Acta Pharm. Sci. Vol 62:(1), 2024
Research article
DOI: 10.23893/1307-2080.APS6214

The relationship between healthy living-style behaviors and type-2 diabetes risk of students of health sciences

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ABSTRACT

The aim of this study was to determine the relationship between healthy life-style behaviors and risk of Type 2 Diabetes Mellitus of students, and also to compare the sub-dimensions of Healthy Living-Style Behaviors Scale-II (HLBS-II) with the anthropometry and general characteristics. Socio-demographic form, HLBS-II and The Finnish Diabetes Risk Score (FINDRISC) were used and anthropometric measurements were taken. With the increase in waist/height ratio, physical activity sub-dimension of HLBS-II was affected ($p<0.05$). The medical check-up status effected every sub-dimension and the total score of HLBS-II ($p<0.001$). With the increase in waist/hip ratio of female students, FINDRISC also increased ($p<0.001$). As the waist/height ratio increased, the mean scores of FINDRISC also increased ($p<0.001$). Students with a BMI value ≥30 had higher FINDRISC scores ($p<0.001$). There is a negative relationship between HLBS-II total score, nutrition, self-actualization, and stress management, which are sub-dimensions of HLBS-II, and FINDRISC scores of students of health sciences.

Keywords: Type 2 Diabetes, FINDRISC, HLBS II, health behavior, university students

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(Received 21 Sep 2023, Accepted 16 Oct 2023)

INTRODUCTION

Diabetes is defined as a metabolic disease with a chronic course that occurs as a result of insufficiency in insulin secretion or in the use of insulin. This metabolic disease is based on the constant high level of sugar in the blood[1]. According to TURDEP I and TURDEP II studies conducted on approximately 25.000 people in 1997 and 2010 in Turkey, diabetes prevalence increased from 7.2% to 13.7% in a 12-year period[2,3]. It is important for individuals to be able to understand health-related information and maintain their health, because diabetes is a disease that can be prevented and/or controlled before it occurs. Creating the correct perception and increasing awareness about the disease shows that it is possible to prevent the rate of diabetes increase and all related complications[4]. The main goal of the treatment of diabetic individuals should be to provide glycemic control. In addition, other known risk factors such as blood pressure and weight gain of patients should be monitored[5]. In order to bring diabetic individuals blood glucose levels to the reference levels and to optimize their daily life activities, they should receive a medical therapy, medical nutrition therapy and increase their physical activity[6].

The basis of healthy lifestyle choices and behaviors exhibited in adulthood is laid in childhood and adolescence[7]. In this period, when young individuals start university life, which also includes adolescence, they try to get used to many changes that also affects their habits in adulthood. Individuals' in this period, leaving the family home, tending towards eating behaviors independent of the family, preferring food such as fast food rather than healthy food, inactivity, trying to get used to the university life, meeting new people and wanting to resemble their peers, increasing the tendency to use tobacco and tobacco products may pave the way for the emergence of many chronic diseases such as diabetes in the future, as well as causing many changes in individuals' private life and healthy lifestyle behaviors[8-10]. Some of the important causes of diabetes are social environment, lack of information and motivation of individuals and an understanding of unhealthy lifestyle[11]. The fact that university students are in the young age group may reduce the risk of diabetes, but the increase in obesity in recent years due to the sedentary life of the students and the rapid life causes the Type 2 Diabetes Mellitus (T2DM) risk prevalence of university students to increase[12,13]. Students are expected to reflect these behaviors to their lives with the education they receive so that they can gain healthy eating habits, recognize changeable risk factors of diabetes such as increasing physical activity, and make healthy lifestyle behaviors a habit.

Health sciences students' application of healthy lifestyle behaviors to their lives affects the lives of other people in terms of both increasing their quality of life and being a role model for the society they live in[8,14,15]. With this study, it was aimed to determine the relationship between healthy lifestyle behaviors of health science students, who will have a key role in the future both in the society and health institutions, and their risk of developing T2DM.

METHODOLOGY

Study design and sampling

This cross-sectional study was conducted at Marmara University Faculty of Health Sciences between November 2019 and May 2020.

The sample size was calculated using the EpiInfo program. In this calculation, the incidence of the event was 50%, the error level was 5%, and the pattern effect was taken as 2, and the sample size was determined as 648. For the losses that may arise during the research process, it was planned to invite 730 students to the study.

The inclusion criteria for this study were: To be a registered student of the Faculty of Health Sciences at the duration of the study. The exclusion criteria were: Pregnant and lactating women, students that were diagnosed as Type 1 or Type 2 Diabetes Mellitus prior to the study.

Measures

The data was collected by the researchers during face-to-face interviews. Participants of the study completed a socio-demographic form, The Healthy Living-Style Behaviors Scale II (HLBS II) and The Finnish Diabetes Risk Score (FINDRISC) form.

The Healthy Living-Style Behaviors Scale II: HLBS II was prepared by Walker et al. in 1987 and renewed in 1996[16]. The scale measures health-promoting behaviors, such as healthy eating, regular physical activity, positive relationships and reducing stress, associated with an individual's healthy lifestyle. The scale consists of 52 items in total and has 6 sub-factors. Subgroups are health responsibility, physical activity, nutrition, self-actualization, interpersonal support and stress management. The overall score of the scale gives the healthy lifestyle behaviors score. All items of the scale are positive. The rating is in the form of a 4-point Likert; never (1), sometimes (2), often (3), regularly (4). The lowest score for the entire scale is 52, the highest score is 208 and higher scores are interpreted as good healthy lifestyle behavior of the individuals. In our country, a validity and reliability study were carried out by Bahar and col-

leagues; the Cronbach Alpha coefficient of the scale is 0.92 and it has a high degree of reliability. The reliability coefficients of the sub-dimensions of the scale are; Health responsibility 0.77, Physical Activity 0.79, Nutrition 0.68, Self-Actualization 0.79, Interpersonal Support 0.80, Stress Management 0.64[17].

The Finnish Diabetes Risk Score: FINDRISC was developed in 2003 by Lindström and Tuomilehto to measure the 10-year risk of developing T2DM in Finland[18]. FINDRISC is also used by the International Diabetes Federation, and its Turkish translation has been made by Turkey Endocrinology and Metabolism Society in our country. It is recommended to be used for research on risk of developing diabetes in the following 10-years. FINDRISC consists of 8 questions. When the scores obtained to determine the diabetes risk of individuals are added together, those who score less than 7 are considered to have "low risk", 7-11 points have "mild risk", 12-14 points have "medium risk", 15-20 points have "high risk" and more than 20 points are considered to have "very high risk"[6].

Evaluation of anthropometric measurements

All anthropometric measurements were carried out by the researchers at the faculty. The height of the students was measured with a fixed height meter that had 0.5 cm intervals; the measurements were taken without shoes. For body weight, a bioelectric impedance analysis device (Inbody 270 portable) was used. Students were asked to remove all heavy clothing and shoes before stepping on the device. The device was set to -1.0 kg for the remaining clothes. Waist circumference (WC) was measured after normal exhalation, with an inflexible tape at the umbilicus level and without clothes in the area[19], and hip circumference were measured around the largest part of hips and the distance was noted.

Body mass index (BMI) was calculated as weight (kg) divided by height (m) squared and classified into four groups according to World Health Organization. The BMI was considered underweight if it was <18.5, normal if it was 18.5-24.9 kg/m^2, overweight if the BMI was 25.0-29.9 kg/m^2, obese if the BMI was ≥30.0[20].

Statistical analysis

The data were evaluated statistically using the SPSS (Statistical Package for the Social Sciences) 28.0 package program. The Kolmogorov Smirnov Z test was used to determine whether the mean scores of the scale were compatible with the normal distribution. Spearman correlation for determining the relationship between scale scores (sub-dimensions of HBLS and FINDRISC); para-

metric (Independent t-test, One-way ANOVA test), or non-parametric tests (Man Whitney U test, Kruskal Wallis test) were used to compare scale scores with independent variables. Statistical significance was accepted as $p<0.05$ in all analyzes.

RESULTS and DISCUSSION

From the 730 students that were invited for the study, 9 students were excluded for reasons such as not meeting inclusion criteria, and with 721 students the study was started. Five students were excluded from the study due to missing data. Overall, 716 (98.1%) students in 2nd, 3rd and 4th grades from the Department of Nutrition and Dietetics, Physiotherapy and Rehabilitation, Midwifery, Health Management and Nursing completed the study (Figure 1).

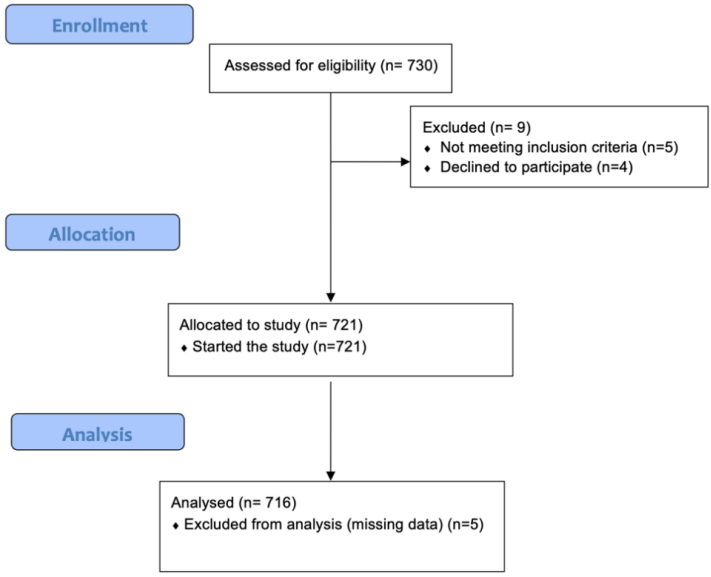

Figure 1. Modified CONSORT flow diagram for a single-arm, nonrandomized study

General characteristics of students were shown in Table 1. Of all students, 99.03% were single, most of the students (43.44%) lived with their family and only 9.93% were employed. The median age of students was 21.0 (19.0-33.0), BMI was 21.3 (15.8-38.5), the median waist circumference measurement was 71.6 cm (58-122) and the median hip circumference measurement was 96.0 cm (69.0-130.0). The median of total scores of HLBS II was 129.0 (64.0-185.0) (not shown in table).

Table 1. General characteristics and anthropometric measurements of students (n=716)

Variable	Number (n)	Percent (%)
Gender		
Female	607	84.78
Male	109	15.22
Department		
Nutrition and Dietetics	127	17.73
Midwifery	101	14.10
Physiotherapy & Rehabilitation	147	20.54
Nursing	283	39.53
Health Management	58	8.10
Class		
2nd grade	234	32.68
3rd grade	253	35.34
4th grade	229	31.98
Body Mass Index		
Underweight (<18.5)	85	11.87
Normal (18.50-24.99)	549	76.68
Overweight (≥25)	67	9.35
Obese (≥30)	15	2.09
Number of Main Meals		
<3 meals	340	47.49
3 meals	372	51.96
>3 meals	4	0.55
Meal Skipping Status		
Yes	578	80.73
No	138	19.27
Physical Activity Level		
Very light	68	9.49
Light	226	31.57
Moderate	379	52.94
Vigorous	40	5.59
Maximal	3	0.41
Medical Problems		
Yes	63	8.79
No	653	91.21
Medical Check-ups		
Yes	247	34.49
No	469	65.51
FINDRISC Categories		
Low Risk	615	85.9
Mild Risk	79	11.0
Medium Risk	17	2.4
High Risk	5	0.7
Very High Risk	0	0.0

Considering the risk of developing T2DM in the next 10 years, it was seen that majority (85.9%) of the students participating in the study were in the low-risk group and only a few of them (0.7%) was in the high-risk group. In a study in which Çolak used FINDRISC, it was observed that 72% of university students

had low risk of T2DM, 24.7% had mild risk, 2.8% had moderate risk and 0.5% had high risk, and these results were similar to our findings[21].

The items of the FINDRISC scale and the distribution of students according to these items were shown in Table 2. Since all the students were under the age of 45, they received 0 points from this item. Only 2.1% of the students had a BMI above 30 and 3.3% had higher waist circumference than reference values and got 3 points in these categories (see Table 1 for the FINDRISC category distribution of students).

Table 2. Distribution of FINDRISC Type 2 Diabetes Risk Factors (n=716)

Variables	Category		FINDRISC Scores	Number (n)	Percent (%)
Age	<45		0	716	100
Family history of diabetes	No		0	289	40.4
	Yes, 1st degree relative		3	303	42.3
	Yes, 2nd degree relative		5	124	17.3
Waist Circumference (cm)	Female	Male			
	<80	<94	0	614	85.8
	80-88	94-102	3	78	10.9
	>88	>102	4	24	3.3
30 minutes exercise per day	Yes		0	678	94.7
	No		2	38	5.3
Daily consumption of vegetables and fruits	Yes		0	364	50.8
	No		1	352	49.2
Use of blood pressure medication	No		0	695	97.1
	Yes		2	21	2.9
History of high blood glucose	No		0	669	93.4
	Yes		5	47	6.6
BMI	<25		0	628	87.7
	25-30		1	73	10.2
	>30		3	15	2.1

According to the data obtained by comparing the anthropometric measurements and the FINDRISC scores presented in Table 3; statistically significant differences were found between T2DM risk scores and waist circumference of both female students' ($p<0.001$) and male students' ($p=0.01$). It was observed that students with a BMI value of 30 and above had statistically higher FINDRISC scores ($p<0.001$).

Table 3. Comparison of anthropometric measurements and FINDRISC Type 2 Diabetes Risk Scores (n=716)

Variables	FINDRISC Score (Mean±SD)	Statistics* Post Hoc**

Waist Circumference of Females (cm)		
<80	3.07±2.39[a]	F= 198.03 p<0.001
80-88	6.03±3.73[b]	c>b>a
>88	9.26±4.00[c]	
Waist Circumference of Males (cm)		
<94	3.57±2.92[a]	F= 6.586 p=0.010
94-102	9.92±4.38[b]	b>a
>102	11.60±2.07[c]	
Waist/Hip Ratio of Females		
<0.85	3.55±2.96	Z=-5.750 p<0.001
>0.85	6.62±4.10	
Waist/Height Ratio		F=109.672 p<0.001
<0.4	3.04±2.30[a]	c>a
0.4-<0.5	3.20±2.54[b]	d>a
0.5-0.6	8.53±3.62[c]	c>b
>0.6	11.85±1.77[d]	d>b
		d>c
BMI		F=101.968 p<0.001
Underweight (<18.5)	3.23±2.31[a]	c>a
Normal (18.50-24.99)	3.14±2.47[b]	d>a
Overweight (≥25)	7.49±3.99[c]	c>b
Obese (≥30)	11.73±2.18[d]	d>b
		d>c

*Z= Mann Whitney U test, F= One-Way ANOVA test **PostHoc = Scheffe Test, Tamhane's T2

Recent studies on waist/height ratio emphasize that this ratio is a better measure for determining cardiometabolic risk and T2DM risk than BMI, waist circumference and waist/hip ratio[22-24]. In this study, a statistically significant difference was found between the waist/height ratio of the students and their diabetes risk scores. When the data obtained were evaluated, it was determined that when waist/height ratio were increased, the averages of FINDRISC scores were also increased.

In Gezer's study to determine the risk of diabetes with nursing students between the ages of 19-24, the rate of female students in the low-risk group for T2DM was found to be 65.5%, while the rate of male students in the same risk group was found to be 77.0%[22]. In our study, no relationship was found between the gender of the students and their diabetes risk scores.

Shown in Table 4, the relationship between the general characteristics of the participants and their HLBS II scores was examined. The average of health re-

sponsibility sub-dimension was higher in female students whose waist circumference was higher than 88 cm and the average score of interpersonal support sub-dimension was higher in those with a waist circumference lower than 80 cm (respectively, p=0.001; p=0.037). The average score of the physical activity sub-dimension of the nursing students was higher than the other departments (p=0.021) and nutrition and dietetics students' average score for the nutrition sub-dimension was higher than the other departments (p<0.001). Also, the mean score of the nutrition sub-dimension of third grade students was found to be statistically higher than other grades (p=0.042) (not shown in table).

Table 4. Comparison of general characteristics and anthropometric measurements of students and sub-dimensions of the Healthy Living-Style Behaviors Scale (n=716)

Variables		Health Responsibility		Physical Activity		Nutrition		Self-actualization		Interpersonal Support		Stress Management		HLBS II Total	
	n	Min.-Max.	Median	Min.-Max.	Median	Min.-Max.	Median	Min.-Max.	Median	Min.-Max.	Median	Min.-Max.	Median	Mean	±SD
Gender															
Female	607	9-35	21	8-32	16	10-34	20	11-36	26	14-36	26	9-29	19	128.6	16.7
Male	109	10-34	20	8-32	18	9-34	20	11-36	26	13-36	26	9-29	19	128.8	20.7
		p=0.125*		p<0.001*		p=0.413*		p=0.974*		p=0.139*		p=0.867*		p=0.914**	
Waist/Height Ratio															
<0.4	180	9-34	20	8-28	16	11-29	19.5	14-36	26	13-36	26	11-29	19	126.5	16.8
0.4-<0.5	462	9-35	21	8-32	17	9-34	20	11-36	27	14-36	26	9-29	19	129.8	17.8
0.5-0.6	67	11-34	21	8-30	17	12-28	20	16-35	26	14-33	26	11-26	19	127.7	15.9
>0.6	7	19-25	23	8-25	15	18-24	19	19-30	25	18-27	24	13-22	16	120	15.6
		p=0.284***		p=0.026***		p=0.103***		p=0.117***		p=0.318***		p=0.051***		p=0.103****	
BMI															
Underweight (<18.5)	85	11-33	20	8-29	16	11-26	19	14-3	26	15-36	26	11-29	18	124.5	15.8
Normal (18.50-24.99)	549	9-35	21	8-32	17	10-34	20	11-36	26	13-36	26	9-29	19	129.4	17.5
Overweight (≥25)	67	10-34	21	8-28	17	9-29	20	11-36	26	16-36	26	9-27	19	128.1	17.6
Obese (≥30)	15	17-34	23	8-30	15	15-28	19	19-34	26	18-33	27	12-26	18	127.8	20.6
		p=0.029***		p=0.012***		p=0.003***		p=0.536***		p=0.970***		p=0.541***		p=0.114****	
Main Meals															
<3 meals	340	9-34	20	8-32	17	9-32	19	11-36	26	14-36	25	9-29	19	126.1	17.1
3 meals	372	11-35	21	8-32	17	12-34	21	13-36	27	13-36	26.5	11-27	19	131.1	16.7
>3 meals	4	22-24	22	15-21	18	16-26	20	21-31	29	19-30	27	14-24	19	133.2	18.7
		p=0.006***		p=0.699***		p<0.001***		p=0.020***		p=0.020***		p=0.105***		p=0.001****	

Table 4. Comparison of general characteristics and anthropometric measurements of students and sub-dimensions of the Healthy Living-Style Behaviors Scale (n=716)

Variables		Health Responsibility		Physical Activity		Nutrition		Self-actualization		Interpersonal Support		Stress Management		HLBS II Total	
	n	Min.-Max.	Median	Min.-Max.	Median	Min.-Max.	Median	Min.-Max.	Median	Min.-Max.	Median	Min.-Max.	Median	Mean	±SD
Mothers' Educational Status															
Not Literate	57	10-28	19	8-24	16	9-26	18	11-34	25	16-36	24	9-26	18	118.7	20.2
Literate	52	10-27	20	8-30	16	12-26	20	18-36	26	14-34	25	12-29	19	125.9	15.2
Primary education	425	9-35	21	8-32	17	10-34	20	11-36	27	14-36	26	9-29	19	129.3	16.6
High school	136	11-34	21	8-29	16	12-34	21	13-36	26	13-36	26	11-28	19	130.3	18.1
University and above	46	14-39	22	8-31	17	12-32	21	20-34	27	20-34	27	14-28	19	133.5	16.3
		p<0.001***		p=0.157***		p=0.001***		p=0.045***		p=0.001***		p=0.168***		p<0.001****	
Fathers' Educational Status															
Not Literate	10	11-18	18	8-20	14	9-24	17.5	11-34	24.5	16-36	23.5	9-24	16.5	117.1	26.6
Literate	22	14-26	19	8-25	16.5	12-26	20	18-34	25.5	15-34	23.5	13-23	19	123.6	17.6
Primary education	343	9-33	21	8-32	17	11-33	20	11-36	26	14-36	26	9-29	19	128.3	17.1
High school	233	9-35	20	8-32	17	10-34	20	11-36	26	13-36	26	9-29	19	128.7	17.6
University and above	108	13-34	21	8-38	16	12-29	21	17-36	26	19-36	27	12-28	19	131.9	16.3
		p=0.088***		p=0.650***		p=0.016***		p=0.503***		p=0.027***		p=0.643***		p=0.038****	
Medical Check-ups															
Yes	247	9-35	23	8-32	18	10-34	21	13-36	27	18-36	27	12-29	20	136.5	16.2
No	469	9-33	19	8-32	16	9-34	19	11-36	26	13-36	25	9-28	19	124.5	16.6
		p<0.001*		p<0.001*		p<0.001*		p<0.001*		p<0.001*		p<0.001*		p<0.001**	

*Mann Whitney U test **Independent Sample T test ***Kruskal Wallis test

****One-Way ANOVA test SD: Standard Deviation

Table 5. Relationship between sub-dimensions of Healthy Living-Style Behaviors Scale and FINDRISC Type 2 Diabetes Risk Assessment (n=716)

	Health Responsibility		Physical Activity		Nutrition		Self-actualization		Interpersonal Support		Stress Management		Total HLBS II Score	
	r	p	r	p	r	p	r	p	r	p	r	p	r	p
FINDRISC Total Score	0.015	0.680	-0.034	0.361	-0.078	**0.037**	-0.085	**0.022**	-0.061	0.103	-0.127	**0.001**	-0.087	**0.020**

*Spearman Correlation test

The correlations between the sub-dimensions of HLBS II and FINDRISC scores were shown in Table 5.

In a study conducted with only female university students, the score of physical activity of sub-dimension of HLBS II were found to be the lowest of all sub-dimensions[25]. In another study, it was found that male university students' physical activity and stress management sub-dimensions of HLBS II were significantly higher than female students[26]. Similar to this study, we found the physical activity sub-dimension scores of male university students statistically higher than the scores of female students.

In a study it was found that the average scores of self-actualization, physical activity, nutrition, interpersonal support and total HLBS II scores of the group with normal waist-to-height ratio (0.4-0.5) to be significantly higher than students with waist-to-height ratio lower than 0.4[25]. Similarly in our study we found that physical activity sub-dimension of HLBS II scores were statistically higher in students with normal waist-to height ratio (0.4-0.6). While some studies could not find any difference between the nutrition sub-dimension and BMI[15,27], Alkan et al. found that students with normal BMI had higher scores in nutrition sub-dimension than underweight students[25]. In our study we found that nutrition sub-dimension score was significantly higher in students that were in the normal and overweight BMI range.

In current study, statistically significant differences were found between the mothers' educational status of the students and the health responsibility, nutrition, self-actualization and interpersonal support. Also, statistically significant differences were found between the fathers' educational status of the students and the sub-dimension of HLBS II; nutrition, interpersonal support and total score of HLBS II. In a study conducted in Mexico, it was observed that as the mothers' educational level increased, the mean scores in nutrition, physical activity, stress management, interpersonal support subscales and the total score

of HLBS II increased significantly[28]. In the study of Tuğut and Bekar, when the health perception and healthy lifestyle behaviors of university students were examined, it was seen that educational status of mothers and fathers was effective in terms of health perception on university students[29]. These results support our findings.

In similar studies it was stated that students mostly had three main meals[30,31]. In the study conducted by Mazıcıoğlu and Öztürk with third and fourth grades of university students, it was found that 48.9% consumed three meals a day, 24.8% consumed less than three meals and 26.1% consumed more than three meals a day[32]. In our study, 51.96% of the students had three main meals, while 47.49% had less than 3 meals and 0.55% had more than 3 meals a day. Significant differences were found between students' main meal consumption status and subscales of HLBS II; health responsibility, nutrition, self-actualization, interpersonal support and total HLBS II scores. Accordingly, it was seen that the average HLBS II score of those who consume more than 3 meals is higher than those who consume 3 meals or less. The reason of majority of the students participating in this study consuming 3 or more meals may be due to the fact that the study was conducted in the faculty of health sciences and the awareness on this issue was high.

In our study, statistically significant differences were found between students' medical check-up status and HLBS II sub-dimensions; health responsibility, physical activity, nutrition, self-actualization, interpersonal support, stress management and HLBS II total score. Accordingly, the average HLBS II score of the students who had medical check-ups was found to be higher than the students who did not. In the study conducted by Cihangiroglu and Deveci with health school students, it was determined that as the students' evaluation of their health status increased in the "good" direction, the total score of the HLBS II scale and the mean scores of health responsibility, physical activity and stress management also increased[15]. Similarly, in the study of Ayaz and colleagues, it was reported that there was a positive significant relationship between the importance of health and self-actualization, nutrition, stress management and HLBS II scale scores[33]. The students' fulfillment of these attitudes and behaviors and their high scores suggested that they care about their health, taking responsibility for their own care, monitoring their own health, having regular medical check-ups, paying attention to the frequency and order of medical controls, and their behaviors in maintaining and improving health were sufficient.

The fact that the study was conducted in a single university and the female gender was very high compared to the males can be shown among the limitations of the study. In addition, since the health awareness of the students studying in health-related departments is high, it is necessary to conduct similar studies with students from other departments.

In conclusion, this student-based study has various results that healthy living-style behaviors have an important impact on the risk of type 2 diabetes mellitus. Students' BMIs, waist/height ratio, waist to hip ratio, waist circumferences have effects on their FINDRISC scores. Also, genders, the educational levels of parents, numbers of main meals and getting medical check-ups affect their HLBS II scores. Moreover, the sub-dimensions of HLBS II (especially, nutrition, self-actualization, and stress management) can affect the FINDRISC total scores. When all our findings are considered together, the risk of developing T2DM may be low but still present in the students of health sciences, especially in terms of anthropometric measurements and socio-demographic characteristics.

STATEMENT OF ETHICS

This study was approved ethically by the Marmara University Faculty of Health Sciences Non-Invasive Clinical Studies Ethics Committee with the protocol no: 31.10.2019/103 and the research was conducted following the principles stated in the Helsinki Declaration.

CONFLICT OF INTEREST STATEMENT

No conflict of interest was declared by the authors.

AUTHOR CONTRIBUTIONS

Design: AHİ, FEG; Acquisition of data: GS, MA, BA; Analysis of data: AHİ, GS, MA, ZMÇ; Drafting of the manuscript: AHİ, ZMÇ; Critical revision of the manuscript: AHİ, FEG; Statistical analysis: AHİ, ZMÇ; Supervision: AHİ, FEG.

FUNDING SOURCES

The authors declared that this study received no financial support.

ACKNOWLEDGMENTS

The authors would like to thank all the students that participate in this study.

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