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THE COMPARISON OF SOME PHYSICAL FITNESS FOR INDIVIDUAL AND TEAM ATHLETES

ABSTRACT

The aim of this correlation study is putting forward the physical fitness level differences among elite athletes age vary between 12 and 14, participated both in individual and team sports living in zmir. Participants of the individual sports are 28 female and 47 male athletes while participants of the team sports are 86 female and 113 male athletes. The physical fitness level evaluated by, muscle strength (hand-grip, sit and reach test, cardiovascular endurance (1 mil cooper test) velocity (30 m sprint, body composition body mass index,(BMI). The t-test statistical analysis was conducted to provide the possible differences between groups.

The results shows that there are significant differences between females participants of team and individual sport according to the flexibility and 1609 m endurance test, two feet steady long jump, 30 m sprint, and body mass index level ($p < .05$). Results also shows that the physical performance level of females who participated in team sports are higher than females participants of individual sports. Additionally result revealed that, male elite athletes participants of team sports have higher physical fitness level than male elite athletes participants of individual sports. According to the t-test results there is no significant differences between flexibility and 1609 m endurance run test between elite level male athletes, although there is significant differences were found according to the both left and right hand grip, shuttle run test, two feet steady long jump, 30 m sprint, and body mass index.

Key Words: Sport, Physical Fitness, Individual Sport, Team Sport

B REYSEL VE TAKIM SPORCULARIN BAZI FİZİKSEL UYGUNLUKLARININ ÖZELLİKLERİNİN KARŞILAŞTIRILMASI

ÖZET

Bu ara tırmanın amacı zmir ili ya aralı ı 12-14 ya olan bireysel ve takım sporu yapan elit kız sporcular ve erkek sporcuların fiziksel uygunluklarının karşılaştırılmasıdır. Çalışmaya bireysel spor yapan 28 kız, 47 erkek ve takım sporu yapan 86 kız, 113 erkek olmak üzere toplam 274 sporcu katılımı tır. Sporcuların fiziksel uygunluk özellikleri, Kasal kuvvet; (el kavrama kuvveti ve durarak uzun atlama), Kasal dayanıklılık; (mekik, Esneklik; otur-eri testi), kardiyovasküler dayanıklılık; (1 mil ko -yürü testi), sürat; (30 m hız ko usu) ve beden kompozisyonu Beden Kitle indeksi (BK) ile değerlendirilmiştir. Verilerin çözümlenmesinde ba ımsız gruplarda t testi kullanılmıştır.

Ara tırmanın sonucunda bireysel ve takım kız sporcularda fiziksel performansları açısından esneklik ve 1609 metre dayanıklılık ko u testleri arasında anlamlı bir farklılık bulunmazken ($p < 0.0$), mekik testi, durarak uzun atlama, 30 metre hız ko usu ve beden kitle indeksi arasında farklılık bulunmu tur ($p < 0.0$). Fiziksel performansları değerlendirildi inde, takım sporları yapan kızlara göre daha yüksek performans de erlerine sahip oldukları görülmektedir. Takım sporu yapan elit erkek sporcuların genel olarak fiziksel performanslarında bireysel sporlarına göre daha yüksek performans de erlerine sahip oldu u ortaya çıkmıştır. Ba ımsız gruplar için yapılan t testi sonucunda bireysel ve takım erkek sporcularda fiziksel performansları açısından esneklik ve 1609 metre dayanıklılık ko u testleri arasında farklılık bulunmazken ($p > 0.05$) sa el kavrama kuvveti, sol el kavrama kuvveti, mekik testi, durarak uzun atlama, 30 metre sprint ve benden kitle indeksi de erleri arasında farklılık bulunmu tur ($p < 0.05$).

Anahtar Kelimeler: Spor, Fiziksel Uygunluk, Bireysel spor, Takım Spor

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INTRODUCTION

Physical fitness is the capacity of an individual. This depends on one's strength, endurance, coordination, velocity and these elements work together. This refers to performance of movements correctly and the status of current condition of the body in relation to the physical durability Lyttle at all.,1996; Zorba and Saygın,2009). Mathews defines physical fitness as the capacity of making a given task by muscular effort(Mathews,1973).

Heart- respiratory system resistance includes muscular endurance, muscle strength, speed, flexibility, agility, balance, reaction time and body composition. These qualities are called performance-related physical fitness and health-related physical fitness as they have different importance in terms of sportive performance and health(Fox,Bowers,Foss.,1999; Özer,2001).

Sportive performance includes aerobic-anaerobic power, strength, endurance and flexibility. It includes coordination, reaction time and agility in the extent of physical fitness. It includes physical structure, height, weight, motor capacity in the extent of ability. It includes individual's personality, needs, motivation etc. It consists of psychological and behavioural dimensions including psychological characteristics(Yüçetürk,1995). Sportive performance on elite level requires technical and tactical skills and personal abilities in addition to good conditional status(Bilge ve ark.,2000). In order to achieve a high level of athletic efficiency and high level of success in any sport branch, both hereditary and acquired skills and characteristics of individual or individuals engaged in sport branch must be adequate and proper(Dündar,1996).

With training made regularly in sport branches and based on scientific basis, intensity of load, muscle strength, durability, speed and flexibility increases and body composition is maintained (Kılıç,2008). Considering struggling time, necessity to play quickly and accurately in team sports

and individual sports, the necessity of basic motoric skills arises such as force, speed, mobility and coordination features in both groups (Koç and ark. , 2010).

The aim of this correlation study is putting forward the physical fitness level differences among elite athletes age vary between 12 and 14, participated both in individual and team sports living in zmir.

METHOD

Participants of the individual sports are 28 female and 47 male athletes while participants of the team sports are 86 female and 113 male athletes and 274 athletes in total in zmir. The physical fitness level evaluated by, muscle strength (hand-grip, sit and reach test, cardiovascular endurance (1 mil cooper test) velocity (30 m sprint) and body composition body mass index,(BMI). The t-test statistical analysis was conducted to provide the possible differences between groups.

274 athletes in total participated in this research; 28 female (21 athletics, 6 swimming, 1 taekwondo), 47 male (21 athletics, 13 swimming, 13 taekwondo) who are participants of individual sport and 86 female (20 basketball, 40 volleyball, 26 handball), 113 male (43 football, 27 basketball, 29 volleyball, 14 handball)who are participants of team sports and age vary between 12-14. The tests in which the characteristics of physical fitness of athletes are chosen, muscle strength (hand grip strength, steady long jump), muscular endurance (shuttle, flexibility, sit and reach test), cardiovascular endurance (1 mile cooper test) and speed(30 m sprint) are evaluated.

Measurements and tests done to determine flexibility, muscle strength and body composition were performed at the gym or in a closed space allocated for physical education or sports lessons; 30 meters speed running test and 1 mile run-walk test which attempt to determine cardiovascular endurance were performed

on a flat ground suitable for test protocol of Fitnessgram.

In the data collection phase, prior to joining the tests the subjects were given necessary information about the test procedure and each measurement tool, instruments used in the tests were introduced and they were motivated during tests. The subjects were informed at least one week before participating the tests and necessary information about their health status was obtained. The study group consisted of club athletes who had a history of at least 2 years in sport and train regularly at least 5 days a week.

The data obtained in research was analyzed using SPSS 15.0 software. The

Mean of data and standard deviation was calculated as descriptive statistics. T test was used in groups to find significant difference. In this study, the level of significance was taken as 0.05.

FINDINGS

The aim of this correlation study is putting forward the physical fitness level differences among elite athletes age vary between 12 and 14, participated both in individual and team sports living in zmir. Standard variation and t test results of female and male athletes are given in tables.

Table 1: Age, height and body weight values of female athletes participants of individual and team sport

	Groups	N	Mean	Std.Dev.
Age (year)	Individual sport	28	13,02	0,63
	Team sport	86	13,08	0,75
Height (cm)	Individual sport	28	153,92	7,26
	Team sport	86	159,88	6,70
Body Weight (kg)	Individual sport	28	45,27	7,46
	Team sport	86	51,58	9,09

In Table 1, age, height and body weight values of female athletes participants of individual and team sport were given. As shown in Table 1, the mean age of 28 female athletes participants of individual sport was found to be 13,02, their

height was 153,92, body weight was 45,27 kg. The mean age of 86 female athletes participants of team sport was found to be 13,08 , their height was 159,88 , body weight was 51,58 kg.

Table 2: Age, height and body weight values of male athletes participants of individual and team sport

	Groups	N	Mean	Std.Dev.
Age (year)	Individual sport	47	13,12	0,80
	Team sport	113	13,41	0,63
Height (cm)	Individual sport	47	158,14	9,34
	Team sport	113	168,25	8,48
Body Weight (kg)	Individual sport	47	48,87	11,47
	Team sport	113	56,49	9,98

In Table 2, age, height and body values of male athletes participants of individual and team sport were given. As shown in Table 2, the mean age of male athletes participants of individual sport was

found to be 13,12 , their height was 158,14 , body weight was 48,87 kg. The mean age of male athletes participants of team sport was found to be 13,41 , their height was 168,25 , body weight was 56,49 kg.

Table 3: Physical fitness values of female athletes participants of individual and team sport

PHYSICAL FITNESS PROPERTIES	Groups	N	Mean	Std.Dev.	T	P
Right hand grip strength (kg)	Individual sport	28	19,09	6,52	.227	p>0.05
	Team sport	86	19,37	5,84		
Left hand grip strength (kg)	Individual sport	28	18,05	6,24	.122	p>0.05
	Team sport	86	17,91	5,41		
Flexibility (cm)	Individual sport	28	18,02	5,65	3.958	p<0.05
	Team sport	86	13,19	6,16		
Shuttle (number)	Individual sport	28	27,67	4,13	4.236	p<0.05
	Team sport	86	24,33	3,79		
Steady long jump (cm)	Individual sport	28	181,17	23,37	3.044	p<0.05
	Team sport	86	167,6	21,45		
30 meter sprint (sn)	Individual sport	28	4,84	0,44	2.669	p<0.05
	Team sport	86	5,09	0,48		
1609 meter endurance (dk)	Individual sport	28	7,73	1,17	4.151	p<0.05
	Team sport	86	8,78	1,23		
Body Mass Index (Body Weight / Height ²)	Individual sport	28	18,85	2,34	4.023	p<0.05
	Team sport	86	20,09	2,77		

Table 4: Physical fitness values of male athletes participants of individual and team sport

PHYSICAL FITNESS PROPERTIES	Groups	N	Mean	Std.Dev.	t	p
Right hand grip strength (kg)	Individual sport	47	22,21	9,98	3.24	p<0.05
	Team sport	113	27,30	9,50		
Left hand grip strength (kg)	Individual sport	47	19,92	9,32	3.79	p<0.05
	Team sport	113	25,74	9,48		
Flexibility (cm)	Individual sport	47	10,35	5,93	.28	p>0.05
	Team sport	113	10,62	6,00		
Shuttle (number)	Individual sport	47	26,51	3,74	2.18	p<0.05
	Team sport	113	25,26	3,41		
Steady long jump (cm)	Individual sport	47	179,7	23,9	2.29	p<0.05
	Team sport	113	189,32	26,28		
30 meter sprint (sn)	Individual sport	47	4,82	0,48	2.66	p<0.05
	Team sport	113	4,60	0,51		
1609 meter endurance (dk)	Individual sport	47	7,64	2,07	1.33	p>0.05
	Team sport	113	7,55	1,31		
Body Mass Index (Body Weight / Height ²)	Individual sport	47	18,98	2,93	2,44	p<0.05
	Team sport	113	19,84	2,48		

As shown in Table 3, as a result of t test for independent groups, in the values of flexibility, shuttle test, steady long jump, 30 meter sprint, 1609 meter endurance run

and body mass index of individual and team female athletes, significant difference was found in terms of physical fitness (p<0.05). No significant differences were found

between other variables ($p > 0.05$). In flexibility, shuttle, standing-long jump and 30 meter sprint female athletes participants of individual sport, in 1609 meter endurance female athletes participants of team sport were found to be more successful.

In Table 4, the physical fitness values of male athletes participants of individual and team sport are given, physical fitness of elite male athletes participants of team sport appeared to have higher values in general than male athletes participants of individual

sport. As a result of t test for independent groups, no significant difference was found in terms of flexibility and 1609 endurance run test of individual and team male athletes ($p > 0.05$), but a significant difference was found between their values of right-hand grip, left-hand grip, shuttle test, steady-long jump, 30 meter sprint and body mass index ($p < 0.05$). A significant difference was found between body mass index of athletes ($p < 0.05$).

DISCUSSION AND CONCLUSION

The purpose of this study is to compare the physical compatibility of sportsmen doing individual sports and team sports that are between ages of 12 and 14 in the province of Izmir. When looked at studies it is seen that there are various differences between determination of physical, physiological and motoric features of sportsmen doing team and individual sports.

According to Harre, strength is overcoming a resistance or counterpoising it with a muscle tension. (Harre, 1982) According to Muratli, the strength as its meaning in sports is overcoming the resistance with muscular activity or counterpoising the resistances. The strength development of children is gaining speed together with the gender differences starts to be seen after the ages of 10 and 11; this development is increasing in a big rate in the ages of 13 and 14 (Muratli, 2007) Bompa defines strength as the nerve-muscle ability which provides to overcome internal and external resistances (Bompa, 2007).

The right hand grip strength values of individual sportswomen is found $19,09 \pm 6,52$ kgs; the left hand grip strength values of individual sportswomen is found $18,05 \pm 6,24$ kgs; the right hand grip strength values of team sportswomen is found $19,37 \pm 5,84$ kgs; the left hand grip strength values of team sportswomen is found $17,91 \pm 5,41$ kgs in our study. The right hand grip strength values of individual sportsmen is found $22,21 \pm 9,98$ kgs; the left hand grip

strength values of individual sportsmen is found $19,92 \pm 9,32$ kgs; the right hand grip strength values of team sportsmen is found $27,30 \pm 9,50$ kgs; the left hand grip strength values of team sportsmen is found $25,74 \pm 9,48$ kgs; is found by the result of the studies of Ölçücü et. al. and they found that the dominant hand strength values of children aged 10-14 are $25,73 \pm 5,10$ kgs; Pense and Serpek found that the dominant hand grip strength values of basketball players with the average age of $14,93 \pm 0,86$ are $25,69 \pm 0,55$ kgs and this value is $21,92 \pm 0,51$ kgs when looked at the children don't play basketball; Hasan found that it is $15,46 \pm 3,21$ kgs in adolescent girls (Ölçücü et.al., 2010; Hasan, 2008; Pense and Serpek, 2010). Kılıç found that the right hand grip strength values of infrastructure football players with a mean age of $13,76 \pm 0,92$ are $26,67 \pm 3,84$ kgs and their left hand grip strength values are $26,53 \pm 4,43$ kgs; bi found that the right hand grip strength values of male football players with a mean age of 12 and 14 are $23 \pm 5,36$ kgs and the left hand grip strength values of male football players are $23,15 \pm 5,45$ kgs.

Flexibility is the ability of a joint to move through its full range of motion is defined as flexibility (Yalçiner, 1993) Wear defined flexibility as range of motion of joints and functional motion capacity (Wear, 1963). The flexibility can be limited with bones, muscle ligaments, tendons and skin (Zorba and Saygın, 2009). The two types of flexibility can be mentioned as static and dynamic

flexibilities. Static flexibility can be mentioned as the range of motion of a joint when a body segment is passively moved and held in position. Dynamic flexibility is utilizing both force and momentum to move through the full range of motion of a joint. Flexibility shows a decrease with age in contrast to the other physical compatibility characteristics (Hasan,2008).

Flexibility values in our study are found as follows: It is $18,02\pm 5,65$ cms for individual sportswomen, $10,35\pm 5,93$ cms for individual sportsmen, $13,19\pm 6,16$ cms for team sportswomen, $10,62\pm 6,0$ cms for team sportsmen. It is specified in a study conducted on 1440 sportsmen and 3000 children and adults that the greater flexibility development occurs between ages of 7 and 11, it is seen that it decreases gradually after age of 15 and shows a significant decrease after age of 50 and it's seen that there is a certain reduction (fall) between the ages of 60 and 70 (Do an, 1995). Koç et. al. have identified the flexibility values of team sportsmen between ages of 13 and 15 as $17,40\pm 8,19$ cms and $21,06\pm 4,41$ cms for individual sportsmen; bi identified this value as $32,56\pm 3,60$ cms for male football players in the 12-14 age group (Koç et.al.,2010; bi ,2002).

Demirel et.al. found that sit-reach test values of girls with a mean age of $12,54\pm 0,93$ are $22,78\pm 6,44$ cms; A ao lu et.al. found that flexibility values of sportswomen in 13-14 age group are $28,77\pm 4,48$ cms; Ölçücü et.al. found that this value is $16,68\pm 7,91$ cms in 10-14 age group; Karadenizli and Karacabey found that it's $30,3\pm 4,0$ cms in star girls; So at found that the flexibility values are $19,66\pm 5,12$ cms for athletes, $18,36\pm 5,97$ cms for gymnasts, $15,63\pm 3,09$ cms for basketball players, $13,43\pm 2,63$ cms for handball players in his study among adolescent female sportswomen (A ao lu et.al.,2008; Demirel et.al.,2004; Karadenizli and Karacabey,2002; Ölçücü et.al.,2010; So at,2007).

Muscular endurance is the ability of a group of muscles to sustain repeated contractions or similar movements or

protecting a certain rate of maximal voluntary contraction for a certain period of time. The 30 seconds Sit Ups Test is recommended in order to assess muscular endurance and determine the strength and development of abdominal muscles of children and adolescents (Eurofit,1988; Kayıhan,2007; Plowman,2002). The total muscle mass for men at birth was 25% of body weight but it's 40% or more in adults. This high rate of increase is based on hormonal changes due to testosterone production (Zorba and Saygın,2009).

The maximal scores of repetitions of sit-ups of our study's individual female sportswomen test subjects are $27,67\pm 4,13$ and it's $24,33\pm 3,79$ for elite team sportswomen test subjects. The maximal number of repetitions of sit-ups of individual male sportsmen test subjects are $26,51\pm 3,74$ and it's $25,26\pm 3,41$ for team sportsmen test subjects.

Karadenizli and Karacabey found that the 30 seconds Sit-ups value for star girls are $20,5\pm 4,8$, Duman and Çoksevım found that maximal number of repetitions of sit-ups of girl students of 12-14 age group is $17,6\pm 9,9$ in their study; Pense and Serpek found this values is $20,00\pm 0,53$ for basketball players and $15,61\pm 0,79$ for children who aren't playing basketball; Hasan found the sit-ups value as $21,69\pm 3,67$ for girls (Duman and Çoksevım,2002; Karadenizli and Karacabey,2002; Pense and Serpek, 2010; Hasan,2008). Kılıç has identified that 30 seconds sit-ups test values for infrastructure football players mean aged $13,76\pm 0,92$ are $29,87\pm 2,72$; Karadenizli and Karacabey found this values as $28,4\pm 2,1$ for star male handball players; Baydil found this values for 12-14 age group as $22,36\pm 3,25$ (Kılıç,2008; Karadenizli and Karacabey,2002; Baydil,2006). We can say that this big difference emerges because of regular training of elite sportsmen.

Muscle strength is the resistance of a muscle tension or a muscle group as a result of a maximal effort. It's impossible to perform a sportive performance without motoric strength (Fox at all.,1999). The key element

of success in many sports branches is explosive muscle strength. Sportsmen need explosive muscle strength in order to show high-level performance (Adams et al., 1992). Explosive strength is to reveal maximum force as soon as possible. Explosive strength is an important physical property determining performance in all common sports (Kayihan, 2007).

In our study, standing long jump values are defined as $181,17 \pm 23,37$ cm for individual sportswomen, $167,6 \pm 21,45$ cm for team sportswomen, $179,79 \pm 23,94$ cm for individual sportsmen, and $189,32 \pm 26,28$ cm for team sportsmen.

Kızılet et al. found that the standing long jump values for 12-14 age group basketball players are $181,25 \pm 26,73$ cms; Duman and Çoksevrim found that these values for 12-14 age group girls are $157,3 \pm 20,3$ cms; Karadenizli and Karacabey found that it's $171 \pm 0,13$ cm for star girls and Ölçücü et al. found that it's $190,82 \pm 17,10$ cms for 10-14 age group children; Pense and Serpek found that it's $175,10 \pm 3,25$ cms for basketball player girls. The literature about this age group sports(women) have parallels (Duman and Çoksevrim, 2002; Kızılet et al., 2010; Karadenizli and Karacabey, 2002; Ölçücü et al., 2010; Pense and Serpek, 2010). Kılıç found that it's $177,52 \pm 13,41$ cms for infrastructure football players, Akpınar et al. found that it's $143,73 \pm 42,27$ cms for skier children and $134,04 \pm 9,97$ cms for volleyball player children; Baydil found that it's $146,61 \pm 16,90$ cms for 12-14 age group children; Koç et al. found that it's $201,53 \pm 29,80$ cms for 13-15 age group male team sportsmen and $184,53 \pm 17,35$ cms for individual sportsmen; Özaker found that it's $151,29 \pm 22,33$ cms for 12-14 age group male children. (Kızılet et al., 2010; Karadenizli and Karacabey, 2002; Kılıç, 2008; Akpınar, 2006; Baydil, 2006; Koç et al., 2010; Özaker, 2011)

One of the most important biomotor abilities needed in sports branches is speed, making way too quickly or ability of acting (Bompa, 2007). Only players whose speed, rapidity, durability and physical structure developed may be struggling with players

whose speed and rapidity is on high-level (Kılıç, 2008). The speed that is one of the important motoric features of sportsmen is a nerve-muscle process requires nerve-muscle system like coordinative capabilities. Speed is the skill of a sports(women) moving him/herself from one place to another in maximum speed. Or it can also be defined as skill of implicating these movements in a very high speed (Dündar, 1998; Günay, 2001; Sevim, 2006). The strength is increasing with age and speed performance increases depending to this.

In our study, 30-meter sprint values for individual sportswomen are $4,84 \pm 0,44$, $5,09 \pm 0,48$ for team sportswomen, $4,82 \pm 0,48$ for individual sportsmen, $4,60 \pm 0,51$ for team sportsmen. The highest value for speed frequency is said to be between the ages of 8-13 and the highest value of speed increase is between ages of 8-11 and 14-15 according to some studies. (Erdil et al., 1990). Aolu et al. found that 30-meter sprint values for sportswomen aged 13-14 is $5,69 \pm 0,37$ sec., Duman and Çoksevrim found that it's $5,6 \pm 0,8$ sec. for sportswomen aged 12-14; Yıldız found that it's 5,08 seconds for female national athletes aged 11-15; Tüzen et al. found that it's $5,5 \pm 0,57$ sec. for swimmers aged 12-14; Karadenizli and Karacabey found that 30-meter sprint values for star female handball players are $5,38 \pm 0,37$ seconds (Aolu et al., 2008; Duman and Çoksevrim, 2002; Karadenizli and Karacabey, 2002; Tüzen et al., 2005; Yıldız, 2002). Eniseler have specified that 30-meter sprint performance values according to ages of children and young football players as follows: 5,05 sec. for age of 12; 4,92 sec. for age of 13 and 4,65 sec. for age of 14 (Eniseler, 2009). Tüzen et al. found that the 30-meter sprint values for swimmers aged 12-15 are $5,42 \pm 0,7$ sec.; Koç et al. found that it's $5,28 \pm 0,42$ sec. for team sportsmen aged 13-15 and $5,04 \pm 0,47$ sec. for individual sportsmen; Karadenizli and Karacabey found that it's $4,36 \pm 0,15$ sec. for star male handball players; Özaker found that this value is $5,54 \pm 0,49$ sec. for the 12 age group, $5,39 \pm 0,47$ sec. for 13 age group and

5,17±0,56 sec. for 14 age group in the study that he had made on boys aged 12-14 age group (Tüzen et.al.,2005; Koç et.al.,2010; Karadenizli and Karacabey, 2002; Öz aker,2011).

The durability that is a condition property which occurs based on aerobic energy of organism is defined as resistance strength of sports(women) against physical and physiological fatigue. The durability is developed with the effort of sportsmen to overcome fatigue during training process. Whether the conditions are hard, the organism will be able to adapt the requirements of training. The adaptation level is also reflected to the development of durability (Açıkada,1991; Ate o lu,2002; Kılıç,2008). The durability is a property effecting training productivity no matter if the person or the activity applied by is different. The durability reaches its peak in ages between 13 and 14 for females and it begins to fall back after this age (Demir,2001).

Our study's 1 mile (1609 meters) run-walk test values for individual sportswomen test subjects are 7,73±1,17; it's 8,78±1,23 for team sportswomen test subjects. 1 mile (1609 meters) run-walk test values for individual sportsmen test subjects are

7,64±2,07; it's 7,55±1,31 for team sportsmen test subjects. According to a study, it's known that the highest absolute development value for girls is seen on age of 12 and it is determined that a very slight development takes place on age of 14 for girls. And other studies determines that there is a fall in pace of development in adolescence. (Erdil et.al.,1990; Karadenizli and Karacabey,2002; Aydos and Kürkçü, 1997). Durability shows a rapid increase in men aged 11-12 and this increase slows down after age of 45 (Demir,2001; Muratlı,2007; Akgün,1994). According to Dal Monte, aerobic endurance shows maximal development between ages of 10 and 13, anaerobic development shows maximal development between ages of 13 and 16 (Agopyan,1993). Aerobic capacity can be increased in children with the help of regular trainings. But this increase may vary from person to person.

As the result, the differences of physical compatibility characteristics of sportsmen and sportswomen each doing sports individually or in a team depends on the intensity, duration and frequency of training and differences between used energy systems.

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