

The Effects of Sport on the Body Measure from Students of Different Disciplines

Vatan Kavak

SUMMARY

Problems arising from excessive body weight may be overcome. Sport emerges to take a great part in this respect. This paper shows how human body is affected by sport. The individuals were selected from the students of two different disciplines. The body measure of students totaling to 200, was then compared to those of the same number of students, who did not perform a regular physical activity. The values pertaining to the weight variable, implied a significant difference for both males and females. The BMI values obtained for the all students were in "no risk" group, while the average BMI values for the all female students, emerged to exhibit differences from those of the all male students.

The results and the findings of this investigation implied that physical activities practiced regularly, have an influence on the body measure index of individuals.

Key Words: BMI, Sport and Exercise, Health, Body Measure

Farklı Bölüm Öğrencilerinde Sporun Vücut Ölçümleri Üzerindeki Etkileri

ÖZET

Aşırı kilo problemleri günlük hayatta düzenli yapılan değişik fiziksel aktivitelerle büyük ölçüde yenilebilir.. Bu araştırmada düzenli fiziksel aktivitesi olan veya olmayan bireylerin vücut ölçülerini karşılaştırıp, vücut ölçülerinin sporla nasıl etkilendiğini ortaya koymayı amaçlandı.

Bireyler iki değişik bölüm öğrencilerinden seçildi. Bireyler 200 kişinin bedensel ölçümleri alınarak farklı bölüm öğrencileriyle karşılaştırıldı. Vücut ağırlığı farkı erkek ve kadınlarda istatistiksel olarak anlamlı bulundu. Spor yapan öğrencilerde her iki cinsiyet için ayak uzunluğu açısından istatistiksel anlamlı fark bulunmadı. Bununla beraber kız ve erkek öğrenciler arasında ayak genişliği açısından anlamlı fark bulundu. Spor yapan öğrencilerde el uzunluk ve genişliği değişkenlik gösterdi ve bu değişkenlik istatistiksel olarak anlamlı bulundu. Vücut kitle indeksi risk grubu olmayan bütün öğrenciler için ölçüldü ve kız ve erkek öğrenciler arasında anlamlı fark bulundu. Bu sonuç ve bulgular günlük yapılan fiziksel aktivitenin vücut kitle indeksi üzerine etkileri olduğunu göstermektedir.

Key Words: BMI, Spor ve Eksersiz Yapma, Sağlık, Vücut Ölçümleri



INTRODUCTION

Obesity is defined to be a pathologic case, resulting from the development of excessive fat-build-up and disorders in the energy balance in the human body. Improving the level of a physical activity was emphasized to be an important factor in the prevention of obesity. A properly performed physical activity is reported to be obtained by increasing active time, throughout the process of the daily life (4, 7).

Recent investigations have pointed out that the hazard of smoking is considered to be even worse than obesity. All sporting activities contribute greatly to the heart to function properly (5). The weight of the human heart, being normally around 250-300 gr, is likely to rise up to 450-500 gr, with the individuals who practice regular sport. This increase, which is a reaction to the physical activity that is undertaken, implies a strong and healthy development attained in the heart. Furthermore, with such increased weight, more blood will be pumped to the entire body by means of the tiny chambers in the heart. The muscles of the heart, consequently become more powerful, and the blood pumped will be distributed in the entire body much more effectively, and in this way, the heart is enabled to function efficiently. Yet, greater amount of oxygen would be supplied with the expansion of the capillary in the heart muscles, resulting in a healthy and extended life span, when regular exercises are practiced. Individuals without regular physical activities feel tired and weary when involved in a sporting activity, and as a consequence, the heart has to function excessively to send more blood required by the active tissues (13, 8).

Physical activities, such as, jumping, pulling and expanding, all stretch the body, and therefore, results in increased body height. A relief that is felt after a sporting is due to the secretion of endorphin hormone which usually increases, in quantity, aftermath of a physical exercise. Regular sporting were found, through clinical studies, to increase the production of

testosterone (male) hormones, as well as to activate female hormones. Yet, a warmth felt in the body, after an exercise, is known to impose positive effects on sexual feelings. Furthermore, regular physical activities also help greatly to prevent diabetes, in addition to the above-mentioned benefits and advantages (3).

This paper is concerned with the differences in body measure of individuals who practice a regular physical activity and those who do not. The body measure of a certain number of people selected from sporting and non-sporting groups, respectively, was taken, and then subjected to a statistical analysis. The results were evaluated and discussed in terms of height, weight and Body Measure index (BMI), and the impacts of regular sporting on human health was emphasized.

MATERIALS and METHODS

Individuals considered to practice regular sport throughout their life were chosen from the students of physical Training School, whilst those who were not involved in such an regular activity were considered from those of the Faculty of Medicine at the University of Dicle, in Turkey. The students, subject to the body measure investigation, were predominantly (at least 70 %) local, and all in the similar age group. Since the information required for the students from the Faculty of Medicine (Hereinafter will be called medical students) were already available from previous study, no further data collection was therefore carried out (1). The method and the procedure adopted for the students of Physical Training School (Hereinafter will be called physical training students) were exactly the same as those outlined in the previous study. Respective body measurements of 100 males and 100 females physical training students were taken and then compared, on the bases of height, weight and BMI, to those of the medical students, consisting of 100 males and 100 females.



Variables related to the foot length, foot width and hand width of the students were measured. Weight variables were obtained by using a balance of 0,5 kg sensitivity, in a manner that all individuals are in light dress and with no shoes on, standing upright on a level surface, while their heads were held by the mastoid prominence in accordance with “Frankfort Plane” (11). The distance from the point where the styloid prominence of the bones radius and ulna intersects, up to the longest fingertip, was considered when taking hand length measurement. The spacing between the caputes of the second and the fifth hand bones formed the base for hand width measurement. Foot length was measured from tuber calcanei prominence of foot bones up to the tip of the longest toe, while the spacing between the caputs of the first and the fifth

osmetatarsale foot bones was considered for foot width. Furthermore, the measurements related to height, hand width, hand length, foot width and foot length were obtained by using a Martin-type antropometre. The methods undertaken in this study were fully approved by the Local Ethics Committee of the University, and the all students mentioned voluntarily participated in the investigation.

All the measurements taken were subject to Students’ test statistical analysis comparing two independent average values. The definition of “ $p>0,05$ ” in the analysis indicates no difference between the group averages, whereas “ $p<0,05$ ” refers to meaningful differences. The statistical analysis was carried out by using SPSS and Statistica computer package programme (9,10).

RESULTS

The body measures of physical training students consisting of 100 males and 100 females were taken and then presented to compare to those of the medical students, under identical conditions, with respect to height, weight, age, hand length, foot length and BMI values.

Definitive statistical values related to the height variable are given in Table-1, where meaningful differences between the students of all sexes are indicated ($p< 0,05$). The values pertaining to the weight variable, as shown in Table-2, also, implied a significant difference for both males and females ($p< 0,05$).

Table 1. Height variables for all students.

	Mean	N	Std. Dev.		Mean	N	Std.Dev.	P
Physical Training Students				Medical Students				
Females	160.59	100	5.35	Females	158.55	100	6.11	$p<0.05$
Males	175.55	100	8.32	Males	173.52	100	5.91	$p<0.05$
Total	168.07	200	10.2	Total	166.03	200	6.05	$p<0.05$

Table 2. Weight variables for all students.

	Mean	N	Std.Dev.		Mean	N	Std. Dev.	
Physical Training Students				Medical Students				
Females	53.89	100	5.48	Females	56.13	100	7.75	$p<0.05$
Males	74.97	100	11.80	Males	68.90	100	8.64	$p<0.001$
Total	64.43	200	13.99	Total	62.51	200	8.19	$p>0.05$

Variables obtained for both foot length and foot width, are presented in Table-3. No difference was found in the mean values of foot length for the physical training students of all sexes ($p>0,05$), whereas meaningful difference emerged in foot width between the males and females ($p<0,001$), as shown in Fig-1.



Table 3. Foot length and foot width for all students.

	Mean	N	Std. Dev.		Mean	N	Std. Dev.
Foot length				Foot width			
Females	23.05	100	1.29	Females	7.63	100	0.92
Males	23.58	100	2.43	Males	10.67	100	2.41
Total	23.31	200	1.96	Total	9.15	200	2.37
			p>0.05				p<0.05

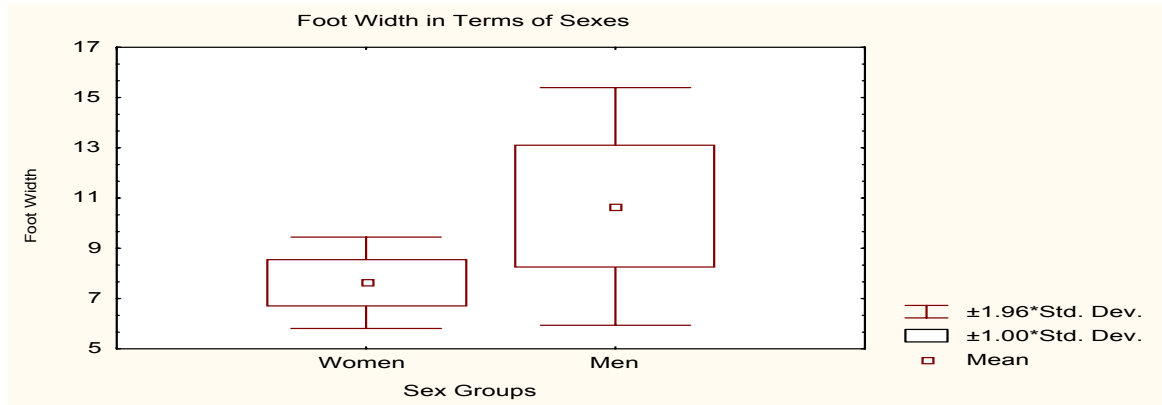


Figure 1. Foot Width Variable for the Physical Training Students, in Terms of Sexes

The variables for hand length and hand width, found for the physical training students, are given in Table-4. A significant difference was found for both variables ($p < 0,001$), and the hand length variable with respect to sex is further shown in Fig-2.

Table 4. Hand length and hand width for all students.

	Hand length			Hand width			
	Mean	N	Std. Dev.	Mean	N	Std. Dev.	
Females	16.52	100	1.07	Females	6.71	100	0.70
Males	19.70	100	2.45	Males	9.31	100	1.96
Total	18.11	200	2.47	Total	8.01	200	1.96
			P<0.001				P<0.001

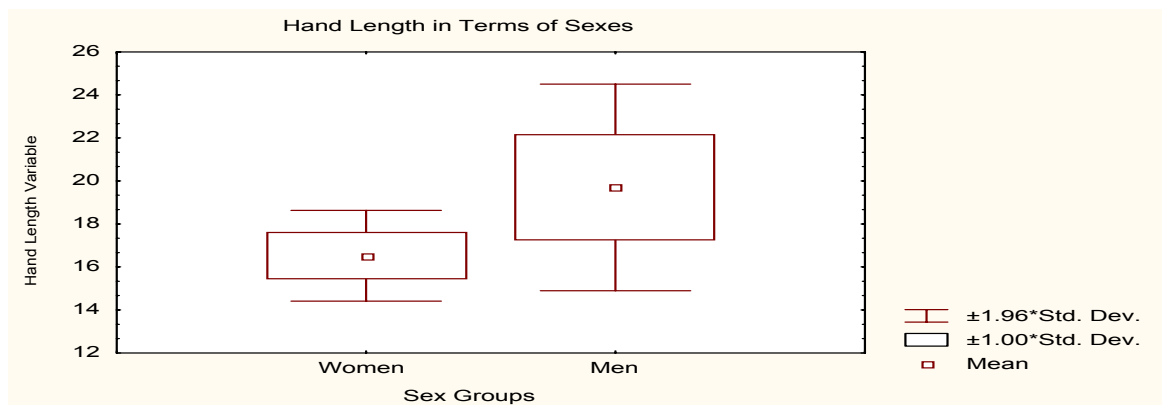


Figure 2. Hand Length Variable found for the Physical Training Students, in Terms of Sexes.



Based upon the result of the measurements, the body measure index (BMI) was also determined in accordance with the definitions outlined in Table-5, and the results obtained for the students investigated are presented in Table-6.

Table 5. General Definition of Body Mass Index

Males	Females	Risk factor
Lower than 20.7	Lower than 19.1	Slimness, risky when accompanied with lower BMI values.
Between 20.7-26.4	Between 19.1-25.8	Normal, with no risk
Between 26.5-27.8	Between 25.9-27.3	At the threshold of obesity, slight risk
Between 27.9-31.1	Between 27.4-32.2	Obesity, medium risk
Between 31.2-45.4	Between 32.3-44.8	Obesity, high risk
Up 45.4	Up 44.8	Fatal obesity.

Table 6. BMI Values obtained for all students

BMI	Physical Training Students	Medical Students	P
Males	24.26±2.77	22.88±0.24	<0.001
Females	20.85±1.68	22.48±0.20	<0.001

The BMI values obtained for the all students of both disciplines hence, fall in “no risk” group. The average BMI values for all female students emerged to exhibit differences from those of all male students due to $p < 0,001$. The frequency of average BMI values for both female and male students of the Physical Training School, are given in Fig- 3 and Fig-4, respectively. The BMI measurements obtained for the both sexes are seen to have a normal distribution trend.

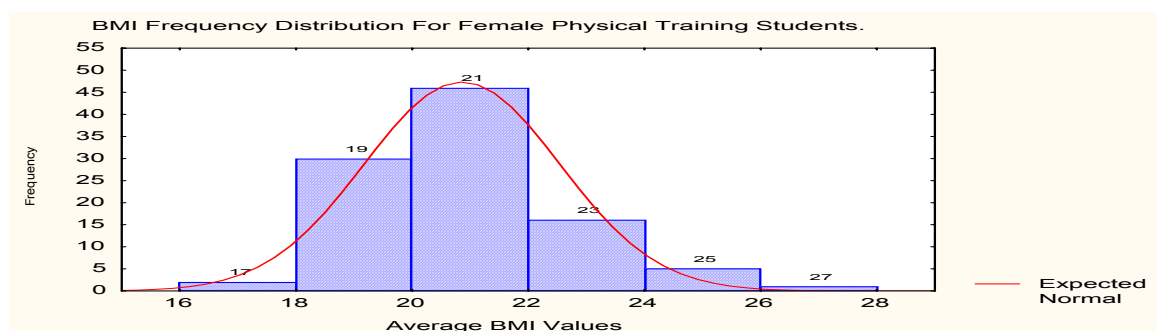


Figure 3. BMI Frequency Distribution for Female Physical Training Students

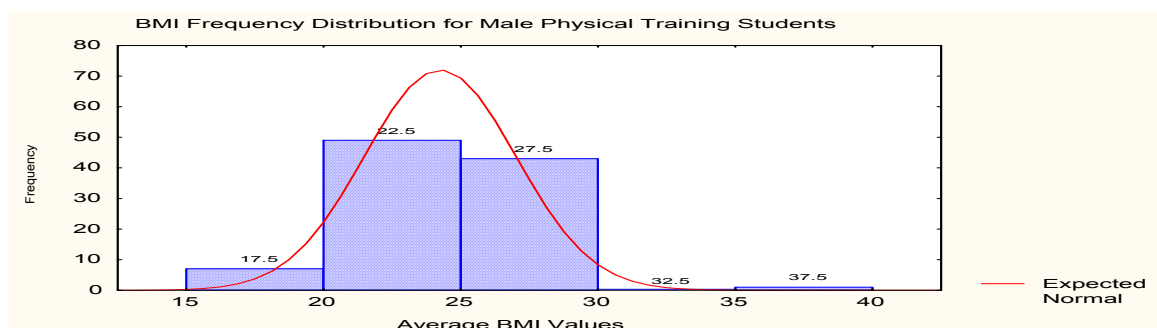


Figure 4. BMI Frequency Distribution for Male Physical Training Students



DISCUSSION

The results of this study showed that a significant difference existed in height and weight measurements between the physical training students and the medical students, though all of them were in “no risk” group in terms of BMI values. Among the females, the physical training students were found to be taller than the medical students, yet the height variable obtained for the males was also in favor of the physical training students.

Further comparisons were also extended to the students of some other universities in Turkey in order to provide information related to the objective of this investigation. The mean height for the male medical students, being $173,52 \pm 5,91$ cm, at the University of Dicle, was found to be very similar to those of the medical students at the University of Thrace (in the North-western Turkey), which was previously reported to be $174,15$ cm (12). Along with the males, the height variable for the female students, stated to be $158,6$ cm at the university of Thrace, also appeared to show a close similarity to those of Dicle. Furthermore, the height variable which was previously obtained as $160,0 \pm 0,05$ cm for a total of 300 female medical students at the University of Uludag (in western Turkey), however, emerged to be different from those of the female medical students of Dicle, while being similar to those of the female physical training students (6). The mean weight value for female medical students at the university of Uludag, being $55,96 \pm 7,17$ kg, was similar to those of the female medical students at Dicle, whereas significantly different from the female physical training students (6).

Among the individuals at the University of Dicle, the mean value of hand length variable obtained for the female physical training students was found to be significantly different from those of medical students which was measured to be $18,28 \pm 0,84$ cm (2). The same was, however, not true for the females of Physical Training School, since the values showed similarity.

The greater body size observed, in general, with the students of Physical Training School, as detailed above, can not be necessarily attributed to the effect of sport, since they are mainly due to genetic factors. However the result of this study may, to a certain extent, imply that students with greater body measure are more inclined to take sporting activity.

The BMI values for physical training students, being $24,26 \pm 2,77$ for males, were found to be greater than those of the medical students, which was measured to be $22,88 \pm 0,47$. The same situation may also be said to be the case for the female students, along with the males. This result indicates that individuals performing regular sport throughout their life have greater BMI values than the non-sporting ones. This fact may be ascribed to the volumetric differences in muscles, which may develop through a regular physical activity taken by individuals.

Considering the results of this investigation, it may be concluded that individuals should pay utmost care to keep their BMI parameters within “no risk” group, to obtain a healthy life. The best way to achieve that is to perform a physical activity or an exercise that is regular and consistent in daily life.

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Corresponding Author:

Vatan KAVAK
University of Dicle, Faculty of Medicine
Department of Anatomy, Diyarbakir, Turkey
E-mail: kavakv@dicle.edu.tr

