

## Sporcu Öğrencilerin Beslenme, Ergojenik Destek Kullanım ve Fiziksel Aktivite Durumları\* *Nutrition, Using Ergogenic Aids and Physical Activity States of Sport Students*

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**Özet: Amaç:** Bu çalışma öğrencilerin fiziksel aktivite düzeylerini, beslenme durumlarını ve ergojenik yardım kullanım durumlarını değerlendirmek amacıyla yapılmıştır. **Yöntem:** Araştırma, spor takımlarında yer alan öğrencilerin genel beslenme durumlarının değerlendirilmesi, fiziksel aktivite düzeyleri ve ergojenik destek kullanımını değerlendirmektedir. **Bulgular:** Ayrıca öğrencilerin %22.95'i diyet programı dahilinde yemek yediklerini ve %84'ü günde en az bir öğün tükettiğini belirtmiştir. Öğrenciler günlük ortalama 2590 kcal enerji almaktadır ve aldıkları enerjinin %14.67'si proteinlerden, %33.28'i yağlardan, %52.02'si karbohidratlardan gelmektedir. Sporcu öğrencilerin %27,23'ünün ergojenik yardımcı madde kullandığını, 26'sının hayatında bir kez doping kullandığını ve 22'sinin halen doping ilacı kullandığını belirtmiştir. IPAQ (uluslararası fiziksel aktivite anketi) ölçeğine göre öğrencilerin %73.77'si çok aktif, %13.66'sı orta derecede aktif ve %5.54'ü ise aktif inaktif grupat yer almıştır. **Sonuç:** Ergojenik yardımcıları kullananlar arasında öğün atlama alışkanlığı olanların sayısı, öğün atlamayan sporculara göre daha fazladır; takım sporlarına katılan öğrencilerin çoğu enerji ihtiyaçlarını karşılamakta yetersiz kalmaktadır.

**Anahtar Kelimeler:** Ergojenik destek, Fiziksel aktivite, Sporcu, Sporcu beslenmesi

**Abstract: Objective:** The purpose of the study is to evaluate physical activity levels, nutritional status and ergogenic aid utilization status of students. **Methods:** The research was carried out to determine whether the general nutritional status of the students in the sports teams was sufficient; and to evaluate the physical activity levels, and the use of ergogenic aids. **Results:** In addition, 22.95% of the students ate within a dietary plan and 84% did not eat at least one meal per day. Students received an average daily energy of 2590 kcal and 14.67% of the energy they received came from proteins, 33.28% from fat, 52.02% from carbohydrates. The results of the study showed that 27.23% of the athletes used ergogenic aids, 26 of them used doping once in their life, and 22 of them were still taking doping drugs. According to the IPAQ (international physical. activity questionnaire) scale, 73.77% of the students were very active, 13.66% moderately active and the remaining 5.54% belonged to inactive. **Conclusion:** Among those who resort to ergogenic aids, the number of those who have the habit of skipping meals is higher than the athletes who do not skip meals; and most of the students who take part in team sports are insufficient to meet their energy needs.

**Keywords:** Ergogenic aids, Physical activity, Athlete, Sport nutrition.

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## INTRODUCTION

Today, the interest in various sports branches flourishes day by day. While those who do sports as a hobby remains, licensed professional athletes continue to play sports for financial purposes (Argan and Kose, 2009). The principal factors impacting performance of athletes are genetic structure, training, and nutrition (Yarar et al, 2011). The nutrition of an athlete is certainly crucial for deliverance of high-level performance (Argan and Köse, 2009). However, plenty of professional athletes make improper dietary plans and do not manage to meet their daily energy needs. They endeavor to compensate these deficiencies with ergogenic aids. The methods and materials used other than training to boost performance in sports are called ergogenic aids (Dziedzic and Higham, 2014). The word ergogenic derives from the Greek words, “ergon” which means work and “genon”, which means producing. Nutritional ergogenic aids, which belongs to the five main categories of ergogenic aids, are forms of nutrients consumed together with natural daily nutrition, in liquid, powder and tablet forms, that sustain the improvement of performance (Argan and Kose, 2019). Nowadays, in addition to the popularity of ergogenic aids among athletes from separate branches, their misuse accelerates due to lack of knowledge (Yıldırım and Sahin, 2019). As a result, numerous athletes repeatedly suffer from acute and chronic diseases. Hence identifying, at a scientific level, amateur and professional athletes’ knowledge and use of conscious nourishment and ergogenic aids, has been gaining prominence in Turkey, as well as the world.

Particular studies have examined the attitudes of certain individuals- who were members of fitness centers and engaged in bodybuilding- towards nutritional supplements (Argan and Kose, 2009; Yalnız et al, 2004). Senel et al. (2004), on the other hand, evaluated the ergogenic aids knowledge of players from different individual branches such as athletics, gymnastics, wrestling, weightlifting, and badminton; and concluded that a substantial number

of athletes (72.5%) does not possess sufficient information on ergogenic aids (Senel et al, 2004). The fact that students who play sports in the course of their university education fail to pay heed to their diet implies that this failure can affect their performance in sports. As a consequence, athletes are more inclined to utilize ergogenic aids.

The aim of this study is to draw information from university students, who are involved in sports and come from a sports background, about their daily energy intake and use of.

## MATERIALS AND METHODS

### Participants

The study consisted of students selected for the sports teams established at Adnan Menderes University. The population of the study comprised of 183 individuals. Sample selection was not generated, and the entire population (183 individuals) was included in the sample group. The mean age of the participants was  $20.77 \pm 2.581$ . 54 of the students were females and 129 were males. In the study, 7 different groups were formed and examined according to sports teams, such as basketball (n=33), football-futsal (n=40), volleyball (n=29), handball (n=24), athletics-cross (n=42), wrestling (n=14), and table tennis (n=4).

### Data Collection Techniques

#### Ipaq

The method of the research was based on a questionnaire and the IPAQ-short (international physical activity questionnaire) form scale. The questionnaire was prepared under the guidance of expert opinion and was based on the questionnaire questions from previous similar studies. The pilot study was applied to Aydın Yıldız Spor Football Club (20 individuals). The students filled the personal questionnaire with the person-oriented technique.

Dr. Micheál Booth (Sydney-Australia) designed in 1996 the International Physical Activity Questionnaire (IPAQ) to examine the health and physical activity levels of the public and the

relationship between the two elements (Booth, 2000). Subsequently, the International Consensus Group developed the IPAQ based on this questionnaire. The IPAQ was designed in short and long forms to identify physical activity and sedentary lifestyles of adults (Atienza, 2001). As a result of these studies, IPAQ emerges as a reliable and valid method for identifying physical activity (Bozkus et al, 2013). In Turkey, Ozturk studied the validity and reliability of the long and short forms of the scale (Ozturk, 2005). The interpretation of the scale is calculated in MET-minutes. The IPAQ score is calculated by multiplying the MET coefficient with the duration of daily activities (in minutes). The calculation is done by taking the constant coefficient 8 MET for intense physical activity, 4 MET for moderately intense activity, 3.3 MET for walking, and 1.5 MET for sitting (Ozudogru, 2013).

### Questionnaire

In the nutrition section of the personal questionnaire, students were asked to provide their nutritional histories in order to distinguish their general eating habits. The data on the foods consumed by the students were evaluated through Beslenme Bilgi Sistemi (BEBIS) (Nutrition Information System) (version 8.1). Then the

students' daily average energy intakes were calculated. The energy calculation was made based on portion sizes of foods provided by Kredi Yurtlar Kurumu (the Credit and Hostels Institution).

### Statistical Analyzes

IBM SPSS Statistics (version 24) program was used to evaluate the obtained data. Descriptive statistics were applied for the distribution of various information belonging to the students, and arithmetic means and standard deviation were taken for the evaluation. Differences between categorical variables were measured with the Chi-Squared test. One Way ANOVA was utilized to evaluate the difference between the means of the three groups. In the evaluation, the level of significance was accepted as  $p < 0.05$ .

## RESULTS

The study targeted students who took part in 9 teams, including basketball, football, futsal, volleyball, table tennis, athletics, cross, wrestling, and handball. A total of 183 student-athletes, 70.5% male (n: 129) and 29.5% female (n: 54), participated in the study. The age range of the athletes who were surveyed varied between 17-27 and the average age was  $20.88 \pm 2.07$  years. The general characteristics of the athletes are shown in (Table 1).

**Table 1.** General Information

Variables	Mean±SD	Minimum value	Maximum value
Age	20.88±2.07	17	27
Height	1.77±0.09	1.5	2.06
Weight	71.28±13.77	45	136
BMI	22.50±2.47	16.60	43
		Number	%
Gender	Male	129	70.49
	Female	54	29.51
Smoking Use Status	Yes	59	32.24
	No	124	67.76
Alcohol Use Status	Yes	48	26.23
	No	135	73.77

65% of the athletes participating in the survey stated that their eating habits changed after they had started to have an active sports life. This rate is 69.5% for male student-athletes and 66.7% for female student-athletes. Considering the sports branches, 93% of the wrestler students, with the highest rate, reported that their eating habits changed. In the second place, stood the athletics-cross with 81%, and in the last, with 25% percent, table tennis students revealed that their eating habits changed. 23% of the student-athletes expressed that they eat within a program, paying attention to their diet. 37.5% of the student-athletes affirmed that they eat snacks on training days. On non-training days, this rate is 57.38%. As for the habit of skipping meals, 83.6% recounted that they skip meals. 39.2% reported skipping

breakfast, 35.94% lunch, 22.22% snack and 4% dinner. Among the reasons for skipping meals, 59% revealed that they mostly skip meals because they do not have time, and 4% noted that they skip meals to lose weight. 65.6% of the student-athletes shared that they follow the same diet on training days as normal days, and do not have a special diet for training days. 34.4% of the participants stated that they follow a different diet on training days compared to other days. In the daily average water consumption of the sports students, the highest rate of 28.96% drinks 1-1.5 liters, and the lowest rate of 18% drinks 2.5 liters or more water a day (Table 2).

**Table 2:** Nutrition Habits

Variables		f	%
<b>Dietary Habits Change</b>	Yes	119	65
	No	64	35
<b>Implementing a Nutrition Program</b>	Yes	42	22.95
	No	141	77.05
<b>Training Day Specific Diet</b>	Yes	63	34.4
	No	120	66.6
<b>Number of Meals Consumed in Training Days</b>	Main & Snacks Meals	105	57.38
	3 Main Meals	55	30.05
	1 or 2 Main Meals	23	12.57
<b>Number of Meals Consumed in Non-Training Days</b>	Main & Snacks Meals	105	57.38
	3 Main Meals	55	30.05
	1 or 2 Main Meals	23	12.55
<b>Skipping Meal Habits</b>	Yes	47	24.14
	Sometimes	106	57.92
	No	30	16.39
<b>Skipped Meal</b>	Morning	60	39.22
	Noon	55	35.95
	Evening and Snacks	38	24.83
<b>The Reason For Skipping Meals</b>	I do not have time	88	59.06
	I want to lose weight	6	4.03
	Other	55	36.91
<b>Daily Water Consumption</b>	1-1.5Lt	53	28.96
	1.5-2.5Lt	97	53.01
	2.5 Lt and above	33	18.03

The average daily vitamin and mineral intakes of the athletes participating in the survey are listed below. Average daily protein, fat and carbohydrate consumption rates are also listed (Table 3). The participants receive  $14.67 \pm 3.35\%$  of their daily

average energy intake from proteins,  $33.28\% \pm 7.73\%$  from fat, and  $52.02\% \pm 9.72\%$  from carbohydrates. Table 3 illustrates the average amount of energy intake students from different branches receive during periods of competition.

**Table 3:** Average Amounts of Daily Food and Mineral Intake

Variables	Male (kcal)	Female (kcal)
<b>Energy</b>	2618.96 ± 892.71	
<b>Basketball</b>	3011 ± 1049.4	2258.2 ± 560.9
<b>Volleyball</b>	2521.4 ± 677.2	2548.1 ± 1088.5
<b>Handball</b>	2943.2 ± 1042.5	2226.2 ± 635.9
<b>Football-Futsal</b>	2215.9 ± 800.4	2612.4 ± 2122
<b>Athletics-Kross</b>	2799 ± 908.8	2417.2 ± 865.35
<b>Wrestling</b>	3337.5 ± 933.9	X*
<b>Table Tennis</b>	2393.4 ± 463.3	X*
<b>Water</b>	2055.85 ± 695.15ml	
<b>Protein(%)</b>	92.48 ± 33.96g (14.67 ± 3.35)	
<b>Fat(%)</b>	96.47 ± 35.92g (33.28 ± 7.73)	
<b>Carbohydrate(%)</b>	343.31 ± 141.53g (52.02 ± 9.72)	
<b>Fiber</b>	25.21 ± 10.9g	

X: No sports team

27.23% of the student-athletes who completed the questionnaire stated that they have been using at least 1 type of nutritional ergogenic aid, while 72.8% reported that they are not using any nutritional aids. 29.5% of the male student-athletes and 18.5% of the female student-athletes maintained that they utilize nutritional ergogenic aids. The usage rate of at least 1 type of nutritional ergogenic aid was found to be 35.7% in sports students who have a bodybuilding or fitness membership. With regards to the sports branches, the wrestler students, with a rate of 57.1%, were the one group who preferred ergogenic aids the most. To increase performance in sports (with the rate of 20.22%) was chosen as the primary reason for the utilization of ergogenic aid.

No statistically significant disparity was observed between the athletes' use of ergogenic aids according to their gender, membership in bodybuilding/fitness centers, and IPAQ category ( $p > 0.05$ ). However, a statistical difference in the use of ergogenic aids was found between the students when their meal skipping habits were analyzed. It was discovered that athletes who resort to ergogenic aids, have the habit of skipping meals more than the athletes who do not use ergogenic aids. ( $\chi^2: 7.800$ ;  $p: 0.020$ ) ( $p < 0.05$ ).

When an analysis was carried out on whether there existed a divergence between the levels of sufficient knowledge on ergogenic aids of students who did and did not use ergogenic aids, a statistically significant difference was observed. The majority of

the athletes who did not make use of ergogenic aids thought that they did not have enough information about ergogenic aids ( $X^2:14.611$ ;  $p:0.000$ ) ( $p<0.05$ ).

**Table 4:** Comparison of Ergogenic Supplements Use

Variables		Ergogenic Support Use Case			Value
		Yes	No	Total	
		n (%)	n(%)	n(%)	
Gender	Male	38(21)	90(49.7)	128(70.7)	$X^2:2.252^a$ $p:0.133$
	Female	10(5.5)	43(23.8)	53(29.3)	
IPAQ Group	Inactive	1(0.6)	9(5)	10(5.5)	$X^2:1.789^a$ $p:0.409$
	Moderately Active	8(4.4)	17(9.4)	25(13.8)	
Fitness membership	Very Active	39(21.5)	107(59.1)	146(80.7)	$X^2:3.929^a$ $p:0.047^*$
	Yes	20(11)	35(19.3)	55(30.34)	
The habit of skipping meals	No	28(15.5)	98(54.1)	126(69.6)	$X^2:7.800^a$ $p:0.020^*$
	Yes	5(2.8)	40(22.1)	45(24.9)	
	Sometimes	32(17.7)	74(40.9)	106(58.6)	$X^2:7.800^a$ $p:0.020^*$
	No	11(6.1)	19(10.5)	30(16.6)	

\* $p<0,05$

Student-athletes participating in the IPAQ form were divided into 3 categories according to their IPAQ scores. Accordingly, 79.41% of the students constituted the very active (category 3) group in terms of physical activity. In the second place stood the moderately active (category 2) group with 14.71%, and there were 5.88% of the students in the inactive (Category 1) group. 5 students did not give an answer for the IPAQ scale. 26.7% of the student-athletes in the category 3 use nutritional ergogenic aids. This rate was found to be 32% in category 2 and 10% in category 1. 78.3% of the male athletes were in the very active group, 10.9% in the moderately active and 3.9% in the inactive group. On the other hand, 63% of the female student-athletes were in the very active group, 20.4% in the moderately active and 9.3% in the inactive group.

There was no statistically significant difference between the IPAQ categories of the athletes according to their gender, average daily water consumption, habit of skipping meals, and smoking status ( $p>0.05$ ) (Table 5).

**Table 5:** Comparison of IPAQ and Other Parameters

IPAQ Category			Inactive	Moderately Active	Very Active	Total	Value
<b>Gender</b>	Male	n(%)	5(2.7)	14(7.7)	110(60.1)	129(70.5)	X <sup>2</sup> :5.588 <sup>a</sup> p:0.061
	Female	n(%)	5(2.7)	11(6)	38(20.8)	54(29.5)	
<b>Daily Water Consumption</b>	1-1.5Lt	n(%)	6(3.3)	11(6)	36(19.7)	53(29)	X <sup>2</sup> :10.666 <sup>a</sup> p:0.099
	1.5-2.5Lt	n(%)	2(1.1)	11(6)	84(45.9)	97(53)	
	2.5 Lt and above	n(%)	2(1.1)	3(1.6)	28(15.3)	33(18)	
<b>Skipping Meals</b>	Yes	n(%)	3(1.6)	5(2.7)	38(20.8)	46(25.1)	X <sup>2</sup> :2.631 <sup>a</sup> p:0.621
	Sometimes	n(%)	5(2.7)	18(9.8)	84(45.9)	107(58.5)	
<b>Use of Smoking</b>	No	n(%)	2(1.1)	2(1.1)	26(14.2)	30(16.4)	X <sup>2</sup> :1.340 <sup>a</sup> p:0.855
	Yes	n(%)	2(1.1)	7(3.8)	50(27.3)	59(32.2)	
<b>Meal Consumption On Non-Training Days</b>	Having at least one snack	n(%)	6(3.3)	14(7.7)	85(46.4)	105(57.4)	X <sup>2</sup> :0.048 <sup>a</sup> p:0.976
	Having no snack	n(%)	4(2.2)	11(6)	63(34.4)	78(42.6)	
<b>Meal Consumption On Training Days</b>	Having at least one snack	n(%)	7(3.8)	21(11.5)	115(62.8)	143(78.1)	X <sup>2</sup> :0.907 <sup>a</sup> p:0.635
	Having no snack	n(%)	3(1.6)	4(2.2)	33(18)	40(21.9)	

\*p&lt;0.05

When the differences between the IPAQ category, the percentage of meeting the need (of average daily energy intake), the use of ergogenic support, and the sports branches were examined, no statistically significant disparity was found in terms of IPAQ groups between the athletes from distinct sports branches ( $p > 0.05$ ). However, a considerable difference was found between the students from separate sports branches with regards to the percentages of meeting the athletes' needs, ( $X^2:5.212$ ;  $p:0.022$ ). Most of the students who take part in team sports were not able to meet their energy needs sufficiently, and statistically meaningful differences were encountered between

students from dissimilar sports branches in terms of their use of ergogenic aids ( $X^2:15.731$ ;  $p:0.000$ ) (Table 6).

**Table 6:** Differences Between Sport Branch and Various Variables

Sport branch						
Variables			Team sports	Individual sports	Total	Value
IPAQ Category	Inactive	n(%)	6(3.3)	4(2.2)	10(5.5)	X <sup>2</sup> :2.043 <sup>a</sup> p:0.360
	Moderately active	n(%)	14(7.7)	11(6)	25(13.7)	
	Very active	n(%)	103(56.3)	45(24.6)	148(80.9)	
Percentage of meeting the needs	Insufficient	n(%)	66(37.1)	22(12.4)	88(49.4)	X <sup>2</sup> :5.212 <sup>a</sup> p:0.022*
	Sufficient	n(%)	53(29.8)	37(20.8)	90(50.6)	
Ergogenic support use case	Yes	n(%)	21(11.6)	27(14.9)	48(26.5)	X <sup>2</sup> :15.731 <sup>a</sup> p:0.000*
	No	n(%)	100(55.2)	33(18.2)	133(73.5)	

## DISCUSSION

In the study, no revealing difference was noticed between sports students in terms of smoking and physical activity levels. In the study of Arslan et al. (2015), different from this study, there was a serious discrepancy between smoking and intense activity, weekly walking activity, and total physical activity; similar to this study, a major difference was not encountered between moderate activity values (Arslan et al, 2015). There are many studies on the harm of smoking on the health of athletes. For example, in a study by Fubuko et al. (1993), the researchers stated that smoking impacts not only aerobic strength but also anaerobic strength negatively, and that even though some individuals were addicted for less than a year, smoking seriously damaged their physical performance (Fubuko et al, 1993). However, in this study, unlike the literature, it was seen that the physical activity levels of smokers were not different from the physical activity levels of non-smokers. The reason for this may be that the harms of smoking begin to show their effects in the long term. In the study, due to the low average age of the student-athletes, the students may not have encountered the possible harms of smoking yet.

Two of the most essential elements for athletes to be successful in competitions are training and sports nutrition (Yarar et al, 2011). In addition, the tendency to use ergogenic aids for the betterment of performance has become very popular, especially

among young athletes (Cetin et al, 2008). It has been proved by various studies that even students participating in university sports competitions seek solutions to achieve success and high-level performance quickly, and do not pay attention to their nourishment. As in similar survey studies, the accuracy of the data obtained in this study is limited by the reliability of the answers given by the students.

In the survey study, there were substantial differences between the BMI values of the student-athletes depending on their gender. The male student-athletes had a higher BMI average than female sports students. In the study conducted by Cinar et al. (2004) on different branches, as in this study, a significant divergence was also detected between genders in terms of BMI values (Cinar, 2004). Again, in Çınar's study, in parallel with this study, male students' BMI values were higher. The reason for the gender-related difference may be due to the fact that in males and females, the level of physical activity and the percentage of meeting the daily energy intake are not the same amount.

In a study conducted by Sirinyildiz et al. (2017), 82.5% of the participants stated that they did not pay attention to any dietary plan (Sirinyildiz, 2017). Regarding this issue, there was a notable contrast between awareness of BMI score and attention to nutrition. In this study, similar to Sirinyildiz's, statistically noteworthy divergences were found between nutrition and BMI. According to these



results, if the athletes get their nourishment properly and within a plan, they can have the optimal BMI value for their performances.

In a journal published by Türkiye Halk Sağlığı Kurumu (the Public Health Agency of Turkey) in 2013, it was maintained that a poor and irregular eating habit has negative effects on BMI value of a person. In the survey study, there are dissimilarities between the BMI values of the students who eat according to a plan and those who do not. It is of great importance to provide training to student-athletes about the eminence of nutrition plans.

There have been multiple studies that demonstrate how university-age students who are interested in sports do not pay attention to their nutrition (Bozkurt ve Nizamlioglu, 2005; Ozturk, 2006; Yarar et al, 2011). Nutrition is the basic condition and determinant of health. The principal factors that have an impact on performance of athletes are genetic structure, appropriate training program, and nutrition. The newly-emerging rapid upsurge of interest in sports nutrition can be linked with the fact that nutrition enhances performance (Lawrence ve Kirby, 2002). There exists, three goals in sports: being healthy, preventing injuries, and increasing performance. These three objects are closely related to proper nutrition strategies before, during, and after competition and/or training. An athlete's sources of nutritional elements can play a role in improving or impairing their sports performance (Hawley et al, 2006).

In various studies examining the nutritional knowledge and habits of university students, the results for skipping meals are similar to our study (Bora, 2014; Saygin et al, 2009; Yilmaz ve Ozkan, 2007; Vancelik, 2007). In this study, in parallel with the results of Vancelik et al. (2007), it was observed that the student-athletes who had the habit of skipping meals mostly skipped breakfast (Vancelik et al, 2007).

In the survey study, a difference was found between the number of meals consumed by the student-athletes on training days and non-training days, and

the rate of having at least one snack on training days was noticed to be higher compared to other days. The high number of meals gains importance in terms of increasing energy expenditure in athletes (Argan and Kose, 2009; Vancelik, 2007; Ozdemir, 2010) found that cyclists who ate 5 meals (3 main, 2 snacks) a day outperformed cyclists who ate three meals a day; the total working efficiency was maximized with five meals had throughout the day; frequent meals enhanced the maximum efficiency; eating two meals a day without breakfast showed that it does not increase athletic performance (Ozdemir, 2002; Vancelik et al, 2007 Argan and Kose, 2009). Ekwerekwu and Ejoorv (2012) mentioned, in their study, the importance of meals consumed during the day and concluded that football players reached a stronger, leaner, faster and agile state if breakfast was included sufficiently in their meals during a day (Ekwerekwu and Ejoorv, 2012).

In addition to water for the importance of sports nutrition, sports drinks are also crucial to prevent dehydration and to balance the minerals and energy that needs be taken. According to type of sport and need for energy, the athlete should acquire the habit of consuming as much liquid as they need (Demirkan et al, 2010). Demirkan et al. (2010), in a study, asserted that if enough water is not consumed, it is possible for athletes to encounter performance problems due to dehydration (Demirkan et al, 2010). When the literature is reviewed, water consumption eliminates negative effects such as muscle cramps, dry mouth and vomiting (Ersoy, 2012; Pular ve Cicioglu, 2001). In this examination, it was seen that most of the students could not reach the average daily intake of liquid. It is important to give necessary trainings so that students do not experience problems during competitions.

Nutritional supplements are frequently used by athletes to improve performance because they are not on the World Anti-Doping Agency's list of doping substances and methods. When various articles questioning the use of ergogenic aids by amateur, elite or professional athletes are examined,

the usage rate of nutritional ergogenic aids varies. Bora (2014), in his work, stated the percentage of ergogenic use by athletes as 92 (Bora, 2014). According to a study by Guler et al. (2004) investigating the use of ergogenic aids by football players, 86% of the athletes used nutritional and physiological ergogenic aids (Guler, 2004). In Swirzinski et al.'s study (2000), 33% of football players reported that they used ergogenic aids (Swirzinski et al, 2000). Again, in the study of Dinc et al. on individuals who exercise regularly, it was asserted that approximately one-third of the individuals participating in the survey used ergogenic aids. One of the results of the research conducted by Cetin et al. (2008), was that 85.3% of the students did not use any ergogenic aids and drugs, and those who used them were students who actively engaged in high-level sports (Cetin et al, 2008). In this study, approximately one fourth of the student-athletes was found to be using ergogenic aids several times a week, and similar values were obtained with the literature on the subject.

34% of the athletes who participated in Demirci's (2012) study recounted that they used ergogenic aids (Demirci, 2012). The most common reasons for the use of these supplements were related to their assistance in burning fat and increasing muscle mass. In this study, the result was parallel to Demirci's study, and the majority of the students who used ergogenic aids reported that they used them to increase lean muscle mass. Although body composition varies according to different sports branches, as seen in studies, the low body fat percentage of an athlete is a condition that has adverse effects on their performance in most sports (Akin et al, 2004). Therefore, one of the reasons why athletes turn to ergogenic aids is to increase their lean muscle mass.

In a study conducted by Sirinyildiz et al. (2017) on BESYO (School of Physical Education and Sports) students, no statistically significant difference was found in the utilization of ergogenic aids between the male and female athletes. Similar results were obtained in this study, and no statistically

noteworthy distinction was observed between genders in terms of the use of ergogenic aids (Sirinyildiz, 2017).

It has been observed that most of the student-athletes have a high level of physical activity. In addition to genetically determined muscle strength, muscle strength can be increased with exercises. In the study conducted by Miçooğulları et al (2016), it was found that most of the students had a high level of physical activity. It was affirmed that the group with high level of physical activity had more body muscle mass (Micoogulları, 2016). Another study claimed that physical activity has positive effects on various qualities including physical fitness level, endurance capacity, increase in strength and flexibility, increase in strength of bones and muscles, improvement in social relations, and increase in self-confidence (Thompson et al, 2009). The literatures given above indicate the gravity and necessity of physical activity in sports. As a result of this study, the fact that most of the student-athletes have a high level of physical activity suggests that this factor will most likely have a positive impact on their performance during a competition/training.

This study, also reached the conclusion that there was no statistically significant difference in the physical activity levels of the student-athletes according to their gender. In accordance with this result, it can be maintained that the physical activity levels of female and male athletes are at a similar level. Arslan et al. (2015), in the study conducted on university students, as this study, found no statistical disparity between genders in regards to their level of physical activity (Arslan et al, 2015). The reason why there is no statistical difference between the groups may be due to the fact that all of the students are licensed athletes, they participate in competitions and regularly train at least a few times a week.

### **Conclusion and Recommendations**

Approximately one-quarter of the student-athletes participating in the survey make use of at least one

type of nutritional ergogenic supplement. Among those who resort to ergogenic aids, the number of those who have the habit of skipping meals is higher than the athletes who do not skip meals; and most of the students who take part in team sports are insufficient to meet their energy needs. It is recommended that the study be performed in larger groups.

#### **Conflict of Interest**

No conflict of interest was declared by the authors.

#### **Ethics**

The study was deemed ethically appropriate by the Adnan Menderes University, Faculty of Health Sciences, Non-Interventional Ethics Committee (Date: 23.08.2017 and Number: 31). Necessary permissions were obtained for the study to be carried out at Adnan Menderes University, School of Physical Education and Sports. In addition, the IPAQ-Short Form was applied to the students after obtaining permission from Ozturk (2005), who finalized the form's validity and reliability in Turkey (Ozturk, 2005).

## REFERENCES

- Akın, G., Ozder, A., Koca Ozet, B., Gultekin, T. (2004). Elit erkek sporcuların vücut kompozisyonu değerleri, Ankara Üniversitesi Dil ve Tarih-Cografya Fakültesi Dergisi, 44, 125-134.
- Argan, M., Kose, H. (2009). Sporcu Besin Desteklerine (Sports Supplements) Yonelik Tutum Ve Faktorleri: Fitness Merkezi Katilimcileri Uzerine Bir Arastirma. Spor Bilimleri Dergisi, 20(4), 152–164.
- Arslan, C., Kizar, O., Sandikci, B., Cakaroglu, D., Kizar, O., Sandikci, B., Cakaroglu, B. (2015). Bingol Universitesindeki Ogrencilerin Fiziksel Aktivite Duzeylerinin Incelenmesi. 8. Ulusal Spor Bilimleri Ogrenci Kongresi, 160-168.
- Booth, M. (2000). Assessment of Physical Activity: An International Perspective. Research Quarterly For Exercise And Sport, 71(2), 114-120.
- Bora, Z. (2014). Spor Salonunda Calisan Vucut Gelistirme İle İlgilenen Spor Hocalarinin Beslenme ve Takviye Destek Urun Tuketim Durumlarinin Saptanmasi. Yuksek Lisans Tezi, Baskent Universitesi Saglik Bilimleri Enstitusu, Ankara, 116.
- Bozkurt, S., Nizamlioglu, M. (2005). Beden Eğitimi Ve Spor Yüksekokullarında Okuyan Aktif Spor Yapan Öğrencilerin Beslenme Aliskanliklarin Belirlenmesi ve Değerlendirilmesi. Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 14, 209-215.
- Cetin, E., Ertas, B.D., Orhan, O. (2008). Gazi Universitesi Beden Eğitimi ve Spor Yüksekokulu Öğrencilerinin Ergojenik Yardımcılar, Doping ve Sağlık Hakkındaki Bilgi ve Aliskanliklarinin Belirlenmesi, Spormetre Beden Eğitimi ve Spor Bilimleri Dergisi, VI (3) 129-132
- Cinar, V., Bostanci, O., Imamoglu, O., Kabadayi, M., Sahan, H. (2004). Ogrenci Sporcularda Brans ve Cinsiyete Gore Antrapometrik Farkliliklar, Ataturk Universitesi Beden Egitimi ve Spor Bilimleri Dergisi, 26-34.
- Demirci, U. (2012). Saglik Amaci İle Egzersiz Yapan Kisilerde Vucut Bilesimi, Besin Destegi Kullanimi, Beslenme Aliskanliklarinin Saptanmasi. Yuksek Lisans Tezi, Halic Universitesi, Saglik Bilimleri Enstitusu, Istanbul.
- Demirkan, E., Koz, M., Kutlu, M. (2010). Sporcularda Dehidrasyonun Performans Uzerine Etkileri ve Vucut Hidrasyon Duzeyinin İzlenmesi. Spormetre Beden Egitimi ve Spor Bilimleri Dergisi 8(3), 81–92.
- Dziedzic, C.E., Higham, D.G. (2014). Performance Nutrition Guidelines For International Rugby Sevens Tournaments. Int J Sport Nutr Exerc Metab, 24(3), 305-14, doi: 10.1123/ijsnem.2013-0172.
- Ekweroku, B.E. (2012). Collegiate Football Student-Athlete Body Mass Composition Change Related To Mandatory Breakfast Consumption. University of Missouri Columbia, 195
- Ersoy, G. Sporcu Beslenmesi (2. bs.), Reklam Kurdu Ajansı, Ankara, 2012, 5-28
- Fubuko, Y., Takamotu, N., Kushima, K., Ohtaki, M., Kihara, H., Tanaka, T., Use, S., Munaka, M. (1993). Cigarette Smoking And Physical Fitness. Annual Physiology Anthropology, 12, 195-212.
- Guler, D., Senel, O., Colak, M., Donmez, G., Zorba, E. (2004). Bazı Takım Sporlarındaki Üst Düzey Sporcuların Ergojenik Yardımcılar Hakkındaki Bilgi ve Kullanım Düzeyleri. The 10th Ichper SD Europe Congress & 8th International Sport Science Congress, 134
- Hawley, J.A., Tipton, K.D. (2006). Promoting Training Adaptations Through, Nutral Interventions. Journal Sport Science, 24(7), 709-721.
- Lawrence, M.E., Kirby, D.M. (2002). Nutrition and Sport Supplements: Factor Fiction. Journal of Clinical Gastroenterology, 35(4), 299-306.
- Micoogulları, A., Yıldızgoren, M.T., Turhanoglu A.D, Ustun N, Guler H. (2016). Amatör Sporcularda Fiziksel Aktivite Düzeyleri ile Izokinetik Kas Performansı, Turk Journal Osteoporos, 22:35-9
- Ozdemir, G. (2010). Spor Dallarina Gore Beslenme. Spormetre Beden Egitimi ve Spor Bilimleri Dergisi 1, 1–6.
- Ozturk, M. (2005). Universitede Egitim-Ogretim Goren Ogrencilerde Uluslararası Fiziksel Aktivite Anketinin Gecerlilik ve Guvenirligi Fiziksel Aktivite Duzeylerinin Belirlenmesi. Yuksek Lisans Tezi, T.C. Hacettepe Universitesi Saglik Bilimleri Enstitusu, Ankara.
- Ozudogru, E. (2013). Universite Personelinin Fiziksel Aktivite Düzeyi İle Yaşam Kalitesi Arasındaki İlişkinin İncelenmesi. Yüksek Lisans Tezi, Mehmet Akif Ersoy Üniversitesi Eğitim Bilimleri Enstitüsü, Burdur, 89.
- Pulur, A., Cicioglu, I. (2001). Bayan Basketbolcuların Beslenme Bilgisi ve Alışkanlıkları. Beden Eğitimi ve Spor Dergisi, 1(2).
- Senel, O., Guler, D., Kaya, I., Ersoy, A., Kurkcu, R. (2004). Farkli Ferdi Branslardaki Ust Duzey Turk Sporcularin Ergojenik Yardimcilara Yonelik Bilgi Ve Yararlanma Duzeyleri. Spormetre Beden Egitimi ve Spor Bilimleri Dergisi, 2, 41–47.
- Sirinyildiz, F., Cesur, G., Alkan, A., Ek, R.O. (2017). Beden Egitimi Ve Spor Yüksekokulu Ogrencilerinin Vucut Kitle

Indeksi Farkındalığının Belirlenmesi, Smyrna Tıp Dergisi, 1-3.

Swirzinski, L., Latin, R.W., Berg, K.A. (2000). Survey Of Sports Nutrition Supplements In High School Football Players. J Strength Cond Res. 14(4):464-469

Thompson, W.R., Gordon, N.F., Pescatello, L.S. (2009). ACSM's Guidelines for Exercise Testing and Prescription (8th ed.), Lippincott Williams&Wilkins, Hiladelphia, 232-250

Vancelik, S., Onal, S., Guraksin, A., Beyhun, E. (2007). Üniversite Öğrencilerinin Beslenme Bilgi ve Alışkanlıkları ile İlişkili Faktörler. TSK Koruyucu Hekimlik Bülteni, 6, 4.

Yarar, H., Gokdemir, K., Eroglu, H., Ozdemir, G. (2011). Elit Seviyedeki Sporcuların Beslenme Bilgi ve Alışkanlıklarının Değerlendirilmesi. Selcuk Üniversitesi Beden Eğitimi ve Spor Bilim Dergisi, 13(3), 368-371.

Yildirim, Y., Sahin, S. (2019). Elit Güreşçilerin Doping ve Ergojenik Yardım Hakkındaki Bilgi ve Kullanma Düzeylerinin İncelenmesi. Spor Bilimleri Araştırmaları Dergisi, 4(2), 187 - 204.

Yılmaz, E., Ozkan, S. (2007). Üniversite Öğrencilerinin Beslenme Alışkanlıklarının İncelemesi, Fırat Sağlık Hizmetleri Dergisi, 2(6), 87-104.

Zorba E, Saygın O. (2009). Fiziksel Aktivite ve Uygunluk. İnceler Ofset, Ankara.