Evaluation of eating attitudes of nursing students for type-2 diabetes and cardiovascular diseases

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Summary. Eating disorders/attitudes might lead to disrupted metabolic control. When body releases insulin insufficiently and irregularly, this causes the blood glucose level to rise. Abnormal eating attitudes and behaviors, which develop especially during adolescence, are acknowledged to be the strongest precursor to eating disorders at later ages. The study aimed to evaluate eating attitudes of nursing students with regard to the risk of type 2 diabetes and cardiovascular diseases. This study was designed as a descriptive. The sample contained 356 volunteers. The data were collected using A Questionnaire For The Risk Of Type 2 Diabetes (FINDRISC), the Cardiovascular Disease Risk Factors Knowledge Level Scale (CARRF-KL) and the Eating Attitudes Test (EAT) and various measurements such as waist circumference measurement, blood pressure measurement and body mass indeks. The mean scores on the CARRF-KL Scale suggested a statistically significant difference between the students of different grades. Additionally, the students' scores on the FINDRISC were significantly correlated with their weight, body mass index, waist circumferences, family history of diabetes or heart disease, and level of exercising. The findings suggest that higher weight and body mass indexes and larger waist circumferences lead to a corresponding increase in the scores on the FINDRISC and pose a risk in terms of type 2 diabetes and that higher educational status means a higher knowledge level about cardiovascular diseases.

Keywords: nursing students, type 2 diabetes, cardiovascular diseases, eating behavior.

Introduction

Eating disorders involve excessive eating that leads to obesity, refusing to eat, limiting the amount of eating as a result of being a vegetarian or some psychological reasons, eating non-food items, digesting and discharging food rapidly, or exhibiting uncontrollable night eating behaviors (1).

Eating disorders/attitudes might lead to disrupted metabolic control. When body releases insulin insufficiently and irregularly, this causes the blood glucose level to rise. In such situations, individuals start to get hungry quickly and suffer from thamuria, xerostomia, and excessive dehydration. This long hyperglycemic condition paves the way for long-term complications (neuropathy, retinopathy, hypertension, and cardiovascular diseases) (2).

Abnormal eating attitudes and behaviors, which develop especially during adolescence, are acknowledged to be the strongest precursor to eating disorders at later ages. Adolescence and youth are risky periods in terms of eating behaviors. During these periods, individuals tend to eat in non-family contexts, which change their food choices and might lead to risky eating behaviors. Increased consumption of fast food, which is especially rich in fat and calories, and decreased physical activity, might give rise to an increase in the rates of obesity and eating disorders (3).

Obesity not only poses a great risk to health but also leads to various diseases. The primary obesity-induced health problems with high morbidity and mortality are type 2 diabetes (DM), hypertension (HT), dyslipidemia, and cardiovascular diseases (CVDs) (2). Wrong nutritional attitudes and behaviors displayed during adolescence and youth may lead to obesity and pave the way for the above mentioned health problems.

During their university education, students try to adapt to a new school and environment. This attempt, when coupled with their ideals of having a profession and leading their future, causes many students to start suffering from social, psychological, and health-related problems. Adequate and balanced nutrition plays a key role in the prevention of such health-related problems. However, obesity emerges as a problem among university students as fast-food habits are becoming more and more popular, as their physical activity is getting more and more limited to pave the way for a more sedentary lifestyle, and as malnutrition is becoming increasingly prevalent (4). It is essential that young people of university age, who are at risk of obesity and chronic diseases, should be enabled to develop a healthy lifestyle. Nevertheless, it is also known that these young people rarely follow the advice about healthy nutrition, that they consume vegetables, fruit, and wholegrain food less often than processed and convenience food, and that they take in an insufficient amount of vitamins, minerals, and fiber but excessive amounts of salt and saturated fat. Besides, they usually have a sedentary lifestyle, which puts them at risk of developing not only obesity but also hypertension, diabetes, coronary heart diseases, and certain types of cancer (4).

Within the scope of global fight against chronic diseases, nurses have great responsibilities for the reduction and control of the risk factors associated with chronic diseases (nutrition counselling, physical activity counselling, hypertension treatment, smoking cessation, and weight loss/maintenance) (5). Considering that nurses, who receive health education at university, will provide the public with health training throughout their professional life, set a role model for the public, and raise public awareness about health issues, they should be the first to exhibit proper health behaviors. Therefore, the purpose of this study is to evaluate nursing students' eating attitudes with regard to the risk of type 2 DM and CVDs.

Methods

Study Design

This study was designed as a descriptive one to evaluate nursing students' eating attitudes with regard to the risk of type 2 diabetes and cardiovascular diseases.

Setting and sample

The study was carried out at the School of Health between December 2016 and February 2017 in Turkey. The population of the study comprised of 487 students who studied Nursing at the School of Health during the fall semester of the 2016-2017 academic year. The sample contained 356 students who were not speech, hearing or vision impaired, who did not suffer from any chronic diseases, and who volunteered to take part in the study.

Data collection tools

The data were collected using the Demographic Information Form, which contained questions releated ed to age, weight, height, waist circumference, place of accommodation, dieting, skipping meals, smoking, exercising, and stress level, the FINDRISC, which is a questionnaire to estimate the risk of type 2 diabetes, the Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL) Scale, and the Eating Attitudes Test (EAT). After the students filled out the data forms, the researcher measured and recorded their height, weight, waist circumferences, and blood pressure levels. The students' weight measurements were taken using a digital scale, and their waist circumference measurements were taken using a non-elastic tape measure. The students were instructed to take off their shoes for height measurements, which were performed using a measurement stick with 0.1 cm spaces on it. Their blood pressure levels were measured after they had rested at least 15 minutes and while they were in the sitting position. The measurements were performed using a pre-calibrated pneumatic pressure gauge in accordance with the techniques for blood pressure measurement.

The Eating Attitudes Test (EAT-40):, The Eating Attitudes Test Developed by Garner and Garfinkel

is a self-report scale used across the world to identify problematic eating behaviors. Its validity and reliability for the Turkish context were tested by Savaşır and Erol (6). The rating is based on responses that are at pathological extremes. Responses to the items are assigned a score of zero to 3. The rating for items 1, 18, 19, 23, 27, and 39 are as follows: 1 for "sometimes," 2 for "rarely," 3 for "never," and zero for other responses. For the other items in the scale, the responses "always," "very often," and "often" are assigned a score of 3, 2, and 1 respectively, and a score of zero is assigned for other responses. The total score on the scale is the sum of the scores assigned for each item. Higher scores mean a greater disruption in eating attitudes. In the original form of the scale, the cut-off point was 30. Savaşır and Erol found that the Cronbach's alpha coefficient for the scale was 0.7(6).

A Questionnaire For The Risk Of Type 2 Diabetes (FINDRISC): Developed to identify individuals who are at high risk of type 2 diabetes, the FINDRISC is based on an evaluation of the responses to eight questions and can easily be administered on the public level. The distribution of the total scores by the level of risk is as follows: low risk for a score less than 7, slight risk for a score between 7 and 11, moderate risk for a score between 12 and 14, high risk for a score between 15 and 20, and very high risk for a score more than 20(7).

The Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL) Scale: The scale was developed by Arıkan et al. to identify the knowledge level about risk factors associated with cardiovascular diseases, and its validity and reliability were tested by them (8). Knowledge Level (CARRF-KL) Scale: a validity and reliability study. The items in the scale are in the form of complete statements. The items are introduced to the participants, who are then asked to respond to them in three ways: "Yes," "No," and "I do not know". Each correct answer is assigned a score of 1. Of the 28 items, six (items 11, 12, 16, 17, 24, and 26) are reversely scored. The correct responses to the items are as follows: "Yes" for the first ten items, "No" for items 11 and 12, "Yes" for items 13 to 15, "No" for items 16 and 17, "Yes" for items 18 to 23, "No" for item 24, "Yes" for item 25, "No" for item 26, and "Yes" for items 27 and 28. The maximum possible score on the scale is 28. A higher score means a higher knowledge level. Arıkan

et al. reported that the Cronbach's alpha coefficient for the scale was 0.7 (8).

Data analysis

The data were analyzed using SPSS 20.(SPSS Inc., Chicago, IL, USA) The Mann-Whitney U test and Kruskal-Wallis H test were used since the variables did not have normal distribution for the differences between the groups. The level of significance was accepted to be .050.

Ethical Considerations

Consent was obtained from the School of Health. Additionally, ethical approval was granted by the Ethics Committee for Non-Interventional Clinical Research (Ethics committee decision no: 2016/114/10/04). Finally, verbal consent was obtained from the participants, who had already been informed about the study.

Results

More than three quarters of the participants (76.9%) were women, and 36.8% had graduated from a regular high school. As for the family history, 30.9% reported having a family history of type 2 diabetes or heart disease. Approximately two-thirds of the participants (64.0%) reported skipping meals and 50.8% exercises sometimes or played sports. Finally, 73.6% reported that their nutrition was affected by stress, 61.8% reported that they did not diet, and 37.9% were satisfied with their weight (Table 1).

The study identified certain statistics regarding the participants and their scores on the data collection tools: their mean age was 20.63 ± 2.1 years, mean height 166.95 ± 7.84 cm, mean weight 63.08 ± 13.08 kg, mean body mass index 22.55 ± 3.88 kg/m^2, mean waist circumference 78.78 ± 10.62 cm, mean systolic blood pressure 68.81 ± 9.22 mmHg, mean score on the FINDRISC 5.5 ± 3.56, mean score on the EAT 18.39 ± 10.44, and their mean score on the CARRF-KL Scale 19.92 ± 3.10. Approximately two-thirds of the participants (62.0%) were found to be at low risk of type 2 DM.

There was a statistically significant difference between the students of different grades in terms of their

Table 1. Frequency Distribution Table for Demographic Information (n=356)

		n	%
Gender	**Woman**	274	76.9
	Man	82	23.0
Grade	**Freshman**	84	23.6
	Sophomore	100	28.0
	Junior	93	26.1
	Senior	79	22.1
Do you have a family history of Type 2 Diabetes or Heart Disease?	**Yes**	110	30.9
	No	246	69.1
Do you diet?	**Yes**	25	7.0
	No	220	61.8
	Sometimes	111	31.1
Are you satisfied with your weight?	**Yes**	135	37.9
	No	125	35.1
	Partly	96	26.9
Do you exercise?	**Yes**	64	17.9
	No	111	31.1
	Sometimes	181	50.8
Is your nutrition affected by stress?	**Yes**	262	73.6
	No	33	9.2
	Sometimes	61	17.1

mean scores on the CARRF-KL Scale ($p < 0.050$). The freshman students had a significantly lower mean score on the CARRF-KL Scale than the sophomore, junior, and senior students. Also, the students with a family history of heart disease or type 2 DM had a highly statistically significantly higher mean score on the FINDRISC (7.45 ± 3.77) than those without a family history of heart disease or type 2 DM (4.63 ± 3.10) ($p < 0.001$). The students who dieted had a statistically significantly higher mean score on the EAT than those who did not diet or those who sometimes dieted ($p < 0.001$). The students who were satisfied with their weight had statistically significantly lower mean scores on the FINDRISC and EAT than those who were not satisfied with their weight ($p < 0.050$; $p < 0.001$, respectively) (Table 2).

The students who exercised had a statistically significantly lower mean score on the FINDRISC than those who exercised sometimes and those who did not exercise ($p < 0.001$). The students whose nutrition was

not affected by stress had a statistically significantly lower mean score on the FINDRISC than those whose nutrition was affected by stress and those whose nutrition was sometimes affected by stress ($p < 0.050$) (Table 2).

The weight, BMIs, and waist circumferences of the students were positively correlated with their scores on the FINDRISC, and the correlation was statistically significant (r= 0.336, r= 0.421, r= 0.468, respectively). In addition, there was a statistically significant correlation between age and the overall scores on the CARRF-KL Scale (r= 0.116). There were not significant correlations among the overall scores on the EAT, FINDRISC, or CARRF-KL Scale ($p > 0.050$).

Discussion

Apart from factors affecting the eating attitude negatively, many factors (such as personal eating choices, eating habits of family, behaviors, beliefs, family, friends) may lead to the development of eating disorders (9). Thus, nurses who will provide service to society and raise awareness of protecting and improving health and become a role model should display healthy behavioral patterns themselves first.

The study found that the freshman students had a significantly lower mean score on the CARRF-KL Scale than the sophomore, junior, and senior students, which suggests that education makes a positive difference in students' knowledge level about cardiovascular diseases and associated risk factors. A similar finding was reported by Yılmaz and Boylu, who found that high school graduates had a lower score on the CARRF-KL Scale than university graduates (10). In another study on nursing students, Badır et al. reported that higher educational status led to a corresponding increase in the scores on the CARRF-KL Scale (5). In other words, the findings of the present study are supported by the literature.

The students with a family history of heart disease or type 2 DM had a highly statistically significantly higher mean score on the FINDRISC than those without a family history of heart disease or type 2 DM ($p < 0.001$). In their study on nurses, Yurtsever et al. found a significant correlation between having close

Table 2. Socio-demographic variables and the overall scores on the EAT, CARRF-KL Scale and FINDRISC (n=356)

		n	Mean	ss	H	p
			Grade		**Kruskal-Wallis H Test**	
The Overall Score on the CARRF-KL Scale	Freshman	84	18.57	3.04	31.50	**0.001**
	Sophomore	100	20.35	2.24		
	Junior	93	19.77	3.36		
	Senior	79	20.99	3.30		
The Overall Score on the EAT		**Do you diet?**			**Kruskal-Wallis H Test**	
	Yes	25	28.88	16.48	32.44	**0.001**
	No	220	15.95	7.94		
	Sometimes	111	20.87	11.12		
The Overall Score on the FINDRISC		**Are you satisfied with your weight?**			**Kruskal-Wallis H Test**	
	Yes	135	4.87	3.04	9.53	**0.009**
	No	125	6.47	4.21		
	Partly	96	5.13	3.05		
The Overall Score on the EAT		**Are you satisfied with your weight?**			**Kruskal-Wallis H Test**	
	Yes	135	16.76	9.32	25.19	**0.001**
	No	125	22.03	11.93		
	Partially	96	15.94	8.48		
The Overall Score on the FINDRISC		**Doing Exercise**			**Kruskal-Wallis H Test**	
	Yes	64	3.95	3.63	25.41	**0.001**
	No	111	6.51	3.66		
	Sometimes	181	5.43	3.28		
The Overall Score on the FINDRISC		**Is your nutrition affected by stress?**			**Kruskal-Wallis H Test**	
	Yes	262	5.80	3.54	8.90	**0.012**
	No	33	4.64	3.46		
	Sometimes	61	4.69	3.57		
The Overall Score on the FINDRISC		**Family history of Type 2 Diabetes or Heart Disease**			**Mann-Whitney U Test**	
	Yes	110	7.45	3.77	-6.99	**0.001**
	No	246	4.63	3.10		

Table 3. Certain variables and the overall scores on the EAT, CARRF-KL Scale and FINDRISC (n=356)

		FINDRISC (Overall Score)	EAT (Overall Score	CARRF-KL Scale (Overall Score)
Age	r	0.07	–0.05	**0.11**
	p	.161	0.302	0.029
Height	r	–0.06	–0.06	–0.06
	p	0.245	0.206	0.237
Weight	r	**0.33**	0.03	–0.05
	p	0	0.460	0.349
BMI	r	**0.42**	0.06	–0.03
	p	0	0.196	0.514
Waist Circumference	r	**0.46**	0.06	–0.05
	p	0	0.224	0.296

relatives with diabetes and insulin resistance (11). In another study on nurses who worked shifts, Çekinmez et al. found a significant correlation between the family history of diabetes and the risk of developing diabetes (12). They reported that most of the participants who had first degree relatives diagnosed with diabetes and more than half of the participants who were on medication for high blood pressure had high/very high diabetes risk scores. Other studies have reported a positive correlation between the rise of blood pressure levels and diabetes risk scores (13,14). These findings suggest that individuals with a family history of diabetes and hypertension have insulin resistance and are predisposed to DM.

The students who dieted had a statistically significantly higher mean score on the EAT than those who did not diet and those who sometimes dieted. The students who were satisfied with their weight had a statistically significantly lower mean score on the EAT than those who were not satisfied with their weight ($p<0$ .001). Similar findings were reported in a study by Kadıoğlu and Ergün on university students (3). In another study on high school students, Büyük and Duman reported that the students who were not satisfied with their weight and tried to lose weight were at statistically significantly higher risk of having an eating disorder (15). In a study on two groups, one with eating disorders and the other without eating disorders, the former group had a higher score on the EAT, and they were more overweight (16). These findings support those of the present study. Nevertheless, Ünalan et al. studied the eating habits among students from a school of health and found that the students with normal weight were at significantly higher risk of developing an eating disorder (17).

The students who exercised had a statistically significantly lower mean score on the FINDRISC than those who did not exercise and those who exercised sometimes ($p<$ 0.001). Kutlu et al. and Viitasalo reported that individuals who had sedentary lifestyles had higher diabetes risk scores (18,19). Çekinmez et al. found a significant correlation between physical exercise and the risk of diabetes and reported that 95.9% of those who did not do physical exercise at least for 30 minutes a day were at high/very high risk of diabetes (12). Physical activity is a primary risk factor associated with diabetes. The findings of the present study are supported by the literature. The students whose nutrition was affected by stress had a statistically significantly higher mean score on the FINDRISC than those whose nutrition was not affected by stress ($p<$ 0.001).

It is reported in the literature that individuals whose nutrition is affected by stress are more likely to have risky eating attitudes. The primary causes of stress among university students are their ideals of having a profession and leading their future lives, being away from their families, and attempting to adapt themselves to a new environment. Eating attitudes and behaviors are likely to be affected by stressors especially experienced by the young since they experience more stressors and they do not know about the methods for coping with stress yet (20-22).

The students who were not satisfied with their weight had a statistically significantly higher mean score on the FINDRISC than those who were satisfied with their weight and those who were partly satisfied with their weight. Research has shown that the most common method of weight control used by university students is dieting (23).

Higher weight and BMIs and larger waist circumferences led to a corresponding increase in the overall scores on the FINDRISC. Similarly, Çekinmez et al. reported that higher BMIs and larger waist circumferences meant a higher risk of diabetes (12). Yurtsever et al. studied nurses of different age groups and reported that 53.5% of the nurses who were under 45 years old were overweight and obese and 76.8% of those who were above 45 years old were overweight and obese. They also found that 39.9% of the nurses had high scores on the FINDRISC. This finding among nurses is worrying considering that they are professional health care members (11).

As the students' age increased, so did the overall scores on the CARRF-KL Scale. Nevertheless, Yilmaz and Boylu studied individuals with desk jobs and reported that age was not a factor in the scores on the CARRF-KL Scale (10). This could be attributed to the idea that as students get older, their educational status gets higher and thus they have better awareness.

In the present study, it was determined that there was no statistically significant difference between

the total scores of YTT, Findrisk and KARRIF-BD (p>0.05). Positive nutritional attitudes and behaviors are important for nursing students. These positive attitudes and behaviors are important for the future public health. In a study, it was reported that university students consumed more frequently foods like sweets, cake, chips and fast food, but fruits and vegetables less (24,25). Negative behaviors especially in such eating attitudes may lead to obesity in the first place and also diabetes and cardiovascular diseases in the future. This result of in the present study suggests that the increase students' knowledge concerning nutrition and health reflects on their nutritional behaviors and eating attitudes positively.

Conclusion

Nurses play an important role in protecting and promoting an individual's health and promoting public health. It can be recommended to train nurse candidates who will contribute awareness of the society and become a role model before starting their professionespecially on precautions to take concerning methods of coping with stress, healthy nutrition and protection from the risk factors of DM and cardiovascular diseases in order to protect their health.

Limitations

The results obtained from the study can be generalized to only the nursing students studying at the faculty where the study was conducted. It is recommended to conduct the study in more than one centers.

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