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Investigating the Relationship between Mindful Eating, Body Image Concerns and Obsessive-Compulsive Behaviors as Predictors of Orthorexia Nervosa in the General Female Population

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The research study examined how mindful eating and body image problems and obsessive-compulsive symptoms interact to predict orthorexia nervosa in women from the general population. The study applied a descriptive-correlational research method to its applied research work. The research study examined women who resided in Ahvaz City and reached the age of 18 years as its total research population for the year 2025. The study selected 427 participants through a convenience sampling method to form its study sample. The study used four measurement tools which included the

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Orthorexia Nervosa Questionnaire (ORTO-15) and the Mindful Eating Questionnaire (MEQ) and the Body Image Concern Inventory (BICI) and the Revised Obsessive-Compulsive Inventory (OCI-R). The researchers used Pearson correlation coefficients and regression analysis to analyze the data they collected. The researchers performed data analysis through SPSS version 26. The findings showed that mindful eating had a significant negative relationship with orthorexia nervosa The study found that body image concerns and obsessive-compulsive components which include washing and checking and ordering and obsessing and hoarding and neutralizing showed a strong positive connection to orthorexia nervosa. The regression analysis results demonstrated that the research variables could account for 68% of the orthorexia nervosa variance. The current study results demonstrate that mindful eating and body image concerns and obsessive-compulsive behaviors have a significant impact on predicting orthorexia nervosa. The development and persistence of orthorexic tendencies stem from disturbances in mindful eating and increased body image concerns and heightened obsessive-compulsive behaviors.

Keywords: mindful eating, body image concerns, obsessive-compulsive behaviors, orthorexia nervosa.

Social media platforms drive people to adopt clean eating and wellness-oriented diets, which have become more popular according to current dietary patterns. The world has experienced a rise in orthorexic behavior reports during this period, which demonstrates the need to study orthorexia nervosa because of its present-day social relevance. Orthorexia nervosa (ON) is a mental health disorder that causes people to become excessively focused on their eating habits while they follow strict eating rules which they have established for themselves. People who have ON spend too much time on their activities which include food planning and food preparation and food eating. People tend to avoid all food items which they consider to be "unhealthy". The framework establishes that "healthy" foods must possess the characteristics of being pure and clean and organic and natural and safe whereas

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"unhealthy" foods include all items that have undergone processing and those which contain additives and products considered toxic or contaminated (Donini et al., 2022).

The general population studies show that orthorexia nervosa prevalence rates differ widely because of different assessment instruments and cut-off criteria. The ORTO-15 assessment showed a 57.6% prevalence rate when using a cut-off score of <40 but the rate fell to 14.6% when using a lower cut-off <35. The Düsseldorf Orthorexia Scale (DOS) assessment produced prevalence estimates that were significantly lower at 6.9% according to Carpita et al. 2024. The wide range of results creates problems for researchers who need to assess study results because they need to compare and validate different methods of estimating prevalence.

The development and persistence of this disorder are significantly dependent on sociocultural factors which include exposure to cyberspace and internalisation of body ideals and appearance-based social comparison (Scheiber et al., 2023; Syurina et al., 2018). The results from multiple studies indicate that both adolescents and women face increased likelihood of developing orthorexia nervosa because they experience social and media-related pressures more intensely than other population groups (Łucka et al., 2024).

Researchers found that people with orthorexia nervosa (ON) show one cognitive defect which affects their ability to practice mindful eating (Christodoulou et al., 2024; Kalika et al., 2023; Miley et al., 2022). Mindful eating requires people to experience their eating process through sensory perception while they need to practice continuous non-judgmental observation of food during every present moment. Some people use mindful eating as a

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weight loss method but this technique does not focus on weight and it also does not depend on the nutritional value of food (e.g., fats, carbohydrates, or protein). The main purpose of this practice is to help people stay present while they eat and to improve their understanding of the eating process (Nelson, 2017) which has the potential to boost mental health (Masoumparast, 2020). Mindful eating shows a negative relationship with eating disorder symptoms which include orthorexia nervosa based on empirical research. Higher levels of mindful eating practice lead to decreased orthorexia symptoms according to multiple studies (Bayram et al., 2024; Christodoulou et al., 2024; Kalika et al., 2023). The studies found that "focused eating" which stands as the main element of mindful eating leads to higher orthorexia nervosa rates. People who demonstrate strong healthy eating patterns tend to show higher focused eating behavior according to the research findings (Davies et al., 2022; Miley et al., 2022).

Body image concern serves as a potential predictor for the development of orthorexia nervosa. Body image represents the personal mental image that people create about their bodies which exists separately from their actual physical look. The concept encompasses multiple dimensions which people use to observe themselves and feel about themselves and think about themselves and imagine themselves and display body-related behaviors that they either recognize or hide (Mallaram et al., 2023). Body image concerns consist of four different components which all connect together: (1) the perceptual aspect which involves how individuals perceive their body weight and shape, (2) the cognitive aspect which encompasses all thoughts and beliefs and attitudes that people have about their bodies, (3) the behavioral aspect which includes all dysfunctional behaviors that people use

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to check their bodies or avoid their bodies, and (4) the emotional aspect which encompasses all affective responses that people experience towards their bodies (Baker et al., 2023; Hosseini & Padhy, 2023).The research evidence shows that people who have orthorexic tendencies exhibit increased focus on their appearance and they spend more time worrying about their body weight and body shape (Barnes & Caltabiano, 2017; Messer et al., 2022). Women typically experience more body image issues than men which results in women having higher levels of eating disorder symptoms according to research which found that body image problems increase with more severe disordered eating patterns (Baker et al., 2023).

The understanding of orthorexia nervosa now includes obsessive–compulsive (OCD) behaviors which have risen as evidence for its diagnosis. The disorder which affects about 1.1% to 1.8% of people worldwide defines its symptoms through the presence of both obsessive thoughts and compulsive behaviors. People experience distress or anxiety because their minds keep bringing up forbidden thoughts and images and they try to stop these thoughts through mental and physical actions. People who experience compulsions engage in specific movements or mental functions which they believe will help them decrease their anxiety or stop their worst fears from happening. The temporary relief from compulsive behaviors causes a short-term effect which results in cyclic patterns because people experience ongoing obsessive thoughts which drive them to perform their compulsive actions (American Psychiatric Association, 2022). The study conducted by Duradoni et al. (2023) discovered that there is a strong link between obsessive–compulsive symptoms and ON. The people who exhibit orthorexic behavior patterns

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demonstrated elevated levels of obsessive thinking which they displayed through multiple dimensions including hoarding and perfectionism and precision and doubt and their degree of obsessive thinking but their checking behavior and contamination concerns resulted in lower links to ON symptoms. The appearance of obsessive–compulsive tendencies during food-related situations which involve the ritualistic checking of food information and the repetitive development of thoughts to attain a perfect "healthy" diet establishes a potential relationship between OCD-related behaviors and ON (Koven & Abry, 2015).

The present study investigates three variables that predict orthorexia nervosa in women because research studies in Iran have not been conducted to examine the relationship between orthorexia nervosa and mindful eating and body image concerns and obsessive–compulsive behaviors. Iranian women face dual pressures which arise from societal demands for their physical appearance and body standards and the increasing power of social media which advocates for clean eating practices and wellness trends and strict diet rules. Iranian women represent a significant population for this research because cultural and media-related pressures make them more susceptible to developing orthorexic behaviors. The researchers believed that mindful eating would show an inverse relationship with orthorexia nervosa while body image concerns and obsessive–compulsive behaviors would demonstrate a direct relationship according to existing research. The present study provides an in-depth analysis of psychological factors that predict orthorexia nervosa in the Iranian sociocultural context by filling existing research gaps in the field.

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Method

The research study used a descriptive–correlational design to conduct its investigation. The researchers conducted data analysis through the usage of SPSS version 26 software. The study aimed to recruit women from Ahvaz who were 18 years or older in 2025 and who had shown interest in participating in the research. The researchers calculated the sample size through Cochran's formula, which used a 95% confidence level and 5% margin of error and maximum variability ($p = 0.5$) to establish a minimum sample requirement of 384 participants. The study required participants to choose whether to join after they received complete information about the study. The research team used a cross-sectional study design to gather data through an online self-report questionnaire that they distributed on the Porsline platform. The researchers used convenience sampling to distribute the questionnaire through Telegram channels and online groups which focused on women's social and cultural activities in Ahvaz. The research team manually checked all duplicate and highly similar responses to their study which resulted in them removing specific responses from the study. The screening question established two criteria to confirm residency in Ahvaz and to verify that participants met the age requirement. All questionnaire items were written in clear Persian language which the research team enhanced with brief explanations at required points. The final dataset excluded responses from non-residents and duplicate submissions. The final sample included 427 participants who completed the study after 37 out of 464 initial responses were excluded for missing information or not meeting eligibility criteria. Data collection took place in April and May 2025. The mean age of participants was 29 years and 4 months with a

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standard deviation of 10 years and 6 months. The participants reported 32.8% single status 63.5% married status 2.8% divorced status and 0.9% widowed status. The educational levels of the population showed that 2.8% achieved education below high school 16.9% earned high school diplomas 49.6% obtained bachelor degrees 26.5% attained master degrees and 4.2% received doctorates.

Instruments

Orthorexia Nervosa Questionnaire

The Orthorexia Nervosa Questionnaire (ORTO-15) was created by Donini and his team in 2005 as a tool that contains 15 assessment items which measure the cognitive and emotional and clinical aspects of orthorexia nervosa. Items are rated using a four-point scale which follows the Likert system. The instrument has achieved suitable psychometric performance because it resulted in a Cronbach's alpha coefficient of 0.81. The criterion-related validity assessment revealed a sensitivity of 55.6% and a specificity of 75.8% which resulted in an overall accuracy rate of 73.8 (Donini et al., 2005). The Persian version of the ORTO-15, validated by Eskandari et al. (2022), showed acceptable reliability with total scale Cronbach's alpha coefficients of 0.81 and subscale coefficients of 0.73 0.72 and 0.69. The three factors showed composite reliability values of 0.78 and 0.77 and 0.82. The study reported that the total scale Cronbach's alpha coefficient reached 0.72 which demonstrated sufficient internal consistency for the present sample.

Mindful Eating Questionnaire

Framson et al. (2009) created The Mindful Eating Questionnaire (MEQ) to evaluate how well people understand

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their eating habits and how they feel about those habits. The questionnaire consists of 28 items which are divided into five subscales: awareness, emotional response, distraction, disinhibition, and external cues. Respondents evaluate the items using a four-point Likert scale (Framson et al. 2009). The original study found that the total scale achieved a Cronbach's alpha score of 0.64 while its subscale reliability scores ranged from 0.64 to 0.83. Pondeh Nezhadan et al. (2018) validated the Persian version of the MEQ which showed strong internal consistency with a total scale Cronbach's alpha of 0.80 and subscale values between 0.74 and 0.84. The study found that the Five Facet Mindfulness Questionnaire showed significant correlations which provided evidence for concurrent validity (r = 0.22–0.28). The total scale achieved a Cronbach's alpha score of 0.92 for this study sample which shows excellent reliability according to the standards.

Body Image Concern Inventory

Littleton et al. (2005) created The Body Image Concern Inventory (BICI) to measure body image related concerns. The inventory consists of 19 items which are divided into two subscales that measure appearance concern and social avoidance. Items are rated on a five-point Likert scale (Littleton et al., 2005). The original study showed strong internal consistency for the instrument which obtained Cronbach's alpha coefficients of 0.93 for the total scale and 0.92 and 0.76 for the appearance concern and social avoidance subscales respectively. The study found item–total correlations between 0.32 and 0.73 with a mean value of 0.62 while the Body Dysmorphic Disorder Scale results showed a significant correlation at 0.60 which confirmed the convergent validity of the measurement. The Persian version of the BICI was validated by Bassak Nejad and Ghafari 2008

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through their research with university students. The total sample showed a Cronbach's alpha value of 0.95 while female participants had 0.93 and male participants had 0.95. The Fear of Negative Appearance Evaluation Scale showed a significant correlation with the measurement which reached 0.55 to establish further evidence for convergent validity. The present study showed a Cronbach's alpha value of 0.87 for the total scale which demonstrated good reliability for the sample used.

Obsessive–Compulsive Inventory–Revised

Foa et al. (2002) created The Obsessive–Compulsive Inventory–Revised (OCI-R) as a tool to measure different types and levels of obsessive–compulsive symptoms. The questionnaire contains 18 items which are divided into six different subscales: washing, checking, ordering, obsessing, mental neutralizing, and hoarding. The response options use a five-point Likert scale for participants to select their answers. The original research showed that OCI-R achieved strong internal consistency because its total scale obtained a Cronbach's alpha of 0.90 and its subscales achieved between 0.83 and 0.90. The Yale–Brown Obsessive–Compulsive Scale yielded a strong correlation with the test results which proved the convergent validity of the assessment (r = 0.98). The Persian version of the OCI-R, validated by Ghassemzadeh et al. (2011), also demonstrated satisfactory psychometric properties. The complete scale showed a Cronbach's alpha score of 0.85 while the subscales showed a range of 0.77 to 0.86. The research established convergent validity through its identification of significant correlations between the Maudsley Obsessive–Compulsive Inventory (r = 0.57) and the Compulsive Activity Checklist (r = 0.47) which showed subscale–total correlations between 0.63 and 0.76. The study achieved excellent internal

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consistency through its total scale score of 0.91 which established a high level of Cronbach's alpha for this particular sample.

Resualt

The results of descriptive findings of research variables are presented in Table 1. Using the ORTO-15 cut-off point (≤35) to further classify participants, 94.4% of participants were classified as being at risk of orthorexia nervosa.

Table 1
Descriptive Statistics for Research Variables

Variables	Minimum	Maximum	Mean	Std. Deviation
Mindful Eating	29	110	72.54	18
Body Image Concern	24	80	53.64	13.01
Washing	0	12	7.20	3.47
Checking	0	12	7.19	3.44
Ordering	0	12	8.04	2.85
Obsessing	0	12	7.82	3.17
Hoarding	0	12	7.36	3.52
Mental Neutralizing	0	12	7.01	3.71
Orthorexia	20	41	29.44	3.33

A key assumption for using parametric tests is the normal distribution of the variables. To assess this, the Kolmogorov–Smirnov test was conducted. Overall, the significance levels were

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generally above 0.05, supporting the assumption of normality. The table 2 presents the Pearson correlation coefficients between the study variables.

Table 2
Correlation coefficient between variables

Variables	1	2	3	4	5	6	7	8	9
Washing	1								
Checking	.72**	1							
Ordering	.65**	.75**	1						
Obsessing	.75**	.67**	.64**	1					
Hoarding	.54**	.65**	.63**	.44**	1				
Mental Neutralizing	.49**	.55**	.60**	.41**	.75**	1			
Body Image Concern	.57**	.46**	.44**	.47**	.34**	.26**	1		
Mindful Eating	-.28**	-.26**	-.30**	-.20**	-.30**	-.29**	-.36**	1	
Orthorexia	.68**	.65**	.64**	.61**	.59**	.54**	.62**	.51**	1

**$p \leq 0.01$

As shown in Table 2, mindful eating was negatively correlated with orthorexia nervosa (r = -.51, $p \leq .01$), whereas body image concerns showed a strong positive correlation (r =.62, $p \leq .01$). All components of obsessive-compulsive behaviours were positively correlated with orthorexia nervosa, with the strongest associations for washing (r =.68), checking (r =.65), and ordering (r =.64), and somewhat lower for obsessing, hoarding, and mental neutralizing (all $p \leq .01$).

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To study the predictive role of independent variables, stepwise regression analysis was used. The results of the model analysis are reported in Tables 3 and 4.

Table 3
Stepwise Regression Analysis Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	F	Sig.
1	.51[a]	.26	.26	2.85390	156.179	.000
2	.69[b]	.48	.48	2.40489	197.229	.000
3	.78[c]	.61	.61	2.06629	228.560	.000
4	.79[d]	.63	.63	2.01434	186.151	.000
5	.81[e]	.66	.66	1.94019	167.295	.000
6	.82[f]	.68	.67	1.88720	151.514	.000
7	.83[g]	.68	.68	1.87623	132.239	.000
8	.83[h]	.69	.68	1.86885	117.165	.000

a. Predictors: (Constant), mindful eating

b. Predictors: (Constant), mindful eating, body image concern

c. Predictors: (Constant), mindful eating, body image concern, washing

d. Predictors: (Constant), mindful eating, body image concern, washing, obsessing

e. Predictors: (Constant), mindful eating, body image concern, washing, obsessing, checking

f. Predictors: (Constant), mindful eating, body image concern, washing, obsessing, checking, hoarding

g. Predictors: (Constant), mindful eating, body image concern, washing, obsessing, checking, hoarding, ordering

h. Predictors: (Constant), mindful eating, body image concern, washing, obsessing, checking, hoarding, ordering, mental neutralizing

Based on Table 3 and based on the adjusted R^2 value obtained, the results of the analysis show that, in general, about 68 percent of the total changes in ON

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can be predicted by mindful eating, body image concern, washing, obsessing, checking, hoarding, ordering, mental neutralizing.

Table 4
Results of Model Analysis by Independent Variables

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	36.411	.574		63.426	.000
	mindful eating	-.096	.008	-.518	-12.497	.000
2	(Constant)	27.154	.851		31.890	.000
	body image concern	.127	.010	.496	13.210	.000
3	(Constant)	26.846	.732		36.673	.000
	washing	.435	.035	.454	12.302	.000
4	(Constant)	26.422	.719		36.746	.000
	obsessing	.227	.047	.216	4.806	.000
5	(Constant)	26.009	.696		37.357	.000
	checking	.240	.041	.248	5.820	.000
6	(Constant)	25.136	.699		35.943	.000
	hoarding	.176	.035	.186	4.997	.000
7	(Constant)	24.761	.712		34.771	.000
	ordering	.130	.053	.111	2.434	.015
8	(Constant)	24.592	.714		34.444	.000
	mental neutralizing	.080	.039	.089	2.078	.038

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Based on the results of Table 4, mindful eating was a significant negative predictor of orthorexia nervosa (β = −.51, p < .001). In contrast, body image concern (β = .49, p < .001), washing (β = .45, p < .001), obsessing (β = .21, p < .001), checking (β = .24, p < .001), hoarding (β = .18, p < .001), ordering (β = .11, p = .015), and mental neutralization (β = .08, p = .003) were all significant positive predictors of orthorexia nervosa.

Discussion

The current research introduces new findings about psychological factors which predict orthorexia nervosa in Iranian women, who have been neglected in previous studies. The research found that mindful eating functions as a protective factor through its negative relationship with body image concerns and obsessive-compulsive behaviors which include all subscales: washing and checking and ordering and obsessing and hoarding and mental neutralizing. The research validated all of its proposed hypotheses.

Our research findings show that they support existing evidence while proving new results in the context of Iran. The present study found a negative relationship between mindful eating and orthorexia nervosa because different studies used different methods to measure mindful eating. Research findings show that orthorexic tendencies have positive links to focused eating which shows increased food attentional control (Davies et al., 2022; Miley et al., 2022). The broader definitions of mindful eating introduce nonjudgmental awareness together with flexible movement and internal cue recognition. The three dimensions have shown permanent connections to decreased orthorexic tendencies (Bayram et al., 2024; Christodoulou et al., 2024;

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Kalika et al., 2023). The current study found a stronger negative relationship because researchers used different measurement methods which interacted with specific cultural contexts.

Messer et al. (2022) demonstrated that body image issues together with negative weight and appearance perceptions created a strong relationship that increased orthorexia nervosa symptoms which matched our research findings because body image issues operated as a main predictor for orthorexia nervosa. The findings of Huynh et al. (2024) and Koven and Abry (2015) demonstrate that various aspects of obsessive-compulsive disorder create a direct connection to orthorexia nervosa which confirms our research findings about how obsessive-compulsive behaviors including obsessing and checking and ordering and hoarding and mental neutralizing interact with orthorexia nervosa.

The outcomes demonstrate direct practical applications which stem from our research findings. Culturally adapted mindfulness-based interventions which use Telegram as delivery method should be implemented to decrease orthorexic tendencies among Iranian women because mindful eating protects against such behavior. The research shows that psychoeducational programs which treat distorted body perceptions and compulsive traits will help high-risk groups who show strong ties between body image concerns and obsessive-compulsive behavior. The study provides theoretical support for cognitive-behavioral models by showing how attention regulation and emotional processes and compulsive behaviors work together to create orthorexia nervosa in a non-Western cultural environment.

The research findings provide valuable insights but the study establishes multiple limitations. First, researchers used convenience sampling by selecting participants through Telegram

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channels and online groups which were focused on women's social and cultural activities in Ahvaz. The sampling method used in the study created selection bias because it attracted people who had stronger interest in health and diet and lifestyle matters. The research team found that people who participated in the study presented themselves at increased risk for orthorexia nervosa but this result needs careful evaluation. The second limitation of this study relates to the internal consistency of certain OCI-R subscales. The overall scale demonstrated excellent reliability but the washing and ordering and checking and obsessing subscales showed lower alpha coefficients ($\alpha < 0.70$). The results from these subscales require careful interpretation and researchers must investigate their stability across various samples before drawing conclusions.

The research findings establish a base for future studies but must recognize their existing research restrictions. The researchers should use a broader participant base that includes various groups while conducting their study through longitudinal or experimental methods and implementing qualitative research and conducting sensitivity and subgroup assessments to better understand the cognitive and emotional and behavioral aspects of orthorexia nervosa and improve intervention effectiveness.

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Conflicts of Interest

The authors declare no conflicts of interest.

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