

Access this article online
Quick Response Code:

Website: <a href="http://www.jehp.net">www.jehp.net</a>
DOI: 10.4103/jehp.jehp_902_21

# The correlation between nursing students' healthy lifestyle behaviors, cardiovascular disease risk factors' knowledge level, and obsession symptoms

Dilek Baykal, Leman Kutlu, Burcu D. Demir<sup>1</sup>

## Abstract:

**BACKGROUND:** Nursing students have a role in the awareness of risk factors in the development of healthy lifestyle behaviors. Nursing students' awareness of disease risk factors plays a role in developing healthy lifestyle behaviors. Therefore, it was aimed to determine the relationship between the effect of nursing students' healthy lifestyle behaviors and cardiovascular disease risk factors' knowledge levels and obsessive–compulsive symptoms.

**MATERIALS AND METHODS:** This was a descriptive cross-sectional study. Two hundred and twenty-four students studying in the nursing departments of two foundation universities participated in the study between April and October 2020. Sociodemographic information form, Health Promoting Lifestyle Profile II (HPLP-II), Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL), and Maudsley Obsessive–Compulsive Inventory (MOCI) were applied to the students.

**RESULTS:** It was found that the nursing students' healthy lifestyle behaviors ( $123.53 \pm 25.78$ ) and cardiovascular risk factors' knowledge level ( $21.08 \pm 2.70$ ) were high. Obsessive–compulsive symptoms ( $16.12 \pm 6.22$ ) were moderate. In the correlation of sociodemographic characteristics, it was found that age correlated with the nutrition subdimension of CARRF-KL and HPLP-II, income level correlated with HPLP-II, place of residence correlated with HPLP-II, CARRF-KL, and MOCI, and having a health problem correlated with health responsibility. Income status, place of residence, and presence of health problems were found to be correlated with HPLP-II in all subdimensions in the regression analysis. In the regression analysis of HPLP-II with CARRF-KL and MOCI scales, it was found that it was significantly related to interpersonal relations, spiritual growth, stress management, and total score dimensions.

**CONCLUSION:** Healthy lifestyle behaviors of nursing students are related to cardiovascular risk factors' knowledge level and obsession symptoms. In addition, some demographic characteristics affect healthy lifestyle behaviors.

## Keywords:

Cardiovascular disease risk, healthy lifestyle, nursing, obsessive–compulsive symptom

## Introduction

The concept of health-promoting lifestyle behaviors has become more important with the prolonged human life as a result of increasing scientific developments in recent

years. The human lifespan has been prolonged with the effect of developing technology, and the concept of health-promoting lifestyle behaviors has gained more importance. This concept has become known with Nola Pender's definition of the health promotion model, and it is defined as the

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [WKHLRPMedknow\\_reprints@wolterskluwer.com](mailto:WKHLRPMedknow_reprints@wolterskluwer.com)

**How to cite this article:** Baykal D, Kutlu L, Demir BD. The correlation between nursing students' healthy lifestyle behaviors, cardiovascular disease risk factors' knowledge level, and obsession symptoms. *J Edu Health Promot* 2022;11:281.

Department of Nursing,  
Faculty of Health  
Sciences, Istanbul Atlas  
University, Istanbul,  
Turkey, <sup>1</sup>Department of  
Nursing, Faculty of Health  
Sciences, Arel University,  
Istanbul, Turkey

## Address for correspondence:

Dr. Dilek Baykal,  
Istanbul Atlas University,  
Department of Nursing,  
Faculty of Health  
Sciences, Hamidiye  
Mah. No: 40 Kagithane,  
Istanbul, Turkey.  
E-mail: [dbaykal@hotmail.com](mailto:dbaykal@hotmail.com)

Received: 18-06-2021  
Accepted: 12-05-2022  
Published: 25-08-2022

effort of the individual toward productive life, ensuring the optimum level of welfare and personal satisfaction.<sup>[1]</sup> Health-promoting lifestyle behaviors are based on initiating and carrying on individual behaviors aimed at maintaining and promoting health. These behaviors are providing a healthy diet, exercising regularly, getting enough sleep, avoiding smoking, and reducing alcohol consumption.<sup>[2]</sup> Mental health is also a dimension of health. According to the World Health Organization (WHO), mental health is defined as "a state of well-being in which an individual realizes his/her abilities, copes with the stresses of life, works productively and efficiently, and contributes to society."<sup>[3]</sup> Obsessive-compulsive disorder (OCD), which is among mental illnesses, is a complex neuropsychiatric disease and causes disability substantially.<sup>[4]</sup>

The estimated prevalence of OCD varies around the world. Its lifetime prevalence rates are 1.5% in females and 1.0% in males.<sup>[5]</sup> The prevalence of lifetime is reported to be 1% and 3.6% in Canada and Singapore, respectively.<sup>[6,7]</sup> In Turkey, the prevalence of OCD is reported to be 3% in the general population and 4.2% in university students.<sup>[8,9]</sup> Morbidity and mortality risk due to cardiovascular diseases increase in psychiatric diseases. Cardiovascular diseases cause 31% of all deaths all around the world.<sup>[10]</sup> This can sometimes be caused by illness-related causes or the antipsychotic drugs used for illness. In a study conducted in Italy, it was found that 21.2% of OCD patients developed metabolic syndrome due to their antipsychotic use.<sup>[11]</sup>

Nursing students, who are at the beginning of adulthood, have an important role in bringing healthy lifestyles to the society.<sup>[12]</sup> Nursing students who have information about healthy lifestyle behaviors and diseases play a more active role in the protection and maintenance of the health of society in their professional life.

In the literature, studies have been conducted on healthy lifestyle behaviors, cardiovascular risk knowledge levels, and obsessive-compulsive symptoms.<sup>[13-17]</sup> However, they just evaluate the patterns related to healthy living or consider the parameters one by one.

However, although it has been stated that acquisition of healthy lifestyle behaviors is especially important in adolescents, there has been no study to determine the obsessive-compulsive symptoms and the knowledge levels of cardiovascular diseases' risk factors. In this study, it was aimed to determine the relationship between nursing students' healthy lifestyle behaviors and cardiovascular diseases' risk factors' knowledge levels and obsessive-compulsive symptoms.

This study was conducted on nursing students with the following objectives:

1. To determine the levels of healthy lifestyle behaviors and cardiovascular diseases' risk factors' knowledge levels and obsessive-compulsive symptoms among nursing students.
2. To find out the association between healthy life behaviors, cardiovascular disease risk knowledge level, obsessive-compulsive symptoms, and sociodemographic variables of nursing students.

## Materials and Methods

### Study design and setting

This study is a descriptive and analytical cross-sectional study.

### Study participants and sample

It was aimed to reach all the students studying in the nursing departments of two foundation universities in Istanbul, Turkey, between April and October 2020, without choosing a sample. Two hundred and twenty-four of 435 students who studied in the nursing departments of two universities participated in the study. 51.49% of the students who were sent the questionnaire were reached.

### Data collection tool and technique

During data collection, a questionnaire prepared via Google forms was applied. At the end of the pre-form, in which the purpose of the study was explained and the consents were taken, the data collection tools were delivered to the students via e-mail or message. Statistical Package for the Social Sciences (SPSS) version 22 software (SPSS statistics for Windows version 22; IBM Corp., Armonk, NY, USA) was used to analyze the data.

An information form consisting of eight questions to determine the sociodemographic characteristics of the students (age, income, marital status, etc.) was used.

Health Promoting Lifestyle Profile II (HPLP-II) scale to evaluate healthy lifestyle behaviors, Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL) scale to measure the knowledge level of cardiovascular diseases' risk factors, and the Maudsley Obsessive-Compulsive Inventory (MOCI) scale to measure obsessive-compulsive features were applied to the students.

### Health Promoting Lifestyle Profile II

The Turkish validity and reliability study of HPLP-II was performed by Bahar *et al.*<sup>[18]</sup> The Cronbach's alpha value of the scale was found to be 0.94 for the total of the scale. The HPLP-II scale examines health promotion behaviors associated with a healthy lifestyle. The scale, in a 4-point Likert structure, is scored as 4 (regularly), 3 (often), 2 (sometimes), and 1 (never). It consists of 52

items, and the score that can be obtained from the scale is between 52 and 208. The extent to which an individual performs the specified health behaviors is proportional to the score obtained from the scale. The scale itself includes six titles: stress management, physical activity, health responsibility, spiritual growth, interpersonal relationships, and nutrition. In this study, the Cronbach's alpha value of the scale was found to be 0.96.

### CARRF-KL scale

It is a 28-item scale consisting of 16 items from the "Heart Disease Fact Questionnaire" and four items from the "40-Item Coronary Heart Disease Knowledge Test" questionnaire that were translated into Turkish, and eight items (5, 8, 9, 10, 17, 18, 22, and 26) that are important for the researchers to know about the risk factors associated with cardiovascular diseases were added.<sup>[19]</sup> The score that can be obtained from the scale is between 0 and 28. A high score from the scale indicates a high level of knowledge of cardiovascular disease risk factors. In the validity and reliability study, the Cronbach's alpha value was determined as 0.768. The Cronbach's alpha value in this study was 0.672.

### Maudsley Obsessive-Compulsive Inventory

The scale developed by Hodgson and Rachman aims to measure the level of obsessive-compulsive symptoms. The validity and reliability of the scale in Turkish society was tested by Erol and Savaşır.<sup>[20]</sup> Each item in the scale is marked as true or false. The score obtained from the scale varies between 0 and 37. An increase in the score obtained from the scale indicates an increase in obsessive-compulsive symptoms. It consists of 37 items in total. In the validity study of the scale, the Cronbach's alpha score was 0.86. The Cronbach's alpha score in this study was 0.83.

IBM SPSS 22.00 program was used for analysis of data of the research. Skewness and kurtosis (normal distribution between -1.5 and 1.5) values were used in the analysis of normal distribution. In the analysis of data, the following were used: for descriptive statistical analyses, number, percentage, mean, standard deviation, minimum and maximum tests; in intergroup comparisons, *t* and analysis of variance (ANOVA); in correlation analysis, Pearson correlation and multiple regression analysis; to determine from which group the difference originates, Tukey; and in the reliability analysis of the scales, Cronbach's alpha tests. The statistical significance level in the relationships and comparisons was accepted at  $P < 0.05$ .

### Ethical consideration

Ethics committee permissions were obtained for the study (no.: 58/03.20.2020). The purpose of the study was explained to the participants and their consent was

taken. Throughout the study, the Declaration of Helsinki was adhered to.

## Results

The mean age of the participants was  $27.38 \pm 5.6$  years, and their body mass index (BMI) was  $22.32 \pm 3.71$ . Also, 86.6% of them are females and 74.6% of them had a medium income level. It was found that 97.3% were single, 83.5% lived at home, 85.7% had no health problems, and 53.6% had no chronic disease in their family [Table 1].

Regarding the mean scores of the participants, the mean CARRF-KL was  $21.08 \pm 2.70$ , the total MOCI score average was  $16.12 \pm 6.22$ , and the total HPLP-II mean score was  $123.53 \pm 25.78$ . The mean of interpersonal relations subgroup of HPLP-II was  $24.65 \pm 5.51$ , the mean of health responsibility subgroup was  $21.25 \pm 5.51$ , the mean of physical activity subgroup was  $16.85 \pm 5.05$ , the mean of nutrition subgroup was  $16.98 \pm 4.02$ , the mean of the spiritual growth subgroup was  $25.06 \pm 6.05$ , and the mean of the stress management subgroup was  $18.73 \pm 4.35$  [Table 2].

There was a very weak positive correlation between the sociodemographic characteristics of the participants, age, and nutrition ( $r = 0.19/P = 0.00$ ) and CARRF-KL ( $r = 0.14/P = 0.03$ ). Interpersonal

**Table 1: Sociodemographic characteristics of the participants (n=224)**

Characteristics	n	%
Age (min.-max.) (Mean±SD)	20-56	27.38±5.6
BMI (min.-max.) (Mean±SD)	15.7-39.1	22.32±3.71
Gender		
Males	30	13.4
Females	194	86.6
Class		
1	51	22.8
2	49	21.9
3	45	20.1
4	79	35.3
Income		
Good	44	19.6
Moderate	167	74.6
Low	13	5.8
Marital status		
Single	218	97.3
Married	6	2.7
You live at...		
Home	187	83.5
Lodged Dormitory	37	16.5
Health problem		
Yes	32	14.3
No	192	85.7

BMI=body mass index, SD=standard deviation

relationship ( $P = 0.01$ ), physical activity ( $P = 0.01$ ), nutrition ( $P = 0.002$ ), spiritual growth ( $P = 0.005$ ), and stress management ( $P = 0.001$ ) subdimensions of those with a high-income level were found to be associated with the total HPLP-II score ( $P = 0.002$ ). Interpersonal relationships ( $P = 0.02$ ), physical activities ( $P = 0.02$ ), nutrition ( $P = 0.01$ ), and stress management ( $P = 0.05$ ) were found to be associated with HPLP-II total ( $P = 0.01$ ), CARRF-KL ( $P = 0.00$ ), and MOCI ( $P = 0.04$ ). A relationship was found between those with health problems and the sub-dimension of health responsibility ( $P = 0.01$ ) [Table 3].

**Table 2: CARRF-KL, MOCI, and HPLP-II mean scores of the participants**

Scale and subscales	Min.-max.	$\bar{x} \pm SD$
Total CARRF-KL	8-26	21.08±2.70
Total MOCI	7-37	16.12±6.22
Total HPLP-II	51-193	123.53±25.78
Subscales		
Interpersonal relationship	9-36	24.65±5.51
Health responsibility	9-36	21.25±5.51
Physical activity	8-30	16.85±5.05
Nutrition	8-31	16.98±4.02
Spiritual growth	9-35	25.06±6.05
Stress management	8-32	18.73±4.35

CARRF-KL=Cardiovascular Disease Risk Factors Knowledge Level, HPLP-II=Health Promoting Lifestyle Profile II, MOCI=Maudsley Obsessive-Compulsive Inventory, SD=standard deviation

In the multivariate regression analysis performed to evaluate the effects of income status (good), place of residence (home), and health problem (yes) on healthy lifestyle and total scores, it was determined that HPLP-II had a significant regression with the interpersonal relations score ( $F_{(3,220)} = 4.312, P = 0.006$ ) and 4.3% of the variance in the dependent variable ( $R^2_{adj} = 0.043$ ). It was determined that there was a significant regression with the health responsibility score ( $F_{(3,220)} = 4.350, P = 0.005$ ) and 4.3% of the variance in the dependent variable ( $R^2_{adj} = 0.043$ ). It was found that there was a significant regression with the physical activity score ( $F_{(3,220)} = 5.117, P = 0.002$ ) and 5.2% of the variance in the dependent variable ( $R^2_{adj} = 0.052$ ). Also, there was a significant regression with the nutrition score ( $F_{(3,220)} = 7.187, P = 0.000$ ) and 7.7% of the variance in the dependent variable ( $R^2_{adj} = 0.077$ ). It was determined that there was a significant regression with the spiritual growth score ( $F_{(3,220)} = 3.882, P = 0.01$ ) and 3.7% of the variance in the dependent variable ( $R^2_{adj} = 0.037$ ). There was a significant regression with the stress management score ( $F_{(3,220)} = 5.107, P = 0.002$ ) and 5.2% of the variance in the dependent variable ( $R^2_{adj} = 0.052$ ). Also, that there was a significant regression with the total score of HPLP-II ( $F_{(3,220)} = 6.423, P = 0.000$ ) and 6.8% of the variance in the dependent variable ( $R^2_{adj} = 0.068$ ) [Table 4]. Significant values in the regression analysis are given in Table 4.

**Table 3: Correlation of sociodemographic characteristics with HPLP-II, CARRF-KL, and MOCI scales**

Variables	IR	HR	PA	N	SG	SM	Total HPLP-II	CARRF-KL	MOCI
Age ( $r/P$ )	(0.01/0.88)	(0.08/0.22)	(0.1/0.11)	(0.19/0.00)	(0.03/0.59)	(0.06/0.34)	(0.88/0.18)	(0.14/0.03)	(-0.07/0.26)
BMI ( $r/P$ )	(-0.03/0.58)	(-0.02/0.67)	(-0.06/0.35)	(0.00/0.92)	(-0.10/0.13)	(-0.03/0.58)	(-0.05/0.41)	(-0.06/0.37)	(0.09/0.18)
Gender									
Male	23.07±7.93	21.07±7.14	18.23±6.61	17.57±5.50	23.40±8.72	19.20±6.39	122.53±39.70	21.10±3.23	17.80±8.19
Female	24.89±5.01	21.28±4.85	16.64±4.75	16.89±3.75	25.31±5.51	18.66±3.96	123.68±23.04	21.08±2.62	18.16±5.89
<i>P</i>	0.09	0.83	0.10	0.39	0.10	0.52	0.82	0.97	0.76
Income									
Good	26.48±5.20	22.68±5.59	18.89±5.86	18.89±4.63	27.25±5.41	20.68±4.72	134.86±26.93	21.36±2.36	14.73±5.84
Moderate	24.37±5.51	21.00±5.10	16.37±4.73	16.56±3.76	24.75±6.06	18.38±4.15	121.43±24.84	21.03±2.67	16.54±6.33
Low	22.00±5.09	19.69±4.38	16.23±4.78	15.92±3.37	21.62±5.88	16.62±3.64	112.08±23.27	20.85±4.07	15.38±5.82
<i>P</i>	0.01	0.08	0.01	0.002	0.005	0.001	0.002	0.72	0.20
Marital status									
Single	21.83±4.62	20.17±3.86	17.17±5.81	18.00±3.03	23.33±5.71	17.67±5.95	118.17±26.93	22.50±2.81	16.33±7.03
Married	24.72±5.52	21.28±5.24	16.84±5.05	16.95±4.05	25.11±6.06	18.76±4.31	123.67±25.79	21.05±2.70	18.17±6.21
<i>P</i>	0.205	0.605	0.878	0.532	0.480	0.544	0.607	0.19	0.47
You live at...									
Home	25.02±5.35	21.53±5.03	17.19±5.03	17.28±4.01	25.37±5.88	18.98±4.36	125.37±25.17	21.30±2.32	15.75±6.14
Dormitory	22.76±5.97	19.86±5.87	15.16±4.90	15.46±3.80	23.46±6.66	17.49±4.10	114.19±27.12	19.97±3.98	17.97±3.98
<i>P</i>	0.02	0.07	0.02	0.01	0.07	0.05	0.01	0.00	0.04
H. problem									
Yes	25.78±4.90	23.31±4.61	17.75±5.32	17.91±3.99	26.19±5.66	18.81±3.93	129.75±23.44	20.72±2.78	15.53±6.54
No	24.46±5.59	20.91±5.22	16.70±5.01	16.83±4.02	24.87±6.10	18.72±4.42	122.49±26.06	21.15±2.69	13.88±6.15
<i>P</i>	0.20	0.01	0.27	0.16	0.25	0.91	0.14	0.41	0.16

BMI=body mass index, CARRF-KL=Cardiovascular Disease Risk Factors Knowledge Level, HPLP-II=Health Promoting Lifestyle Profile II, H. problem=health problem, HR=health responsibility, IR=interpersonal relationships, MOCI=Maudsley Obsessive-Compulsive Inventory, N=nutrition, PA=physical activity, SG=spiritual growth, SM=stress management



**Table 4: Regression of sociodemographic characteristics with HPLP-II**

	Dependent variable	Independent variable	$\beta$	$t$	$P$	$F$	Model ( $P$ )	$R^2$	Durbin-Watson
Model 1	Interpersonal relationships	Constant	22.208	24.430	0.000	4.312	0.006	0.043	2.165
		Income (good)	0.162	2.467	0.014				
		Living area (home)	0.148	2.263	0.025				
	Health responsibility	Constant	19.293	22.472	0.000	4.350	0.005	0.043	1.923
		Income (good)	0.131	2.006	0.046				
		Health problem (yes)	0.154	2.346	0.02				
	Physical activity	Constant	14.593	17.578	0.000	5.117	0.002	0.052	2.186
		Income (good)	0.197	3.016	0.003				
		Living area (home)	0.145	2.218	0.028				
	Nutrition	Constant	0.653	22.856	0.000	7.187	0.000	0.077	1.985
		Income (good)	0.231	3.590	0.000				
		Living area (home)	0.163	2.532	0.012				
	Spiritual growth	Constant	1.001	22.799	0.000	3.882	0.01	0.037	2.060
		Income (good)	0.177	2.694	0.008				
	Stress management	Constant	0.714	23.842	0.000	5.107	0.002	0.052	2.028
		Income (good)	0.221	3.390	0.001				
	Total HPLP-II	Constant	4.197	26.415	0.000	6.423	0.000	0.068	2.054
		Income (good)	0.215	3.319	0.001				
		Living area (home)	0.156	2.409	0.017				

HPLP-II=Health Promoting Lifestyle Profile II

Multivariate regression analysis was performed to evaluate the effects of students' CARRF-KL and MOCI independent variables on healthy lifestyle and total scores. It was determined that there was a significant regression with the interpersonal relations score ( $F_{(3,220)} = 3.248, P = 0.041$ ) and 2% of the variance in the dependent variable ( $R^2_{adj} = 0.020$ ). Also, there was a significant regression with the spiritual development score ( $F_{(3,220)} = 7.283, P = 0.001$ ) and 5.3% of the variance in the dependent variable ( $R^2_{adj} = 0.053$ ). It was also determined that there was a significant regression with the stress management score ( $F_{(3,220)} = 4.169, P = 0.017$ ) and 2.8% of the variance in the dependent variable ( $R^2_{adj} = 0.028$ ). Analysis made with the total score of HPLP-II showed that there was a significant regression ( $F_{(3,220)} = 4.396, P = 0.013$ ) and 3% of the variance in the dependent variable ( $R^2_{adj} = 0.030$ ) [Table 5].

### Discussion

In this study, it was aimed to determine the relationship between nursing students' healthy lifestyle behaviors and cardiovascular disease risk factors' knowledge levels and obsessive-compulsive symptoms. It was found that the level of knowledge of healthy lifestyle behaviors and cardiovascular risk factors of nursing students was high and their obsessive-compulsive symptoms were moderate. It was found that the highest scores were obtained in the spiritual growth and interpersonal relations dimensions of the healthy lifestyle behaviors scale and the lowest score was obtained in the physical activity dimension of the healthy lifestyle behaviors scale. In addition, it was understood that characteristics such as age, income level, place of residence (home/dormitory),

and having a health problem were effective factors for healthy lifestyle behaviors, cardiovascular disease risk factors' knowledge level, and obsessive symptoms. It was found that those with poor interpersonal relationships, spiritual growth, and stress management had more obsessive-compulsive symptoms.

University students are in an important period in the acquisition and development of lifestyle behaviors. Positive or negative behaviors acquired at these ages continue throughout life and influence health. Studies on university students have reported that supporting students in the school environment and guiding students contribute to increasing their sociocultural activities and well-being.<sup>[21]</sup> In the Cochrane review, it is stated that the education given to students (personal, social, health, and economic education) is effective in reducing BMI, increasing physical activity, and increasing the consumption of vegetables and fruits.<sup>[22]</sup> Although it is reported that university education makes such a contribution in general, it is thought that the fact that the students participating in this study are studying in the nursing department contributes to increased cardiovascular disease risk factors' knowledge level as well as healthy lifestyle behaviors. On the other hand, in this study, it was found that although students' healthy lifestyle behaviors were high, their physical activity scores were low. Studies have shown that the environmental conditions of the university are also important for students to develop healthy lifestyle behaviors.<sup>[22]</sup> The fact that the students participating in this study were not physically active may be due to unsuitable environmental conditions. According to WHO, many reasons such as exposure to violence and

**Table 5: Regression analysis of HPLP-II with MOCI and CARRF-KL**

	Dependent variable	Independent variable	$\beta$	$t$	$P$	$F$	Model ( $P$ )	$R^2$	Durbin-Watson
Model	Interpersonal relationship	Constant	21.509	7.319	0.000	3.248	0.041	0.02	2.139
		MOCI	-0.135	-2.020	0.045				
		CARRF-KL	0.118	1.767	0.079				
	Health responsibility	Constant	17.096	6.128	0.000	2.121	0.122	0.019	2.009
		MOCI	-0.070	-1.047	0.296				
		CARRF-KL	0.126	1.878	0.062				
	Physical activity	Constant	16.026	5.899	0.000	1.656	0.193	0.193	2.223
		MOCI	-0.113	-1.684	0.094				
		CARRF-KL	0.059	0.872	0.384				
	Nutrition	Constant	15.479	7.165	0.000	2.008	0.137	0.009	0.025
		MOCI	-0.113	-1.679	0.095				
		CARRF-KL	0.085	1.272	0.205				
	Spiritual growth	Constant	20.482	6.458	0.000	7.283	0.001	0.053	2.070
		MOCI	-0.205	-3.126	0.002				
		CARRF-KL	0.165	2.159	0.012				
	Stress management	Constant	17.176	7.429	0.000	4.169	0.017	0.028	2.053
		MOCI	-0.172	-2.591	0.010				
		CARRF-KL	0.103	1.552	0.122				
	Total HPLP-II	Constant	107.768	7.876	0.000	4.396	0.013	0.03	2.099
		MOCI	-0.160	-2.409	0.017				
		CARRF-KL	0.132	1.982	0.049				

CARRF-KL=Cardiovascular Disease Risk Factors Knowledge Level, HPLP-II=Health Promoting Lifestyle Profile II, MOCI=Maudsley Obsessive-Compulsive Inventory

crime in public, traffic, air pollution, and inaccessibility to sports fields can prevent one from staying physically active.<sup>[23]</sup> The study conducted with university students in Turkey supports this.<sup>[24]</sup>

The students got the highest scores from the HPLP-II subscale in the dimensions of spiritual growth and interpersonal relations. Spirituality is defined as positive emotions, happiness, and physical and mental well-being associated with spiritually and religiously positive psychology.<sup>[25]</sup> However, in studies conducted with societies with different religious views, having a religious view is generally associated with social attitudes such as empathy, concern for others, volunteerism, benevolence, and value.<sup>[26]</sup> In Turkey, 99% of the population has a religious view and believes in Islam.<sup>[27]</sup> This belief is effective on people's values, beliefs, and healthy life behaviors. It was found that the students got high scores in the dimension of interpersonal relations as well as spiritual growth. Socialization of students in the university environment contributes to the development of their interpersonal relationships and spiritual growth. In addition, in studies conducted with nursing students, it was reported that the problems they encounter in clinical practice improve their interpersonal communication.<sup>[28]</sup> Nursing profession, as in other health professions, is an area where communication is used intensively. Having a good interpersonal relationship is also important in solving problems quickly, understanding the patient, and managing emotions and giving care.<sup>[29]</sup> It is thought that the education that nursing students receive

contributes to increasing the level of interpersonal relations. Having high interpersonal relationships will also contribute to their harmonious and comfortable work with their patients and co-workers when they step into professional life.

Sociodemographic characteristics can be effective in the development of healthy lifestyle behaviors. Especially during student years, when they are not economically independent, their vital concerns increase. In studies conducted with university students in Turkey and other countries, it was reported that income level is related to healthy lifestyle behaviors.<sup>[30,31]</sup> As a result of these findings, it is understood that it is important for students to be supported financially by their families or by the university. In this study, it was found that as the age of the students increased, their cardiovascular risk factor knowledge levels and nutrition scores increased. The more the students studying in the health department get older, the more their awareness about health increases and they start to gain their economic independence.<sup>[32]</sup> This result is parallel to the literature reports.

Another factor affecting healthy lifestyle behaviors is living conditions. In this study, students living in the dormitory had low healthy lifestyle behaviors and cardiovascular risk factor knowledge levels and a moderate level of obsessive symptoms. Living in a dormitory increases the risk of unhealthy behaviors. Lack of adequate sanitation on being away from home and being together with people from different cultures

can lead to the development of unhealthy behaviors and depression.<sup>[33]</sup> In addition to depression, the emergence of obsessive symptoms also affects healthy lifestyle behaviors. The stress caused by living conditions in the dormitory can lead to obsession-specific repetitive, impulsive, intrusive, and inappropriate behaviors.<sup>[9]</sup> In this study, it was found that healthy lifestyle behaviors were positively related to cardiovascular risk factor knowledge level. This finding shows that positive health behaviors are also effective in preventing cardiovascular diseases. This finding is also supported by previous studies.<sup>[34]</sup> At the same time, HPLP-II and CARRF-KL were found to be negatively related to obsessive symptoms. Although OCD is a psychological illness, it can affect general health and quality of life. At least one metabolic or cardiovascular complication occurs in OCD. At the same time, the risk of developing obesity and circulatory system diseases increases in these people.<sup>[13]</sup> A recent study showed a dramatic association between OCD and metabolic or cardiovascular complications. Their quality of life decreases and their use of health-care resources increases for many reasons such as the etiology of the disease and the treatments used.<sup>[35]</sup> It is thought that the low knowledge level about cardiovascular risk factors in OCD leads to a higher incidence of cardiovascular diseases, and this leads to a decrease in healthy lifestyle behaviors.

It was found that those with poor interpersonal relationships, spiritual growth, and stress management had more obsessive-compulsive symptoms. Studies have shown that people with obsessive-compulsive symptoms have problematic interpersonal relationships, low coping skills, and spiritual growth problems.<sup>[33]</sup>

### Limitations and Recommendation

Health and healthy life are a multidimensional concept. In this study, the healthy lifestyle behaviors of nursing students may have been affected by the parameters not included in the scale used. In addition, the province where this study was conducted is one of the highest socioeconomically ranked provinces of Turkey. Therefore, it may be possible to obtain different results in parameters such as healthy lifestyle behaviors, cardiovascular risk factor knowledge level, and obsessive-compulsive symptoms from different geographic areas. Therefore, it is difficult to generalize the results of the study to the whole of Turkey.

Another limitation of this study is that nursing students' clinical and family environment experiences were not analyzed in the study. One of the limitations of the study is that it is a quantitative study. Qualitative studies allow the problem to be examined in more detail. However,

the quantitative nature of this study only provides information about the scales used for the problem.

### Conclusions

The main finding of this study is that nursing students' healthy lifestyle behaviors are related to cardiovascular risk factor knowledge level and obsession symptoms. In healthy lifestyle behaviors, especially the scores of interpersonal relations and spiritual development were high and physical activity scores were low. In addition, characteristics such as age, income level, place of residence, and having a health problem affect healthy lifestyle behaviors. Supporting students with low income, those living in dormitories, and those having health problems can contribute to improving their healthy lifestyle behaviors. In addition, it can be suggested that nursing students should be encouraged to increase their physical activity by finding the underlying reason for their low physical activity. The last finding of this study is that students with poor interpersonal relationships, spiritual growth, and stress management have more obsessive-compulsive symptoms. It may be recommended that students with poor interpersonal relationships and poor stress management be guided by academics.

### Acknowledgements

We are grateful to students of nursing who participated and cooperated whole-heartedly in this research.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

1. Pender NJ. Health promotion model manual. 2011. Available from: <https://deepblue.lib.umich.edu/bitstream/handle/2027.42/85350/?sequence=1>.
2. Johnson BT, Acabchuk RL. What are the keys to a longer, happier life? Answers from five decades of health psychology research. *Soc Sci Med* 2018;196:218-26.
3. Mental health: Strengthening our response. Available from: <https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response>. [Last accessed on 2022 Jan 10].
4. Macy AS, Theo JN, Kaufmann SC, Ghazzaoui RB, Pawlowski PA, Fakhry HI, et al. Quality of life in obsessive compulsive disorder. *CNS Spectr* 2013;18:21-33.
5. Fawcett EJ, Power H, Fawcett JM. Women are at greater risk of ocd than men: A meta-analytic review of OCD prevalence worldwide. *J Clin Psychiatry* 2020;81:. doi: 10.4088/JCP.19r13085.
6. Osland S, Arnold PD, Pringsheim T. The prevalence of diagnosed obsessive compulsive disorder and associated comorbidities: A population-based Canadian study. *Psychiatry Res* 2018;268:137-42.

7. Subramaniam M, Abdin E, Vaingankar J, Shafie S, Chang S, Seow E, et al. Obsessive-compulsive disorder in Singapore: Prevalence, comorbidity, quality of life and social support. *Ann Acad Med Singapore* 2020;49:15-25.
8. Cilli AS, Telcioglu M, Askin R, Kaya N, Bodur S, Kucur R. Twelve-month prevalence of obsessive compulsive disorder in Konya, Turkey. *Compr Psychiatry* 2004;45:367-74.
9. Yoldascan E, Ozenli Y, Kutlu O, Topal K, Bozkurt AI. Prevalence of obsessive compulsive disorder in Turkish University students and assessment of associated factors. *BMC Psychiat* 2009;9. doi: 10.1186/1471-244X-9-40.
10. World Health Organization. Cardiovascular Diseases (CVDs). World Health Organization; 2017. Available from: <https://www.who.int/en/news-room/fact-sh>. [Last accessed on 2022 Jan 10].
11. Albert U, Aguglia A, Chiarle A, Bogetto F, Maina G. Metabolic syndrome and obsessive-compulsive disorder: A naturalistic Italian study. *Gen Hosp Psychiatry* 2013;35:154-9.
12. Kelly M, Wills J, Sykes S. Do nurses' personal health behaviours impact on their health promotion practice? A systematic review. *Int J Nurs Stud* 2017;76:62-77.
13. Isomura K, Sidorchuk A, Brander G, Jernberg T, Rück A, Song H, et al. Risk of specific cardiovascular diseases in obsessive-compulsive disorder. *J Psychiatr Res* 2021;135:189-96.
14. Rueda-Medina B, Gómez-Urquiza JL, Tapia-Haro R, Casas-Barragán A, Aguilar-Ferrándiz ME, Correa-Rodríguez M. Assessing health science students' health literacy and its association with health behaviours. *Health Soc Care Community* 2020;28:2134-9.
15. Pedersen SS, Von Känel R, Tully PJ, Denollet J. Psychosocial perspectives in cardiovascular disease. *Eur J Prev Cardiol* 2017;24(3\_suppl):108-15.
16. Turan N, Güven Özdemir N, Çulha Y, Özdemir Aydın G, Kaya H, Aşti T. The effect of undergraduate nursing students' e-Health literacy on healthy lifestyle behaviour. *Glob Health Promot* 2021;28:6-13. doi: 10.1177/1757975920960442.
17. Kutuk MO, Tufan AE, Erden S, Aksu GG, Kilicaslan F, Sogut F, et al. Sociodemographic and clinical features of obsessive compulsive disorder in a large sample of children and adolescents from Turkey. *Psychiatry Behav Sci* 2018;8:186-95.
18. Bahar Z, Beşer A, Gördes N, Ersin F, Kıssal A. Sağlıklı yaşam biçimi davranışları ölçeği II'nin geçerlik ve güvenilirlik çalışması [In Eng: Validity and reliability study of the healthy lifestyle behaviours scale II]. *Cumhuriyet Üniversitesi Hemşirelik Yüksekokulu Dergisi* 2008;12:1-13.
19. Arıkan İ, Metintaş S, Kalyoncu C, Yıldız Z. Kardiyovasküler hastalıklar risk faktörleri bilgi düzeyi (KARRİF-BD) ölçeği'nin geçerlik ve güvenilirliği. [In Eng: Validity and reliability study of the cardiovascular diseases risk factors knowledge level]. *Türk Kardiyol Dern Arş-Arch Turk Soc Cardiol* 2009;37:35-40.
20. Erol N, Savaşır I. Maudsley Obsesif Kompulsif Soru Listesi. [In Eng: Maudsley Obsessive Compulsive Question List] XXIV. Ulusal Psikiyatri ve Nörolojik Bilimler Kongresi Bildiri Kitabı, Ankara, GATA Basımevi; 1998. p. 107-14.
21. González C, Varela J, Sánchez PA, Venegas F, De Tezanos-Pinto P. Students' participation in school and its relationship with antisocial behaviour, academic performance and adolescent well-being. *Child Indic Res* 2021;14:269-82.
22. Langford R, Bonell CP, Jones HE, Poulou T, Murphy SM, Waters E, et al. The WHO health promoting school framework for improving the health and well-being of students and their academic achievement. *Cochrane Database Syst Rev* 2014;4:CD008958.
23. World Health Organization. Physical Inactivity: A Global Public Health Problem. WHO; 2016. [Last accessed on 2021 Jun 01].
24. Tek NA, Mortas H, Arslan S, Tatar T, Köse S. The physical activity level is low in young adults: A pilot study from Turkey. *Am J Public Health Res* 2020;8:7-13.
25. Benson PL, Scales PC, Syvertsen AK, Roehlkepartain EC. Is youth spiritual development a universal developmental process? An international exploration. *J Positive Psychol* 2012;7:453-70.
26. Day JM. Religion and human development in adulthood: Well-being, prosocial behaviour, and religious and spiritual development. *Behav Dev Bull* 2017;22:298.
27. Turkey population: Demographic situation, languages and religions. Available from: [https://eacea.ec.europa.eu/national-policies/eurydice/content/population-demographic-situation-languages-and-religions-103\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/population-demographic-situation-languages-and-religions-103_en). [Last accessed on 2022 Jan 14].
28. Immonen K, Oikarainen A, Tomietto M, Kääriäinen M, Tuomikoski AM, Kaučić BM, et al. Assessment of nursing students' competence in clinical practice: A systematic review of reviews. *Int J Nurs Stud* 2019;100:103414. doi: 10.1016/j.ijnurstu.2019.103414.
29. Erkayiran O, Demirkiran F. The impact of improving emotional intelligence skills training on nursing students' interpersonal relationship styles: A quasi-experimental study. *Int J Caring Sci* 2018;11:1901-12.
30. Azami Gilan B, Janatolmakan M, Ashtarian H, Rezaei M, Khatony A. Health-promoting lifestyle and associated factors among medical sciences students in Kermanshah, Iran: A cross-sectional study. *J Environ Public Health* 2021. doi: 10.1155/2021/6691593.
31. Nacar M, Baykan Z, Cetinkaya F, Arslantas D, Ozer A, Coskun O, et al. Health promoting lifestyle behaviour in medical students: A multicentre study from Turkey. *Asian Pac J Cancer Prev* 2014;15:8969-74.
32. Maksimović MŽ, Marinković JM, Vlajinac HD, Maksimović JM, Tomanić MS, Radak DJ. Awareness and knowledge of cardiovascular disease risk factors among medical students. *Wiener klinische Wochenschrift* 2017;129:458-63.
33. Moghaddam F, Norouzi S, Norouzi M, Norouzi A, Neisary Z. Evaluation of lifestyle health promotion of dormitory medical students regarding comprehensive aspects. *Crescent J Med Biol Sci* 2017;4:205-10.
34. Ammouri AA, Tailakh A, Isac C, Kamanyire JK, Muliira J, Balachandran S. Knowledge of coronary heart disease risk factors among a community sample in Oman. *Sultan Qaboos Univ Med J* 2016;16:e189-96.
35. Aguglia A, Signorelli MS, Albert U, Maina G. The impact of general medical conditions in obsessive-compulsive disorder. *Psychiatry Investig* 2018;15:246-53.