

# Investigation of The Relationship Between Healthy Life Style Behaviors and Body Mass Index of University Students

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## Abstract

**Aim:** Obesity is one of the most important health problems in this century that affects many people of all ages and genders in the world. Particularly, the irregular eating habits of students, their orientation towards fast-foods and their sedentary lives are some of the reasons that trigger obesity as health problem. Therefore, more importance should be given to this topic and to get rid of obesity and lead a healthy life to prevent complications related to obesity in the population in adulthood. This study was carried out to determine the relationship between healthy lifestyle behaviors and body mass index of university students.

**Method:** The sample of the study included 632 students from Inonu University in the 2017-2018 academic year. A 20-question personal information form, anthropometric measurements and Healthy Lifestyle Scale (HLSS) were used to collect data. The data was analyzed by using independent sample t-test, Mann Whitney-U test, one-way Analysis of Variance and Kruskal Wallis-H test.

**Results:** The primary finding of the study is that inadequate physical activity and irregular dietary habits may affect stress level of the students. Moreover, when the relationship between the body mass index (BMI) and HLSS sub-dimensions of university students were analyzed, a statistically significant difference was found among BMI and sub-dimensions of dietary habits and health responsibility.

**Conclusion:** It can be concluded that physical activity and balanced diet play key roles in health. To avoid obesity and related complications in adulthood, University students should avoid consuming fast-food and increase their physical activity levels during their youth.

**Key words:** Healthy life style behaviors, body mass index, university students.

## INTRODUCTION

Nutrition is the consumption of basic nutrients that has been consumed in sufficient quantity and in a balanced way so that the body can improve health and thereby increases the quality of life. Adequate and balanced nutrition is essential for individuals healthy, economical and social improvement increased level of welfare (28).

Obesity, which is defined as an excessive accumulation of fat in the body, occurs as a result of unbalanced nutrition, that is, if the amount of energy taken with food is more than the amount of energy spent (21). Obesity may develop not only due to imbalance in the energy metabolism or sedentary lifestyle, but also due to genetic and familiar predisposition, birth weight, mother's history of diabetes, behavioral or socio-economic

factors (38). Although obesity rarely develops due to a primary disease (19), age, gender, marital status, smoking, alcohol consumption and sedentary lifestyle are also known to may cause obesity (39). For this reason, obesity is not a medical issue alone, but it is an important public health problem that should be considered with its socio-economic dimensions and not limited to individuals (26, 50).

The prevalence of overweight and obesity increases with accelerating rate all over the world and causes related complications even in early ages (8, 37). According to the estimates of the World Health Organization (WHO), 70-80% of deaths in developed countries and 40-50% of deaths in underdeveloped countries are diseases caused by lifestyle behaviors (52). Some studies showed that the economic situation is also a factor affecting the healthy lifestyle (1, 54). In addition to a balanced diet, regular physical activity play an important role in a healthy life. Regular physical activity significantly reduces the risk of obesity by regulating the energy balance and thus lower the risk of many diseases, especially for cardiovascular system diseases (6, 39, 40). Therefore, accurate and reliable assessment of physical activity and its relationship with health is extremely important (41, 45).

Body Mass Index (BMI) which is a value obtained by dividing the individual's body weight (kg) by the square of the height (m<sup>2</sup>) ( $BMI = kg/m^2$ ), is a simple, easy and invasive method to determine obesity. Since BMI is an indicator that evaluates body weight according to height, it gives fast information about the distribution of fat in the body (36, 49). Although there are various studies investigating the relationship between the healthy lifestyles and BMI of children and adolescents in literature, studies on young adults at higher education are limited (7, 13). The university period is an important period in which the individual tries to become a young adult and passes adolescence and takes many decisions about lifestyle. In this period, it has been shown that technology and innovation reforms dietary and physical activity habits of university education (29). The vast majority of university youth are under intense stress due to the increasing demands from academic life, do not pay attention to their nutrition and perform inadequate physical activity. They also, consume foods with high energy, skip meals, prefer fast-food, do not consume vegetables, fruits, milk and dairy products at adequate amounts during this period

(15). All these factors may negatively affect the physical and mental health of the young people, and their well-being (20, 32). Thus, determining the healthy lifestyle behaviors of the youth during this period and determining the effects on the body composition plays an important role for future life when they become adults. Therefore, the purpose of this study is to reveal the relationship between healthy lifestyle behaviors and BMI in university students.

## MATERIAL AND METHOD

### Sample

The descriptive type cross-sectional study was performed with University students in 2017-2018 academic year. Informed consent forms were taken from the students before participating in the study and all procedures were fulfilled accordance with the Declaration of Helsinki. A total of 632 students volunteered to the study and 151 students from the Faculty of Education, 202 from Faculty of Engineering, 157 from Faculty of Economics and 22 from Faculty of Science and Literature were included to the study.

### Data Collection Tool

The socio-demographic characteristics of the participants such as age, gender, department, class, monthly income level, the number of individuals living in the family were determined by self questionnaire form. Health-promoting attitudes and behaviors in relation to the healthy lifestyle was determined by using Healthy Lifestyle Scale (HLSS) developed by Walker, Sechrist and Pender (47) and adapted to Turkish by Esin (17) was used. HLSS consists of six sub-dimensions of 48 items including dietary habit, self-realization, health responsibility, exercise habit, interpersonal support and stress management. According to the results of the exploratory factor analysis, the subscales of the scale explained 42% of the total variance and the factor load values of the items varied between 0.33 and 0.74. The fit indices obtained as a result of confirmatory factor analysis are as follows: GFI=0.87, AGFI=0.71, RMSEA=0.22, CFI=0.89. Cronbach Alpha coefficients of the scale ranged between 0.71 and 0.92. On the other hand, in order to calculate BMI, the heights of the participants were measured using 1 mm precision stadiometer and body weights using 0.1 kg precision with electronic scale. Finally, the calculated BMIs were evaluated according to WHO reference values (49).

## Data Analysis

SPSS (IBM, New York, USA, version 21.0) was used for statistical analysis. Normality of data was tested by Shapiro Wilk analysis and independent group t-test, Mann Whitney-U test, one-way Analysis of Variance and Kruskal Wallis-H tests were used to determine the relationships between

variables. The statistical tests were performed within the 95% confidence interval and significance level was set to  $p < .05$ .

## Results

The purpose of this study is to examine the relationship between healthy lifestyle behaviors and BMI in university students. Findings obtained as a result of statistical analysis are given below.

**Table 1.** The relationship between age and HLSS subscales

Subscale	Age	n	$\bar{x} \pm SD$	$\chi^2$	p
Diet Habit	17-18	75	14.30±3.57	6.875	.173
	19-21	298	14.51±3.82		
	22-24	166	15.22±3.28		
	25-27	93	14.34±2.74		
Self Realization	17-18	75	33.46±7.80	1.658	.891
	19-21	298	33.94±6.37		
	22-24	166	34.10±5.47		
	25-27	93	33.11±5.77		
Health Responsibility	17-18	75	25.27±6.11	2.124	.783
	19-21	298	25.89±5.23		
	22-24	166	25.84±4.86		
	25-27	93	26.05±5.35		
Exercise Habit	17-18	75	12.84±4.67	2.132	.791
	19-21	298	11.81±3.56		
	22-24	166	12.14±3.95		
	25-27	93	11.99±3.38		
Interpersonal Support	17-18	75	17.74±4.02	9.874	.082
	19-21	298	17.25±4.15		
	22-24	166	18.38±4.87		
	25-27	93	17.67±4.10		
Stress Management	17-18	75	18.97±4.65	2.561	.698
	19-21	298	18.35±3.73		
	22-24	166	17.67±4.11		
	25-27	93	17.21±3.53		
Total	17-18	75	122.58±30.82	2.948	.714
	19-21	298	121.75±26.86		
	22-24	166	123.35±26.54		
	25-27	93	120.37±24.87		

When the results were analyzed, it was seen that there was no statistically significant difference between the age of university students and the subscale of HLSS (Table 1).

**Table 2.** The relationship between gender and HLSS subscales

Subscale	Gender	n	$\bar{x} \pm SD$	$\chi^2$	p
Diet Habit	Man	385	15.94±3.45	1.124	.278
	Woman	247	15.73±2.82		
Self Realization	Man	385	38.78±6.21	.648	.621
	Woman	247	38.11±6.01		
Health Responsibility	Man	385	27.24±5.38	1.351	.310
	Woman	247	26.61±4.78		
Exercise Habit	Man	385	13.32±4.10	.149	.911
	Woman	247	12.85±3.78		
Interpersonal Support	Man	385	18.87±4.97	1.192	.273
	Woman	247	18.34±3.82		
Stress Management	Man	385	19.32±4.21	2.148	.049*
	Woman	247	18.68±4.07		
Total	Man	385	133.47±28.32	1.379	.211
	Woman	247	130.32±25.28		

\* $p < .05$

According to Table 2, when the gender and HLSS subscales of the university students participating in the study were examined, a statistically significant difference was found between the gender and only the stress management subscales ( $p<.05$ ). According to the results, it was observed that mean scores of male students were higher than those of female students in terms of stress management sub-dimension.

**Table 3.** The relationship between BMI and HLSS subscales

Subscale	BMI	n	$\bar{x}\pm SD$	$\chi^2$	p	Mann-Whitney U test
<b>Diet Habit</b>	1) Underweight	81	14.78 $\pm$ 2.93	8.783	.048*	5<1,2,3,4
	2) Normal	325	14.92 $\pm$ 3.48			
	3) Overweight	120	14.95 $\pm$ 3.23			
	4) Class I Obesity	55	15.47 $\pm$ 3.93			
	5) Class II Obesity	51	11.71 $\pm$ 1.15			
<b>Self Realization</b>	1) Underweight	81	34.51 $\pm$ 6.67	3.249	.743	
	2) Normal	325	34.28 $\pm$ 5.98			
	3) Overweight	120	34.41 $\pm$ 5.53			
	4) Class I Obesity	55	33.78 $\pm$ 7.48			
	5) Class II Obesity	51	31.78 $\pm$ 2.67			
<b>Health Responsibility</b>	1) Underweight	81	25.38 $\pm$ 3.91	9.982	.049*	5<1,2,3,4
	2) Normal	325	26.34 $\pm$ 4.82			
	3) Overweight	120	25.67 $\pm$ 4.53			
	4) Class I Obesity	55	24.72 $\pm$ 7.57			
	5) Class II Obesity	51	22.58 $\pm$ 3.38			
<b>Exercise Habit</b>	1) Underweight	81	13.28 $\pm$ 2.90	5.864	.397	
	2) Normal	325	13.11 $\pm$ 3.21			
	3) Overweight	120	12.78 $\pm$ 3.49			
	4) Class I Obesity	55	12.47 $\pm$ 2.95			
	5) Class II Obesity	51	9.67 $\pm$ 1.48			
<b>Interpersonal Support</b>	1) Underweight	81	17.78 $\pm$ 4.22	6.572	.237	
	2) Normal	325	17.49 $\pm$ 4.18			
	3) Overweight	120	17.91 $\pm$ 4.57			
	4) Class I Obesity	55	16.28 $\pm$ 4.83			
	5) Class II Obesity	51	13.72 $\pm$ 2.41			
<b>Stress Management</b>	1) Underweight	81	17.35 $\pm$ 4.78	4.814	.594	
	2) Normal	325	17.82 $\pm$ 4.67			
	3) Overweight	120	18.42 $\pm$ 4.45			
	4) Class I Obesity	55	17.56 $\pm$ 4.84			
	5) Class II Obesity	51	16.21 $\pm$ 2.18			
<b>Total</b>	1) Underweight	81	123.08 $\pm$ 25.41	6.591	.193	
	2) Normal	325	123.96 $\pm$ 26.34			
	3) Overweight	120	124.14 $\pm$ 25.08			
	4) Class I Obesity	55	120.28 $\pm$ 31.60			
	5) Class II Obesity	51	105.67 $\pm$ 13.27			

\* $p<.05$

When the relationship between BMI and HLSS subscales of university students participating in the study was examined, there was a statistically significant difference among the BMI and dietary habit and health responsibility subscales (Table 3). Class II Obese students have higher dietarial intake

and health responsibility mean scores compared to students who are underweight, normal, overweight and class I obese.

**Table 4.** The relationship between department variable and HLSS subscales

Subscale	Department	n	$\bar{x}\pm SD$	F	p	Post-hoc Scheffe
<b>Diet Habit</b>	1) Faculty of Education	151	15.78±3.15	.432	.876	
	2) Faculty of Engineering	202	14.79±2.57			
	3) Faculty of economics	157	14.77±3.59			
	4) Faculty of Arts and Sciences	122	14.45±3.61			
<b>Self Realization</b>	1) Faculty of Education	151	34.07±5.94	1.751	.219	
	2) Faculty of Engineering	202	33.19±5.11			
	3) Faculty of economics	157	34.56±6.48			
	4) Faculty of Arts and Sciences	122	33.01±5.23			
<b>Health Responsibility</b>	1) Faculty of Education	151	26.22±4.97	1.148	.379	
	2) Faculty of Engineering	202	25.20±3.93			
	3) Faculty of economics	157	25.96±5.38			
	4) Faculty of Arts and Sciences	122	26.16±5.72			
<b>Exercise Habit</b>	1) Faculty of Education	151	11.53±3.17	4.428	.005*	2>3,1,4
	2) Faculty of Engineering	202	12.63±3.47			
	3) Faculty of economics	157	12.25±3.32			
	4) Faculty of Arts and Sciences	122	11.16±3.11			
<b>Interpersonal Support</b>	1) Faculty of Education	151	17.01±3.84	4.811	.004*	2>3,1,4
	2) Faculty of Engineering	202	18.19±3.78			
	3) Faculty of economics	157	17.61±4.15			
	4) Faculty of Arts and Sciences	122	16.09±3.89			
<b>Stress Management</b>	1) Faculty of Education	151	17.49±3.84	2.345	.097	
	2) Faculty of Engineering	202	17.96±3.79			
	3) Faculty of economics	157	18.26±3.92			
	4) Faculty of Arts and Sciences	122	16.81±3.67			
<b>Total</b>	1) Faculty of Education	151	122.10±24.91	1.417	.318	
	2) Faculty of Engineering	202	121.96±22.65			
	3) Faculty of economics	157	123.41±26.84			
	4) Faculty of Arts and Sciences	122	117.68±25.23			

\*p&lt;.05

According to the department variable and the subscales of the HLSS, a statistically significant difference was found between the subscales of exercise habits and interpersonal support ( $p<.05$ ). According to the post-hoc analysis, mean scores of

the exercise habit and interpersonal support subscales of the students in faculty of engineering are higher compared to the students in faculty of economics, education and, arts and science.

**Table 5.** The relationship between Grade variables and HLSS subscales

Subscale	Grade	n	$\bar{x}\pm SD$	F	p	Post-hoc Scheffe
<b>Diet Habit</b>	Freshman	149	15.48±2.81	.793	.592	
	Junior	179	15.28±3.48			
	Sophomore	154	15.11±3.32			
	Senior	150	15.37±3.43			
<b>Self Realization</b>	Freshman	149	34.90±5.67	1.584	.259	
	Junior	179	34.28±5.83			
	Sophomore	154	33.04±6.32			
	Senior	150	33.75±5.67			
<b>Health Responsibility</b>	Freshman	149	26.81±4.91	1.981	.236	
	Junior	179	26.91±5.29			
	Sophomore	154	25.48±4.78			
	Senior	150	25.89±4.56			
<b>Exercise Habbit</b>	Freshman	149	13.35±3.72	1.325	.397	
	Junior	179	12.67±3.21			
	Sophomore	154	11.81±3.43			
	Senior	150	12.56±3.63			
<b>Interpersonal Support</b>	Freshman	149	17.81±3.89	.436	.765	
	Junior	179	17.79±3.93			
	Sophomore	154	17.62±4.45			
	Senior	150	17.49±3.65			
<b>Stress Management</b>	Freshman	149	18.28±3.84	2.412	.048*	2>3
	Junior	179	18.64±3.97			
	Sophomore	154	17.51±3.91			
	Senior	150	17.72±3.83			
<b>Total</b>	Freshman	149	126.63±24.84	1.632	.193	
	Junior	179	125.57±25.71			
	Sophomore	154	120.57±26.21			
	Senior	150	122.78±24.77			

\*p&lt;.05

When the grades of university students and the subscales were analyzed, a statistically significant difference was found between the grade and the stress management subscale (p<.05). According to the results, mean scores of the stress management subscale of the sophomores were higher than those of juniors (Table 5).

**Table 6.** The relationship between number of people in the family and HLSS subscales

Subscale	Number of people in the family	n	$\bar{x}\pm SD$	F	p	Post-hoc Scheffe
Diet Habbit	3	130	14.82±3.28	3.624	.028*	3>4,5
	4	222	14.58±3.41			
	5	147	14.91±3.38			
	6 and above	133	14.48±3.05			
Self Realization	3	130	34.87±5.45	1.128	.451	
	4	222	34.47±6.43			
	5	147	34.21±6.18			
	6 and above	133	34.36±5.79			
Health Responsibility	3	130	26.85±4.25	.481	.893	
	4	222	26.27±5.78			
	5	147	25.64±4.63			
	6 and above	133	25.89±4.56			
Exercise Habbit	3	130	13.45±3.25	4.563	.005*	3>4,5
	4	222	12.36±3.89			
	5	147	12.57±3.41			
	6 and above	133	12.43±3.56			
Interpersonal Support	3	130	18.93±3.61	3.349	.032*	3>6 and above
	4	222	18.28±4.47			
	5	147	17.65±4.18			
	6 and above	133	17.72±3.97			
Stress Management	3	130	18.61±3.77	1.911	.248	
	4	222	18.47±4.48			
	5	147	17.90±3.64			
	6 and above	133	17.62±3.81			
Total	3	130	127.53±23.61	2.984	.041*	3>4, 5, 6 and above
	4	222	124.43±28.46			
	5	147	122.88±25.42			
	6 and above	133	122.50±25.39			

\*p&lt;.05

When the relationship between the number of people in the families of university students and the HLSS subscales were analyzed, a statistically significant difference was observed between the number of family members and the dietary habits, exercise habits, interpersonal support subscales and the total score of the scale (Table 6). Considering the results, the mean score of dietary and exercise habit subscales of those with three members in the family was higher than those of the four and five members in the family. When the mean scores of interpersonal support subscales are considered, three members in the family scored higher mean scores than those of six. Similarly, according to the total mean scores of HLSS, it was seen that the number of three people in the family get higher mean scores compared to those of others.

**Table 7.** The relationship between monthly income status and HLSS subscale

Subscale	Monthly income	n	$\bar{x}\pm SD$	F	p
<b>Diet Habit</b>	0-800 TL	78	15.28±3.90	.324	.908
	801-1500 TL	175	15.35±3.21		
	1501-2500 TL	169	15.20±3.40		
	2501-3500 TL	112	15.18±3.27		
	3501 TL and above	98	15.08±3.61		
<b>Self Realization</b>	0-800 TL	78	34.85±7.61	.339	.882
	801-1500 TL	175	34.71±5.28		
	1501-2500 TL	169	34.64±5.73		
	2501-3500 TL	112	34.21±6.81		
	3501 TL and above	98	35.12±5.90		
<b>Health Responsibility</b>	0-800 TL	78	26.48±6.71	.437	.815
	801-1500 TL	175	26.64±4.23		
	1501-2500 TL	169	26.78±4.63		
	2501-3500 TL	112	25.63±5.29		
	3501 TL and above	98	26.42±5.41		
<b>Exercise Habit</b>	0-800 TL	78	12.25±4.58	.214	.981
	801-1500 TL	175	12.34±3.25		
	1501-2500 TL	169	12.11±3.34		
	2501-3500 TL	112	12.28±3.68		
	3501 TL and above	98	12.05±2.99		
<b>Interpersonal Support</b>	0-800 TL	78	17.58±5.35	.978	.471
	801-1500 TL	175	17.86±3.75		
	1501-2500 TL	169	17.24±3.64		
	2501-3500 TL	112	16.91±4.23		
	3501 TL and above	98	17.83±3.67		
<b>Eating Habits</b>	0-800 TL	78	18.48±5.26	.726	.684
	801-1500 TL	175	17.45±3.67		
	1501-2500 TL	169	18.32±3.45		
	2501-3500 TL	112	18.12±4.34		
	3501 TL and above	98	18.04±3.78		
<b>Total</b>	0-800 TL	78	124.92±33.41	.312	.918
	801-1500 TL	175	124.35±23.39		
	1501-2500 TL	169	124.29±24.19		
	2501-3500 TL	112	122.33±27.62		
	3501 TL and above	98	124.54±25.36		

\*p&lt;.05

There was no statistically significant difference between the monthly income status of the university students participating in the study and the sub-dimensions of HLSS (Table 7).

## DISCUSSION

This study was conducted to determine the relationship between healthy lifestyle behaviors of university students and BMI. Primary findings showed that age and the sub-dimensions of HLSS did not show any relationship in BMI, whereas the gender and the stress management subscale of HLSS was strictly correlated to BMI. Men are more successful in stress management than women. Moreover, it was determined that the stress management mean score of the sophomore were higher than the juniors. Similarly, İlhan et al. (23)

compared the mean scores of students' HLSS according to the grades; they found that mean scores of stress management of seniors were higher than freshman. Studies have also shown that women are more successful in stress management than men (22, 25, 40, 45). Moreover, Bilgin et al. (9) found that stress management of students studying at non-health departments was lower than those studying in health related departments. Considering these results, it is thought that university students have difficulties due to the intensity of academic activities and this situation negatively affects their stress levels.

BMI and subscale of dietary habits and health responsibility were closely related in the present study. It has been determined that the students who are underweight, normal weight, overweight and class I obese have higher dietary habits and health responsibility mean scores than those of class II obese. It is expected that individuals with low or normal BMI have a healthier profile (31). However,



it is reported that unhealthy eating habits and insufficient physical activity are common among university students regardless of BMI status (3). Bilgin et al. (9) reported that 15.5% of health department students and 10.5% of students in other departments were on the border of obese. While there was no relationship between HLSS and BMI in students studying in health related departments, a weakly positive relationship was determined between BMI and physical activity and nutrition scores of students in other departments. These findings are parallel to the literature (10, 31).

Ertop et al. (16) reported that adequate and balanced dietary status of the students did not positively affect mean scores of self-actualization, health responsibility, stress management, interpersonal support and dietary habit subscales. Cihangiroğlu and Deveci (11) found that as the age increases, health responsibility and interpersonal support subscale mean scores increase, junior and seniors have higher health responsibility mean scores than those of freshman and sophomores. Moreover, they reported that mean scores of dietary habit of non-smokers were higher than those of smokers. Similarly, İlhan et al. (23) found that mean scores of health responsibility subscales of seniors were higher than others and mean scores of diet habit subscale of juniors and seniors were higher than those of freshman. In the study of Pasinlioğlu and Gözüm (34), it was reported that the mean score of diet habits of women were higher than those of men. Arslan et al. (4) and Akça and Selen (2) reported that the relationship between nutrition and interpersonal scores of the students studying in the health departments did not change according to the gender variable while the average of the nutrition and interpersonal relationship scores of the female students in the non-health departments was higher than the men. Mazıcıoğlu and Öztürk (29) also determined that students who received nutrition education or attended conferences on nutrition fed more regularly. The results of Bilgin et al. (9) study conducted with university students are similar. Since women are more concerned and worried about their body image and weight status, they pay more attention to dietary management and nutrition than men (3, 46). Therefore, it can be said that the awareness about healthy lifestyle behaviors positively affects the nutritional habits of both female and male students due to the education they received.

In another study, students' consumption of vegetables-fruits and high-fat snacks did not change; however, frying-style food consumption has been reported to decrease (37). Çolak (12) reported that body weight of only females increased in favor of fat mass with increasing age, but not in male population where increase of body weight was mainly due to higher lean body mass. Moreover, it was found that those with high BMI had low physical activity levels (18). Akça and Selen (2) and Arslan et al. (4) showed in their studies that even though 2/3 of the students have normal BMI, the mean score of nutrition is still low. Almutairi et al. (3) showed that university students studying in both health and non-health departments generally have irregular or unhealthy eating habits such as skipping meals and choosing fast food-style foods. The fact that students mostly stay away from their families, in the dormitory or at home, may have negatively affected their eating habits and level of physical activity. Thus, the results of the study are compatible with the literature (3, 22, 23, 33, 42, 48, 51).

It is a fact that women have better health responsibility behaviors than those of men. This may be related to taking more responsibility and taking more protective attitude of women in the care of family members and houseworks originating from our traditional culture. We can say that the difference between the results of our study and other studies is due to the region where the studies are conducted, living standards, levels of nutritional knowledge and habits of the participants.

In our study, it was determined that mean scores of exercise habit and interpersonal support subscales of engineering faculty students' were higher than those of other faculties students'. When İlhan et al. (23) compared the mean scores of students' HLSS according to the grades; mean scores of interpersonal support subscale and HLSS total score of seniors were higher than freshman and sophomores.

The age and level of grade of students studying in non-health departments does not affect healthy life style behaviors. However, healthy life style behaviors of students studied in health related departments are positively affected as the age and grade levels of students' increase and it was determined that health responsibility and physical activity levels also increased. Moreover, with the increasing age and education level of students in

health related departments, it is thought that the lessons and practices they take increase and thus contribute to the awareness of healthy lifestyle behaviors. In the study of Zaybak and Fadiloğlu (54), it was determined that the total and mean score of health responsibility subscale of the health department students were higher than those of other departments. However, there was no relationship between gender and healthy life style in both groups. Bilgin et al. (9) stated that while the average of students' health responsibility scores in both health and non-health departments were higher than male students, it was observed that male students had higher physical activity scores than girls.

Ünalın et al. (44) found a statistically significant relationship between exercise habit, self-realization and diet habit subscale and HLSS total scores in students studying at health and social programs. Yurdatapan et al. (53) found the lowest mean score in the exercise subscale in the the students of science education. It is not surprising that physical activity is higher in male students. In a study, women's less active and more sedentary life than men it has been determined to tend to continue (46). However, with the influence of traditional culture, while women mostly focus on housework and spend most of time at home, men tend do do sports and exercise outside the home.

When the relationship between the number of people in the families of the students and subscales of the HLSS was examined, students whose family members are three was higher mean score of diet and exercise habit subscales than those of four and five (Table 6). When the mean score of interpersonal support subscales is considered, students whose family members are three has higher scores than those of six and above. Similarly, when we look at the total score of HLSS, it was seen that students whose family members are three had higher scores than the others. According to these results, it can be said that as the number of people in the family increases, healthy lifestyle behaviors decrease. Moreover, as the economic situation improves, positive health behaviors such as health-related courses, participation in physical activities and access to healthier foods appear to increase (10, 23, 31, 51, 54). Bilgin et al. (9) found that students in non-health departments with higher income level exhibited more positive healthy behaviors compared to those with low income. However, it was detected

that the monthly income of the students studying at health related departments did not affect their health behaviors. It is thought that the difference in healthy lifestyle behaviors between groups cannot be explained only with income level, and that health education received may affect healthy lifestyle behaviors of the students.

There was no statistically significant relationship between the monthly income status of the university students and the subscales of HLSS. Zaybak and Fadiloğlu (54) reported that students with good economic status had higher total scores of HLSS compared to those with low economic status. In other studies, it was stated that interpersonal support and positive health behaviors increases with increasing the economic status (14, 43). It has also been reported that as the income level decreases, the consumption of vegetables decreases and the consumption of fat and carbohydrates increases (5). In some studies, a linear relationship was found between weight loss and income level (5, 24, 35). We can say that the difference among the studies is due to different income levels of students.

Considering the results of the study, it may be recommended that university students who will be adults of the future should be informed about the dietary habits in order to live their lives as a healthy individual, encouraging and maintaining regular physical activity rather than a sedentary lifestyle, avoiding excessive consumption of sugar and a fast-food eating culture. As a result, university youth, which constitutes the most dynamic part of the society, can be transformed into a period when health-strengthening choices are made instead of behaviors that are harmful to health when smart decisions are made.

## REFERENCES

1. Acheson D, Alleyne GA, Casas JA, Castillo-Salgado C, Barzach M, Braveman P, Dahlgren G, Gupta GR, Liu Y, Orosz E. Round table discussion: health inequalities and the health of the poor. *Bulletin of The World Health Organization*, 2000; 78(1): 75-76.
2. Akça SÖ, Selen F. Üniversite öğrencilerinin öğün atlamaları ve günlük fiziksel aktivitelerinin beden kütle indeksi (BKİ) üzerine etkisi. *TAF Preventive Medicine Bulletin*, 2015; 14(5): 394-400. doi: 10.5455/pmb.1-1423989744
3. Almutairi KM, Alonazi WB, Vinluan JM, Almigbal TH, Batais MA, Alodhayani AA, Alsadhan N, Tumala RB, Moussa M, Aboshaiqah AE, Ahoqail RI. Health promoting lifestyle of university students in Saudi Arabia: a cross-sectional assessment. *BMC Public Health*, 2018; 18(1): 1-10. doi: 10.1186/s12889-018-5999-z
4. Arslan SA, Daşkapan A, Çakır B. Üniversite öğrencilerinin beslenme ve fiziksel aktivite alışkanlıklarının belirlenmesi. *TAF Preventive Medicine Bulletin*, 2016; 15(3): 171-80. doi: 10.5455/pmb.1-1436432564
5. Bakhshi E, Eshraghian MR, Mohammad K, Foroushani AR, Zeraati H, Fotouhi A, Siassi F, Seifi B. Sociodemographic and smoking associated with obesity in adult women in Iran: Results from the National Health Survey. *J Public Health*, 2008; 30(4): 429-35. doi:10.1093/pubmed/fdn0243.
6. Bastien M, Poirier P, Lemieux I, Després JP. Overview of epidemiology and contribution of obesity to cardiovascular disease. *Progress in Cardiovascular Diseases*, 2014; 56(4): 369-381.
7. Baş Aslan Ü. Fiziksel aktivite düzeyinin farklı yöntemlerle değerlendirilmesi. Sağlık Bilimleri Enstitüsü. Doktora Tezi, Ankara: Hacettepe Üniversitesi, 2003.
8. Biesma R, Hanson M. Childhood Obesity. In: Puri P. (eds) *Pediatric Surgery*. Springer, Berlin, Heidelberg, 2020. pp 529-539. doi:10.1007/978-3-662-43588-5\_35
9. Bilgin NÇ, Ak B, Cerit B, Ertem M, Çıtak Tunç G. Üniversite öğrencilerinin sağlıklı yaşam biçimi davranışlarının belirlenmesi. *Sağlık Akademisi Kastamonu*, 2019, 4(3): 188-210
10. Can G, Özdilli K, Erol O, Tulek Z, Savaser S, Ozcan S, Durna Z. Comparison of the health-promoting lifestyles of nursing and non-nursing students in Istanbul, Turkey. *Nurs Health Sci*, 2008; 10(4): 273-80. doi:10.1111/j.1442-2018.2008.00405.x
11. Cihangiroğlu Z, Devci SE. Fırat Üniversitesi Elazığ Sağlık Yüksekokulu öğrencilerinin sağlıklı yaşam biçimi davranışları ve etkileyen faktörler. *Fırat Tıp Dergisi*, 2011; 16(2): 078-083.
12. Çolak M. Evaluation of body composition of boarding and non-boarding students. *Journal of Erzincan Education Faculty*, 2007; 9(2): 183-195.
13. Daşkapan A, Tüzün EH. Fizik tedavi ve rehabilitasyon öğrencilerinde Paffenbarger fiziksel aktivite indeksi sonuçlarının değerlendirilmesi. *Fizyoterapi Rehabilitasyon Dergisi*, 2003; 14(3): 110-114.
14. Edelman CL, Mandle CL. *Health promotion throughout the life span*. Philadelphia: Mosby Comp, 1998.
15. Enes CC, Slater I.B. Dietary intake of adolescents compared with the Brazilian Food Guide and their differences according to anthropometric data and physical activity. *Rev Bras Epidemiol*, 2015; 18: 798-808. doi:10.1590/1980-5497201500040010
16. Ertop NG, Yılmaz A, Erdem Y. Üniversite öğrencilerinin sağlıklı yaşam biçimleri. *KÜ Tıp Fak Derg*, 2012; 14(2): 1-7.
17. Esin N. Adaptation of the healthy lifestyle behavior scale into Turkish. *Nursing Bulletin*, 1999; 12(45): 87-95.
18. Fine JT, Colditz GA, Coakley EH, Moseley G, Manson JE, Willett WC, Kawachi I. A prospective study of weight change and health-related quality of life in women. *JAMA*, 1999; 282(22): 2136-42.14.
19. Flier S, Folder DW. Eating disorders: obesity, anorexia nervosa, and bulimia nervosa In: Williams Textbook of Endocrinology, Wilson, JD, Foster, DW, Kronenberg, HM and Larsen, PR, eds. WB: Saunders Company, 1998: 1061-1095.
20. Garibağaoğlu M, Budak N, Öner N, Sağlam Ö, Nişli K. Nutritional status and body weight assessment of female students studying in three different universities. *Journal of Health Sciences*, 2006; 15(3): 173-180.
21. González-Muniesa P, Martínez-González MA, Hu FB, Després JP, Matsuzawa Y, Loos RfJ, Moreno LA, Bray GA, Martínez JA. Obesity. *Nat Rev Dis Primers*, 2017; 3(17034):1-18. doi:10.1038/nrdp.2017.3
22. Hacıhasanoğlu R, Yıldırım A, Karakurt P, Sağlam R. Healthy lifestyle behaviour in university students and influential factors in eastern Turkey. *International Journal of Nursing Practice*, 2011; 17: 43-51. doi:10.1111/j.1440-172X.2010.01905.x
23. İlhan N, Batmaz M, Akhan L. Üniversite öğrencilerinin sağlıklı yaşam biçimi davranışları. *Maltepe Üniversitesi Hemşirelik Bilim ve Sanatı Dergisi*, 2010; 3(3): 34-44.
24. Jeffery RW, French SA, Forster JL, Spry VM. Socioeconomic status differences in health behaviors related to obesity: The Healthy Worker Project. *Int J Obesity*, 1991; 15(10): 689-96.
25. Karadeniz G, Uçum EY, Dedeli O, Karaağaç O. Üniversite Öğrencilerinin sağlık yaşam biçimi davranışları. *TAV Preventive Medicine Bulletin*, 2008; 7(6): 497-506.
26. Karasalihoğlu. S., 2005. Çocukluk çağı obezitesi. *Türkiye Klinikleri J Int Med Sci*, 1(37): 66-71.
27. Kılıç T, Balta TS. Üniversite öğrencilerinin sağlıklı yaşam biçimi davranışlarının incelenmesi. *Electronic Turkish Studies*, 2019; 14(1): 425-438. doi:10.7827/TurkishStudies.14811
28. Kim D, Ahn BI. Eating Out and Consumers' Health: Evidence on Obesity and Balanced Nutrition Intakes. *Int J Environ Res Public Health*. 2020; 17(2): 586. doi:10.3390/ijerph17020586
29. Mazıroğlu M, Öztürk A. Üniversite 3. ve 4. sınıf öğrencilerinde beslenme alışkanlıkları ve bunu etkileyen faktörler. *Erciyes Tıp Dergisi*, 2003; 25(4): 172-178.
30. Murathan F, Uğurlu FM, Murathan T, Koç M. Beden eğitimi ve spor yüksekokulu öğrencileri ile sağlık yüksekokulu öğrencilerinin sağlıklı yaşam biçimi davranışlarının karşılaştırılması (Adıyaman üniversitesi örneği). *Electronic Turkish Studies*, 2017; 12(3): 493-504.
31. Nacar M, Baykan Z, Cetinkaya F., Arslantaş D, Özer A, Coşkun Ö, Batı H, Karaoğlu N, Elmalı F, Yılmazel G. Health promoting lifestyle behaviour in medical students: a multicentre study from Turkey. *Asian Pac J Cancer Prev*, 2014; 15(20): 8969-74. doi: 10.7314/APJCP.2014.15.20.8969
32. Özyazıcıoğlu N, Gökdere Çınar H, Buran G, Ayverdi D. Uludağ üniversitesi sağlık yüksekokulu öğrencilerinde beslenme alışkanlıkları. *Atatürk Üniversitesi Hemşirelik Yüksekokulu Dergisi*, 2009; 12(2): 34-40.
33. Özyazıcıoğlu N, Kılıç M, Erdem N, Yavuz C, Afacan S. Hemşirelik öğrencilerinin sağlıklı yaşam biçimi davranışlarının belirlenmesi. *Uluslararası İnsan Bilimleri Dergisi*, 2011; 8(2): 277-332.
34. Pasinlioğlu T, Gözüm S. Birinci basamak sağlık hizmetlerinde çalışan sağlık personelinin sağlık davranışları. *Cumhuriyet Üniversitesi Hemşirelik Yüksekokulu Dergisi*, 1998; 2(2): 60-68.
35. Paxon SJ, Sculthorpe A, Gibbons K. Weight-loss strategies and beliefs in high and low doi:10.1111/j.1753-6405.1994.tb00273.x

36. Pereira PF, Serrano HM, Carvalho GQ, Ribeiro SMR, Peluzio MCG, Franceschini SCC, Priore SE. Measurements of location of body fat distribution: an assessment of collinearity with body mass, adiposity and stature in female adolescents. *Rev Paul Pediatr*, 2015; 33(1): 63-71. doi:10.1016/j.rpped.2014.11.011
37. Racette SB, Deusinger SS, Deusinger RH. Obesity overview of prevalence etiology and treatment. *Phys Ther*, 2003; 83: 276-288.
38. Rohde K, Keller M, la Cour Poulsen L, Blüher M, Kovacs P, Böttcher Y. Genetics and epigenetics in obesity. *Metabolism*, 2019; 92: 37-50. doi:10.1016/j.metabol.2018.10.007
39. Ministry of Health. Overweight (obesity) and physical activity - an overview of the energy balance's activity direction, Ministry of Health Publications, 2008.
40. Steptoe A, Wardle J, Fuller R, Holte A, Justo J, Sanderman R, Wichstrøm L. Leisure-time physical exercise: prevalence, attitudinal correlates, and behavioral correlates among young Europeans from 21 countries. *Prev Med*, 1997; 26(6): 845-854.
41. Suetani S, Firth J. Benefits, assessment, and preferences of physical activity in psychosis. *A Clinical Introduction to Psychosis*, 2020; 273-293. doi:10.1016/b978-0-12-815012-2.00012-2
42. Tambağ H. Hatay Sağlık Yüksekokulu öğrencilerinin sağlıklı yaşam biçimi davranışları ve etkileyen faktörler. *Sağlık Bilimleri Fakültesi Hemşirelik Dergisi*, 2011; 18: 47-58.
43. Ulla Díez SM, Pérez-Fortis A. Socio-demographic predictors of health behaviors in Mexican college students. *Health Promot Int*, 2010; 25(1): 85-93. doi: 10.1093/heapro/dap047
44. Ünalın D, Şenol V, Öztürk A, Erkorkmaz U. Meslek yüksekokullarının sağlık ve sosyal programlarında öğrenim gören öğrencilerin sağlıklı yaşam biçimi davranışları ve öz-bakım gücü düzeyleri arasındaki ilişkinin incelenmesi. *İnönü Üniversitesi Tıp Fakültesi Dergisi*, 2007; 14(2): 101-109.
45. Vanhees L, Lefevre J, Philippaerts R, Martens M, Huygens W, Troosters T, Beunen G. How to assess physical activity? How to assess physical fitness? *Eur J Cardiovasc Prev Rehabil*, 2005; 12(2): 102-114. doi: 10.1097/01.hjr.0000161551.73095.9c
46. Varela-Mato V, Cancela JM, Ayan C, Martín V, Molina A. Lifestyle and health among Spanish university students: differences by gender and academic discipline. *Int. J. Environ Res Public Health*, 2012; 9(8): 2728-41. doi:10.3390/ijerph9082728
47. Von Bothmen MI, Fridlund B. Gender differences in health habits and in motivation for a healthy lifestyle among Swedish university students. *Nursing ve Health Sciences*, 2005; 7(2): 107-118.
48. Vural PI, Bakır N. Meslek yüksekokulu öğrencilerinin sağlıklı yaşam biçimi davranışları ve etkileyen faktörler. *ACU Sağlık Bil Derg*, 2015; 6(1): 36-42.
49. Walker SN, Sechrist KR, Pender NJ. The health-promoting lifestyle profile: development and psychometric characteristics. *Nurs Res*, 1987; 36(2): 76-81.
50. Wang Y, Beydoun MA, Min J, Xue H, Kaminsky LA, Cheskin LJ. Has the prevalence of overweight, obesity and central obesity levelled off in the United States? Trends, patterns, disparities, and future projections for the obesity epidemic. *International Journal of Epidemiology*, 2020; dyz273. doi.org/10.1093/ije/dyz273
51. Wang D, Xing XH, Wu XB. Healthy lifestyles of university students in China and influential factors. *Scientific World Journal*, 2013; 412950: 1-10. doi:10.1155/2013/412950
52. World Health Organization. World health statistics overview 2019: monitoring health for the SDGs, sustainable development goals. Geneva: World Health Organization, 2019. <https://apps.who.int/iris/bitstream/handle/10665/311696/WHO-DAD-2019.1-eng.pdf>
53. Yurdatapan M, Benzer E, Güven İ. Fen bilgisi öğretmenliği öğrencilerinin sağlıklı yaşam biçimi davranışlarının değerlendirilmesi. *Milli Eğitim Dergisi*, 2014; 44(201): 183-202.
54. Zaybak A, Fadiloğlu C. Üniversite öğrencilerinin sağlığı geliştirme davranışı ve bu davranışı etkileyen etmenlerin belirlenmesi. *Ege Üniversitesi Hemşirelik Yüksekokulu Dergisi*, 2004; 20(1): 71-95.