Araştırma Makalesi
(Research Article)

Gülsüm Zekiye TUNCER[1]
Orcid: 0000-0001-8969-7139
Sena YİĞEN[2]
Orcid: 0009-0009-5203-2809

[1] Department of Psychiatric and Mental Health Nursing, Dokuz Eylül University Faculty of Nursing, Izmir, Türkiye

[2] Dokuz Eylül University Faculty of Nursing, Izmir, Türkiye

Corresponding Author (Sorumlu Yazar): Gülsüm Zekiye TUNCER

gulsum.damlarkaya@deu.edu.tr

Keywords:

Mindful eating; nutrition literacy; nutrition education; nursing student.

Anahtar Sözcükler:

Yeme farkındalığı; beslenme okuryazarlığı; beslenme eğitimi; hemşirelik öğrencisi.

EGEHFD, 2025, 41(3): 469-480
DOI: 10.53490/egehemsire.1494439

The Effect of Mindful Eating and Conscious Nutrition Education on Food and Nutrition Literacy and Mindful Eating in Nursing Students

Hemşirelik Öğrencilerinde Farkındalıkla Yeme ve Bilinçli Beslenme Eğitiminin Gıda ve Beslenme Okuryazarlığı ve Yeme Farkındalığı Üzerine Etkisi

Gönderilme Tarihi: 03 Haziran 2024 **Kabul Tarihi:** 19 Eylül 2025

ABSTRACT

Objective: The aim of the study is to examine the effect of conscious nutrition and mindful eating education on food and nutrition literacy and mindful eating of first-year nursing students with limited and insufficient food and nutrition literacy.
Methods: This study consists of two stages: a descriptive cross-sectional first stage and a quasi-experimental pretest-posttest-follow-up second stage without a control group. The data of this study were collected between December 2023 and January 2024. The sample of the first stage of the study consisted of 172 first-year nursing students. The sample of the second stage consisted of 45 students with limited and insufficient level of food literacy. Data were collected using Mindful Eating Questionnaire (MEQ) and Food and Nutrition Literacy Scale (FNLS). In the second stage, Mindful Eating and Conscious Nutrition Education was applied.
Results: In the first stage of the study, the mean MEQ score of nursing students was 3.18 ± .45, the mean FNLS Knowledge subscale score was 10.27 ± 2.72 and 39.5% of them were at excellent level; the mean FNLS Attitude subscale score was 47.85 ± 6.89 and 41.85% of them were at limited level; the mean FNLS Behavior subscale score was 29.44 ± 5.27 and 51.7% of them were at limited level. In the second stage of the study, it was observed that the MEQ mean of the pre-test before the education was lower than the post-test and first month measurements (λ=11.207, $p<0.05$). In addition, FNLS Knowledge and FNLS Behavior Dimension averages were found to be lower than the measurements of the pre-test, post-test and first month (λ=8.990, $p<0.05$), (λ=20.703, $p<0.05$).
Conclusion: Short-term mindful eating and conscious nutrition education can improve nursing students' food and nutrition literacy, including attitudes and behaviors.

ÖZ

Amaç: Araştırmanın amacı Gıda ve beslenme okuryazarlığı sınırlı ve yetersiz düzeyde olan hemşirelik birinci sınıf öğrencilerinin bilinçli beslenme ve farkındalıkla yeme eğitiminin gıda ve beslenme okuryazarlığı ve yeme farkındalığı üzerine etkisinin incelenmesidir.
Yöntem: Bu çalışma iki aşamadan oluşmaktadır: Birinci aşama tanımlayıcı kesitsel tasarımda, ikinci aşama ise kontrol grubu olmayan yarı deneysel ön test-son test-izlem modeliyle gerçekleştirilmiştir. Bu çalışmanın verileri Aralık 2023 - Ocak 2024 tarihleri arasında toplanmıştır. Birinci aşamada 172 birinci sınıf hemşirelik öğrencisi yer almıştır. İkinci aşamada ise gıda okuryazarlık düzeyi sınırlı ve yetersiz olan 45 öğrenci yer almıştır. Veriler, Yeme Farkındalığı Ölçeği (YFÖ) ve Gıda ve Beslenme Okuryazarlığı Ölçeği (GBOY) ile toplanmıştır. İkinci aşamada Bilinçli Yeme ve Bilinçli Beslenme Eğitimi uygulanmıştır.
Bulgular: Çalışmanın ilk aşamasında hemşirelik öğrencilerinin YFÖ ortalaması 3.18 ± .45 olduğu, GBOY Bilgi alt boyut puan ortalamasının 10.27 ± 2.72 olduğu ve %39.5'inin mükemmel düzeyde olduğu; GBOY Tutum alt boyut puan ortalamasının 47.85 ± 6.89 olduğu ve %41.85'inin sınırlı düzeyde olduğu; GBOY Davranış alt boyut puan ortalamasının 29.44 ± 5.27 olduğu ve %51.7'sinin sınırlı düzeyde olduğu görülmüştür. Çalışmanın ikinci aşamasında MEQ ortalaması eğitim öncesi ön testinin, son test ve birinci ay arasındaki ölçümlerine göre düşük olduğu görülmüştür (λ=11.207, $p<0.05$). Ayrıca GBOY Bilgi ve Davranış ortalamaları eğitim öncesi ön testinin, son test ve birinci ay arasındaki ölçümlerine göre düşük olduğu görülmüştür (λ=8.990, $p<0.05$), (λ=20.703, $p<0.05$).

Sonuç: Kısa süreli yeme farkındalığı ve bilinçli beslenme eğitimi, birinci sınıf hemşirelik öğrencilerinin tutum ve davranışları da dahil olmak üzere gıda ve beslenme okuryazarlığını geliştirebilir

How to cite: Tuncer, G.Z., Yiğen, S. (2025). The Effect of Mindful Eating and Conscious Nutrition Education on Food and Nutrition Literacy and Mindful Eating in Nursing Students. *JEUNF, 41*(3), 469-480 DOI: 10.53490/egehemsire.1494439.
Kaynak gösterimi: Tuncer, G.Z., Yiğen, S. (2025). Hemşirelik Öğrencilerinde Farkındalıkla Yeme ve Bilinçli Beslenme Eğitiminin Gıda ve Beslenme Okuryazarlığı ve Yeme Farkındalığı Üzerine Etkisi. EGEHFD, 41(3), 469-480 DOI: 10.53490/egehemsire.1494439.

INTRODUCTION

Nutrition and food intake constitute the fundamental area of need for individuals to sustain their lives. Adequate and balanced nutrition is crucial for both physiological and emotional well-being, ensuring the continuity of individuals' lives (Truman, Lane and Elliott, 2017). Therefore, food and nutrition literacy plays a significant role in the development of healthy eating behaviors (Aktaş and Özdoğan, 2016). The concept of food literacy is defined as the adequacy of skills and knowledge necessary for understanding food and nutrient interactions and using foods (Carbone and Zoellner, 2012). Nutrition literacy, on the other hand, is the ability of individuals to acquire, apply, and understand the basic nutrition information and services needed to make appropriate nutrition decisions (Velardo, 2017). Food and nutrition literacy consist of components related to nutrition practices and nutrition ecology (Yıldırım, Kızıltan and Ok, 2021). Food and nutrition literacy emphasize the improvement and strengthening of dietary resilience by promoting healthy eating, thereby preserving dietary quality, and draw attention to the interaction of knowledge, skills, and behaviors in determining food intake through aspects such as planning, managing, selecting, and preparing food (Aktaş and Özdoğan, 2016). This concept holds significant importance in public health issues such as preventing obesity and preserving environmental health (Krause, Beer-Borst, Sommerhalder, Hayoz and Abel, 2018). However, there is a need for research on the effectiveness of interventions aimed at improving food and nutrition literacy and developing healthy eating and nutrition behaviors.

University students are an important group in which proper nutritional habits can be gained and health problems that may arise in later ages can be prevented (Mengi Çelik and Semerci, 2022). The period of university attendance is an effective period in which nutrition education can be provided to young people so that they can make adequate and appropriate food choices, gain healthy eating habits and have a healthy life (Gao et al., 2023; Mearns, Chepulis, Britnell and Skinner, 2017). Education aimed at increasing students' ability to access the right food and consume the right food is considered as a part of nutrition literacy (Yıldırım et al., 2021). It is stated that the development of food and nutrition literacy is important in ensuring the right food choice and the right dietary pattern (Ahmadpour, Omidvar, Doustmohammadian, Rahimiforoushani and Shakibazadeh, 2020). Basic nutrition education makes a significant contribution to both correcting the impaired lifestyle and reducing the risk of diseases in students (Mengi Çelik et al., 2022).

Lack of food and nutrition literacy, faulty eating behaviors, wrong food choices, emotional and uncontrolled eating behaviors affect health in many ways. However, mindful eating intervention, which is defined as eating by focusing on the food consumed without being affected by environmental factors, affects eating behaviors (Köse, Tayfur, Birincioğlu, and Dönmez, 2016). By increasing attention during eating behavior and reducing the influence of emotions and thoughts, healthier foods can be selected (Hamurcu and Taş, 2022). With mindful eating, uncontrolled eating behavior of individuals can be prevented and healthy eating behavior can be created (Altaş et al., 2022).
University students, especially in their first year, may also tend towards different eating behaviors than they normally show due to the fast pace of life and stress factors in the new environment they encounter. Deficiencies in mindful eating can bring negative consequences such as problems in body and self-perception and increased stress levels, especially in these young people (Altaş et al., 2022). Regular monitoring of these students' mindful eating behaviors and nutritional literacy is necessary. Conducting studies on the awareness of nursing students, especially in their first year, regarding eating behaviors is necessary not only to prevent inadequate and unbalanced nutrition, but also to be aware of this issue while providing nursing care. In the literature, it is seen that mindful eating intervention has an effect on the eating and nutrition behaviors of healthcare professionals and students (Loui-Tang, 2019; Knol and Lawrence, 2020). In addition, conscious nutrition education is known to have an effect on students' food literacy (Sümen and Evgin, 2023). For this reason, nutrition education to be given to nursing students is extremely important in preventing problems and practices that threaten health and changing wrong habits and behaviors (Sümen et al., 2023). Therefore, the aim of this study was to investigate the effect of mindful eating and nutrition education on food and nutrition literacy and mindful eating behaviours of first-year nursing students with limited literacy levels.

Within this purpose, the following research questions were addressed:

1. What are the levels of food and nutrition literacy and mindful eating of first-year nursing students?
2. Do the sociodemographic characteristics of first-year nursing students affect their levels of food and nutrition literacy and mindful eating?
3. What is the effect of mindful eating and nutrition education on the food and nutrition literacy and mindful eating behaviours of first-year nursing students with limited literacy levels?

METHODS

Research Design

The first stage of this study is a descriptive cross-sectional study. The second stage of the study is a quasi-experimental pretest-posttest-follow-up research without control group.

Population and Sample

The population of this study comprised 293 first-year students enrolled in the Faculty of Nursing. Data were collected between December 2023 and January 2024. In the first stage of the study, the sample included 172 first-year nursing students. In the second stage, the sample consisted of 45 students who demonstrated limited or insufficient levels of food literacy in the knowledge, attitude, and behavior dimensions. (Figure 1). In the first stage, 142 students who obtained a limited or insufficient score in at least one of the three sub-dimensions were identified. Among these students, 62 agreed to participate in the training program. However, the training was conducted with only 45 students who actively participated in all sessions, and post-test assessments were administered to this group.

Data Collection Tools

Demographic Data Form: The Introductory Form, which was created in order to obtain information about the characteristics of nursing students, includes questions about descriptive variables including age, gender, economic status and BMI.

Mindful Eating Questionnaire (MEQ): The Mindful Eating Questionnaire (MEQ) was first developed by Framson et al., in 2009 to measure mindful eating. The MEQ was adapted to Turkish culture by Köse et al., in 2016 (Köse et al., 2016). MEQ is a Likert-type scale and has a five-point Likert scale feature. MEQ consists of seven sub-dimensions and 30 items. In the scale, 20 items are reverse scored. The evaluation of the scale is made by taking the arithmetic mean of the sub-dimensions and the total score. A score of three and above in each sub-dimension of the scale indicates that the individual has the characteristic evaluated by the relevant sub-dimension. The scale also gives a total mindful eating score. The Cronbach α coefficient value of the scale was found to be .78 over the total score (Köse et al., 2016). The Cronbach alpha reliability coefficient of MEQ in this study was found to be 0.87.

Food and Nutrition Literacy Scale (FNLS): The Food and Nutrition Literacy Scale (FNLS) was developed by Demir and Özer in 2022 to determine food literacy and nutrition literacy status. The FNLS scale is a five-point Likert-type self-report scale developed to assess food and nutrition literacy. The FNLS scale consists of knowledge, attitude and behavior dimensions. There are 13 questions in the knowledge dimension and 13 and 10 items in the attitude and behavior dimensions, respectively, for a total of 36 items. Provided that the scores obtained from the dimensions of the FNLS scale are evaluated within their own dimension, the minimum and maximum range of total scores in the knowledge, attitude and behavior dimensions are 0-13, 13-65 and 10-50 points, respectively. FNLS Knowledge level ≤ 9 points: Insufficient, 10-11 points: Limited, ≥12 points: Excellent; FNLS Attitude level ≤ 43 points: Insufficient, 44-51 points: Limited, ≥ 52 points: Excellent; FNLS Behavior level ≤ 25 points: Insufficient, 26-33 points: Limited, ≥ 34 points: Excellent. The lowest and highest variance ratios explained in the explanatory factor analysis of the scale were 54.62% and 62.32%, and the confirmatory factor analysis model fit indices were quite good. The Cronbach's alpha coefficients of the knowledge, attitude and behavior dimensions of the FNLS scale are ≥.60 (Demir and Özer, 2022). The Cronbach alpha reliability coefficient of FNLS in this study was found to be 0.79.

Data Collection

In the descriptive cross-sectional study, which is the first stage of the research, MEQ and FNLS, which are data collection forms, were applied to the students who volunteered to participate in the research among the first-year students studying at the Faculty of Nursing. In line with the data obtained from the first stage of the study, students with limited or insufficient food and nutrition literacy knowledge, attitude or behavior sub-dimensions were invited to the second stage of the study. A total of 142 students who had a limited or insufficient score in at least one of the three sub-dimensions were identified in the first stage of the study. These students were invited to participate in the second stage, and were contacted by phone using the numbers they had provided on the informed consent and sociodemographic data forms. Among them, 62 students agreed to participate in the training programme. However, the intervention was ultimately conducted with 45 students who actively participated in the training sessions, and post-test assessments were administered to this group (Figure 1).

A total of 120 minutes of Mindful Eating and Conscious Nutrition Education consisting of two sessions was applied on the day when the students did not have classes. After the education, MEQ and FNLS were administered to the students again. The five-week follow-up period in studies conducted with healthcare students demonstrates the short-term effectiveness of the training (Knol & Lawrence, 2020). Therefore, in our study, follow-up measurements were conducted on the intervention group students one month after the training.

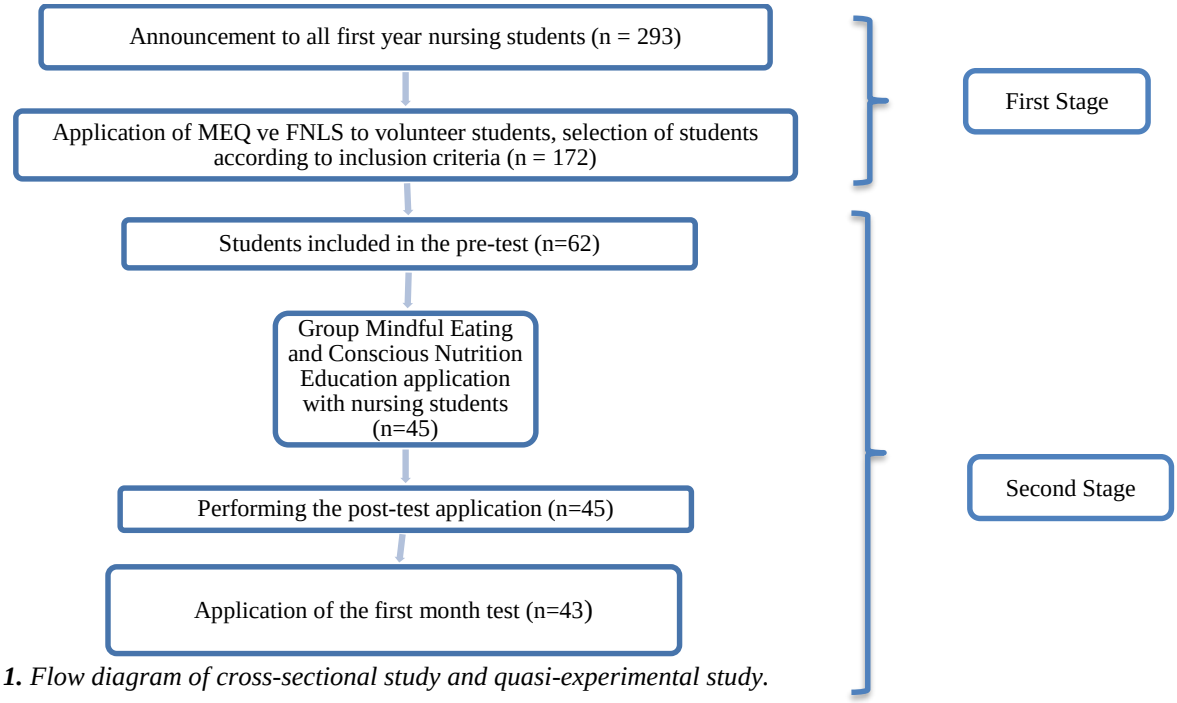

Figure 1. *Flow diagram of cross-sectional study and quasi-experimental study.*

Mindful Eating and Conscious Nutrition Education

This education consists of conscious eating behaviors consisting of healthy eating principles and mindful eating behaviors including mindful eating techniques. The education consists of two modules. Both modules consist of 60 minutes. The first module includes "Conscious Eating Behaviors" and the second module includes "Mindful eating Techniques". The "Conscious Eating Behaviors" module aims to explain healthy nutrition by adapting nutrition information in daily life (Makiabadi et al., 2019; Zaghamir & Ibrahim, 2023). Within the scope of this module, it is aimed to provide students with food and nutrition literacy. The content of the module; Definition of nutrition, definition of adequate and balanced nutrition, food groups, factors affecting food choice (price, accessibility, hygiene, quality, environment, peer influence, quantity / saturation, preferences, budget), good eating guide, food clover method, my plate method, label reading exercise, plate planning exercise. The "Mindful eating Techniques" module covers awareness of food choices and eating behaviors and mindful eating behaviors (Knol & Lawrence, 2020; Köse, 2021; Mantzios, 2023). Within the scope of this module, nutrition beyond food, seeing the needs that cannot be satisfied with food and mindful eating techniques are explained. The content of the module includes; the method of being full instead of full, step by step journey to satisfaction, "taste instead of pleasure" principle, mindful eating keys, living firsts, eating experience, free eating exercise, sensory eating exercise. Additionally, the first author who designed and implemented the training has conducted research on eating behaviors and mindful eating, as well as provided cognitive-behavioral therapy and mindfulness training. The author delivers course on eating behaviors and awareness as part of the official curriculum.

Data Analysis

Number, percentage and mean will be used in the analysis of descriptive data of all variables of the study. In the First Stage descriptive study, Pearson correlation analysis was performed between age, BMI and MEQ and FNLS sub-dimensions, and independent groups t test was performed between gender and income status and MEQ and FNLS sub-dimensions. In the Second Stage quasi-experimental study, the difference between pretest, posttest and follow-up of "Mindful Eating and Conscious Nutrition Education" MEQ and FNLS sub-dimensions was measured by one-way ANOVA.

Ethical Considerations

Ethics committee approval to conduct the study was obtained from the non-interventional ethics committee of a university (decision number:8482-GOA). To administer the scales, permission was obtained from the authors who performed the validity and reliability studies of the scales. Participants were selected voluntarily, and written and verbal informed consent was obtained from each participant to answer the questionnaire.

RESULTS

First Stage – Descriptive cross-sectional results

Table 1. Mindful Eating (MEQ) and Food and Nutrition Literacy (FNLS) Scores of Nursing Students (n = 172)

In the study, it was observed that the mean MEQ score of nursing students was 3.18 ± .45, the mean FNLS Knowledge subscale score was 10.27 ± 2.72 and 39.5% of them were at excellent level; the mean FNLS Attitude subscale score was 47.85 ± 6.89 and 41.85% of them were at limited level; the mean FNLS Behavior subscale score was 29.44 ± 5.27 and 51.7% of them were at limited level (Table 1).

Table 1. Mindful Eating (MEQ) and Food and Nutrition Literacy (FNLS) Scores of Nursing Students (n=172)

		n	%	X̄±SD	Min-Max	Scale Score Ranges
MEQ				3.18±.45	1.77-4.17	1-5
FNLS Knowledge	**Isufficient**	48	27.9	10.27 ± 2.72	0-13	0-13
	Limited	45	26.2			
	Excellent	**68**	**39.5**			
FNLS Attitude	**Insufficient**	33	19.2	47.85 ± 6.89	16-63	16-65
	Limited	**71**	**41.3**			
	Excellent	51	29.7			
FNLS Behavior	**Insufficient**	36	20.9	29.44 ± 5.27	14-45	10-50
	Limited	**89**	**51.7**			
	Excellent	37	21.5			

*MEQ: Mindful Eating, FNLS: Food and Nutrition Literacy.

Table 2. Sociodemographic Characteristics of Nursing Students and Cmparison with MEQ and FNLS (n=172)

While there was no difference between the MEQ scores of nursing students and their age, BMI, gender and economic status, there was a negative low-level significant relationship between FNLS Knowledge and age (r=-.169, p<0.05); there was a significant difference between FNLS Attitude and gender (t=2.917, p<0.05), female students had higher scores, and there was a significant difference between FNLS Behavior and gender (t=-3.059, p<0.05), males had higher scores.

Second Stage - Quasi-Experimental results

Table 3. Socio-Demographic Characteristics of Nursing Students (n=45)

In Table 3, the sociodemographic characteristics of nursing students were given. The mean age of the students was 19.13±2.09 years and the mean BMI was 22.09±4.40. While 80% of the students were female, 71.1% had a middle income level.

Table 3. Socio-Demographic Characteristics of Nursing Students (n=45)

Sosyodemografik Faktör		**X̄±SD**	**Min-Max**
Age		19.13±2.09	17.0-29.0
BMI		22.09±4.40	16.42-33.79
		n	**%**
Gender	Women	**36**	**80.0**
	Men	9	20.0
Economic status	Low income	8	17.8
	Middle income	**32**	**71.1**
	High income	5	11.1
Total		**45**	**100**

*BMI: Body Mass Index.

Table 2. Sociodemographic Characteristics of Nursing Students and Comparison with MEQ and FNLS (n = 172)

					MEQ		FNLS Knowledge			FNLS Attitude			FNLS Behavior		
		X̄±SD	Min-max		r	p		r	p		r	p		r	p
Age		19.34±1.93	17-30		.102	.207		**-.169**	**.033**		-.097	.235		.015	.850
BMI		22.73±4.47	15.78-43.21		-.080	.333		-.086	.292		-.070	.397		.078	.333
		n	**%**	**X±SD**	**t**	**p**	**X±SD**	**t**	**p**	**X±SD**	**t**	**p**	**X±SD**	**t**	**p**
Gender	**Women**	119	69.2	3.18±.46	.031	.975	10.53±2.63	1.906	.058	**48.85±6.93**	**2.917***	**.004**	28.59±4.74	-**3.059***	**.003**
	Men	53	30.8	3.18±.43			9.64±2.86			45.34±6.26			**31.28±5.97**		
Economic status	**Low income**	37	21.5	3.12±.40	-.862	.390	9.67±3.03	-1.461	.146	46.77±6.03	-1.074	.188	29.54±4.60	-.004	.997
	Middle and hing income	125	727	3.20±.47			10.44±2.58			48.23±7.30			29.54±5.49		

*p<0.05, MEQ: Mindful Eating, FNLS: Food and Nutrition Literacy, BMI: Body Mass Index.

Table 4. Comparison of the Mean Scores Obtained by Nursing Students from the MEQ and FNLS Over Time (n = 45)Table 4 shows the comparison of MEQ and FNLS scores of nursing students according to time. Before the education, the MEQ mean of the students was 91.57±15.04, after the education it was 98.57±13.60 and the first month mean was 104.17±10.92. When the MEQ averages were compared, there was a statistically significant difference between them according to time (λ=11.207, p<0.05). This difference is due to the fact that the pre-test (p<0.001) was lower than the post-test and first month measurements.

Table 4. Comparison of the Mean Scores Obtained by Nursing Students from the MEQ and FNLS Over Time (n = 45)

	Pre-test ($\bar{X}$ ± SD)	**Post-test ($\bar{X}$ ± SD)**	**First month ($\bar{X}$ ± SD)**	**Wilks' lambda (λ)**	**Partial Eta Square[a]**	**Inter-group differences[b]**
MEQ	3.05±.50	3.29±.43	3.43±.39	**11.207**	**.283**	**Pretest-posttest t=-4.013, p<0.001* Pretest-first month t=-4.423, p<0.001*** Posttest-first month t=-1.872, p>0.05*
FNLS Knowledge Dimension	9.93±3.21	12.06±1.43	12.15±1.52	**8.990**	**.333**	**Pretest-posttest t=-4.399, p<0.001* Pretest-first month t=-4.187, p<0.001*** Posttest-first month t=.251, p>0.05*
FNLS Attitude Dimension	48.12±8.35	52.15±5.20	52.02±7.35	**4.130**	**.200**	**Pretest-posttest t=-2.998, p=0.005* Pretest-first month t=-2.690, p=.011*** Posttest-first month t=-.537, p>0.05*
FNLS Behavior Dimension	28.81±5.71	31.67±4.17	35.80±5.05	**20.703**	**.535**	**Pretest-posttest t=-3.528, p=0.001* Pretest-first month t=-6.020, p<0.001* Posttest-first month t=-5.545, p<0.001***

a = One way ANOVA, b = independent groups t test, *p < 0.05, MEQ: Mindful Eating, FNLS: Food and Nutrition Literacy.

Before the education, the mean FNLS Knowledge Dimension of the students was 9.93±3.21, after the education it was 12.06±1.43 and the first month mean was 12.15±1.52. When the FNLS Knowledge Dimension averages were compared, there was a statistically significant difference between them according to time (λ=8.990, p<0.05). This difference is due to the fact that the pre-test (p<0.001) was lower than the post-test and first month measurements. The mean FNLS Attitude Dimension of the students was 48.12±8.35 before the education, 52.15±5.20 after the education and 52.02±7.35 in the first month. When the FNLS Attitude Dimension averages were compared, there was a statistically significant difference between them according to time (λ=4.130, p<0.05). This difference is due to the fact that the pre-test (p<0.05) was lower than the post-test and first month measurements. The mean FNLS Behavior Dimension of the students before the education was 28.81±5.71, 31.67±4.17 after the education and 35.80±5.05 in the first month. When the FNLS Behavior Dimension averages were compared, there was a statistically significant difference between them according to time (λ=20.703, p<0.05). This difference is due to the fact that the first month measurement (p<0.001) is higher than the pre-test and post-test.

DISCUSSION

First year nursing students go through a period in which they cannot monitor the change and development of their eating behaviors with stressors such as starting university, leaving home, and the intensity of nursing theoretical and practical courses. Disruptions in students' eating behaviors and insufficient nutrition may increase stress factors and make school processes difficult. It is known that nursing students have insufficient nutritional knowledge and low levels of confidence in providing nutritional guidance to hospital and community-based patient populations (Livne, 2019; Shea, Brophy, Nininger, Abbott and Wilson 2021). Regular screening of nursing students' mindful eating and nutritional literacy and providing educations on this subject can strengthen the health of students. In this study, we evaluated the mindful eating and nutritional literacy of first-year nursing students and strengthened the knowledge level of students by providing awareness education to at-risk students. In this section, the findings are discussed in two stages and the importance of the subject in the literature is reviewed.

First Stage – Descriptive Cross-sectional

In this study, it was indicated that while 39.5% of nursing students exhibited an excellent level of knowledge, limited levels were observed in the attitude (41.85%) and behavior (51.7%) subscales of FNLS. In a study conducted with first-year nursing students in New Zealand, nutrition literacy was found to be slightly above average, indicating a good level of literacy (Mearns et al., 2017); in another study conducted with university students in Turkey, 91.6% of the students were found to have adequate nutrition literacy (Mengi Çelik et al., 2022). In this study, it was observed that as age increases, the level of nutritional literacy in the knowledge dimension decreases, while changes in BMI do not have any effect on nutritional literacy. However, the weakness of the age relationship may be that all participants were first-year students with no major age difference. In a study conducted with nursing students, no relationship was found between age and BMI and nutrition literacy (Mostafazadeh, Jafari, Nemati-Vakilabad and Mirzaei, 2024). In this study, it was observed that the attitude sub-dimension of nutritional literacy had a higher mean in female students and the behavior sub-dimension had a higher mean in male students. Women students may have a greater interest in nutrition education and health-related topics and may be more willing to learn and engage in these areas. However, the higher prevalence of disordered eating behaviors, particularly emotional eating triggered by stress, may hinder the translation of this attitude into behavior (Tuncer & Duman, 2024). In studies conducted with nursing students, no significant difference was found between gender and nutrition literacy (Bahramfard et al., 2020; Mostafazadeh et al., 2024). It is necessary to examine all students regardless of their sociodemographic factors and to plan educations for the formation of correct food knowledge while first year nursing students are trying to adapt to school and new university life.

In this study, the level of mindful eating among first-year nursing students was found to be moderate. In another study, nursing students were found to have a similar level (Başkale, Çetinkaya, and Demiral, 2023). Similarly, a study conducted with medical and nutrition students reported a moderate level of mindful eating (Knol et al., 2020), while university students in general also demonstrated a similar moderate level (Köse and Ciplak, 2020). These findings suggest that nursing students demonstrate a moderate level of mindful eating, which appears to be similar to that reported among medical and nutrition students in previous studies. Mindful eating is an important factor influencing students' eating behaviors and mental health. Previous research has shown that university students with lower mindful eating levels tend to have higher levels of eating addiction (Cebioğlu et al., 2022), binge eating behaviors (Giannopoulou et al., 2020), and depression (Yassıbaş and Yeşildemir, 2022). Given that the transition to university is a critical period for students, enhancing mindful eating skills may contribute to better mental health outcomes among nursing students.

In this study, it was observed that there was no relationship between age and BMI levels of nursing students and mindful eating. In studies conducted with nursing students, a low-level negative relationship was found between age and mindful eating (Topan, Ayyıldız, Seval, Kurt and Top, 2021). A low-level positive relationship was found in a study involving university students (Köse et al., 2020). In another study, no significant difference was found between age groups (Başkale et al., 2023). These findings suggest that the relationship between BMI and mindful eating is inconsistent, with different studies yielding varying results. This may indicate that mindful eating is more strongly associated with psychological and behavioral factors than with biological ones. In studies with university students, a negative relationship was found between BMI and mindful eating (Kes and Can Çicek, 2021). However, in some studies, no difference was found between BMI and mindful eating (Köse et al., 2020; Köse and Tayfur, 2021; Başkale et al., 2023). In a study conducted with nursing students, a weak positive relationship was found between BMI and mindful eating (Topan et al., 2021). It is seen that the mindful eating of university students in a similar age group and at a similar BMI level is not affected by these variables. In this study, it was observed that there was no difference between gender and economic status and mindful eating of nursing students. In studies conducted with university students, no difference was found between gender and mindful eating (Kes and Can Çicek, 2021; Köse et al., 2021; Topan et al., 2021; Başkale et al., 2023). In a study conducted with female students, 61.4% of the students were found to have moderate mindful eating (Ebrahim Essa, Abo-Elyazeed, and Abdelaty Hassan, 2020). In a study conducted with nursing students, it was observed that female students had higher mindful eating (Başkale et al., 2023). In a study conducted with nurses, no difference was found between genders (Choi and Lee, 2020). Since university students are in the period of transition to adulthood and identity development, disruptions in eating behavior may occur regardless of gender. University students, as they transition to adulthood and undergo identity development, may experience disruptions in eating behavior due to societal pressures related to appearance, social approval, and media influence conform to idealized body images, can contribute to unhealthy eating patterns, regardless of gender (Aparicio-Martinez et al., 2019; Vankerckhoven et al. 2025). Therefore, care should be taken to ensure that mindful eating studies cover all university students independent of sociodemographic variables.

Second Stage - Quasi-Experimental

Poor eating habits are common among university students. Therefore, practical and effective intervention programs are needed to increase nutrition awareness and promote healthy eating practices that encompass food choices and diet quality. In this study, "Mindful Eating and Conscious Nutrition Education" was provided to at-risk students with borderline and insufficient food and nutrition literacy. At the end of this study, it was found that the 2-session mindful eating and conscious nutrition education given to first year nursing students was effective on students' levels of mindful eating after the education and 1 month later. Mindful eating interventions are known to increase mindful eating in adolescents, students and health professionals when implemented between 5 and 12 weeks (Barnes and Kristeller, 2016; Omiwole, Richardson, Huniewicz, Dettmer and Paslakis, 2019; Knol et al., 2020). However, brief or online interventions are known to increase mindful eating behavior. In a study conducted with healthy overweight women, it was found that even just 3 days of practicing mindful eating techniques had an effect on food intake (Seguias and Tapper, 2022). It can be argued that practicing mindful eating techniques acts as a "nudge" that reduces food intake or encourages healthy eating. Mindfulness-based interventions seem to be effective in preventing impaired eating behaviors (Lattimore, 2020; Yu, Song, Zhang and Wei, 2020). Mindful eating behavior is known to consist of mindful awareness and self-regulation dimensions. Self-regulation includes stability and flexibility in executive functions (Dohle, Diel and Hofmann, 2018). In eating behavior, it is thought that self-regulation should be increased instead of dietary restriction (Johnson, Pratt and Wardle, 2012). Mindful-based practices are known to be associated with self-regulation in university students (MacDonald, 2021). For this reason, mindful-based practices can provide the person with information about eating behavior and also help self-regulation.

In this study, it was observed that 2-session conscious nutrition and mindful eating education was effective in the dimensions of knowledge, attitude and behavior of food and nutrition literacy of first year nursing students. It is known that short educations such as in this study affect knowledge and behavior. In a study conducted with nursing students, it was observed that students' total dietary habits knowledge score and total reported nutritional practice scores increased with 4-hour group education (Zaghamir and Ibrahim, 2023). It is known that not only short-term educations but also healthy nutrition courses provide changes in nutrition knowledge and attitudes in university students (Coppoolse, Seidell and Dijkstra, 2020). It was observed that the general nutrition knowledge levels of the nutrition course given to nursing students were higher than the control group (Chepulis and Mearns, 2015). It was also found that web-based nutrition literacy education was effective in nutrition literacy and healthy eating behaviors in first-year university students (Lai, Chang, Lee and Liao, 2023). Therefore, nursing students who transition to university life and try to adapt to the stressors of the new life should be given short educations including conscious nutrition. In addition, teaching courses on conscious nutrition in nursing school curricula will both affect students' own health and will enable students to care about the level of nutrition in health care for their patients in the following years.

Limitations

The first limitation of this study is that it was conducted with first-year students of a single nursing faculty, which limits its generalizability. Repeating the intervention in different schools with large samples and randomized to improve its applicability will provide more comprehensive information on the effectiveness of the education. Another limitation of this study is that the inclusion of students with limited and insufficient food and nutrition literacy in the intervention group after screening caused other students not to benefit from this awareness education. The other limitation is that factors such as living at home with family, staying in a dormitory, or living separately from the family can significantly influence eating awareness, attitudes, and behaviors. The absence of these factors in the socio-demographic data should be noted as a limitation in the study. Another limitation was encountered during the training when small packets of raisins were distributed to students before the second session for the 'raisin exercise.' Students were informed that the raisins would be consumed as part of the exercise toward the end of the session and were advised to refrain from eating between sessions. However, some students snacked during the break, while others consumed the entire packet before the session ended. The raisin exercise involves individuals using all their senses to mindfully eat a single raisin. This exercise helps individuals slow down, pay attention to the act of eating, and savor each bite. In this context, students' consumption of food between sessions and the premature consumption of the raisins may have negatively impacted the intended purpose of the exercise. Another limitation is the lack of follow-up assessments at the 3rd and 6th months to evaluate the long-term effects on attitudes. Implementing such additional assessments could have strengthened the comprehensive evaluation of the sustained impact of the training program.

CONCLUSION

In this study, at the screening stage, first year nursing students had a limited level in the attitude and behavior dimension of food and nutrition literacy. Nursing students, who will be nursing professionals of the future, need to be

informed about conscious nutrition in their first year. Thus, it will ensure that they care about the evaluation of nutrition in the field of basic awareness while providing health care throughout their student life. In this study, it is seen that short-term mindful eating and conscious nutrition education given to students can increase both mindful eating and food and nutrition literacy in the short term. While this education, which will be given to students with limited and insufficient nutritional knowledge and mindful eating, will enable students to protect their own health; As health care providers, patient education can also help them be aware of this issue. It is recommended to increase the teaching of mindful eating and conscious nutrition in nursing programs to increase students' knowledge and effectiveness in promoting healthy behaviors in care settings.

Author Contributions

Concept and design: G.Z.T.; Data Collection: G.Z.T., SY.; Data analysis and interpretation: G.Z.T.; Writing manuscript: G.Z.T., SY.; Critical review: G.Z.T.

Conflict of Interest: The authors have no conflicts of interest to declare.

Funding: The authors declared that this study has received no financial support

Acknowledgements

The authors gratefully acknowledge TÜBİTAK for accepting and supporting this study under the 2209-A University Students Research Projects Support Programme.

REFERENCES

Ahmadpour, M., Omidvar, N., Doustmohammadian, A., Rahimiforoushani, A., Shakibazadeh, E. (2020). Children food and nutrition literacy-a new challenge in daily health and life, the new solution: Using intervention mapping model through a mixed methods protocol. *Journal of Medicine and Life*, *13*(2), 175. https://doi.org/10.25122/jml-2019-0025

Aktaş, N., Özdoğan, Y. (2016). Food and nutrition literacy. *Harran Tarım ve Gıda Bilimleri Dergisi, 20*(2), 146-153. https://doi.org/10.29050/harranziraat.259105

Altaş, Z. M., Save, D., Bayram, S., Ladikli, Ş. B., Soğukpınar, T., Domruk, Ö. F., Cihanyurdu, C. (2022). Determining the relationship between perceived stress level and eating awareness among university students. *Kocaeli Tıp Dergisi, 11*(2), 26-34. https://doi.org/10.5505/ktd.2022.54037

Aparicio-Martinez, P., Perea-Moreno, A. J., Martinez-Jimenez, M. P., Redel-Macías, M. D., Pagliari, C., & Vaquero-Abellan, M. (2019). Social media, thin-ideal, body dissatisfaction and disordered eating attitudes: An exploratory analysis. *International Journal of Environmental Research and Public Health*, *16*(21), 4177. https://doi.org/10.3390/ijerph16214177

Bahramfard, T., Salehi, S. O., Toori, M. A., Pourmahmoudi, A., Jowshan, M., Parvin, S., Malekzadeh, J. (2020). Nutritional literacy status and its related factors in students of Yasuj University of Medical Sciences. *Nutrición Clínica y Dietética Hospitalaria, 40*(4), 55-62. https://doi.org/10.12873/404malekzadeh

Barnes, V. A., Kristeller, J. L. (2016). Impact of mindfulness-based mindful eating on diet and exercise habits in adolescents. *International Journal of Complementary and Alternative Medicine, 3*(2), 70. https://doi.org/10.15406/ijcam.2016.03.00070

Başkale, H., Çetinkaya, B., Demiral, Ü. (2023). Social appearance anxiety and mindful eating in nursing students. *İzmir Katip Çelebi Üniversitesi Sağlık Bilimleri Fakültesi Dergisi, 8*(2), 307-315.

Carbone, E. T., Zoellner, J. M. (2012). Nutrition and health literacy: a systematic review to inform nutrition research and practice. *Journal of the Academy of Nutrition and Dietetics, 112*(2), 254-265. https://doi.org/10.1016/j.jada.2011.08.042

Cebioğlu, İ. K., Bilgin, G. D., Kavsara, H. K., Koyuncu, A. G., Sarioğlu, A., Aydin, S., Keküllüoğlu, M. (2022). Food addiction among university students: The effect of mindful eating. *Appetite, 177*, 106133. https://doi.org/10.1016/j.appet.2022.106133

Chepulis, L. M., Mearns, G. J. (2015). Evaluation of the nutritional knowledge of undergraduate nursing students. *Journal of Nursing Education*, *54*(9), S103-S106. https://doi.org/10.3928/01484834-20150814-19

Choi, S. H., Lee, H. (2020). Associations of mindful eating with dietary intake pattern, occupational stress, and mental well-being among clinical nurses. *Perspectives in Psychiatric Care, 56*(2). 355. https://doi.org/10.1111/ppc.12441

Coppoolse, H. L., Seidell, J. C., Dijkstra, S. C. (2020). Impact of nutrition education on nutritional knowledge and intentions towards nutritional counselling in Dutch medical students: an intervention study. *BMJ Open*, *10*(4), e034377. https://doi.org/10.1136/bmjopen-2019-034377

Demir, G., & Özer, A. (2022). Development and validation of food and nutrition literacy instrument in young people, Turkey. *Diabetes*, 24, 3-4. https://doi.org/10.23751/pn.v24i4.13051

Dohle, S., Diel, K., Hofmann, W. (2018). Executive functions and the self-regulation of eating behavior: A review. *Appetite, 124*, 4-9. https://doi.org/10.1016/j.appet.2017.05.041

Ebrahim Essa, H., Abo-Elyazeed, S. M., and Abdelaty Hassan, L. A. (2020). Eating disorders among female university students and its' relation with their body attitudes and mindful eating. *Tanta Scientific Nursing Journal, 19*(1), 8-32. https://doi.org/10.21608/TSNJ.2020.131959

Gao, T., Duan, Y., Qi, Q., Mo, G., Han, S., Liu, H., Zhang, M. (2023). Nutrition literacy differs based on demographics among University students in Bengbu, China. *Frontiers in Public Health, 11*, 1113211. https://doi.org/10.3389/fpubh.2023.1113211

Giannopoulou, I., Kotopoulea-Nikolaidi, M., Daskou, S., Martyn, K., Patel, A. (2020). Mindfulness in eating is inversely related to binge eating and mood disturbances in university students in health-related disciplines. *Nutrients, 12*(2), 396. https://doi.org/10.3390/nu12020396

Hamurcu, P., Taş, D. (2022). Determining the level of eating awareness among healthcare professionals: The example of Zeynep Kamil Women and Children's Diseases Training and Research Hospital. *Batı Karadeniz Tıp Dergisi, 6*(1), 96-105. https://doi.org/10.29058/mjwbs.1030982

Johnson, F., Pratt, M., Wardle, J. (2012). Dietary restraint and self-regulation in eating behavior. *International Journal of Obesity, 36*(5), 665-674. https://doi.org/10.1038/ijo.2011.156

Kes, D., Can Çicek, S. (2021). Mindful eating, obesity, and risk of type 2 diabetes in university students: A cross-sectional study. *Nursing Forum 56*(3), 483-489. https://doi.org/10.1111/nuf.12561

Kılıç, G., Samar, B. Ş., Akkuş, K., Sütcü, G. S. T. (2022). Examining the relationships between increase in body mass index and eating awareness, problem solving skills and mood symptoms. *Psikoloji Çalışmaları, 42*(3), 611-642. https://doi.org/10.26650/SP2022-912407

Knol, L. L., Lawrence, J. C. (2020). Eat like a chef: a mindful eating intervention for health care providers. *Journal of Nutrition Education and Behavior, 52*(7), 719-725. https://doi.org/10.1016/j.jneb.2020.02.024

Köse, G. (2021). Is it possible to think while eating? Ankara: Academician Publishing.

Köse, G., Çıplak, E. (2020). Mindful eating questionnaired: Eating control, emotional eating and conscious nutrition trio. *Progress in Nutrition 22*(2). https://doi.org/10.23751/pn.v22i2.9312

Köse, G., Tayfur, M. (2021). BMI, physical activity, sleep quality, eating attitudes, emotions: Which one is affected by mindful eating?. *Progress in Nutrition 23*(1). https://doi.org/10.23751/pn.v23i1.9194

Köse, G., Tayfur, M., Birincioğlu, İ., Dönmez, A. (2016). A study on adapting the Mindful Eating Scale to Turkish. *Bilişsel Davranışçı Psikoterapi ve Araştırmalar Dergisi, 3*(1), 125-134. https://doi.org/10.5455/JCBPR.250644

Krause C.G., Beer-Borst S., Sommerhalder K., Hayoz S., Abel, T. (2018). A short food literacy questionnaire (SFLQ) for adults: Findings from a Swiss validation study. *Appetite, 120*, 275-280. https://doi.org/10.1016/j.appet.2017.08.039

Lai, I. J., Chang, L. C., Lee, C. K., Liao, L. L. (2023). Preliminary evaluation of a scenario-based nutrition literacy online programme for college students: a pilot study. *Public Health Nutrition, 26*(12), 3190-3201. https://doi.org/10.1017/S1368980023002471

Lattimore, P. (2020). Mindfulness-based emotional mindful eating education: Taking the emotional out of eating. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 25*, 649-657. https://doi.org/10.1007/s40519-019-00667-y

Livne, N. (2019). Need for nutrition education in health professional programs: A review of the literature. *Internet Journal of Allied Health Sciences and Practice, 17*(1), 5. https://doi.org/10.46743/1540-580X/2019.1799

Loui-Tang, C. (2019). Evaluating Mindful Eating Mobile Application in College Students (Doctoral dissertation, The University of Arizona).

MacDonald, H. Z. (2021). Associations of five facets of mindfulness with self-regulation in college students. *Psychological Reports, 124*(3), 1202-1219. https://doi.org/10.1177/0033294120937438

Makiabadi, E., Kaveh, M. H., Mahmoodi, M. R., Asadollahi, A., & Salehi, M. (2019). Enhancing nutrition-related literacy, knowledge and behavior among university students: a randomized controlled trial. *International Journal of Nutrition Sciences, 4*(3), 122-129. https://doi.org/10.30476/IJNS.2019.82709.1027

Mantzios, M. (2023). Mindful eating: A conceptual critical review of the literature, measurement and intervention development. *Nutrition and Health*, *29*(3), 435-441.

Mearns, G. J., Chepulis, L., Britnell, S., Skinner, K. (2017). Health and nutritional literacy of New Zealand nursing students. *Journal of Nursing Education, 56*(1), 43-48. https://doi.org/10.3928/01484834-20161219-09

Mengi Çelik, Ö., Semerci, R. (2022). Evaluation of nutrition literacy and nutrition knowledge level in nursing students: a study from Turkey. *BMC Nursing*, 21(1), 359. https://doi.org/10.1186/s12912-022-01146-z

Mostafazadeh, P., Jafari, M. J., Mojebi, M. R., Nemati-Vakilabad, R., Mirzaei, A. (2024). Assessing the relationship between nutrition literacy and eating behaviors among nursing students: a cross-sectional study. BMC Public Health, 24(1), 18. https://doi.org/10.1186/s12889-023-17468-9

Omiwole, M., Richardson, C., Huniewicz, P., Dettmer, E., Paslakis, G. (2019). Review of mindfulness-related interventions to modify eating behaviors in adolescents. *Nutrients, 11*(12), 2917. https://doi.org/10.3390/nu11122917

Román, N., Urbán, R. (2019). Mindful awareness or self-regulation in eating: an investigation into the underlying dimensions of mindful eating. *Mindfulness, 10*, 2110-2120. https://doi.org/10.1007/s12671-019-01170-2

Seguias, L., Tapper, K. (2022). A randomized controlled trial examining the effects of mindful eating and eating without distractions on food intake over a three-day period. *Nutrients, 14*(5), 1043. https://doi.org/10.3390/nu14051043

Shea, A., Brophy, L., Nininger, J., Abbott, M., Wilson, L. (2021). Nutrition integration across the nursing curriculum: a novel teaching model within a pre-licensure program. *Journal of Professional Nursing, 37*(6), 1162-1166. https://doi.org/10.1016/j.profnurs.2021.10.006

Stefano, M., Marco, S., Daniela, C., Fanny, S., Geoffrey, A., Beatrice, M., Piredda, M. (2023). Nutritional knowledge of nursing students: A systematic literature review. *Nurse Education Today*, 105826. https://doi.org/10.1016/j.nedt.2023.105826

Sümen, A., Evgin, D. (2023). The effect of nutrition education given to nursing and child development department students on their knowledge and literacy levels regarding nutrition: an intervention study. *İnönü Üniversitesi Sağlık Hizmetleri Meslek Yüksek Okulu Dergisi, 11*(2), 1480-1498. https://doi.org/10.33715/inonusaglik.1165877

Topan, A., Ayyıldız, T. K., Seval, M., Kurt, A., and Top, F. Ü. (2021). The relationship between mindful eating, body mass index and physical activity in nursing students–a cross-sectional study. *European Journal of Clinical and Experimental Medicine*, (3), 233-240. https://doi.org/10.15584/ejcem.2021.3.4

Tuncer, G. Z., & Duman, Z. Ç. (2024). Investigation of emotional eating, uncontrolled eating and mindful eating behaviors in female nursing students: A cross-sectional study. *Journal of Basic and Clinical Health Sciences*, 8(2), 227-235. https://doi.org/10.30621/jbachs.1070068

Truman, E., Lane, D., Elliott, C. (2017). Defining food literacy: A scoping review. *Appetite*, *116*, 365-371. https://doi.org/10.1016/j.appet.2017.05.007

Vankerckhoven, L., Claes, L., Raemen, L., Palmeroni, N., Eggermont, S., & Luyckx, K. (2025). Longitudinal associations among identity, internalization of appearance ideals, body image, and eating disorder symptoms in community adolescents and emerging adults: adaptive and maladaptive pathways. *Journal of Youth and Adolescence*, *54*(2), 290-309. https://doi.org/10.1007/s10964-024-02058-8

Velardo, S. (2017). Nutrition literacy for the health literate. *Journal of Nutrition Education and Behavior*, *49*(2), 183. https://doi.org/10.1016/j.jneb.2016.07.018

Yassıbaş, E., Yeşildemir, Ö. (2022). Evaluation of the relationship between depression, emotional appetite, and mindful eating in university students. *Beslenme ve Diyet Dergisi*, *50*(2), 56-65. https://doi.org/10.33076/2022.BDD.1643

Yıldırım, M., Kızıltan, G., Ok, M. A. (2021). What is nutrition literacy? *Başkent Üniversitesi Sağlık Bilimleri Fakültesi Dergisi*-Büsbid, 6.

Yu, J., Song, P., Zhang, Y., Wei, Z. (2020). Effects of mindfulness-based intervention on the treatment of problematic eating behaviors: a systematic review. *The Journal of Alternative and Complementary Medicine*, *26*(8), 666-679. https://doi.org/10.1089/acm.2019.0163

Zaghamir, D. E. F., Ibrahim, A. M. (2023). Efficiency of an intervention study on nursing students' knowledge and practices regarding nutrition and dietary habits. *Libyan Journal of Medicine*, *18*(1), 2281121. https://doi.org/10.1080/19932820.2023.2281121