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Determination of healthy lifestyle behaviors and related factors in university students: An observational study

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Abstract

It is important for students to acquire and maintain healthy lifestyle behaviors during university education. This study investigates healthy lifestyle behaviors and related factors in university students. A total of 869 associate degree students participated in the study. Data were collected with the Data Registration Form created by the researchers and the Health Promotion Lifestyle Profile-II (HPLP-II). The mean HPLP-II total score of the study group was 127.9±19.9. Students who stay with their families, whose economic status and general health perceptions are good/very good, and who do not smoke had higher health responsibility scores ($p<0.05$). The mean physical activity scores of students who were male, whose parents had higher education, and who had a good/very good general health perception were higher ($p<0.05$). The nutrition scores of the students who were studying in the second grade, who were staying with their families, who were non-smokers, who were overweight and obese, and who had a good/very good general health perception were found to be higher ($p<0.05$). Those with good/very good general health perception had higher interpersonal relations and personal development scores, and female students had higher interpersonal relations scores ($p<0.05$). The stress management scores of the second-grade students with good/very good general health perception were higher ($p<0.05$). It is important to implement lifestyle interventions to improve the health of university students. Considering socio-demographic factors in health promotion programs to be implemented may help develop healthy lifestyle behaviors.

Keywords: Health promotion, health behavior, nutrition

Introduction

Noncommunicable diseases are the leading cause of morbidity and mortality worldwide [1]. The World Health Organization states that nearly three-quarters of deaths worldwide occur due to non-communicable diseases such as cardiovascular diseases, cancer, and chronic respiratory diseases [2]. They account for approximately 71% of all deaths, especially in developing countries [1]. The lifestyles and behaviors of individuals affect the morbidity and mortality of non-communicable diseases [3]. Negative health behaviors increase the vulnerability and sensitivity of an individual to diseases and health problems. However, adopting and maintaining positive health behaviors reduce morbidity and mortality rates, increase the well-being of the individual by promoting a healthy life, and enable self-realization [4-6].

During adolescence, young people are faced with risk factors for noncommunicable diseases such as unhealthy diet, physical inactivity, and active and passive exposure to tobacco smoke [2,6].

To improve health, it is important to know the risk factors caused by the lifestyle and to protect individuals from these risk factors as of childhood [2]. Health-promoting behaviors are behaviors that a person believes and practices not to get sick but to stay healthy. They are formed by the combination of six components, i.e. health responsibility, physical activity, nutrition, stress management, life appreciation, and social support [7,8]. These practices provide protection and development of health [5,7]. For this reason, a holistic approach is recommended to protect and improve health [3,7]. It is important that every individual take responsibility and maintain a healthy lifestyle as a routine part of his/her daily life to protect and improve his/her health [2]. The period of adolescence is crucial for adopting health-related behaviors since these behaviors may continue throughout adulthood [3]. Risky health behaviors related to many health problems in adulthood can be prevented if they are identified and changed early in life [5,6].

In studies conducted with university students, it was seen that the

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healthy lifestyle behaviors of the students were not high enough [9-19]. During university education, students can make independent decisions about their own health and lifestyle. It is important for students to acquire and maintain healthy lifestyle behaviors in this period. The habits acquired during university education can also guide the future life of the individual [4]. Thus, it is important to determine whether vocational school students who will be future employees in the production and service sectors have a healthy life and related factors.

This study investigates healthy lifestyle behaviors and related factors in university students.

Materials and Methods

Design and Sample of the Study

This cross-sectional study was conducted at a public university in the western part of Turkey. The universe of this study consisted of 921 students who continued their university education at the associate degree level. Associate degree programs of universities in Turkey are schools that provide two-year education and train technicians in different fields. The universe was determined by learning the number of students from the school administrations. In this study, we aimed to reach the entire universe without sample selection. Data were collected through a questionnaire (Data Registration Form) created by the researchers using the literature [9-21] and Health Promotion Lifestyle Profile-II (HPLP-II). There was no information in the questionnaires indicating the name or the identity of the student. A total of 869 students participated in our study and the rate of participation was 94.3%.

Data Collection Tools and Variables

Data Registration Form

The questionnaire consisted of 20 questions. It includes questions to determine students' sociodemographic, individual, and familial characteristics in addition to smoking and alcohol use.

HPLP-II

The scale was developed by Walker et al. in 1987 [7]. It was revised in 1996 and consists of 52 items. The Turkish adaptation and validity and reliability study of the scale was conducted by Bahar et al. in 2008 [8]. The scale consists of six sub-factors. These sub-factors are health responsibility, physical activity, spiritual growth, nutrition habits, interpersonal relations, and stress management. All items of the scale are positive and there is no reverse item. The scale has a four-point Likert-type answer key (1=Never -4=Routinely). The lowest score obtained was 52, while the highest score was 208. The increase in the scores indicates that the healthy lifestyle behaviors improved positively [4,7,8].

Variables of the Study

The dependent variable of the study is the healthy lifestyle behaviors of the students. The independent variables are the student's age, gender, grade, place of current residence, place of childhood residence, general health perception, body mass index (BMI), smoking and alcohol use, education of parents, employment status of parents, marital status of parents, and economic status of parents. BMI was calculated according to the height and weight stated by the students participating in the study. To calculate BMI, weight (kg) is divided by height (m) squared (kg/m^2). BMI is classified according to the World Health Organization classification (<18.50

kg/m^2 : underweight; 18.50-24.99 kg/m^2 : normal; 25.00-29.99 kg/m^2 : overweight; ≥ 30.00 kg/m^2 : obese). Since the number of obese students was low (24 students), overweight and obese students were evaluated as a single group.

Statistical analysis

Statistical analysis was performed using the SPSS 24.0 statistical package program. For descriptive findings, categorical variables were presented as numbers and percentages, while continuous variables were given as mean, standard deviation, minimum and maximum values. The Kolmogorov-Smirnov tests of normality were used to determine whether the data showed a normal distribution. As the data showed a normal distribution, parametric tests were used in the analysis. In the statistical analysis, the independent samples t-test and one-way ANOVA were used to determine the relationship between independent and dependent variables. The 'post hoc' Bonferroni test was used when there was a significant difference between the group means in the one-way ANOVA. Statistical significance level was set as $p < 0.05$.

Ethical Approval

Written permission was obtained from the Non-Interventional Research Ethics Committee of Dokuz Eylul University (decision no: 2018/14-31). Before collecting the data, the purpose of the study was explained to the participating students by the researchers, and they were stated that they were free to participate in the study. The students were informed that the data would be kept confidential within the scope of the study and their informed consent was obtained. Those who did not agree to respond were excluded from the study.

Results

A total of 869 students participated in the study. The mean age of the students was 21.3 ± 3.6 (min:18, max:56). 64.9% of the study group were females, 42.7% were living in dormitories, and 61.1% stated their economic status as moderate. Some descriptive findings of the students are presented in Table 1.

The scores obtained from the total and sub-dimensions of HPLP II are shown in Table 2. The HPLP-II total mean score of the study group was 127.9 ± 19.9 (min:74, max:208). The highest mean score was in the spiritual growth dimension, while the lowest mean score was in the physical activity dimension.

Students staying with their families had higher health promotion behavior scores than those of living in a separate house, dormitory and with friends ($p < 0.05$, Table 3). Those whose perception of the economic status was good/very good had higher health promotion behavior scores compared to the bad/very bad ones ($p < 0.05$, Table 4). Non-smokers had higher health promotion behavior points compared to smokers ($p < 0.05$, Table 5). Finally, those with a good/very good general health perception had higher health promotion behavior scores than those with a moderate perception of health ($p < 0.05$, Tables 5).

Compared to female students, male students had higher physical activity scores ($p < 0.05$, Table 3). Compared to those whose parents' education was middle school and below, those with high school and above had higher physical activity scores ($p < 0.05$, Table 4). Finally, those with a good/very good general health perception had

higher physical activity scores than those moderate ones ($p<0.05$, Tables 5).

Compared to the first graders, the second graders had higher nutritional scores ($p<0.05$). Those who stayed with their families had higher nutritional scores than those living in separate houses, dormitories and with their friends ($p<0.05$, Table 3). Non-smokers had higher nutritional scores compared to smokers ($p<0.05$). Additionally, those who were overweight and obese had higher nutritional scores compared to those who were thin and normal ($p<0.05$). Finally, the nutritional scores of those with good/very good general health perception were significantly higher than those with moderate ($p<0.05$, Table 5).

Spiritual growth scores of those with good/very good general health perception were significantly higher than those with moderate health perception ($p<0.05$, Table 5).

Compared to male students, female students had higher interpersonal relations scores ($p<0.05$, Table 3). Additionally, those with good/very good general health perception had significantly higher interpersonal relations scores than those with moderate ($p<0.05$, Table 5).

The second graders had higher stress management scores compared to the first graders ($p<0.05$, Table 3). Those with good/very good general health perception had significantly higher stress management scores than those with moderate ($p<0.05$, Table 5).

In the analysis conducted according to the total score obtained from the scale, the HPLP-II total mean scores of the students with bad/very bad perception of their family's economic status was significantly lower than the students with good/very good and moderate ($p<0.05$, Table 4). The HPLP-II total mean scores were significantly higher in those with good/very good general health perception than in those with moderate ($p<0.05$, Table 5).

Table 1. Distribution of some sociodemographic and familial characteristics of students (n=869)

Characteristics	n	%	
Gender	Male	305	35.1
	Female	564	64.9
Place of residence	Dormitory	371	42.7
	Home with friends	233	26.8
	Home with family	180	20.7
Perception of the family's economic status	Home alone	85	9.8
	Very good	16	1.8
	Good	240	27.6
	Moderate	531	61.1
	Bad	72	8.3
Perception of health	Very bad	10	1.2
	Very good	141	16.2
	Good	466	53.6
	Moderate	226	26.0
	Bad	31	3.6
Father's education	Very bad	5	0.6
	Illiterate	8	0.9
	Literate	15	1.7
	Primary	298	34.3
	Middle	221	25.4
	High	247	28.4
Mother's education	University	80	9.2
	Illiterate	32	3.7
	Literate	35	4.0
	Primary	401	46.1
	Middle	217	25.0
	High	154	17.7
Marital status of the parents	University	30	3.5
	Together	735	84.6
	Divorced	84	9.7
	Father is dead	35	4.0
	Mother is dead	9	1.0
	Mother and father are dead	6	0.7

Table 2. Scores according to the HPLP-II sub-dimensions (n=869)

Sub-dimensions	Mean \pm SD*	Min-Max
Health responsibility	20.0 \pm 4.8	9-36
Physical activity	17.3 \pm 5.2	8-46
Nutrition habits	19.7 \pm 3.9	9-36
Spiritual growth	26.3 \pm 4.8	12-36
Interpersonal relations	25.3 \pm 4.5	13-36
Stress management	19.3 \pm 3.8	9-32
Total score	127.9 \pm 19.9	74-208

*Mean \pm standard deviation

Table 3. The relationship between students' sociodemographic characteristics and healthy lifestyle behaviors

Characteristics	HR Mean ± SD	PA Mean ± SD	NH Mean ± SD	SG Mean ± SD	IR Mean ± SD	SM Mean ± SD	STS Mean ± SD
Age							
≤20 age (n=429)	20.2±4.5	17.5±4.9	19.7±3.8	20.1±4.8	25.4±4.2	19.2±3.8	128.0±19.5
≥21 age (n=440)	19.8±4.9	17.2±5.3	19.7±4.1	26.6±4.8	25.2±4.7	19.5±3.9	127.9±20.4
p*	0.167	0.440	0.932	0.114	0.529	0.182	0.957
Gender							
Male (n=305)	19.8±5.2	18.5±5.5	19.8±4.4	26.6±5.2	24.8±4.6	19.7±4.1	129.5±21.2
Female (n=564)	20.1±4.5	16.7±4.8	19.7±3.7	26.2±4.5	25.5±4.4	19.3±3.7	127.2±19.2
p*	0.507	<0.001	0.607	0.210	0.018	0.065	0.158
Grade							
1 (n=422)	19.8±4.5	17.4±5.4	19.4±3.7	26.4±4.7	25.1±4.2	18.9±3.8	127.1±19.3
2 (n=447)	20.2±5.0	17.2±4.8	20.0±4.1	26.3±4.8	25.4±4.7	19.7±3.8	128.8±20.5
p*	0.278	0.814	0.019	0.744	0.432	0.007	0.200
Place of residence							
Dormitory (n=371)	20.0±5.0	17.4±4.9	19.4±3.9	26.3±4.9	25.7±4.6	19.1±4.1	127.1±21.0
Home with friends (n=233)	19.4±4.6	18.0±5.2	19.3±3.9	26.2±4.9	24.8±4.2	19.3±3.6	127.1±18.6
Home with family (n=180)	21.0±4.0‡	18.0±5.3	21.0±3.7‡	26.6±4.1	25.2±4.3	19.8±3.4	131.5±17.9
Alone (n=85)	18.8±5.3	18.0±5.5	19.4±4.4	26.2±5.1	24.8±4.9	19.5±3.9	126.8±22.0
p**	0.001	0.068	<0.001	0.886	0.088	0.246	0.068
Childhood residence							
City (n=360)	20.0±4.8	17.8±5.2	19.8±3.8	26.4±4.8	25.5±4.4	19.4±4.0	129.0±20.1
Town (n=357)	19.9±4.8	17.1±5.4	19.6±4.1	26.5±4.6	25.2±4.5	19.5±3.8	128.0±20.1
Village (n=152)	20.0±4.5	16.6±4.4	19.8±3.7	25.4±4.6	24.8±4.4	18.8±3.4	125.3±19.2
p**	0.975	0.058	0.701	0.063	0.276	0.061	0.148

HR: Health responsibility; PA: Physical activity; NH: Nutrition habits; SG: Spiritual growth; IR: Interpersonal relations; SM: Stress management; STS: Scale total score. *Independent Samples t-Test. **Analysis of Variance ‡Significantly higher than those staying in other places (p<0.01).

Table 4. The relationship between students' familial characteristics and healthy lifestyle behaviors

Characteristics	HR Mean ± SD	PA Mean ± SD	NH Mean ± SD	SG Mean ± SD	IR Mean ± SD	SM Mean ± SD	STS Mean ± SD
Father's education							
≤Middle (n=542)	20.1±4.5	17.0±4.8	19.7±3.8	26.1±4.7	25.2±4.3	19.2±3.6	127.3±19.1
≥High (n=327)	19.9±5.1	18.8±5.6	19.7±4.2	26.7±4.8	25.3±4.6	19.6±4.2	129.0±21.4
p*	0.624	0.032	0.843	0.056	0.898	0.168	0.231
Mother's education							
≤Middle (n=685)	20.0±4.7	17.1±4.9	19.8±3.9	26.2±4.7	25.3±4.4	19.2±3.7	19.6
≥High (n=184)	20.0±5.1	18.3±5.7	19.5±4.2	26.6±4.8	25.2±4.6	19.7±4.2	129.3±21.1
p*	0.928	0.009	0.449	0.333	0.762	0.175	0.302
Father's employment status							
Self-employed (n=263)	19.5±4.9	17.1±5.1	19.3±4.1	26.2±4.9	25.3±4.6	19.3±3.8	126.6±20.6
Worker (n=240)	20.4±4.7	17.6±4.8	19.6±3.6	26.4±4.6	25.3±4.2	18.9±3.8	128.2±19.1
Officer (n=76)	19.2±4.7	17.7±6.1	19.3±4.8	26.0±5.0	24.5±4.6	19.2±3.5	125.9±20.7
Retired (n=247)	20.4±4.6	17.2±5.3	20.3±3.9	26.6±4.8	25.5±4.4	19.6±3.8	129.6±19.9
Unemployed (n=43)	20.3±5.1	16.4±5.1	19.9±3.6	25.9±4.9	24.8±4.7	20.4±4.5	128.3±19.9
p**	0.073	0.663	0.064	0.779	0.508	0.083	0.443
Mother's employment status							
Housewife (n=648)	20.0±4.8	17.1±4.9	19.7±3.9	26.3±4.6	25.4±4.3	19.4±3.8	127.9±19.4
Worker (n=109)	20.2±5.2	17.4±4.9	19.4±4.1	26.3±5.3	25.2±4.8	19.2±4.4	127.7±21.8
Self-employed (n=60)	19.7±4.4	18.4±6.8	19.6±4.1	26.6±5.3	24.7±5.2	19.4±3.9	128.6±22.4
Retired (n=52)	19.8±4.5	18.3±5.5	20.6±4.0	25.8±5.0	24.3±4.8	18.8±3.4	127.5±20.1
p**	0.912	0.142	0.374	0.806	0.287	0.754	0.992
Marital status of family							
Together (n=765)	20.0±4.7	17.1±5.1	19.7±4.0	26.3±4.7	25.3±4.4	19.3±3.7	127.7±19.9
Divorced (n=134)	19.8±4.9	18.0±5.4	19.6±3.7	26.7±5.2	25.3±4.5	19.6±4.1	128.9±20.1
p*	0.626	0.075	0.683	0.379	0.986	0.387	0.520
Perception of family's economic status							
Good-very good (n=256)	20.7±4.9†	17.7±5.3	19.7±4.2	26.8±5.1	25.5±4.9	19.8±3.8	130.2±20.6
Moderate (n=531)	19.8±4.8	17.3±5.1	19.8±3.9	26.4±4.5	25.3±4.2	19.2±3.9	127.8±19.9
Bad-very bad (n=82)	19.0±4.2	16.4±4.7	19.0±3.6	25.4±5.1	24.3±4.3	19.6±3.3	121.7±16.8††
p**	0.009	0.101	0.250	0.062	0.115	0.073	0.003

Table 5. The relationship between healthy lifestyle behaviors with students' habits and health perceptions

Characteristics	HR Mean ± SD	PA Mean ± SD	NH Mean ± SD	SG Mean ± SD	IR Mean ± SD	SM Mean ± SD	STS Mean ± SD
Smoking							
Yes (n=303)	19.4±4.9	16.9±5.2	19.1±3.8	26.4±5.0	25.3±4.9	19.3±4.0	126.5±20.5
Quit (n=57)	20.1±5.1	17.8±6.1	19.6±4.3	27.0±5.3	26.2±4.4	19.4±3.6	130.2±22.1
No (n=509)	21.4±4.6†	17.5±5.0	21.1±3.9†	26.2±4.5	25.1±4.2	19.4±3.7	128.6±19.4
p*	0.022	0.247	0.005	0.444	0.174	0.972	0.227
Alcohol							
Yes (n=236)	19.4±5.0	17.6±6.0	19.2±4.3	26.0±5.2	24.8±5.0	19.1±4.3	126.4±22.8
Quit (n=44)	19.5±4.6	18.1±4.6	20.0±3.4	27.2±3.6	24.9±4.0	19.9±2.9	129.6±14.6
No (n=589)	19.6±4.6	17.1±4.8	19.8±3.8	26.3±4.6	25.4±4.2	19.3±3.6	128.4±19.0
p*	0.067	0.283	0.182	0.263	0.230	0.433	0.345
BMI							
Thin (n=109)	20.1±4.8	16.7±5.7	18.8±3.5	25.6±4.9	25.7±4.2	18.7±3.3	125.7±19.7
Normal (n=607)	19.9±4.6	17.3±5.1	19.6±3.9	26.1±4.8	25.1±4.5	19.4±3.9	127.6±19.8
Overweight-obese (n=153)	19.9±5.1	17.5±3.5	20.7±4.2††	26.5±4.2	25.7±4.6	19.4±3.9	130.8±20.4
p*	0.985	0.488	<0.001	0.238	0.162	0.149	0.095
General perception of health							
Good-very good (n=607)	20.4±4.8‡	17.8±5.3‡	20.2±3.9‡	26.9±4.6‡	25.7±4.4‡	19.9±3.7‡	130.6±19.6‡
Moderate (n=226)	18.9±4.5	16.1±4.4	18.5±3.5	24.8±4.7	24.1±4.3	17.4±3.7	121.1±18.3
Bad-very bad (n=36)	19.4±5.1	16.6±5.9	19.0±4.5	25.5±5.3	25.5±5.2	18.5±4.6	126.2±24.4
p*	<0.001						

HR: Health responsibility; PA: Physical activity; NH: Nutrition habits; SG: Spiritual growth; IR: Interpersonal relations; SM: Stress management; STS: Scale total score
*Analysis of Variance

†Significantly higher than smoking students (p<0.01).

††Significantly higher than thin and students with normal weight (p<0.01).

‡Significantly higher than those with the moderate level (p<0.001)

Discussion

In our study, the healthy lifestyle behaviors of university students and related factors were examined. A significant relationship was found between the gender of the students with the physical activity and interpersonal relations dimension of HPLP II, the grade with the nutrition and stress management dimension, the place of residence with the health responsibility and physical activity dimension, the education of the parents with the physical activity dimension, the bad economic status of the family with the health responsibility dimension and total score, smoking habits with health responsibility and nutrition dimension, BMI with nutrition dimension, and general health perception with all sub-dimensions and total score of the scale.

In our study, the mean HPLP-II total score was found to be 127.9±19.9. In studies conducted with university students in Turkey, the mean total score of the scale varied in the range of 124.3-142.6 [11-16,22]. In studies conducted in different countries, the mean score of the scale varied between 123.8 and 126.9 [17,20,21]. In our study, the students got the highest mean scores from the spiritual growth sub-dimension, while the lowest mean score in the physical activity sub-dimension. In the literature, similar findings have been obtained in studies conducted with university students recently [9,11-17,20,21]. The departments in which university students study and their curricula may affect healthy lifestyle behaviors [19]. Students at the department of health have healthier living habits than those studying in other departments [10,14]. Since our study group was associate degree students studying in other departments, they may not have had enough knowledge about healthy lifestyle behaviors.

In our study, while the mean physical activity scores of male

students were higher, the mean interpersonal relation scores of female students were higher. There are studies in the literature showing results consistent with our findings [9,10,13,15,16,22]. Although not significant in our study, other studies reported that female students have higher health responsibility [10,11,15], stress management behavior [11,13,22], and nutrition scores [11,13,15]. There is no relationship between the gender of the students and the other dimensions. However, in a study conducted in India, the physical activity habits of male students studying in the department of nursing were said to be higher [20]. It was reported that physical activity and stress management behavior in medical students from Saudi Arabia were higher in male students [17]. When the findings of our and other studies are evaluated, depending on the cultural differences of societies, the roles and responsibilities expected from different genders, especially in adolescence, may have affected students' habits and healthy living behaviors.

In our study, no relationship was found between the age of the students with any sub-dimensions and total score of the scale. However, a significant relationship was found with the grade of the students. Second-year students had higher nutrition and stress management scores than first-year students. In a study, no relationship was found between the grade of students studying in the department of health with nutrition and stress management, while senior students were found to have more health responsibility and physical activity habits and students from other departments only had more health responsibility [10]. Bozlar et al. found that as the age of the students increased, they ate more healthily and their health responsibility increased, however, those under 18 did more physical activity [9]. As the grade of the students increases, health responsibility [16,18,19], nutrition [16,19], and stress management [16,17] behavior also increase.

The students staying with their families had higher health responsibility and physical activity scores in our study. In some recent studies in the literature, students staying with their families have been found to practice healthy lifestyle behaviors more [10,16]. It was stated that interpersonal relations [14], spiritual growth [14] and stress management scores [13,14] were higher in those staying with their families. It was also stated that among nursing students in India, health responsibility behaviors were higher in those staying with their families [20]. The reason for this may be that those students are more careful about health checks and positive health behaviors with the guidance of their families. It may be easier to maintain the healthy living habits gained by being influenced by their family. However, students who stay with their families have less responsibility, so they can spend more time doing physical activity.

In our study, the students whose parents had high school or higher education were found to do more physical activity. In the literature, in studies conducted with university students recently, the increase in the education level of the parents positively affects the healthy lifestyle habits of their children [10,16]. The high level of education of the parents affects the health responsibility of the student [11,15]. Another important finding related to the familial characteristics of the student in our study was the low economic status of the family. The students who reported their family's economic situation as low had lower health responsibility and total healthy lifestyle behavior scores. University students in different departments, who stated that their income was more than their expenses, got higher points from the HPLP-II total, interpersonal relations, stress management, and spiritual growth dimensions [14]. It was stated that health science students with a high economic level have higher interpersonal relations scores [16]. In the literature, the total score, physical activity, spiritual growth, and stress management scores of students with low income studying in non-health fields have been found to be lower [10]. Low income is associated with less physical activity of students [13]. Students with low socioeconomic status should be supported in accessing health services and participating in social programs.

In our study, it was seen that non-smokers had higher health responsibility and nutrition scores than smokers. It was stated that non-smokers had better eating habits among associate degree students [11,13]. It was also reported that there was no relationship between smoking habits and healthy lifestyle behaviors in medical students [17]. The non-smoking university students in China scored higher on all sub-dimensions of HPLP-II except for health responsibility and physical activity [19]. Students who were aware of the health risks of smoking may have adopted more healthy habits to protect their health.

In our study, while there was no significant relationship between the BMI of the students with the total score and other dimensions of the scale, a positive relationship was found between BMI with the nutrition score, which was noteworthy. Overweight and obese students had higher nutrition scores than thin and students with normal weight. It is necessary to investigate the reasons why students with healthy eating habits are overweight and obese. While there are studies in the literature that found a relationship only between the BMI level of students and the dimension of spiritual growth [9], and showed that the interpersonal relations

score decreased as the BMI level increased [17], there are also studies stating that there was no relationship between the BMI level with the weight of the individuals and healthy lifestyle behaviors [11,22,23].

In our study, the healthy lifestyle behavior scores of those who had a good/very good general health perception were higher than other students. This finding of our study is consistent with the literature [10,16,18]. University students' positive perception of health may be a motivating factor in maintaining healthy lifestyle behaviors. There is a positive relationship between university students' perception of physical, psychological and social health with healthy lifestyle behaviors [19]. Polat et al. reported that nursing students who regularly went to health check-ups had higher scores on dimensions other than interpersonal relations [16]. It is recommended to develop programs to support healthy living behaviors of university students studying in non-health-related departments.

The main limitation of this study is that since it is a cross-sectional study, it is not strong enough to determine the cause-effect relationship between healthy lifestyle behaviors and factors related to healthy lifestyle behaviors. There was no direct observation and the data were collected by means of a self-report questionnaire. This study can be defined as a "status determination study" conducted to determine healthy lifestyle behaviors of associate degree students. The results of the study can be guiding in terms of creating programs that will support the healthy behaviors of students.

Conclusion

In conclusion, the students studying in higher education are ideal targets for lifestyle interventions aiming to promote healthy behaviors. For students, the university environment is surrounded by multidisciplinary health professionals and potentially health-promoting facilities and resources [5]. Therefore, it is important for the implementation of lifestyle interventions to improve the health of this group. In our study, a significant relationship was found between the gender of the students with the physical activity and interpersonal relations dimension of HPLP-II, the grade with the nutrition and stress management dimension, the place of residence with the health responsibility and physical activity dimension, the education of the parents with the physical activity dimension, the economic status of family with the health responsibility dimension and total scale score, smoking habit with the health responsibility and nutrition dimensions, BMI with the nutrition dimension, and general health perception with all sub-dimensions and total score of the scale. Considering socio-demographic factors in health promotion programs to be applied to university students may help promote healthy lifestyle behaviors.

Conflict of interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical approval

Written permission was obtained from the Non-Interventional Research Ethics Committee of Dokuz Eylul University (decision no: 2018/14-31). Before collecting the data, the purpose of the study was explained to the participating students by the researchers, and they were stated that they were free to participate in the study. The

students were informed that the data would be kept confidential within the scope of the study and their informed consent was obtained. Those who did not agree to respond were excluded from this study.

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