



Research Article

Ankara Med J, 2021;(3):327-338 // doi 10.5505/amj.2021.92408

THE RELATIONSHIP BETWEEN HEALTHY LIFESTYLE BEHAVIORS AND BODY COMPOSITIONS IN UNIVERSITY STUDENTS

ÜNİVERSİTE ÖĞRENCİLERİNDE SAĞLIKLI YAŞAM BİÇİMİ DAVRANIŞLARI İLE VÜCUT KOMPOZİSYONLARI ARASINDAKİ İLİŞKİ

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Geliş Tarihi (Submitted): 17.06.2021 // Kabul Tarihi (Accepted): 09.08.2021



Öz

Amaç: Sağlıklı yaşam tarzı davranışları, “sağlıklı bir zihin durumunu sürdürmek ve sağlıklı aktivite davranışları geliştirmek” anlamına gelir. Bu çalışmanın amacı üniversite öğrencilerinde sağlıklı yaşam tarzı davranışları ile vücut kompozisyonları arasındaki ilişkiyi incelemektir.

Materyal ve Metot: Kesitsel tipteki bu çalışmanın evrenini Beslenme ve Diyetetik Bölümü'nde okuyan öğrenciler oluşturdu. Katılımcıların demografik verileri toplandı ve “Sağlıklı Yaşam Biçimi Davranışları Ölçeği-II” uygulandı.

Bulgular: Öğrencilerin ortalama Sağlıklı Yaşam Biçimi Davranışları Ölçeği II puanı $130,15 \pm 15,07$ olarak belirlendi. Vücut kitle indeksine göre normal olan öğrencilerin fiziksel aktivite puanları, zayıf ve fazla kilolu olanlara göre istatistiksel olarak anlamlı düzeyde daha yüksekti. Vücut kitle indeksine göre normal olan öğrencilerin beslenme puanları zayıf olanlara göre istatistiksel olarak anlamlı derecede daha yüksekti. Vücut yağ yüzdelere göre obez olan öğrencilerin fiziksel aktivite puanları atlet, fit veya normal olanlara göre istatistiksel olarak anlamlı derecede düşüktü. Bel çevresine göre fazla kilolu olan öğrencilerin sağlık sorumluluğu ve fiziksel aktivite puanları normal olanlara göre istatistiksel olarak anlamlı derecede düşüktü.

Sonuç: Bu çalışma, daha sağlıklı ve daha zinde bir vücuda sahip öğrencilerin beslenmelerine daha fazla önem verdiklerini, daha fazla fiziksel aktivitede bulduklarını ve daha yüksek sağlık sorumluluklarına sahip olduklarını göstermiştir.

Anahtar Kelimeler: Vücut kompozisyonu, sağlıklı yaşam tarzı davranışı, öğrenci.

Abstract

Objectives: Healthy lifestyle behaviors refer to “maintaining a healthy state of mind and developing healthy activity behaviors.” The aim of this study was to investigate the relationship between healthy lifestyle behaviors and body composition in university students.

Materials and Methods: The population for this cross-sectional study consisted of students from the Nutrition and Dietetics Department. Demographic data were collected, and the “Health Promoting Lifestyle Profile II” (HPLP-II) was administered.

Results: The mean HPLP-II score of the students was 130.15 ± 15.07 . The physical activity score of the students was normal according to body mass index (BMI), and it was significantly higher than that of those who were underweight and overweight. According to BMI, the nutrition scores of normal students were statistically significantly higher than those who were underweight. The physical activity scores of the students who were obese according to their body fat percentage were statistically significantly lower than those of those who were athletes, fitness, or average. According to their waist circumference, the health responsibility and physical activity scores of the overweight students were statistically significantly lower than those of those who were normal.

Conclusion: In this study, it was shown that students who have healthier and fitter bodies pay greater attention to their nutrition, take part in more physical activity, and have higher levels of health responsibility.

Keywords: Body composition, healthy lifestyle behavior, students.

Introduction

For individuals in the community to maintain good health, they must create a healthy lifestyle. A healthy lifestyle comprises controlling one's actions and choosing attitudes and behaviors that improve health by maintaining daily activities. On the other hand, healthy lifestyle behaviors refer to "maintaining a healthy state of mind and developing healthy activity behaviors." Healthy lifestyle behaviors include adequate and balanced nutrition, stress management, regular exercise, not smoking or drinking alcohol, hygienic measures, spiritual development, healthy interpersonal relationships, and the responsibility for protecting and improving one's health.¹

The first steps toward creating healthy lifestyle behaviors are taken in the family and society and are followed by development through education. According to World Health Organization estimates, 70–80% of deaths in developed countries and 40–50% of deaths in underdeveloped countries are from diseases that occur due to unhealthy lifestyles. For this reason, the health services provided should be in the direction of protecting, maintaining, and improving health this direction.²⁻⁴

University life is a period during which people experience significant changes. For the first time, most students who start university leave their families and attain some personal freedom. Therefore, during this period, students can develop unhealthy lifestyle behaviors, such as unhealthy nutrition, which can cause significant body composition changes.⁵ There are a few studies in the literature examining the relationship between healthy lifestyle behaviors and body mass index (BMI). Nonetheless, in none of them, the relationship between healthy lifestyle behaviors and body composition, such as body fat percentage, waist circumference, and waist-to-hip ratio, were developed or identified in English literature.⁶⁻⁹ The aim of this study was to investigate the relationship between healthy lifestyle behaviors and body composition in university students.

Materials and Methods

This questionnaire-based cross-sectional study considered 127 students from the Faculty of Health Sciences, Department of Nutrition and Dietetics at Trakya University in 2017.

The data were collected by asking demographic information questions, making anthropometric measurements, and administering the "Health Promoting Lifestyle Profile-II" (HPLP-II). Demographic data included questions related to descriptive characteristics (e.g., age, gender, place of residence, place of eating, grade level, smoking, and presence of chronic disease) of the participants and their families. The HPLP-II total and subgroup scores were evaluated according to demographic characteristics and body compositions.

Anthropometric Measurements

The weight, height, and waist and hip circumferences of the participants were measured. Body fat percentage was assessed using a bioimpedance analyzer (Tanita MC 780 MA, Tanita Corporation, USA), considering age, gender, and height. Participants were divided into four groups according to the American Council on Exercise (ACE) body fat chart: athletes (14-20%), fitness (21-24%), average (25-31%), and obese (higher than 32%).¹⁰ Body mass index was calculated using the weight/height² formula. Body mass index scores are categorized into four groups: underweight (≤ 18.5), normal weight (18.6-24.9), overweight (25-29.9), and obese (≥ 30).¹¹ The waist-to-hip ratio was calculated using the waist circumference/hip circumference formula. A waist circumference greater than 80 cm in women and 90 cm in men is considered overweight.¹² Waist-to-hip ratio should generally be less than 0.7. Values above 0.8 in women and above 1.0 in men indicate abdominal obesity.¹³ Before beginning the study, the aim of the research was verbally discussed with the participants. The questionnaire forms were administered at appropriate times without disrupting the lessons of the students.

Health Promoting Lifestyle Profile II

The Health Promoting Lifestyle Profile was developed in 1987 by Walker et al.¹⁴ The first version consisted of 48 items and six sub-factors. Walker et al. reorganized the scale in 1996 and renamed it "Health Promoting Lifestyle Profile II."¹⁵ A Turkish validity and reliability study was conducted by Bahar et al.¹⁶ in 2008. The scale consists of 52 items and six sub-factors. All the items are positive, and marking is based on a 4-point Likert-type scale. Each of the four sub-factors with nine items (e.g., health responsibility, nutrition, spiritual development, and interpersonal relationships) provides a score from nine to 36 points. The sub-factors with eight items (e.g., physical activity and stress management) provide a score from eight to 32 points each. The lowest possible total score is 52 points, and the highest possible total score is 208 points. High scores in the subscales mean more frequent health-promoting behaviors. Cronbach's alpha coefficient of the HPLP-II original version is 0.94, and the coefficient in the Turkish version is 0.92.^{15,16}

In the HPLP-II, the following sub-factors are considered: 1. Spiritual development: It determines the personal life goals, the ability to perform oneself individually, and to what extent the participants know and are satisfied with themselves; 2. Health responsibility: determines the level of responsibility for the health of the individual and to what extent the person is involved in health; 3. Physical activity: shows the level of physical activity of the individual; 4. Nutrition: determines the values of the person in choosing, organizing, and choosing food; 5. Interpersonal relationships: determines the communication and continuity of communication with the immediate environment of the person; 6. Stress management: determines the level of recognition of stress mechanisms and stress sources of the person.¹⁵

Statistical Analysis

Statistical evaluation was performed using SPSS (version 22.0; SPSS Inc., 2016). After examining the suitability of the quantitative data obtained due to the research to the normal distribution, the Student t-test was used in two independent groups, and the one-way ANOVA test was used in three or more independent groups to compare variables that fulfill the parametric test assumptions. Pearson test was used for correlation analysis. Descriptive statistics are given as mean \pm standard deviation, numbers, and percentages. $P < 0.05$ was taken as the limit of significance.

Results

In 2017, 237 students were studied at Trakya University Faculty of Health Sciences, Department of Nutrition and Dietetics, who were potentially eligible participants in a questionnaire-based cross-sectional study. One hundred fifty (63.30%) of them were contacted and invited to participate in the study. One hundred thirty-five (56.96%) of them agreed to participate in the study, and the questionnaires were distributed to them to fill out. One hundred twenty-seven (53.58%) of them filled out the questionnaires completely, and their data were analyzed for the study (Figure 1). The mean age of the participants was 20.38 ± 2.22 , with 44 (34.64%) under the age of 20. There were 108 (85.03%) females. It was determined that 12 (9.44%) students had a chronic disease. Thirteen (10.23%) stated that they smoked. Thirty-nine (30.70%) students lived at home, 51 (40.15%) lived in a state dormitory, and 37 (29.15%) lived in a private dormitory. Regarding the eating location of the participants, 38 (29.92%) ate at home, 79 (62.20%) ate at school/dormitory, and 10 (7.88%) ate at restaurants. Forty-eight (37.79%) were in the first grade, 36 (28.34%) were in the second grade, 22 (17.32%) were in the third grade, and 21 (16.55%) were in the fourth grade (Table 1).

According to BMI, 50 (39.37%) students were underweight, 67 (52.75%) were normal weight, and 10 (7.88%) were overweight. According to body fat percentage, 39 (30.70%) were athletes, 38 (29.92%) were fit, 40 (31.49%) were normal, and 10 (7.89%) were obese. According to waist circumference, 118 (92.91%) students were of normal weight, and nine (7.09%) were overweight. The waist-to-hip ratio was normal in 118 (92.91%) students and abnormal in nine (7.09%).

The mean HPLP-II score was 130.15 ± 15.07 . The two subgroups with the highest scores were spiritual development and interpersonal relationships, while the two with the lowest scores were physical activity and stress management (Table 2).

According to the demographic characteristics of the students, the mean HPLP-II for each subgroup and total scores are presented in Table 2. The nutrition scores of students aged 20 years and over were statistically

significantly higher than those under 20 years of age ($p=0.042$). It was found that the physical activity scores of males were statistically significantly higher than females ($p=0.048$). There was no statistically significant difference between the accommodations of the students, their eating places, their grade levels, smoking habits, chronic disease states, or the mean HPLP-II subgroup and total scores.

The mean HPLP-II subgroup and total scores according to body compositions are shown in Table 3. According to BMI, the physical activity scores of the normal students were statistically significantly higher than those who were underweight and overweight ($p=0.015$). According to the BMI values, the nutrition scores of the normal students were statistically significantly higher than those who were underweight ($p=0.023$). It was revealed in a Pearson correlation analysis that as the nutrition subgroup scores of the students increased, the BMI increased (Figure 2, $p=0.02$, $r=0.206$). According to their body fat percentage, the physical activity scores of the students who were obese were statistically significantly lower than those who were athletes, fitness, or average ($p=0.046$). According to waist circumference, the health responsibility ($p=0.048$) and physical activity ($p=0.044$) scores of overweight students were statistically significantly lower than normal ones. No statistically significant difference was found between normal and abnormal waist-to-hip ratios in terms of HPLP-II subgroup scores.

Table 1. Participants' Demographic Characteristics (n=127)

Demographic data	n (%)
Gender	
Female	108 (85.03)
Male	19 (14.97)
Chronic disease	
Yes	12 (9.45)
No	115 (90.55)
Smoking	
Smoker	13 (10.24)
Non-smoker	114 (89.76)
Living location	
Home	39 (30.70)
State dormitory	51 (40.15)
Private dormitory	37 (29.15)
Chronic disease	
Yes	12 (9.45)
No	115 (90.55)
Eating location	
Home	38 (29.92)
School / dormitory	79 (62.20)
Restaurant	10 (7.88)
Academic grade	
1	48 (37.79)
2	36 (28.34)
3	22 (17.32)
4	21 (16.55)

Table 2. Health Promoting Lifestyle Profile II Scores of students' characteristics (n=127)

	Health Responsibility	Physical Activity	Nutrition	Spiritual Development	Interpersonal Relations	Stress Management	Total HPLP-II Score
HPLP-II Scores	20.21 ± 3.66	17.14 ± 4.18	21.32 ± 3.28	26.59 ± 3.67	25.67 ± 4.00	19.20 ± 3.00	130.15 ± 15.07
Age							
< 20	20.13 ± 4.23	17.00 ± 3.16	20.54 ± 2.90	26.61 ± 3.74	25.84 ± 3.97	19.52 ± 3.28	129.65 ± 14.85
≥ 20	20.25 ± 3.34	17.21 ± 4.64	21.73 ± 3.41	26.59 ± 3.66	25.59 ± 4.03	19.03 ± 2.85	130.42 ± 15.27
p value	0.875	0.757	0.042 *	0.973	0.737	0.409	0.786
Gender							
Female	20.34 ± 3.82	16.75 ± 3.87	21.13 ± 3.27	26.54 ± 3.49	25.93 ± 4.02	19.18 ± 2.93	129.89 ± 15.22
Male	19.47 ± 2.50	19.36 ± 5.18	22.36 ± 3.23	26.89 ± 4.67	24.21 ± 3.61	19.31 ± 3.46	131.63 ± 14.50
p-value	0.211	0.048 *	0.140	0.760	0.071	0.878	0.638
Place to stay							
Home	20.33 ± 3.40	17.94 ± 5.17	21.71 ± 3.46	26.51 ± 4.03	24.87 ± 4.25	19.02 ± 3.09	130.41 ± 15.70
State Dormitory	20.33 ± 3.97	16.90 ± 3.53	21.43 ± 3.03	26.43 ± 3.31	26.07 ± 4.10	19.23 ± 2.87	130.41 ± 14.93
Private Dormitory	19.91 ± 3.56	16.62 ± 3.81	20.75 ± 3.42	26.91 ± 3.84	25.97 ± 3.53	19.35 ± 3.16	129.54 ± 14.98
p-value	0.848	0.337	0.426	0.818	0.320	0.892	0.958
Place to eat							
Home	20.26 ± 3.51	17.42 ± 5.17	21.42 ± 3.26	26.57 ± 3.61	25.18 ± 3.77	18.84 ± 3.07	129.71 ± 15.91
School cafeteria	20.34 ± 3.77	16.97 ± 3.66	21.34 ± 3.23	26.84 ± 3.46	26.16 ± 4.03	19.46 ± 3.07	131.13 ± 14.93
Outside	19.00 ± 3.39	17.40 ± 4.27	20.80 ± 4.04	24.70 ± 5.22	23.70 ± 4.16	18.50 ± 2.06	124.10 ± 12.49
p-value	0.552	0.848	0.867	0.221	0.123	0.429	0.374
Class							
1	19.93 ± 4.07	17.02 ± 3.84	20.56 ± 3.14	26.64 ± 3.95	25.70 ± 4.16	19.58 ± 3.29	129.45 ± 14.80
2	20.38 ± 3.19	18.08 ± 4.77	22.33 ± 3.56	26.88 ± 3.46	26.11 ± 3.70	19.30 ± 3.19	133.11 ± 15.39
3	19.95 ± 2.78	16.81 ± 3.68	21.13 ± 2.31	26.50 ± 2.85	24.77 ± 3.13	19.31 ± 1.78	128.50 ± 8.08
4	20.80 ± 4.34	16.14 ± 4.30	21.52 ± 3.66	26.09 ± 4.30	25.80 ± 4.94	18.04 ± 2.88	128.42 ± 20.23
p value	0.800	0.366	0.104	0.889	0.670	0.269	0.572
Smoking							
Yes	20.00 ± 2.58	17.61 ± 6.21	21.97 ± 3.94	25.61 ± 2.93	26.23 ± 3.67	19.38 ± 3.42	129.92 ± 17.40
No	20.35 ± 3.75	17.07 ± 3.96	21.36 ± 3.25	26.74 ± 3.76	25.64 ± 4.08	19.19 ± 3.00	130.38 ± 15.01
p-value	0.666	0.763	0.801	0.219	0.601	0.854	0.928
Chronic illness							
Yes	21.75 ± 3.84	16.50 ± 3.65	22.25 ± 3.86	27.50 ± 2.74	26.83 ± 4.13	18.58 ± 2.39	133.41 ± 14.11
No	20.05 ± 3.62	17.20 ± 4.24	21.22 ± 3.22	26.50 ± 3.75	25.55 ± 3.98	19.26 ± 3.06	129.81 ± 15.18
p-value	0.166	0.539	0.392	0.268	0.325	0.373	0.418

* Student's t-test, HPLP-II: Health Promoting Lifestyle Profile II

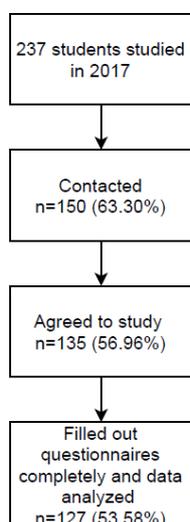


Figure 1. The flow diagram of the participants

Table 3. Students' Health-Promoting Lifestyle Profile-II Scores According to Body Compositions (n=127)

Body Compositions	Health Responsibility	Physical Activity	Nutrition	Spiritual Development	Interpersonal Relations	Stress Management	Total Score
BMI							
Underweight	19.58 ± 3.73	15.96 ± 3.80	20.36 ± 2.96	26.52 ± 3.72	25.80 ± 3.96	19.08 ± 3.40	127.30 ± 15.42
Normal	20.53 ± 3.65	18.14 ± 4.41	22.02 ± 3.43	26.58 ± 3.63	25.67 ± 4.07	19.35 ± 2.80	132.32 ± 14.91
Overweight	21.20 ± 3.19	16.30 ± 2.75	21.32 ± 2.75	27.10 ± 4.09	25.10 ± 4.04	18.80 ± 2.29	129.90 ± 13.14
p-value	0.255	0.015 &	0.023 &	0.902	0.882	0.804	0.204
Body Fat Percentage							
Athletes	20.21 ± 3.87	17.15 ± 5.74	21.21 ± 3.63	26.63 ± 4.35	25.68 ± 4.55	19.42 ± 3.83	130.31 ± 18.91
Fitness	19.47 ± 2.42	17.47 ± 3.16	21.71 ± 2.81	25.76 ± 3.38	24.57 ± 2.88	19.10 ± 2.63	128.10 ± 10.57
Average	20.95 ± 4.11	17.20 ± 3.48	21.12 ± 3.54	27.50 ± 3.02	26.60 ± 4.21	19.07 ± 2.73	132.45 ± 15.15
Obese	20.09 ± 4.63	15.72 ± 3.37	21.09 ± 2.77	26.09 ± 3.98	26.09 ± 4.13	19.27 ± 2.00	128.36 ± 13.76
p-value	0.368	0.046 &	0.859	0.206	0.164	0.958	0.622
Waist circumference							
Normal	20.38 ± 3.56	17.34 ± 4.22	21.40 ± 3.28	26.64 ± 3.63	25.77 ± 3.98	19.26 ± 3.03	130.82 ± 15.12
Overweight	17.88 ± 4.31	14.44 ± 2.40	20.22 ± 3.23	26.03 ± 4.41	24.44 ± 4.24	18.44 ± 2.55	121.44 ± 11.84
p-value	0.048 *	0.044 *	0.299	0.615	0.340	0.433	0.072
Waist/Hip Ratio							
Normal	20.27 ± 3.60	17.10 ± 4.23	21.27 ± 3.29	26.62 ± 3.64	25.72 ± 3.97	19.24 ± 3.05	130.23 ± 14.96
Abnormal	19.44 ± 4.58	17.66 ± 3.60	22.00 ± 3.24	26.22 ± 4.32	25.11 ± 4.53	18.66 ± 2.29	129.11 ± 17.43
p-value	0.516	0.698	0.523	0.752	0.662	0.580	0.830

& One-way ANOVA, * Student's t-test, BMI: Body mass index

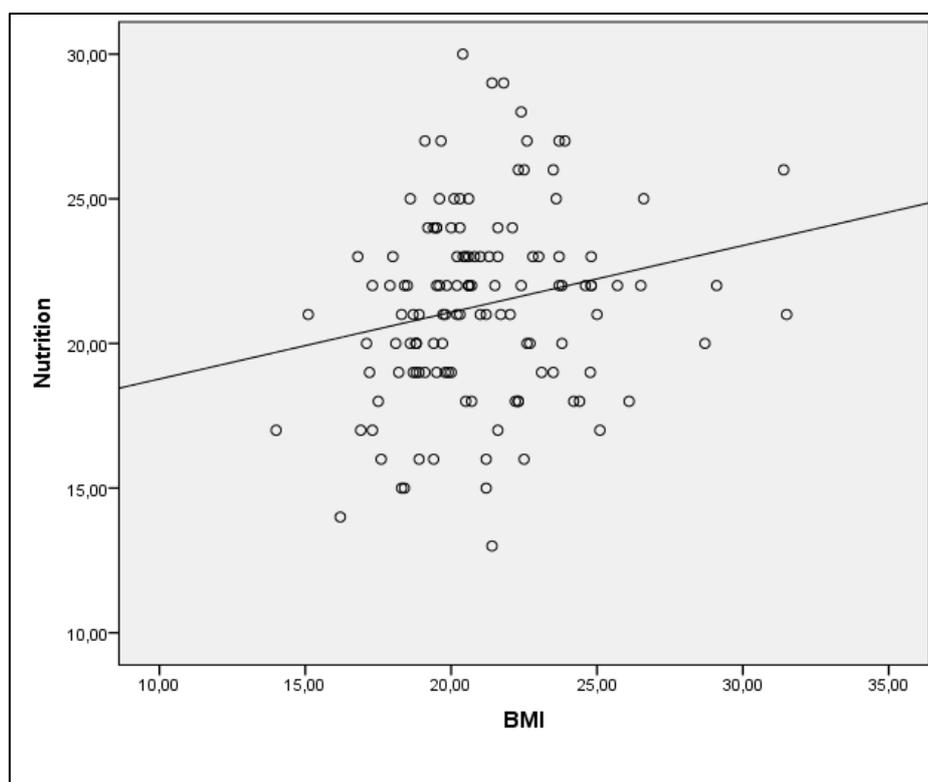


Figure 2. Correlation between the nutrition subgroup scores and the BMI scores in the students (p=0.02, r=0.206).

Discussion

In our study, in which the highest possible total HPLP-II score was 208, the total mean score for the students was 130.15 ± 15.07 . Aksoy and Uçar conducted a study on nursing students and found that their HPLP-II total mean score was 136.12 ± 19.16 . A survey by Unalan et al. in health college students reached 127.81 ± 17.52 .¹⁻¹⁷ A study of nurses by Özkan and Yılmaz¹⁸ found that the total mean score was 125.96 ± 16.99 , and in a survey by Uz and Kitiş¹⁹ of healthcare workers, it was 132.87 ± 12.47 . The study results conducted on the same scale in health workers in Turkey are similar, and usually mean total scores HPLPS II is moderate levels.¹⁸ In a study conducted by Al-Kandari and Vidal²⁰ with nursing students in Kuwait, the total mean score was 128.16, and it was 125.76 in a study conducted by Hawks et al.²¹ with Japanese nursing students in the USA. In Hui's survey of nursing students in Hong Kong, the total mean score was 116.28 ± 16.82 , which is considerably lower than in our study.²²

In studies conducted by Aksoy and Uçar¹ of nursing students and by Türkol and Güneş²³ in assistants practicing at İnönü University Medical Faculty Hospital, the highest scores were in the spiritual development and interpersonal relationships sub-dimensions of HPLP-II. In this same study, the lowest scores were related to physical activity and stress management. In the research conducted by Cürçani et al.²⁴ on nurses, the highest mean score was in the spiritual development sub-dimension, and the lowest average score was in the physical activity sub-dimension. Similarly, Özkan and Yılmaz¹⁸ determined that the highest score for nurses was for spiritual development, and the lowest score was for the physical activity sub-dimension. In our study, the two subgroups for which the participants received the highest scores were spiritual development and interpersonal relationships of HPLP-II, while the two subgroups with the lowest scores were physical activity and stress management. In other studies with nurses, as in our study, the spiritual development sub-dimension mean score was the highest, and the physical activity sub-dimension mean score was the lowest.⁴ In line with the findings, it can be said that healthcare professionals do not have a habit of exercising regularly.

In a study conducted on physical education and sports students, the mean scores of the physical activity and nutrition HPLP-II sub-dimensions were higher for male students than for female students. The mean scores for fourth-grade students were more elevated in four of the six sub-dimensions compared to the other grades.²⁵ In the study conducted by Aksoy and Uçar¹ on nursing students, the age group with the highest HPLP-II score was 24 years old and older. It was determined that there was an increase in the mean scores with increasing age. In our study, while the mean score of the HPLP-II physical activity subscale of male students was significantly higher than that of female students, there was no difference between the grade levels. In addition, the mean score of the nutrition subscale for students aged 20 years and older was significantly higher than the score for those under the age of 20. These results indicate that male students attach more importance to physical activity, and older students pay more attention to nutrition.

In studies conducted by Aksoy and Uçar¹ in nursing students and Şimşek et al.⁵ in Faculty of Medicine students, the HPLP-II mean scores of the students who stayed with their families during their university education were determined to be the highest. In our study, there was no significant correlation between where the students lived and where they ate and the mean scores of the scale and subgroups. In nurse studies by Altay et al.²⁶ and Aksoy and Uçar¹, it was found that having a chronic disease did not affect HPLP-II scores, which is similar to the findings of our study. According to this result, it can be said that students do not perceive diseases as threats and do not give importance to healthy lifestyle behaviors that play an essential role in disease prevention. In the same study conducted by Aksoy and Uçar¹, no significant relationship was found between smoking and HPLP-II scores similar to our study.

There are a few studies in the literature examining the relationship between HPLP-II scores and BMI, but in none of them, the relationship between HPLP-II scores and body composition, such as body fat percentage, waist circumference, and waist-to-hip ratio were developed or identified in English literature.⁶⁻⁹ Nacar et al.⁶ in Turkish medical students and Lolokote et al.⁷ in their work with university students in China did not find a relationship between HPLP-II scores and BMI. In a study conducted by Alzahrani et al.⁹ with medical students, a negative correlation was found between the mean interpersonal relations subgroup score of the HPLP-II and BMI. In a study conducted by Al-Kandari et al.⁸ in nursing students in Kuwait, a negative correlation was found between HPLP-II total and nutrition subgroup scores and BMI. In our study, the mean scores of the nutrition subgroup of HPLP-II were significantly higher in the group with a normal BMI than for those who were underweight. The mean scores of the physical activity subgroup of the HPLP-II were significantly higher in the group with a normal BMI than the scores of the underweight or overweight participants. According to these results, it appears that students with a normal BMI pay greater attention to physical activity and nutrition. Our study found that the students who were obese according to body fat percentage had significantly lower mean scores in the HPLP-II physical activity subgroup compared to athletes, fit, and normal students. In addition, it was found that the average scores of the HPLP-II health responsibility and physical activity subgroups for students who were normal according to waist circumference were higher than those who were overweight. These results emphasize the importance of physical activity in preventing weight gain and maintaining a healthy weight.

To the best of our knowledge, this cross-sectional study is the first to examine the relationship between healthy lifestyle behaviors and body compositions, such as body fat percentage, waist circumference, and waist-to-hip ratio in English literature. Limitations of this study include our study site and our sample size. Concerning the sample site, we conducted a cross-sectional survey of students from only one university. About the sample size, the number of participants was low, which may affect the results.

In conclusion, in this study, it was determined that students who have healthier and fitter bodies pay greater attention to their nutrition, do more physical activity, and have a higher level of health responsibility. Healthcare professionals have important roles and responsibilities for individuals in the community to develop and maintain healthy lifestyle behaviors within the scope of preventive health services. For this reason, healthcare professionals first need to improve their health-related knowledge and then transform this knowledge into attitudes and behaviors. Further studies are required on this subject.

Ethical considerations

Approval from Trakya University Ethics Committee (26.04.2017/124) was granted, and informed consent was obtained from each participant.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

Conflict of interest disclosure:

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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