



## THE COMPARISONS OF AEROBIC CAPACITIES BETWEEN SPORTIVE AND SEDENTARY UNIVERSITY STUDENTS

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**Abstract:** In this study, it was aimed to compare aerobic capacities between actively sportive students (n=47) and sedentary students (n=52) who have been studying in Selçuk University. By determining the ages, height and body weight of the sportive and sedentary students, the Body Mass Index (BMI) was estimated on the body weight (kg) divided by the square of height (m). The Body Fat Percentages were found out with the subcutaneous fat-measuring device of Scinfold Caliper brand, their maximal oxygen usage capacities were also calculated with the Shuttle Run test. In data analysis, the SPSS 16 package program was used. While significant differences were not found out in age, height, body weight and body mass index (BMI) of the groups, there were significant differences in body fat percentage (BFP), total skinfold and maxVO<sub>2</sub> values (p<0,05). As a result, the students actively doing exercise had a sportive history at a certain level rather than the sedentary students, which can be a reason for being at a better level especially in terms of the usage capacity of maxVO<sub>2</sub>.

**Key Words:** Body Mass Index, Body FatPercentage, MaxVO<sub>2</sub>

## SPOR YAPAN VE SEDANter ÜNİVERSİTE ÖĞRENCİLERİNİN AEROBİK KAPASİTELERİNİN KARŞILAŞTIRILMASI

**Özet:** Bu çalışmada, Selçuk Üniversitesinde öğrenim gören ve aktif olarak spor yapan öğrenciler ile (n=47), sedanter (n=52) öğrencilerin aerobik kapasitelerinin kıyaslanması amaçlanmıştır. Spor yapan ve sedanter üniversite öğrencilerinin; yaş, boy ve vücut ağırlıkları tespit edilerek, Vücut Kitle İndeksleri (VKİ)vücut ağırlığının (kg.), boy uzunluğunun (m.) karesine bölünmesiyle hesaplanmıştır. Scinfold Caliper marka deri altı yağ ölçüm cihazı ile Vücut Yağ Yüzdeleri (VYY) belirlenmiştir, maksimal oksijen kullanma kapasiteleri ise Shuttle Run (Mekik) testi ile hesaplanmıştır. Verilerin analizinde SPSS 16 paket programı kullanılmıştır. Grupların; yaş, boy, vücut ağırlığı ve VKİ'lerinde anlamlı bir farklılık görülmezken (p>0.05), VYY'lerinde, toplam skinfold ve maxVO<sub>2</sub> değerlerinde ise anlamlı farklılık bulunmuştur (p<0.05). Sonuç olarak; aktif spor yapan öğrencilerin, sedanter öğrencilere nazaran belirli bir düzeyde spor geçmişine sahip olmaları, özellikle maksimal oksijen tüketim (maxVO<sub>2</sub>) kapasitesi bakımından daha iyi seviyede olmalarının nedeni olarak görülebilir.

**Anahtar Kelimeler:** Vücut Kitle İndeksi, Vücut Yağ Yüzdesi, MaxVO<sub>2</sub>

## INTRODUCTION

Today the importance of sports has been understood about public and public health well, the students have been given active roles through sports which provides them to understand and describe themselves at each type of educational steps as well as the cognitive education programs. Developing technology has especially made university students obese and inactive individuals who do not know to share, with the miraculous products in addition to a lot of tools such as computers, tablets and smart mobile phones. The families' opinion that sportive activities will cause bad effects on education experiences, has led to adopt negative viewpoints for sportive activities among the university students, and thus sportive activities have always become course means. Catching colors and smells in weather we take breath may be a secret in sportive activities.

Özkan and Yılmaz (2010) studied the adaptation situations of the university students to the university life and stated that only 41% of 421 students involved in the research did sport actively. Also, 52.7% of the students explained to join in these activities when their schools give opportunities for sportive activities. In a healthy life quality, aerobic performance (maxVO<sub>2</sub>) is of great importance and sportive activities come first. In our country university youth includes a great part of population and provides a model for other education grades. Owing to exercises and sportive activities, it is possible to increase aerobic performance and maintain this one.

MaxVO<sub>2</sub> is the highest rate which in a body can consume oxygen; also known as aerobic capacity or power (Zorba, 1999). Maximal aerobic capacity is regarded as the best criteria of cardiorespiratory endurance capacity or condition. Hereby, it is a fact that respiration-circulation systems run together. A person's maximum oxygen intake increases at a certain degree with regularly and increasingly controlled trainings. Also, a person's maximal respiratory volume per minute and maximal heart volume per minute increase as well (Helgerud et al., 2007). Sports firstly leads to some changes in respiration-circulation systems, moreover, it causes physical and psychological changes in parts of body (Dündar, 2000). These changes in individuals doing regular exercises and trainings play active roles not only in sportive fields but also improvements in life quality.

Training is an educational process carried out regularly and at certain intervals, aimed at having the best level of physical power and morale, improving technical-tactical skills with organical and psychological overloads in a particular plan, programme (Sevim et al., 2001). In countries sports is scientifically put into practice, the training process has been a topic for multilateral researches, observations and applications, as a result of these studies, the science of trainings has originated and become the most important determinant criteria in increasing sportsmen's performance levels (Sevim, 2002).

Filiz's study (2010) titled with the Evaluation of Sportive Participation in University



Students' Socialization showed that the frequency for doing sport was 8.1% for a group stating as each day, 16.1% for ones doing sport for 3 days in a week and 46.8% for ones doing sport once in a week among 248 students. And within the same study it was given that 39.5% of the students did sport for a healthy life. Our university youth must allocate enough opportunities and time for sportive activities to make great contributions in education experiences. We must increase the number and variety of sportive activities in order to increase life quality, reduce damages of advanced technological products and have an energetic life.

In each field of our education system, giving opportunities especially to university students for doing exercises and leading them to adopt these activities as habits will be the most accurate step taken for having a healthy generation. In this study, the aerobic capacities of the university students being sedentary and actively interested in a sport branch were compared.

## MATERIAL and METHOD

In this study; the actively sportive students (n=47) and the sedentary students (n=52) having education in Selçuk University voluntarily participated. As the participant students had the average age of  $23,76 \pm 3,1$ , the height of  $174,95 \pm 7,2$  and the body weight of  $74,53 \pm 4,3$ , they did not have any health problem.

### Measurements and Tests

**Body Height, Body Weight and BMI:** The body height of the research group was measured

as sensitive to 1 mm when the naked feet were set on the ground, the heels were close, the legs were stretched and the body had a straight position by using the meter (m.) antropometric set (Holtain Mark). The body weight was also measured with naked feet, shorts and T-shirt by using an electronic weighing machine (Tefal Mark) as sensitive to kilogram (kg.), 100 gram (gr.). The BMI was estimated by dividing the body weight (kg.) to the square of the body height (m.) (Anonymous, 2000 ; Tamer, 2000).

### **Skinfold Measurements (Skinfold Caliper):**

In order to determine the BFP, using the Skinfold Caliper (Holtain marka), the measurements from 7 standard areas (biceps, triceps, sub-scapula, supra-iliac, abdominal, thigh, calf) were done. All students' BFPs were calculated in accordance with the Yuhasz formula (Özer, 1993 ; Tamer, 2000).

### **Maximal Aerobic Capacity (maksVO<sub>2</sub>)**

**Measurements:** All subjects' capacities for maximal oxygen usage were estimated with the support of the Shuttle Run test.

A subject runs through a distance of 20 meters as a return. The running speed is controlled by a tape giving a signal sound at certain intervals. The subject starts running when he hears the first signal sound and he has to reach at other line until the second signal sound. When he hears the second signal sound, he returns back towards the starting line and this running goes on with signals. When the subject hears the signal, he adjusts his speed to be at the other end of track during the second signal. If the subject does not miss a sig-

nal sound and catches the second one, he keeps on performing test. If the subject misses two signals consecutively, the test is ended up. There is a level form in the test to assess a sportsman's performance. When each line of 20 meter is passed over, the sign is put on the form. At the end of the test, the signs by the sportsman are calculated and the maximal  $VO_2$  value is predicted in ml/kg-dk from the assesment table (Tamer, 2000).

In the abbreviation "Max  $VO_2$ " used for expressing the capacity of maximum oxygen consumption, it is explained as max = maximum, V = volume,  $O_2$  = oxygen. For this reason, Max  $VO_2$  means the maximum  $O_2$  amount

used per minute. Max  $VO_2$  is the most valid measurement method of aerobic energy system, functional power capacity (Tiryaki, 2002). This test prediction developed by Le-ger and Lampart is one of the best tests to be used in estimating the maximal oxygen usage (Kamar, 2008).

### Statistical Analysis

After the normal distribution and the variance homogeneity were tested here, the differences in between-groups values were analyzed with the independent t test.

### RESULTS

**Table 1. Values Concerning Sportive and Sedentary Students**

Parameters	Sportive	Sedentary	t
	N = 47	N = 52	
	Mean + SD	Mean + SD	
Age (Year)	23,6 + 2,8	24,6 + 3,1	2,42
Height (cm)	176,3 + 8,1	174 + 7,6	3,2
Body Weight (Kg)	74,2 + 4,5	75,9 + 5,9	4,3
BMI (kg/m <sup>2</sup> )	26,8 + 2,8	28,6 + 3,6	2,62
BFP (%)	13,8 + 1,9	16,2 + 3,5	1,02*
Total Scinfeld (mm)	66,8 + 4,8	69,7 + 6,2	1,62*
max $VO_2$	49,5 + 5,1	45,2 + 3,4	0,93*

\*  $P < 0,05$ : Between-Groups Difference.

Any significant differences were not observed between the participant groups in terms of age, height, body weight and BMI.

There was a significant difference between the sportive students and sedentary ones in terms of BFP ( $P < 0,05$ ). And a significant difference was also found in total scinfeld



values ( $P<0,05$ ). When compared to the  $\text{maxVO}_2$  values of the sportive and sedentary students, the result was statistically significant.

## DISCUSSION and CONCLUSION

They (Helgerud et al., 2007) described maximal oxygen intake ( $\text{maxVO}_2$ ) in sports requiring an aerobic endurance as one of the most important factors to achieve success. Their studies (Trap et al., 2008) showed significant decreases in total body weight, BFP, BMI and all skinfold measurements, and significant increases in body density and fat-free body mass at the end of training programs, these support the results in our study. This study (Albayrak, 2013) informed that there was a significant difference in the  $\text{maxVO}_2$  values of the groups ( $P<0,05$ ) and a significant difference in the values during and after trainings for the group subjected to the aerobic training process ( $P<0.01$ ). These changes are similar to increases in the  $\text{maxVO}_2$  values of our study.

According to this study (Öztürk, 2009); the sportive group and the sedentary group had a significant increase in their  $\text{maxVO}_2$  levels after following the exercises ( $P<0.05$ ), also, the sportive group was significantly different in its  $\text{maxVO}_2$  level than the sedentary group ( $P<0.05$ ). They (Günay and Cicioğlu, 2001) observed a meaningful increase over 10% in  $\text{maxVO}_2$  with a 7- 13 weekly training program. This study (Demiriz, 2013) discovered a significant difference in pre-test and post-test  $\text{maxVO}_2$  values of the experimental group subjected to the extensive interval process. Within this study, the sportive students had higher  $\text{maxVO}_2$  level than the sedentary

students, this shows similarity to the results of the researches mentioned.

Their research (Revan et al., 2008) concerning the effect of regular runs and interval trainings on the aerobic power indicated significant differences in body weight, BMI, BFP and  $\text{maxVO}_2$  of the experimental groups dependent on the training process between the pre-post tests ( $P<0.05$ ). Moreover, their study (Tran and Wetlmen, 1985) suggested that any exercise positively affected lipid and carbohydrate metabolism and caused steady decreases in body weight, fat stores, total cholesterol and triglyceride. Within this study, some changes were observed in the BFP, T. Scinfeld and  $\text{maxVO}_2$  values of the sportive students, this is similar to the results of the studies by Revan et al. and Tran and Weltmen.

Sedentary life and intensive university education pave the way for many harmful habits as well as making students keeping less time for themselves increasingly. Rather than students non-doing sport, the differences in the university youth lets sportive activities be an inseparable part of their life in terms of BMI and aerobic power indicate why we must do exercise. In conclusion, it can be mentioned that sportive activities have important effects in reducing BFP, increasing the oxygen usage capacity and keeping BMI in balance.

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