609	0.544
	Female	49	53.49	14.80		

When the physical fitness parameters were examined in accordance with gender, significance was found in body weight, BMI, MaxVO$_2$, right and left hand grip strenghts and bach strenght (p<0.05). Statistical significance was not found in the values of body length, flexibility, BFP, vertical jump and anaerobic strength (p>0.05).

Table 3. Comparison of the data in accordance with the age group

Variable		Sum of Squares	df	Mean Square	F	p	Significant Difference*
Body Length (cm)	Between Groups	2843.196	4	710.799	15.907	**0.000**	4-1, 5-1
	Within Groups	6792.126	114	59.580			5-2, 5-3, 5-4
	Total	9635.322	117				
Body Weight (kg)	Between Groups	2154.877	4	538.719	5.396	**0.002**	5-1
	Within Groups	15175.753	114	133.121			5-2
	Total	17330.630	117				
BMI (kg/m^2)	Between Groups	61.573	4	15.393	1.176	0.322	-
	Within Groups	1989.156	114	17.449			
	Total	2050.729	117				
Flexibility (cm)	Between Groups	49.870	4	12.467	.317	0.813	-
	Within Groups	5986.479	114	52.513			
	Total	6036.350	117				
BFP (%)	Between Groups	30.434	4	7.608	1.835	0.145	-
	Within Groups	630.249	114	5.528			
	Total	660.683	117				
MaxVO$_2$ (ml/kg/dk)	Between Groups	583.584	4	145.896	12.396	**0.000**	5-1, 5-2, 5-3, 5-4
	Within Groups	1788.914	114	15.692			
	Total	2372.498	117				
Right Hand Grip Strength kg)	Between Groups	131.595	4	32.899	1.564	0.202	-
	Within Groups	3196.598	114	28.040			
	Total	3328.194	117				
Left Hand Grip Strength (kg)	Between Groups	116.670	4	29.167	1.413	0.244	-
	Within Groups	3067.448	114	26.907			
	Total	3184.118	117				
Back Strength (kg)	Between Groups	1210.136	4	302.534	1.242	0.298	-
	Within Groups	37010.680	114	324.655			
	Total	38220.816	117				
Vertical Jump (cm)	Between Groups	629.275	4	157.319	3.473	**0.018**	5-1, 5-2, 5-3, 5-4
	Within Groups	6885.024	114	60.395			
	Total	7514.299	117				
Aneorobic power (kg.m/sc)	Between Groups	5525.180	4	1381.295	9.481	**0.000**	5-1, 5-2, 5-3, 5-4
	Within Groups	22145.797	114	194.261			
	Total	27670.977	117				

*Groups: 1. 8 Age, 2. 9 Age, 3. 10 Age, 4. 11 Age, 5. 12 Age

According to age variable ;

In the paratemeter of body length; significance was determined in the favour of 12 age group between 12 age groups and other age groups, and in the favour of 11 age group between 11 age group and 8 age group (p<0.05).

In the paratemer of body length; significance was determined in the favour of 12 age group between 12 age group and 8 age group, and in the favour of 12 age group between 12 age group and 9 age group (p<0.05).

In the parameter of MaxVO$_2$; significance was determined in the favour of 12 age group between 12 age group and other age groups (p<0.05).

In the patameter of vertical jump; significance was determined in the favour of 12 age group between 12 age group and other age groups (p<0.05).

In the parameter of aneorobic power; significance was determined in the favour of 12 age group between 12 age group and other age groups (p<0.05).

In the parameters of BMI, Flexibility, BFP, right and left hand grip strength, back strength, a significance was determined statistically (p>0.05).

DISCUSSION

118 students taking education in primary and seccondary schools in Gaziantep participated in the study made by us and it was aimed to determine their physical fitness related to performance by making various physical and physiological measurements.

Average age of the male students having participated in our study was 10.84±0.9 years, the average age of the female students was found as 10.67±0.47 years. It was seen that the students who participated in our study were in the age of primary and secondary school.

There is no statistically difference between male and female students according to body length (p>0.05). Significance was found statistically between 11 age group and 8 age group, and between 12 age group and other age groups (p<0.05).The result we obtained doesn't coincide with literature (14, 25). Annual heigh growth rate in males is as much as half of females beetween 9-12 ages. While height increase in the females in 13 years old slows down, it speeds up in the males.As of the age of 15, they start to show a parallel growth with females. The differences in the height growth speed constitute the impression that the females between 10 and 13 ages is longer than males (18). In accordance with this information, it was seen that the female students in this age gap had longer body length than male students and it is thought that its' reason has been resulted from the developmental period features that they have.

Significant difference was found between male and female students in body weight (p<0.05). Significance was determined statistically between 8 age

with 9 age groups and 12 age group (p<0.05). The data obtained show similarity with the results of other studies placed in the literature (14, 17). Body weight between 8-12 ages in males is lower than females and there is an effect of entering into puberty late (18). In line with this information,in our study, it was seen that female students had higher body weight in this age range than male students and it is thought that its' reason has been resulted from the developmental period features that they have.

Between male and female students, statistical significance was found in BMI (p<0.05), but was not found among age groups (p>0.05). It was seen that the BMI values we obtained from our study were 75 percentile in males, 85 percentile in females (19) in accordance with Turkish referance, 85 percentile in males, 95 percentile in females in accordance with Gaziantep referance (25). In accordance with the data we obtained from our study, it was determined that the values of the research group coincided with the Turkish referance values, but above the Gaziantep referance values. The reason why they came above the Gaziantep reference values can be thought that it stemmed from the neighborhood where the families, who had a certain income level from the schools.

Significance was not found according to gender variable and age variable of subjects in flexibility (p>0.05). These results support the scientific publications issued beforehand (24, 25). According to Weineck (1986), the flexibilty ability is higher in females and the high flexibilty of the females depends on their tissue to be looser (28). By depending on the information above, it is thought that;

since female students have lower muscle tissue and more fat tissue density than male students, their flexibility values are higher .

In BFP, significant differ was not observed in age and gender variables ($p>0.05$). When the literature was examined, similarity was seen with the results we obtained (23, 29). In literature, it was found that total skin thickness on the body and organs in females after 7 years increase together with age linear proportionally. Besides, it is emphasized that the skin thickness of males increase up to 13 times, it shows a little deviation when they are in 14 years, and, in later ages, a decrase occurs on the skin thickness gradually until late adolescence.Besides, it is known that fat tissue increases in females while estrogen level increases together with puberty, the fat tissue decreases in males (8, 12, 13, 16, 19). In line with this information, it was seen that in our study the female students had higher subcutaneous fat thickness and body fat percentage than the male students in this age range and it is thought that its' reason has been resulted from the developmental period features that they are in.

Significance were found in MaxVO$_2$ between male and female studens ($p<0.05$), and determined between 12 age group and 8 age, 9 age, 10 age and 11 age groups ($p<0.05$). These results also support literature (2, 29). MaxVO$_2$ difference between male and female increase in puberty period however the most appropriate period to the aerobic system development is rapid growth phase in adolescense period.The aerobic system development are more in males than in females, this is connected with the

difference in the fat amount in the body mass, with the hemoglobin and testesterone rate (1). The daily activity levels of the male students are more than female students, so this increases durability and it is thought that this also causes MaxVO$_2$ values to be higher.

In hand grip strength significance was determined in gender variable ($p<0.05$), but was not determined in age variable ($p>0.05$). In accordince with the graphic related to Dietrich's strength ability, the strenght of the male are higher than the female in this age groups.The strength ability of males show a linear increase according to ages. As age proceeds in females, strength increases, as well.The strength difference between males and females are more prominent after 13 and 14 years (7, 24, 27). In line with this information, since the muscle density and volume of male children are more than female children, it is thought that their hand grip stregths are higher.

Significance was observed in back strength according to gender ($p<0.05$), but was not found according to age groups ($p>0.05$). Özgür, in his study, determined that the back strength averages of male children were higher than female children and this height was significance (21). According to Astrand and Kaare (1986), there is not any difference till 10-11 age group in terms of gender on strength development. Since this age group, since male have more muscle volume, their stength are better than females.

In vertical jump and anaerobic power, significance was not determined in gender groups ($p>0.05$), but was observed in age groups ($p<0.05$). Anerobic power increases constantly during growth and development period and, generally in the

period of preadolescence, since the body weight of females are higher than males, the aneorobic power of the females are higher (1, 5, 21). In line with this information, since the leg muscle density and volume of the male students were higher than the female students their vertical jump distances were higher than the female students; at the same time, since the develpment period periods that they were in and since the body weight of the female students were heavier than the male students, it is thought that the

aneorobic power values of the female students wer higher than the male students.

CONCLUSION

As a result, it can be said that their physical fitness parameters have parallels with age, and becasue of development period features, the female students have higher results than the male students becasue of more rapid growth and developments in this period

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