Arch Health Sci Res. 2026;13:1-8
DOI: 10.5152/ArcHealthSciRes.2026.25036

Original Article

The Effect of Motivational Interviewing with Online Group on Eating Behaviors, Healthy Lifestyle Behaviors, and Quality of Life in Nursing Students with Food Addiction: A Randomized Controlled Trial

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Cite this article as: Işık M, Demir S. The effect of motivational interviewing with online group on eating behaviors, healthy lifestyle behaviors, and quality of life in nursing students with food addiction: a randomized controlled trial. *Arch Health Sci Res.* 2026, 13, 0036, doi:10.5152/ArcHealthSciRes.2026.25036.

What is already known on this topic?

- *Nursing students experience high levels of stress, irregular eating patterns, and emotional eating, which may increase their risk of food addiction (FA).*
- *Studies suggest that motivational interviewing can be effective in promoting healthy lifestyle behaviors and improving quality of life in individuals with addictive behaviors.*

What this study adds on this topic?

- *Food addiction is common among nursing students, highlighting the need for targeted interventions.*
- *Food addiction is an urgent health issue that increases various physical and psychological problems for individuals and impairs their quality of life.*
- *Motivational interviewing-based psychosocial interventions play a crucial role in fostering healthy lifestyle behaviors in individuals struggling with FA.*

ABSTRACT

Objective: The aim of this randomized controlled trial is to assess the effect of motivational interviewing (MI) with online group on eating behaviors, healthy lifestyle behaviors, and quality of life in nursing students with food addiction (FA).

Methods: A total of 59 students meeting the diagnostic criteria for FA were randomly assigned to the intervention group (n = 29) or the control group (n = 30). The intervention group received weekly MI sessions for 5 weeks. Data were collected using standardized measures of FA, healthy lifestyle behaviors, and quality of life through the Yale Food Addiction Scale (YFAS), the Healthy Lifestyle Behaviors Scale-II (HLBS-II), and the Quality of Life Survey Short Form (SF-36). This randomized controlled trial was conducted at 3 universities in Türkiye between September 2021 and March 2022. Data were analyzed using a Generalized Linear Model.

Results: After the intervention, the intervention group had significantly higher mean scores of HLBS-II compared to the control group ($t = 3.195$, $P = .002$). However, no significant differences were observed between the groups in terms of YFAS or SF-36 scores ($P > .05$).

Conclusion: The findings suggest that MI effectively promoted healthy lifestyle behaviors in students with FA.

clinictrials.gov id: NCT05046938

Keywords: Clinical trial, food addiction, motivational interviewing, nursing, quality of life, students

Introduction

The consumption of ultra-processed foods that are high in refined carbohydrates and saturated fats (e.g., pizza, chocolate, and potato chips) has significantly increased recently. Functional magnetic resonance imaging studies have suggested that such foods activate mesolimbic reward circuits as strongly as cocaine or nicotine and trigger repeated eating episodes that go beyond an individual's self-control.[1,2] Although the concept of "food addiction" (FA), which covers these behavioral, cognitive, and neurobiological changes, is not listed as a separate diagnosis in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition(DSM-5-TR), it can be assessed reliably with the Yale Food Addiction Scale (YFAS).[1]

The prevalence of FA in adults has been reported between 20% and 24%, according to meta-analysis studies. On the other hand, a recent multicenter study found this prevalence to be 19.3% in nursing and health students.[3,4] Nursing students are at an elevated risk for emotional eating due to heavy academic burden,

This study was produced from the doctoral thesis.
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Received: February 19, 2025
Revision Requested: June 3, 2025
Last Revision Received: June 20, 2025
Accepted: November 18, 2025
Publication Date: January 20, 2026

shift work, and chronic stress.[5,6] This may negatively affect not only their individual health but also their future roles in patient education and health promotion.

Motivational Interviewing (MI), one of the effective brief intervention methods in the management of addictive behaviors, when combined with the transtheoretical model (TTM), allows the intervention content to be adapted according to individuals' readiness for change.[7,8,9] Online MI practices are notable for their low cost, accessibility, and dissemination.[10] Recent randomized controlled trials show that online MI lowers YFAS scores and attenuates the neurological response to high-calorie foods.[11,12,13] For example, the FoodFix program reduced sugar consumption after 3 sessions and led to significant improvements in 6 dimensions of quality of life.[14] However, the majority of studies in this field have focused on individual MI protocols followed for adult individuals, and the number of qualified research on group-based online MI practices run in groups such as nursing students, who are both in the process of health education and at risk for emotional eating, is limited. Moreover, the existing programs mostly target only eating behaviors and insufficiently incorporate other lifestyle components such as physical activity, stress management, and sleep.

This randomized controlled trial aims to evaluate the effects of MI held in 5 sessions with online groups on eating behaviors, healthy lifestyle behaviors, and quality of life in nursing students. The intervention was structured in accordance with the phases of the TTM and the sessions included strategies for awareness development, decision balance analysis, goal setting, social support planning, and relapse prevention. The technical (identifying focus, reflection, eliciting change talk) and relational (empathy, collaboration) components of MI were practiced with a holistic approach; not only eating behavior but also the multidimensional structure of lifestyle was addressed. This study aims to contribute not only to improving individual health outcomes by bridging the gaps in the existing literature but also to supporting permanent and sustainable behavioral changes in the process of training healthcare professionals. The following hypotheses were tested in this randomized controlled trial.

$H_{1\text{-}1}$: Online group MI has an effect on the self-reported eating behaviors of nursing students.

$H_{1\text{-}2}$: Online group MI has an effect on the self-reported healthy lifestyle behaviors of nursing students.

$H_{1\text{-}3}$: Online group MI has an effect on the self-reported quality of life of nursing students.

Methods

Study Design

This 2-center, parallel-group, randomized controlled trial was conducted with pretest/posttest design between September 2021 and March 2022. This study is registered in Clinical.Trials.gov Protocol Registration and Results System (Protocol ID Number NCT05046938). The study was approved by the Gazi University Ethics Committee (Approval Date: 01 June 2021; Decision No: 10; Research Code No: 2021-636). The study was conducted under the supervision of the Institute of Health Sciences and carried out in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants prior to their inclusion in the study.

Participants and Setting

The population of the study consisted of 106 nursing students from 3 universities in Türkiye who had a YFAS score of 3 or higher. The inclusion criteria for students were determined as follows: meeting at least 3 diagnostic criteria for FA, showing clinical significance based on the YFAS, having no communication difficulties, being voluntary to participate in the study, and being in the precontemplation or contemplation stages according to the Change Stages of Food Addiction Form (CSFAF). Exclusion criteria were determined as follows: having a neurological or psychiatric condition preventing them from filling out the questionnaire, undergoing or having previously undergone treatment for FA or an eating disorder, having difficulties in speaking or understanding Turkish, or being in the preparation, action, or maintenance stages on the CSFAF.

Out of the initial 106 students, 36 were excluded since they were in the preparation, action, or maintenance stages. Moreover, 10 declined to participate in the study and 1 could not be reached. Thus, the study was completed with 59 students who were assigned to the groups through randomization (Figure 1).

The required sample size was estimated based on results from a similar study by Mokhtari et al.[14] Through a power analysis using G*Power (version 3.1.9.4), the required sample size was calculated as 52 students ($d = 0.2065$; $\alpha = 0.05$; $1\text{-}\beta = 90\%$). Considering a dropout rate of 10%, the final sample size for this study was set at 59 students.

Randomization and Blinding

The participants were stratified into 2 groups based on their stage of change: precontemplation and contemplation. Within each stratum, students were randomly assigned to the intervention or control group on a 1 : 1 basis using simple randomization methods implemented by an independent statistician using Microsoft Excel. Due to the nature of the intervention, it was not possible to blind the researcher and participants.

Measures

Participant Information Form

This form, prepared by the researcher, contains 13 questions about the socio-demographic characteristics of nursing students (age, gender, cohabitation, and employment) and their FA-related characteristics.

Yale Food Addiction Scale

The scale was developed by Gearhardt et al,[1]to assess eating behaviors that are similar to addiction to foods rich in fat and sugar in the last year. Itwas adapted into Turkish by Bayraktar et al.[15]The scale consists of 27 items.[15]It was adapted based on the substance use disorder criteria in DSM-IV in order to identify addiction to certain foods. The number of symptoms varies between 0 and 7. Similar to the diagnosis of substance use disorder, the score for clinical susceptibility must be equal to 1 and the number of symptoms must be ≥3. The reliability analysis of the scale revealed that its Cronbach's alpha value was 0.93.[15]In the present study, Cronbach's alpha coefficient of YFAS was found to be 0.67.

Healthy Lifestyle Behaviors Scale-II

Walker et al,[16]developed the scale to assess individuals' behaviors that enhance their well-being in relation to a healthy lifestyle.[16] Bahar et al,[17]conducted a Turkish validity and reliability study of the scale. The scale consists of 52 items and 6 subscales (interpersonal relations, health responsibility, physical activity, nutrition, spiritual growth, and stress management). The lowest and highest scores of the scale are 52 and 208 points, respectively. A higher score signifies that the individuals have more positive health behaviors in their life.[17] In the present study, Cronbach's alpha coefficient of Healthy Lifestyle Behaviors Scale-II was found to be 0.94.

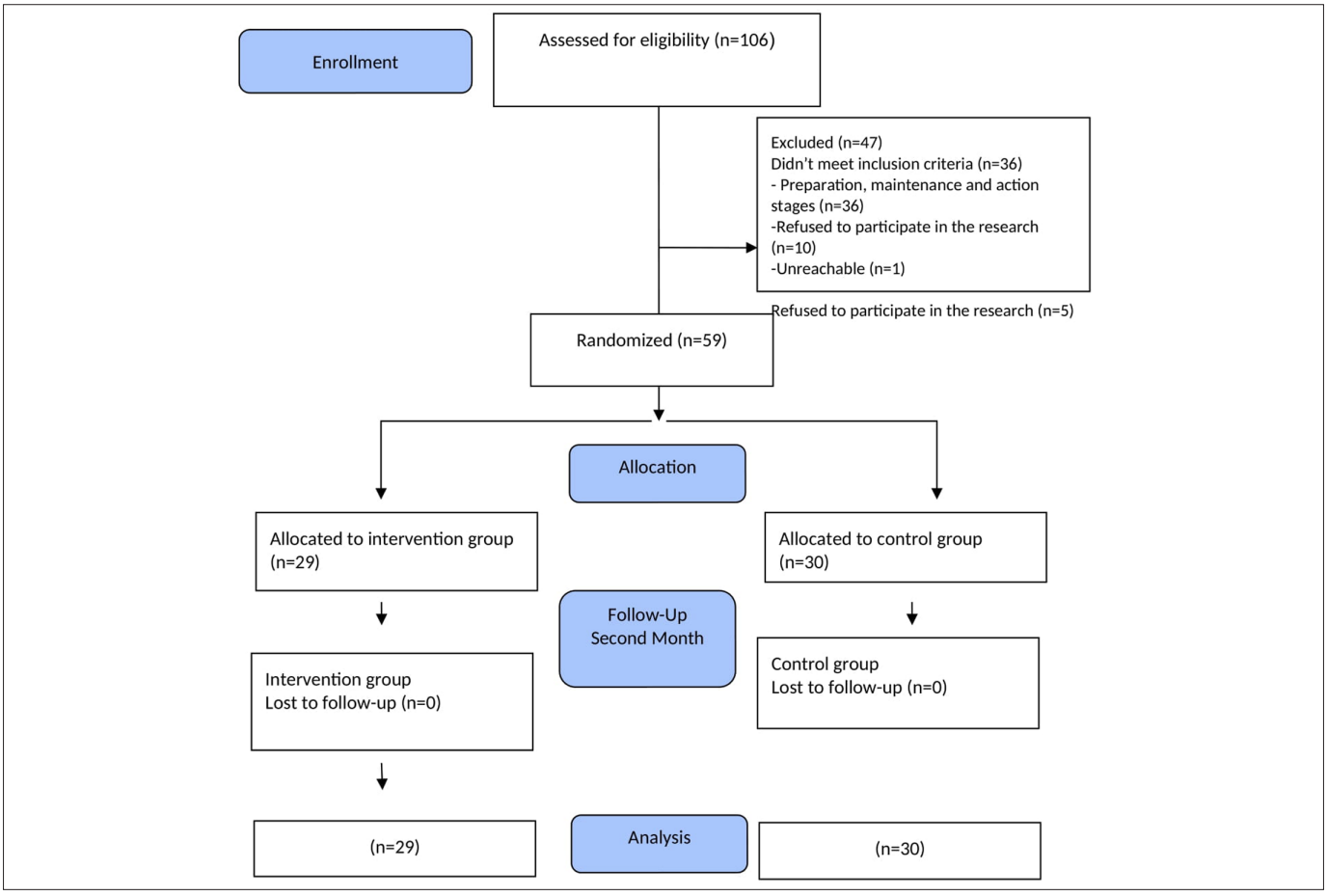

Figure 1. Consolidated Standards of Reporting Trials CONSORT flow diagram.

Quality of Life Questionnaire Short-Form

The Quality of Life Questionnaire Short-Form, developed by Ware[18] and adapted into Turkish by Koçyiğit et al,[19] assesses health status over the past 4 weeks but excludes overall health perception over the past 12 months. It includes 35 items under 8 subscales: physical functioning, social functioning, role physical, role emotional, bodily pain, mental health, vitality, and general health. Each subscale is scored from 0 (poor) to 100 (good), with no total score calculated. In this study, Cronbach's alpha values ranged from 0.590 (social functioning) to 0.901 (bodily pain), indicating an acceptable to high internal consistency.

Change Stages of Food Addiction Form

To identify students in the precontemplation and contemplation stages—an inclusion criterion—a change stage form prepared by the researcher was used. Based on the TTM[8] (precontemplation, contemplation, preparation, action, and maintenance), students answered the following question: "Have you ever thought about stopping eating trigger foods (e.g., sweets, packaged foods)?" with 5 response options. Each option corresponded to a specific stage of change. This form aimed to determine students' readiness for behavioral changes by identifying ambivalence toward problematic eating habits.

Study Procedure and Intervention

Pretest data: The participants were informed about the study. A Participant Information Form, the YFAS, the HLBS-II, and the SF-36 were applied online. After the pretest data were collected, the participants were assigned to the intervention and control groups by randomization. Thus, selection bias (randomization) was avoided.

Posttest data: After the interviews of the intervention group were completed, the posttest data (YFAS, HLBS-II, and SF-36) of the intervention and control groups were collected online.

Follow-up test data (2 months later): 2 months after the posttest data, YFAS, HLBS-II, and SF-36 were completed online by the intervention and control groups. An independent researcher coded the follow-up test data as Group A and Group B and transferred them to SPSS. A statistician and the researcher who analyzed the data were not aware of which group was the intervention group or the control group. Thus, both identification and reporting biases were avoided.

Intervention: Previous studies have demonstrated that MI groups of 5-8 participants are effective.[20,21] Therefore, 4 subgroups of 7 nursing students were created, and a 5-week, food-addiction-focused MI program was applied on Zoom. Students installed Zoom beforehand, sessions were scheduled for times they could attend, and they were reminded by phone the day before the intervention. Because the researcher carried out the intervention, neither researcher nor participant was blind. The participants were informed about the group assignment through informed consent. The control group received no simultaneous program. A single awareness webinar was offered but declined due to final exams. It can be rescheduled for later semesters.

The content validity of the MI plan was assessed using the Content Validity Index (CVI) based on the Davis method. Five experts rated each item on a 4-point scale. The CVI for each item was calculated as the proportion of the experts rating 3 or 4. Two experts rated the session duration and visual aids as "2," resulting in an initial CVI of 0.96. After adjusting the session length to 40 minutes and revising the

visuals for university students, all experts rated each item as 3 or 4. The final CVI was 1.00, and the MI plan was finalized.[22,23] The 5-session MI with online group held in the study was structured with the behavior change stages of the TTM. Each session was planned to overlap with the relevant stage of the model, and the session contents were shaped accordingly.

1. In Session 1 (precontemplation → contemplation stage), it was aimed to raise students' awareness of eating behaviors associated with trigger foods and the emotions accompanying these behaviors. The negative consequences of eating behaviors and possible gains that may come with the change were discussed.
2. In Session 2 (contemplation → preparation stage); the short- and long-term effects of maintaining or discontinuing the trigger foods were assessed and a decision balance analysis was performed. The participants were motivated to mentally prepare for the change plan by identifying people and environments that support change.
3. In Session 3 (Preparation → action stage) the participants were asked to prepare a 1-week change plan. Triggers, target behaviors, and coping strategies were identified in the change plan.
4. In Session 4 (Action stage) strategies appropriate to individual needs were developed and environmental arrangements and social support mechanisms were planned in order to sustain long-term behavior change.
5. In Session 5 (Action → Maintenance stage), the participants compared their awareness levels in the first session with their existing situation. They evaluated their progress in the change process. The achievements were reinforced, and relapse prevention strategies were developed for the maintenance stage.

Data Analysis

IBM SPSS 25.0 software was used to evaluate the data. The independent variable of the study was MI. The quality of life, healthy lifestyle behaviors, and FA were dependent variables. Number, percentage, mean, and SD were used for descriptive statistics, as well as chi-square and Cochran's Q tests for comparison of categorical variables. The normality distribution of the data was evaluated by the Shapiro–Wilk test, and it was determined that they were normally distributed. The independent samples *t*-test was used to compare the data of 2 independent groups, and the repeated measures analysis of variance was run to compare more than 2 dependent stages. In case of a significant difference, the Bonferroni test was run in multiple comparisons made to understand the source of the difference.

The repeated-measures mixed pattern ANOVA test was used to examine the group, time, and group*time interaction of the measurements of the intervention and control groups. The first factor was taken as groups (intervention and control), and the second factor was taken as time (measurements). The effect size was calculated with Cohen's d for standardization of the difference between the intra-group and intergroup means. A Cohen's d effect size of less than 0.2 indicates a weak effect size, 0.5 indicates a moderate effect size, and 0.8 indicates a strong effect size.[24] According to Cohen,[24] an eta squared (η^2) effect size of 0.01 indicates a small effect, 0.06 indicates a medium effect, and 0.14 indicates a large effect. The value of $P < .05$ was accepted as statistically significant.

Results

Distribution of Baseline Characteristics of the Participants by the Groups

The students from the precontemplation stage and those from the contemplation stage were assigned to the intervention and control groups through simple randomization within themselves. No one in both groups dropped out during the study. As a result, the study was completed with 29 participants in the intervention group and 30 participants in the control group (Figure 1). The intervention group was homogeneously distributed into 4 groups including 6-9 people in each group. The CONSORT flow chart illustrates the application process.

Table 1 includes the demographic characteristics of the students. Findings of the present study revealed no statistically significant difference between the groups in terms of age, gender, cohabitants, employment, YFAS status, and anthropometric measurements (height, weight) ($P \geq .05$) (Table 1).

Assessment of Quality of Life Questionnaire Short-Form and Healthy Lifestyle Behaviors Scale-II Mean Scores by the Groups

Table 2 shows the HLBS-II and SF-36 mean scores of the participants in both groups. While there was no statistically significant difference between the HLBS-II mean scores of the groups before MI ($P \geq .05$), a statistically significant difference was found between their mean scores in both measurements made after MI ($P \leq .05$). The effect size of the difference between the groups was high. The HLBS-II mean score of the intervention group was statistically significantly higher than the score of the control group in both post-intervention assessments (Table 2).

Intra-group comparison revealed that there was a statistically significant difference between HLBS-II mean scores within the intervention group ($P \leq .05$). The difference was observed between the posttest and follow-up (second month after intervention) measurements. The HLBS-II mean score of the intervention group was statistically significantly higher in 2 measurements (Table 2).

There was no statistically significant difference between the SF-36 mean scores of the groups before and after MI ($P > .05$). However, in each measurement made after MI, the mean scores of general health, role emotional, social functioning, and vitality subscales showed a statistically significant difference in intra-group comparison ($P \leq .05$). Accordingly, in the intervention group, follow-up mean scores of general health, role emotional, and vitality subscales were statistically

Table 1. Distribution of Demographic Characteristics and Yale Food Addiction Scale of the Participants by the Groups

	Intervention Group (IG) (n = 29)	Control Group (CG) (n = 30)		
Variable	**n (%)**	**n (%)**	X^2	***P***
Gender				
Female	27 (93.1)	27 (93.3)	0.001	.972
Male	2 (6.9)	3 (6.7)		
Cohabitation				
With family	6 (20.7)	12 (44.0)		
With relatives	2 (6.9)	0 (0.0)	4.228	.238
At the dormitory	20 (69.0)	17 (56.7)		
At the house with friends	2 (3.4)	1 (3.3)		
Employment				
Yes	1 (3.4)	4 (13.3)	1.858	.173
No	28 (96.6)	26 (86.7)		
YFAS				
Addicted to food	8 (27.6)	4 (13.3)	1.849	.174
Not addicted to food	21 (72.4)	26 (86.7)		
	$\bar{x} \pm SD$	**$\bar{x} \pm SD$**	***t***	***P***
Age (years)	20.31 ± 1.41	20.53 ± 1.38	0.612	.543
Weight	64.62 ± 12.38	67.13 ± 17.80	0.627	.533
Height	163.31 ± 4.01	165.96 ± 7.44	1.696	.095

$P < .05$.
CG, control group; IG, intervention group; *t*, independent samples *t*-test; X^2, chi-square analysis.

Table 2. The Distribution of Healthy Lifestyle Behaviors Scale-II and Quality of Life Survey Short-Form Mean Scores of the Participants in the Intervention and Control Groups

	Intervention $\bar{x} \pm SD$	Control $\bar{x} \pm SD$	Intergroup Statistics		Cohen's d (Effect Size)	1−β	95% CI for the Mean Difference
			t	*P*			
HLBS-II							
Pretest[a]	112.48 ± 17.00	112.67 ± 15.63	−0.043	.966	0.011	0.050	(8.42, 26.09)
Posttest[b]	124.72 ± 15.91	111.50 ± 15.88	3.195	**.002**	0.831	0.880	
2 months[c]	132.79 ± 18.72	115.53 ± 15.03	3.912	**<.000**	1.016	0.969	
Intragroup statistics							
F	9.927	0.578					
P	**<.000** $\eta^2 = 0.262$ **2 > 1, 3 > 1**	.578 $\eta^2 = 0.019$					
SF-36 General Health							
Pretest[a]	47.93 ± 16.39	54.50 ± 16.52	−1.532	.131	0.337	0.247	(−2.08, 10.42)
Posttest[b]	54.48 ± 14.54	55.83 ± 14.57	−0.356	.723	0.092	0.064	
2 months[c]	60.00 ± 13.83	55.83 ± 10.67	1.334	.188	0.338	0.248	
Intragroup statistics							
F	4.846	0.099					
P	**.011** $\eta^2 = 0.148$ **3 > 1**	.906 $\eta^2 = 0.005$					
SF-36 Physical Functioning							
Pretest[a]	85.00 ± 14.52	86.67 ± 19.27	−0.374	.710	0.503	0.477	(−0.25, 14.17)
Posttest[b]	85.52 ± 14.10	84.83 ± 20.49	0.149	.882	0.039	0.052	
2 months[c]	88.79 ± 12.51	81.83 ± 15.00	1.932	.058			
Intragroup statistics							
F	0.575	0.546					
P	.566 $\eta^2 = 0.020$	.582 $\eta^2 = 0.018$					
SF-36 Role Physical							
Pretest[a]	60.34 ± 35.68	67.50 ± 34.83	−0.779	.439	0.203	0.119	(11.67, 20.00)
Posttest[b]	61.21 ± 36.95	57.50 ± 33.57	0.404	.668	0.105	0.068	
2 months[c]	75.00 ± 25.88	70.83 ± 34.17	0.527	.600	0.137	0.081	
Intragroup statistics							
F	1.641	1.456					
P	.203 $\eta^2 = 0.055$	.241 $\eta^2 = 0.048$					
SF-36 Role Emotional							
Pretest[a]	25.29 ± 32.25	47.78 ± 42.60	−0.205	.834	0.053	0.054	(−18.29,22.43)
Posttest[b]	44.83 ± 44.79	45.56 ± 40.57	−0.065	.948	0.017	0.050	
2 months[c]	62.07 ± 38.55	60.00 ± 39.54	0.203	.839	0.053	0.054	
Intragroup statistics							
F	5.734	1.365					
P	**.005** $\eta^2 = 0.170$ **3 > 1**	.263 $\eta^2 = 0.045$					
SF-36 Social Functioning							
Pretest[a]	70.26 ± 20.43	79.58 ± 17.82	0.757	.452	0.486	0.450	(−4.49, 12.82)
Posttest[b]	75.43 ± 23.97	66.25 ± 18.61	0.788	.434	0.427	0.365	
2 months[c]	75.00 ± 16.02	70.83 ± 16.17	0.963	.340	0.259	0.164	
Intragroup statistics							
F	4.269	0.497					
P	**.019** $\eta^2 = 0.128$ **2 > 1**	.611 $\eta^2 = 0.017$					
SF-36 Bodily Pain							
Pretest[a]	31.72 ± 16.92	30.00 ± 16.82	0.393	.696	0.101	0.067	(−9.84, 7.22)
Posttest[b]	28.62 ± 24.31	24.00 ± 19.58	0.805	.424	0.209	0.124	
2 months[c]	20.69 ± 17.91	22.00 ± 14.72	−0.307	.760	0.079	0.060	
Intragroup statistics							
F	0.355	1.771					
P	.556 $\eta^2 = 0.013$	.179 $\eta^2 = 0.058$					

(*Continued*)

Table 2. The Distribution of Healthy Lifestyle Behaviors Scale-II and Quality of Life Survey Short-Form Mean Scores of the Participants in the Intervention and Control Groups (*Continued*)

	Intervention x̄ ± SD	Control x̄ ± SD	Intergroup Statistics *t*	*P*	Cohen's d (Effect Size)	1−β	95% CI for the Mean Difference
SF-36 Mental Health							
Pretest[a]	50.48 ± 18.09	50.00 ± 14.73	0.113	.911	0.029	0.051	(−0.89, 16.30)
Posttest[b]	56.97 ± 16.65	52.67 ± 16.48	0.997	.323	0.259	0.165	
2 months[c]	59.17 ± 19.34	51.47 ± 13.15	1.795	.075	0.465	0.420	
Intragroup statistics *F*	2.127	0.247					
P	.129 $\eta^2 = 0.071$	.782 $\eta^2 = 0.008$					
SF-36 Vitality							
Pretest[a]	41.90 ± 17.60	45.00 ± 17.81	−0.673	.504	0.017	0.101	(−1.14, 15.62)
Posttest[b]	49.31 ± 17.25	50.00 ± 16.03	−0.159	.874	0.041	0.052	
2 months[c]	57.24 ± 17.20	50.00 ± 14.91	1.730	.089	0.449	0.396	
Intragroup statistics *F*	6.476	1.067					
P	**.003** $\eta^2 = 0.188$ **3 > 1**	.351 $\eta^2 = 0.036$					

P < .05.
1−β, power; d, Cohen's (0.20 low impact, 0.50 medium impact, 0.80 large impact); *F*, repeated measures analysis of variance; HLBS-II, Healthy Lifestyle Behaviors Scale-II; SF-36, Quality of Life Survey Short-Form; *t*, independent *t*-test; η^2, partial eta squared (0.01 low impact, 0.06 medium impact, 0.14 large impact). Note. Values in bold indicate statistically significant differences ($p < 0.05$)

significantly higher than their pretest mean scores (*P* < .05). In the same group, posttest mean scores of the social functioning subscale were statistically significantly higher than pretest mean scores (*P* < .05).

The mean scores of the intervention group on the general health, role emotional, vitality, and social functioning subscales of SF-36 showed a statistically significant difference in the intra-group comparison as well (*P* ≤ .05). The effect size of the difference between these measurements was high, and the difference was observed between the pretest and posttest mean scores (Table 2).

Distribution of Yale Food Addiction Scale by the Groups

Table 3 shows the distribution of FA status of the students. There was no statistically significant difference both between groups and within groups in terms of YFAS distributions (*P* ≥ .05) (Table 3).

Table 4 shows data on group, time, and group*time interaction on HLBS-II and SF-36 scores. The results of the repeated-measures analysis of variance showed a statistically significant difference between HLBS-II mean scores of the groups in terms of time and group-time interaction (*P* ≤ .05). The SF-36 general health and role emotional subscales showed a statistically significant difference in terms of time (*P* ≤ .05). The mean scores of the other subscales of SF-36 scale did not show a statistically significant difference in terms of group, time, and group-time interaction (*P* > .05) (Table 4).

Discussion

This randomized controlled trial examined the effects of online group-based MI on eating behavior, healthy lifestyle, and quality of life in nursing students who met the YFAS score criteria. The findings of the present study showed that MI significantly raised the scores of the HLBS-II both after the intervention and at the 2-month follow-up with large effect sizes. On the other hand, no intergroup difference was found in eating addictive behaviors assessed by the YFAS and in most subscales of the SF-36.

The limited change in FA may be due not only to individual motivation but also to the strength of behavioral habits, environmental stimuli, and psychological burdens.[2] The easy access to high-calorie and processed foods, stressful academic conditions, and social pressures in the university environment may make it difficult for students to avoid trigger foods. Moreover, since eating behaviors often result

Table 3. Distribution of Food Addiction Status of the Students

YFAS		Intervention n (%)	Control n (%)	Total n (%)	Intergroup Statistical Analysis	*P*
Pretest	Addicted to food	8 (27.6)	4 (13.3)	12 (20.3)	1.849**	.174
	Not addicted to food	21 (72.4)	26 (86.7)	47 (79.7)		
Posttest	Addicted to food	5 (17.2)	5 16.7)	10 (16.9)	0.003**	.953
	Not addicted to food	24 (82.8)	25 (83.3)	49 (83.1)		
2 months	Addicted to food	3 (10.3)	6 (20.0)	9 (15.3)	1.063**	.302
	Not addicted to food	26 (89.7)	24 (80.0)	50 (84.7)		
Total		**29 (100.0)**	**30 (100.0)**	**59 (100.0)**		
Intragroup statistics analysis		3.167***	0.600***			
P		.205	.741			

YFAS, Yale Food Addiction Scale.
**Chi-square analysis.
***Cochran Q test.

Table 4. Analysis of Group, Time, and Group*Time Interaction on Quality of Life Survey Short-Form and Healthy Lifestyle Behaviors Scale-II Scores

	Group		Time		Group * Time Interaction	
Scales	***F***	***P***	***F***	***P***	***F***	***P***
HLBS-II	6.843	.000	7.366	.001	4.571	.012
SF-36 General health	0.302	.585	3.368	.038	2.139	.122
SF-36 Physical functioning	0.696	.408	0.026	.974	1.081	.343
SF-36 Role physical	0.002	.964	2.573	0.081	0.555	.576
SF-36 Role emotional	1.191	.280	6.000	.003	1.756	.177
SF-36 Social functioning	0.264	.609	3.155	.437	0.834	.437
SF-36 Bodily pain	0.376	.542	3.782	.694	0.367	.694
SF-36 Mental health	2.365	.130	1.872	.461	0.781	.461
SF-36 Vitality	0.166	.685	6.235	.181	1.737	.181

$P < .05$.
F, repeated measures analysis of variance; HLBS-II, Healthy Lifestyle Behaviors Scale-II; SF-36, Quality of Life Survey Short-Form.

from automatized habitual cycles, a short-term intervention targeting only raising awareness may be insufficient to break these cycles. Likewise, Weinstein et al[25] and by Burrows et al[26] using personality-targeted MI did not observe any significant change in the scores of the YFAS in the short-term MI interventions. On the other hand, no significant change was found in the scores of the YFAS as a result of the group intervention with the addition of psycho-educational elements by Hilker et al,[27] and a year-long holistic weight management program by Miller-Matero et al[28] These differences suggest that both the multicomponent nature of the intervention and its long duration are effective in changing FA behaviors. Although MI strengthens the individual's willingness to change, this effect may be limited in complex cases such as neurobiologically based FA. Impulsive eating behaviors, induced by the triggering of the mesolimbic reward system, are sustained by prolonged reinforcement cycles and should be supported not only by motivational boosting but also by other strategies that lead to behavior change.

A significant and robust effect observed on HLBS-II in the present study may be associated with the function of MI to increase self-awareness and intrinsic motivation. The existing knowledge of nursing students about healthy lifestyles may have facilitated the acceleration of behavior change in these areas by MI. This finding is compatible with the study by Burke et al[29] reporting that MI has similar effectiveness to other methods in healthy lifestyle behaviors and a systematic review by Lundahl et al[30]showing that MI contributes to lifestyle changes in areas such as diet, physical activity, smoking, and substance use.

On the other hand, quality of life has a multidimensional structure and is affected by factors such as academic stress, economic difficulties, and social relationships, all of which were not directly targeted in the MI sessions. This explains the lack of significant change in SF-36 overall quality of life scores with a short-term intervention. Studies by Pearson et al[31] and Simper et al[32] involving a follow-up of 6 months or more showed that the enhanced quality of life became more pronounced, suggesting the importance of the duration of the intervention. Likewise, Miller-Matero et al[28] reported that significant changes in eating behaviors and quality of life could only be observed after 1 year. This result suggests that SF-36 subscales such as physical functioning, role physical, and role emotional may be less sensitive to short-term MI interventions specific to FA.

Consequently, although MI is an effective tool in promoting healthy lifestyle behaviors, it is not sufficient alone to change FA behaviors and quality of life holistically. Therefore, it is recommended to use MI in combination with cognitive-behavioral therapy, relapse prevention training, and environmental modifications; to assess the persistence of behavior change with at least 6-12 months of follow-up; and to address environmental and psychosocial factors such as stress level, social support, and food accessibility with their mediating or moderating roles in future research.

Implications for Practices

Findings suggest that while MI may not immediately affect eating behaviors or quality of life, it supports healthy lifestyle changes. Future studies should consider follow-up length and targeted behavior types when evaluating MI's effectiveness. MI may also benefit broader populations with FA and could be integrated into health promotion programs. Training healthcare professionals in MI may enhance behavior change efforts. Given mixed outcomes, combining MI with other interventions like cognitive behavioral therapy (CBT) may improve effectiveness.

Strengths and Limitations

This randomized controlled trial was conducted by an independent statistician for group assignment, data entry, and analyses, which improved internal validity; the use of MI and validated scales such as HLBS-II, YFAS, and SF-36 were the main strengths of the study. However, 2 months of follow-up is insufficient to determine permanent effects. Therefore, a follow-up of at least 6-12 months is recommended in the future. The lack of blinding of the practitioner and participants posed a risk of observer and performance bias, and double-blinding with third-party practitioners should be preferred in the future. Since clinical diagnosis was not verified despite YFAS criteria, expert assessment should be included. Finally, since potential confounders such as lifestyle, socioeconomic status, and psychiatric comorbidities were not checked, stratified randomization and multivariate analyses would more accurately reflect the effectiveness of MI.

Conclusion

The results of this study showed that the MI intervention applied to nursing students diagnosed with FA was effective in improving healthy lifestyle behaviors; however, it did not produce a significant change in eating behaviors and quality of life in the short term. Based on these findings, it is recommended to prolong the duration of the intervention and follow-up periods in order to evaluate the long-term effects of MI in future studies and to apply multicomponent intervention models integrated with different psychosocial approaches.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Gazi University for Non-Invasive Clinical Trials (Approval No.: 4574941-199-88441 Date:17/05/2021).

Informed Consent: Written informed consent was obtained from all participants who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – M.I., S.D.; Design – M.I., S.D.; Supervision – S.D.; Resource – M.I.; Materials – M.I.; Data Collection and/or Processing – M.I.; Analysis and/or Interpretation – M.I., S.D.; Literature Search – M.I., S.D.; Writing – M.I., S.D.; Critical Review – M.I., S.D.

Declaration of Interests: The authors have no conflicts of interest to declare.

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

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