



<http://doi.org/10.22282/ojrs.2020.67>

## COMPARISON OF SOME PHYSICAL PROPERTIES OF ATHLETES IN DIFFERENT BRANCHES

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### ABSTRACT

This study was planned to investigate whether sports have an effect on height, weight and hand grip strength and whether different sports branches such as; volleyball, basketball, football, handball are meaningful in terms of these features, and also how effective the family income levels are in the preferences of the sports branches of the subjects. Totally 100 students with a mean age of  $16.55 \pm 0.091$  were included in the study. Eighty of them are those who play basketball ( $n = 20$ ), football ( $n = 20$ ), volleyball ( $n = 20$ ), and handball ( $n = 20$ ) in sports clubs and school teams. The control group, on the other hand, was taken on a voluntary basis from high school students ( $n = 20$ ) who took only two hours of physical education lessons per week. The height and weight of the subjects were taken. Right and

left-hand grip strengths of them were measured. The higher of the two measurements was evaluated. In addition, subjects were asked about their family income levels. Statistical Package for Social Sciences (SPSS) 16.00 package program was used in the statistical analysis of these data. As a result, there was a significant relationship between the groups who played sports or not in the height variable at  $p < 0.05$  and in terms of family income levels at  $p < 0.01$ . It was determined that the other parameters between these two groups were not significant but there was significance at the level of  $p < 0.01$  in terms of height, right-hand grip strength and family income among all groups, and  $p < 0.05$  in left-hand grip strength.

**Key Words:** *Sport, height, weight, hand grip strength, level of family income*

## INTRODUCTION

It is known that the individual's growth and maturation process depends on genetic and environmental factors. Physical activity is not only one of the many factors affecting growth and maturation among environmental ones, but it also has a place in regular development (Erkan, 1982: 168; Gökdemir & Koç, 2000: 259). It is stated that the muscle structures of children who do not do sports are underdeveloped, their height is shorter and they have a fat or weak body structure due to excessive or malnutrition (Erkan, 1982). The actions in our daily life and the efficiency in sports movements are realized through the muscles (Bağırhan, 1990). Strength is the ability to apply force and the basic element of sports activities. It both forms the basis of performance in recreational activities and plays an important role in a person's ability to perform daily activities effectively and efficiently (Tamer, 1995). In sports branches, regular and load intensity trainings based on scientific foundations increase muscle strength, durability, speed and flexibility, and regulate body composition (Kartal & Günay, 1994: 24-31). It is stated that the hand grip strength is directly related to the general strength of the body (Aydaş, 2000; Çakmakçı, 2002; Eler, 2002).

Physiological and physical fitness as well as parameters such as technical, tactical and experience, which are mental features in all sports branches, are of great value (Gökdemir & Koç, 2000; Zorba et al., 2000: 23-29). It has been reported that training models and intensities in basketball, which is one of the environmental factors, are closely related to height development of athletes (Akçakaya, 2009). In addition, the anthropometric features of the player in some branches (basketball, football, volleyball and handball) as well as strength, speed, flexibility, jumping ability, endurance and coordination, have been stated to be important factors in the success of the team in terms of performance (Clarke, 1975; Günay et al., 1994: 3-11; Colonel et al., 2008: 13-20).

The aim of this study is to investigate the impact of doing sports in general, and different sports branches in particular, on height, weight and hand grip strength, and how the family income levels of the subjects are effective on preferring sports branches.

### MATERIAL AND METHOD

Eighty athletes doing different sports branches (basketball, volleyball, football, handball) and 20 high school students who do not play sports other than two hours of physical education per week were included in the study on a voluntary basis. The control group was randomly selected from Milli Piyango Anatolian High School students. The lengths of the subjects (Nan-IB 150) were measured with a sliding calliper, their body weights were measured with a precision scale (Angel), and GRIP - D hand dynamometer was used to measure the right and left-hand grip strength while subjects were standing and their arms were in the position of 45-degree angle to their bodies. The higher of the two measurements made was evaluated. In addition, a mini survey was conducted to determine family income levels. The obtained data was transferred to the computer and SPSS 15.00 package program was used in the analysis.

### FINDINGS

**Table 1:** Distribution of some variables according to those who sport and non-sport

Variables	Groups	N	Average	SD	P
Height (cm)	Non-sport	20	172.55	9.77	0.017
	Sport	80	177.17	7.01	
Weight (kg)	Non-sport	20	61.35	15.07	0.088
	Sport	80	65.94	9.29	
Right hand grip strength (kg)	Non-sport	20	36.20	9.21	0.169
	Sport	80	38.83	9.21	
Left hand grip strength (kg)	Non-sport	20	33.86	9.14	0.060
	Sport	80	37.45	7.08	

As seen in Table 1, the average heights of those, who sport and do not, are ( $172.55 \pm 9.77$  and  $177.17 \pm 7.01$  cm). The average weight of those who sport and do not is ( $61.35 \pm 15.07$  and  $65.94 \pm 9.29$  kg). The right-hand grip strength average is  $36.20 \pm 9.21$  kg in playing sport group, while  $38.83 \pm 9.21$  kg in non-sport. Lastly, the left-hand grip average is  $33.86 \pm 9.14$  kg for sport group and  $37.45 \pm 7.08$  kg for non-sport group.

**Table 2:** Some variables of the groups

Variables	Groups	N	Average	SD	P
Height (cm)	Non-sport	20	172.55	9.77	0.01
	Basketball	20	180.70	7.77	
	Volleyball	20	176.00	5.72	
	Football	20	174.45	6.81	
	Handball	20	177.55	6.50	
Weight (kg)	Non-sport	20	61.35	15.07	0.06
	Basketball	20	70.05	12.58	
	Volleyball	20	64.30	6.65	
	Football	20	62.45	7.64	
	Handball	20	66.95	7.96	
Right hand grip strength (kg)	Non-sport	20	36.20	9.21	0.01
	Basketball	20	41.97	7.72	
	Volleyball	20	39.91	5.32	
	Football	20	34.44	6.81	
	Handball	20	38.99	6.77	
Left hand grip strength (kg)	Non-sport	20	33.86	9.14	0.05
	Basketball	20	39.43	7.80	
	Volleyball	20	38.04	6.33	
	Football	20	34.02	6.26	
	Handball	20	38.28	7.14	

In Table 2, when the average size of the groups is examined, the average height of subjects in non-sport group is  $172.55 \pm 9.77$  cm, while sport groups have these values respectively  $180.70 \pm 7.77$ ;  $176.00 \pm 5.72$ ;  $174.45 \pm 6.81$  and  $177.55 \pm 6.50$  cm in basketball, volleyball, football and handball. Considering the average weight values, it was found that subjects whom: do not play sports are  $61.35 \pm 15.07$  kg, on the other hand, values of sport groups are respectively  $70.05 \pm 12.58$ ;  $64.30 \pm 6.65$ ;  $62.45 \pm 7.64$  and  $66.95 \pm 7.96$  kg in basketball, volleyball, football and handball. The distribution of the right-hand grip strength averages by groups is  $36.20 \pm 9.21$  kg in non-sports players. However, values in sport groups are as following  $41.97 \pm 7.72$  kg in basketball,  $39.91 \pm 5.32$  kg in volleyball,  $34.44 \pm 6.81$  kg in football, and  $38.99 \pm 6.77$  kg in handball players. Left hand grip strength averages are  $33.86 \pm 9.14$  kg for non-sports, and respectively  $39.43 \pm 7.80$ ;  $38.04 \pm 6.33$ ;  $34.02 \pm 6.26$  and  $38.28 \pm 7.14$  kg for basketball, volleyball, football and handball players.

**Table 3:** Distribution of family income of groups

Groups		Monthly income levels (Turkish Lira)					Total
		100-500	501-1000	1001-1500	1501-2000	2000 >	
Control	N	0	2	10	3	5	20
	%	0	10	50	15	25	100
Basketball	N	1	2	8	5	4	20
	%	5	10	40	25	20	100
Volleyball	N	10	8	1	1	0	20
	%	50	40	5	5	0	100
Football	N	2	9	8	1	0	20
	%	10	45	40	5	0	100
Handball	N	2	8	6	2	2	20
	%	10	40	30	10	10	100
Total	N	15	29	33	12	11	100
	%	15	29	33	12	11	100

Table 3 shows the distribution of the family income levels indicated by the subjects of groups. Accordingly, 50% of those in the control group stated that their income was 1001-1500 TL, while 25% of them had 2001 TL and above. 40% of athletes who play basketball stated that their family income was 1001 - 1500 TL, 25% of 1501-2000 TL, and 20% of them have 2001 TL and above. It is seen that 50% of those who play volleyball have 100-500 TL while 40% of them have 501-1000 TL family income. For those who play football, this distribution is 45% 501-1000 TL, 40% 1001 - 1500 TL, and 40% of handball players' family incomes are 501-1000 TL and 30% 1001 - 1500 TL.

## DISCUSSION

In this study, it was investigated whether there is a difference in terms of height, weight, right and left-hand grip strengths and economical level between both sports and non-sports branches.

The overall average of the height variable of the subjects is  $176.25 \pm 7.80$  cm. When this variable was evaluated as those who play sports and non-sports, it was found to be statistically significant at the level of  $p < 0.05$ . Hamamioğlu and Kaya (2008) stated that height length is significant in favour of basketball players in their studies comparing some physical properties of 7-12-year-old children playing basketball with the same age sedentary. Kürkçü et al. (2001) stated that there was no difference in terms of height in their studies that they investigated the effect of exercise on physical and physiological parameters in 12-14-year-old boys. It is thought that the different data results between the first study and of Kürkçü et al.

may be due to the age difference in both studied groups and the differences in the years of performing sports.

In consequence of statistical comparison of the height variable, the average height values of the sports branches with those who do not play sports, there was a significant relationship between the groups at the level of  $p < 0.05$ . It was found that those who do not play sports have a significant relationship with basketball players at  $p < 0.01$  and handball players at  $p < 0.05$ , but not with football and volleyball players ( $p < 0.05$ ). Kuter and Öztürk (1992) found that the average height in basketball players was  $181.6 \pm 6.7$  cm. Moreover, Çelenk and Çumralıgil (2005) revealed that volleyball players had a higher average height than footballers did. In his study on university students, Akçakaya (2009) reported that the height average length of basketball players ( $184.06 \pm 8.44$  cm) was higher than footballers' average ( $174.80 \pm 6.51$ cm). These data support the findings of the study.

Average weight of the subjects is  $65.02 \pm 10.76$  kg. When the weight variable was evaluated as sports and non-sports, it was found that these values were not statistically significant ( $p < 0.05$ ). When the groups were compared exactly, it was seen that only the group playing basketball had a significant relationship with the non-sports group at the level of  $p < 0.05$  and the football group at the level of  $p < 0.05$ , but there was no significant relationship between the other groups. Studies on this subject reveal that basketball players have more body weight average than football players do (Akçakaya, 2009; Çebi et al., 2004; Koç & Büyükipেকci, 2010). This situation is thought to be due to the difference in bone structure depending on the height in basketball players.

The average of the right-hand grip strength in all subjects is  $38.30 \pm 7.62$  kg, and the left one  $36.73 \pm 7.62$  kg. As a result of statistical comparison of both the right and left-hand grip strength average values of sport and non-sport group, it was revealed that there was no significant relationship ( $p < 0.05$ ).

When the right-hand grip strength averages of non-sports and other sports branches were statistically compared, it was determined that there was a significant relationship at the level of  $p < 0.01$ . In comparison of the left-hand grip strength averages, a significance level of  $p < 0.05$  was found between the groups. Akçakaya (2009) found that the average of the right-hand grip strength was higher in basketball players, although it was not significant. In addition,

Koç and Büyükkipekci (2010) found that basketball players' hand grip strength average was higher than volleyball players in their study. It is believed that the average of both right and left-hand grip strength higher than football in hand-held sports branches is related to the body region being operated.

When the groups are evaluated according to the family income levels they stated, there was a statistically significant relationship between the groups in terms of monthly income at the level of  $p < 0.01$ . Based on these data, it can be said that those with high income prefer basketball, however; those with low income prefer football and volleyball. It is thought that the physical opportunities in the environment they live in and the economic revenues in the branches may be effective.

As a result, it can be said that sports is an important factor in the development of young people, but it will not be sufficient alone, so it must be supported with nutrition. It was also observed that those with high income prefer basketball but with low family income prefer football. This result shows that the economic situation, along with environmental factors, is effective in the selection of sports branches. At this point, it may be suggested to provide facilities for different sports branches in each region for the provision of talented athletes. In summary, physical conditions should be created based on abilities, not talent based on physical possibilities.

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