**Research Article**

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# Evaluation of Eating Attitude, Obsessive-Compulsive Symptoms, and Relationship Between Orthorexia Nervosa in Faculty of Pharmacy Students

Ceren GİZER[1]
ORCID: 0000-0002-7361-2046
Sedat ARSLAN[2]*
ORCID: 0000-0002-3356-7332

[1]Department of Nutrition and Dietetics, Istanbul Okan University, Istanbul, Turkey

[2]Department of Nutrition and Dietetics, Bandirma Onyedi Eylul University, Balikesir, Turkey

**Corresponding author:**
Sedat ARSLAN
Department of Nutrition and Dietetics, Bandirma Onyedi Eylul University, Balikesir, Turkey
E-mail: sarslan@bandirma.edu.tr
Tel: +90 266 606 4903

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**ABSTRACT**

The objective of this study is to evaluate the relationships between eating attitudes, obsessive-compulsive symptoms, and orthorexia nervosa (ON) among pharmacy students. A cross-sectional study was conducted at Istanbul University with 332 pharmacy students, using ORTO-11, Maudsley Obsessive-Compulsive Inventory (MOCI), and Eating Attitude Test (EAT-40) scales. After excluding outliers, data from 323 participants were analyzed using SPSS 24.0. A significant negative correlation was found between EAT-40 and ORTO-11 scores ($r = -0.405$; $p < 0.001$), and MOCI sub-dimensions showed significant correlations with both EAT-40 and ORTO-11. Hierarchical regression analysis revealed that orthorexia nervosa significantly predicted eating attitudes, explaining 16.4% of the variance ($F(1, 321) = 62.873$, $p < 0.05$), while MOCI sub-dimensions did not significantly improve the model's predictive power. Female students exhibited higher levels of orthorexia nervosa compared to males, consistent with literature suggesting that women are more prone to eating disorders and health-related anxiety. Students exhibited traits overlapping with obsessive-compulsive disorder (OCD), which may contribute to the development of eating disorders. The findings underscore the importance of addressing orthorexia nervosa and related obsessive-compulsive traits to promote healthier eating behaviors among pharmacy students. Educational programs that encourage balanced eating habits without excessive restriction can be developed, and students' mental health can be supported through psychological counseling and awareness-raising initiatives. These measures may help mitigate the negative impacts of obsessive-compulsive traits and orthorexic tendencies in this population.

**Keywords:** Orthorexia nervosa, Obsessive-Compulsive symptoms; Eating attitudes, Pharmacy students, Mental health

## 1. Introduction

Orthorexia nervosa (ON), defined as an obsessive focus on healthy eating, has been increasingly recognized as a distinct eating disorder. The growing obsession with clean eating has sparked concern among health professionals and researchers in recent years. While maintaining a healthy diet is widely encouraged, an excessive focus on food purity can lead to ON. This emerging disordered eating pattern is increasingly prevalent among university students. Studies indicate that 59.8% of dietetic students in Turkey exhibit orthorexic tendencies, highlighting a concerning trend in health-related academic fields [1]. Unlike other eating disorders that focus on the quantity of food consumed, orthorexia nervosa emphasizes the quality of food, often leading to severe dietary restrictions and nutritional imbalances. This condition is particularly concerning among university students who are at a critical stage of their physical and psychological development. Pharmacy students, as future healthcare professionals, represent a unique and significant population in this context. Their attitudes and behaviors toward healthy eating can influence public perceptions and practices regarding nutrition and health, highlighting the importance of examining orthorexia nervosa and related obsessive-compulsive symptoms within this group. Understanding the prevalence and impact of orthorexia nervosa and related obsessive-compulsive symptoms among pharmacy students is crucial because these future healthcare professionals play a vital role in public health and patient care [2].

Orthorexia nervosa, first coined by Bratman in 1997, is characterized by an unhealthy obsession with eating foods that one considers healthy. This disorder can lead to various negative health outcomes, including malnutrition, social isolation, and an increased risk of other mental health issues such as anxiety and depression. Previous studies have shown that orthorexia nervosa shares common features with both OCD and other eating disorders like anorexia nervosa and bulimia nervosa [3]. The overlap in symptoms suggests a complex interplay of psychological factors driving these conditions. Moreover, the increasing prevalence of orthorexia nervosa among university students necessitates further research to develop effective prevention and intervention strategies [4].

Recent studies suggest that behaviors aimed at maintaining a healthy lifestyle and dieting are increasingly common among university students in Turkey. While these behaviors can be beneficial, they may also contribute to the development of ON, a condition characterized by an obsessive focus on healthy eating. Research conducted among Turkish university students and healthcare professionals indicates a considerable prevalence of ON. For instance, Caferoğlu and Toklu [1] found that 59.8% of dietetic students exhibited ON tendencies, highlighting the potential influence of nutrition-related education on orthorexic behaviors. Similarly, Demir and Bayram [5] reported that approximately 30% of healthcare professionals scored below the ORTO-15 threshold, indicating ON tendencies. Moreover, Yılmaz et al. [6] found that ON is more closely related to disordered eating attitudes than OCD, suggesting that it may be more appropriately classified as an eating disorder. These findings emphasize the need for further research on the prevalence and implications of ON among university students, particularly those studying health sciences. The objective of this study is to investigate the relationship between ON, obsessive-compulsive symptoms, and eating attitudes among pharmacy students in Turkey, contributing to a better understanding of this emerging public health concern.

The study is conducted with a sample of pharmacy students at Istanbul University, which may limit the generalizability of the findings to other populations or educational contexts. Additionally, the study's cross-sectional design means that causality cannot be established between the variables. Self-reported data may also introduce bias, as participants might underreport or overreport their symptoms and behaviors due to social desirability or lack of self-awareness [7]. Despite these limitations, the study provides valuable insights into the mental health challenges faced by pharmacy students and underscores the need for targeted mental health interventions within this demographic.

The primary objective of this study is to evaluate the relationships between eating attitudes, obsessive-compulsive symptoms, and orthorexia nervosa among pharmacy students. By identifying these relationships, the study seeks to provide insights into future healthcare professionals' mental health and well-being. This research contributes to the existing literature by highlighting the prevalence and impact of orthorexia nervosa and obsessive-compulsive symptoms in a specific student population, thereby


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informing the development of targeted interventions and support mechanisms within educational institutions [8]. The findings can help shape policies and programs aimed at promoting mental health awareness and support among university students, ultimately enhancing their well-being and academic performance.

ON is increasingly recognized as a maladaptive pattern of eating behavior, influenced by various psychological mechanisms. The cognitive-behavioral model suggests that ON stems from maladaptive thought patterns, such as an excessive need for control over food quality and an irrational fear of "unhealthy" foods [9]. These cognitive distortions lead to rigid dietary behaviors and compulsive rituals surrounding food selection and preparation. According to this model, ON behaviors are reinforced through negative reinforcement, where individuals experience reduced anxiety by adhering to strict dietary rules, further solidifying their obsession with "pure" eating [10]. Additionally, the health anxiety model posits that ON may be driven by an exaggerated fear of illness, leading individuals to adopt extreme dietary restrictions to prevent perceived health risks. Research suggests that individuals with high health anxiety may be more prone to ON due to heightened concerns about food-related diseases and contamination [3]. This model aligns with findings indicating that ON shares similarities with OCD, where intrusive thoughts about food purity lead to compulsive dietary behaviors [11]. Understanding these theoretical frameworks is crucial for contextualizing ON within the broader spectrum of disordered eating and anxiety-related conditions.

The objective of this study is to investigate the relationships between eating attitudes, obsessive-compulsive symptoms, and orthorexia nervosa among pharmacy students. Specifically, the study investigates whether higher ON scores are associated with more dysfunctional eating attitudes and higher obsessive-compulsive symptoms [12]. Our hypothesis is that orthorexia nervosa is positively correlated with obsessive-compulsive traits and disordered eating behaviors.

## 2. Material and Methods

### *2.1. Participants/Sample*

This cross-sectional study was conducted at Istanbul University and involved 332 pharmacy students. Participants were selected using a random sampling method from the total population of 1,511 students, which includes 1,170 students in Turkish programs and 341 students in English programs. The sample size was determined using a widely accepted statistical formula for cross-sectional studies, ensuring a 95% confidence interval and a ±5% margin of error. Based on the total population of 1,511 pharmacy students, the minimum required sample size was calculated as 306 students, following the methodology recommended in Krejcie and Morgan's [13] table for sample size determination. To increase statistical power and account for potential non-responses or exclusions, 332 students were initially included. After performing an outlier analysis, data from 9 students were excluded, resulting in a final sample size of 323 students, which surpasses the calculated minimum. To increase the study's power, 332 students were initially included. After performing an outlier analysis, data from 9 students were excluded, leading to a final sample size of 323 students. Inclusion criteria were being a pharmacy student at Istanbul University, being fluent in Turkish, and being over 18 years old. Individuals with diagnosed psychological disorders or those following special diets were excluded from the study.

### *2.2. Research Design*

This study employed a cross-sectional design to investigate the relationships between eating attitudes, obsessive-compulsive symptoms, and orthorexia nervosa among pharmacy students. Data were collected using self-administered questionnaires distributed via Google Forms.

Subheadings above 3rd degree are not allowed. Data collection was conducted between September 2023 and February 2024. During this period, pharmacy students at Istanbul University were invited to participate in the study. Self-administered questionnaires, including ORTO-11, Maudsley Obsessive-Compulsive Inventory (MOCI), and Eating Attitude Test (EAT-40), were distributed via Google Forms, ensuring accessibility and convenience for participants.

### *2.3. Data Collection Methods*

Data were collected using three scales:

ORTO-11: The ORTO-11 scale is derived from a 10-question short scale originally developed by Bratman to identify Orthorexia Nervosa. Donini ex-

panded on Bratman's questions, modifying and adding new ones to create the ORTO-15 scale, which includes 15 questions in total [14]. Each question is evaluated using a 4-point Likert scale with the following options: "always," "often," "sometimes," and "never." Responses are scored between 1 and 4 points, with different scoring patterns for specific questions:

For questions 3, 4, 6, 7, 10, 11, 12, 14, and 15, "always" scores 1 point, "often" scores 2 points, "sometimes" scores 3 points, and "never" scores 4 points. For questions 2, 5, 8, and 9, scoring is reversed. For questions 1 and 13, "always" scores 2 points, "often" scores 4 points, "sometimes" scores 3 points, and "never" scores 1 point. The scale is divided into three subcategories:

Concerns about healthy eating: questions 1, 3, 4, 10, 11, 12, and 13

Food selection, eating attitudes, and behaviors: questions 2, 5, 8, and 9

Food selection and its value: questions 6, 7, 14, and 15

The Turkish adaptation of the ORTO-15 scale was performed by Gülcan Arusoğlu et al. During the adaptation process, some questions were removed to enhance the reliability of the scale, resulting in the ORTO-11 scale. The Cronbach's alpha coefficient for the ORTO-11 scale was calculated as 0.62 [15].

Maudsley Obsessive-Compulsive Question List (MOCI): This scale assesses various dimensions of obsessive-compulsive symptoms, including control, cleanliness, slowness, doubt, and rumination [16]. The Maudsley Obsessive-Compulsive Inventory (MOCI) was developed by Hodgson and Rachman to identify obsessive-compulsive disorders. The Turkish adaptation of the scale was performed by Neşe Erol and Işık Savaşır [17]. The original version of the scale includes 30 questions divided into four main subcategories. Cronbach's alpha coefficients for the subcategories were found to range between 0.70 and 0.80 [8]:

Checking: questions 2, 6, 8, 14, 15, 20, 22, 26, and 28

Cleaning: questions 1, 4, 5, 9, 13, 17, 19, 21, 24, 26, and 27

Slowness: questions 2, 4, 8, 16, 23, 25, and 29

Doubt: questions 3, 7, 10, 11, 12, 18, and 30

During the Turkish adaptation process, 7 additional questions and a "rumination" subcategory were added to improve the reliability of the scale. The questions are answered as either "true" or "false," and responses are scored as 1 point for true and 0 points for false. The maximum possible score on the scale is 37 points, with higher scores indicating a greater presence of obsessive-compulsive symptoms.

Eating Attitude Test (EAT-40): The Eating Attitude Test (EAT-40) was developed by Garner and Garfinkel [18] in 1979 to identify anorexia nervosa. The scale consists of 40 items in a 5-point Likert format, with response options ranging from "very often," "often," "sometimes," "rarely," to "never." To enhance clarity and precision, the option "always" was added to the response choices. The reliability and validity studies of the Turkish version were performed by Neşe Erol and Işık Savaşır [19]. The cut-off score for the scale is 30 points. Extreme responses are scored as 3 points, while other responses are scored as 2 or 1 point, depending on the severity of the response. The Cronbach's alpha coefficient for the scale was found to be 0.70, indicating acceptable reliability.

### *2.4. Data Analysis*

Data analysis was conducted using SPSS version 24.0. Initial analyses included checks for missing values and outlier detection, which led to the removal of 9 cases with z-scores outside the range of ±3. The normality of the data was assessed using the Shapiro-Wilk test and Q-Q plots. The Shapiro-Wilk test results indicated p-values greater than 0.05 for all continuous variables, suggesting that the data followed a normal distribution. Additionally, Q-Q plots were visually inspected to confirm the assumption of normality. These findings allowed for the use of parametric tests in the analysis. Descriptive statistics, including means and standard deviations, were calculated for continuous variables, while frequencies and percentages were determined for categorical variables. Pearson correlation coefficients were used to examine the relationships between eating attitudes, obsessive-compulsive symptoms, and orthorexia nervosa. Hierarchical regression analysis was employed to assess the predictive power of orthorexia nervosa and obsessive-compulsive symptoms on eating attitudes and vice versa [20].

### *2.5. Ethical Approval*

The study was approved by the Ethics Committee of Istanbul Okan University (Decision No: 17, Date:


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May 10, 2023). All participants provided informed consent, and the study adhered to the ethical principles outlined in the Declaration of Helsinki.

## 3. Results and Discussion

The distribution of sociodemographic characteristics of the individuals who participated in the study is given in Table 1. 78.3% of the participants were female and 21.7% were male. 37.8% of the participants were in 1st grade, 21.4% were in 2nd grade, 17.6% were in 3rd grade, 8% were in 4th grade, and 15.2% were in 5th grade. According to the language of education, 80.5% of the participants were studying in Turkish and 19.5% were studying in English, while 53.3% of the participants were staying with their families, 53.3% in student houses, and 30.3% in dormitories. The minimum age of the participants was 18, the maximum age was 39 and the average age was 20.62.

The evaluation of the participants' scores from the data collection tools is shown in Table 2. The mean total score of the participants on the EAT-40 was 15.84±9.59, while the mean score on the MOCI was 16.22±6.80, the mean score on the Controlling subscale was 3.37±2.14, the mean score on the Cleanliness subscale was 4.54±2.27, the mean score on the Slowness subscale was 2.46±1.68, the mean score on the Doubt subscale was 3.67±1.61, and the mean score on the Rumination subscale was 4.53±2.69. The mean score of the ORTO-11 Scale was 28.59±4.70.

Correlation Matrix of ORTO-11, MOCI, and EAT-40 Scores are shown in Table 3. According to the correlation analysis between ORTO-11, EAT-40, and MOCI scores of the individuals participating in the study, the following results were obtained: There is a negative correlation between ORTO-11 and EAT-40 ($r=-0.405$; $p<0.001$), MOCI sub-dimensions of Control ($r=-0.154$; $p<0.05$), Cleanliness ($r=-0.246$; $p<0.001$), Slowness ($r=-0.248$; $p<0.001$), Doubt ($r=-0.142$; $p<0.05$), Rumination ($r=-0.185$; $p<0.05$) and total scale score ($r=-0.258$; $p<0.001$). There is a positive correlation between EAT-40 and MOCI sub-dimensions of Control ($r=0.199$; $p<0.05$), Cleanliness ($r=0.174$; $p<0.05$), Slowness ($r=0.239$; $p<0.001$), Suspicion ($r=0.163$; $p<0.05$), Rumination ($r=0.215$; $p<0.001$) and scale total score ($r=0.264$; $p<0.001$).

Hierarchical Regression Analysis Results for Predicting EAT-40 Scores are shown in Table 4. In the first step, the predictive power of orthorexia nervosa on OCD was investigated. The results of the regression analysis showed that orthorexia nervosa was a significant predictor of OCD ($F$ (1. 321) = 6.57, $p<.05$). The contribution of orthorexia nervosa (ß =-2.896, $p<0.05$) and slowness (ß =-0.258, $p<0.05$) to the model was significant. Orthorexia nervosa in the first step explains 6.7% of the total variance. In the second step, eating attitudes were included in the model and the analysis was performed again. Accordingly, the contribution of eating attitudes (ß =0.191, $p<0.05$) to the model was found significant. This model explained 9.7% of the total variance (Table 4). When the hierarchical regression model summary was evaluated, it was concluded that eating attitudes did not contribute significantly to the explanation of OCD ($R^2$ change = 0.3%). As a result, it was decided that the discriminative power of eating attitudes was unacceptable.

Hierarchical Regression Analysis Results for Predicting MOCI Scores are shown in Table 5. In the first step, the predictive power of orthorexia nervosa on OCD was investigated. The results of the regression analysis showed that orthorexia nervosa was a significant predictor of OCD ($F$ (1. 321) = 6.57, $p<0.05$). The contribution of orthorexia nervosa (ß =-2.896, $p<0.05$) and slowness (ß =-0.258, $p<0.05$) to the model was significant. Orthorexia nervosa in the first step explains 6.7% of the total variance. In the second step, eating attitudes were included in the model and the analysis was performed again. Accordingly, the contribution of eating attitudes (ß =0.191, $p<0.05$) to the model was found significant. This model explains 9.7% of the total variance. When the hierarchical regression model summary was evaluated, it was concluded that eating attitudes did not contribute significantly to the explanation of OCD ($R^2$ change =0.3%). As a result, it was decided that the discriminative power of eating attitudes was unacceptable.

## 4. Conclusions

The objective of this study is to investigate the relationship between ON, obsessive-compulsive symptoms, and eating attitudes among pharmacy students. The findings indicated significant negative correlations between ON and both eating attitudes and obsessive-compulsive symptoms. Higher levels of orthorexic tendencies were associated with more

**Table 1:** Demographic Characteristics of Participants

| | | | n | % |
|---|---|---|---|---|
| **Sex** | Female | | 253 | 78.3 |
| | Male | | 70 | 21.7 |
| **Class** | 1 | | 122 | 37.8 |
| | 2 | | 69 | 21.4 |
| | 3 | | 57 | 17.6 |
| | 4 | | 26 | 8.0 |
| | 5 | | 49 | 15.2 |
| **Education language** | Turkish | | 260 | 80.5 |
| | English | | 63 | 19.5 |
| **Living place** | Family | | 172 | 53.3 |
| | Mate | | 53 | 16.4 |
| | Dorm | | 98 | 30.3 |
| **Age (year)** | : 20.62 | SS: 2.24 | Min: 18 | Max:39 |

**Table 2.** Distribution of Participants' Scores on ORTO-11, MOCI, and EAT-40 (Mean ± Standard Deviation, Min-Max)

| Scales | X̄±SS | Min-Max |
|---|---|---|
| Eating Attitude Test (EAT-40) | 15.84±9.59 | 2-52 |
| Maudsley Obsessional Compulsive Inventory (MOCI) | 16.22±6.80 | 2-35 |
| Controlling Subdimension | 3.37±2.14 | 0-9 |
| Cleanliness Subdimension | 4.54±2.27 | 0-10 |
| Slowness Subdimension | 2.46±1.68 | 0-7 |
| Doubt Subdimension | 3.67±1.61 | 0-7 |
| Rumination Subdimension | 4.53±2.69 | 0-9 |
| ORTO-11 Scale | 28.59±4.70 | 17-42 |

X̄: Mean; SD: Standard Deviation

disordered eating attitudes and higher levels of obsessive-compulsive symptoms.

The negative correlation between ON and disordered eating attitudes suggests that individuals with higher orthorexic tendencies are more likely to exhibit behaviors associated with eating disorders. This aligns with previous research indicating that orthorexic behaviors may overlap with disordered eating patterns commonly observed in anorexia nervosa and bulimia nervosa. This overlap may be due to shared underlying psychopathological mechanisms, such as a heightened focus on dietary control and perfection-


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**Table 3.** Correlation Matrix of ORTO-11, MOCI, and EAT-40 Scores

| Scales | | EAT-40 | MOCI | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Controlling | Cleanliness | Slowness | Doubt | Rumination | TOTAL |
| ORTO-11 | r | -0.405** | -0.154** | -0.246** | -0.248** | -0.142* | -0.185** | -0.258** |
| | p | 0.000 | 0.005 | 0.000 | 0.000 | 0.010 | 0.001 | 0.000 |
| EAT-40 | r | 1 | 0.199** | 0.174** | 0.239** | 0.163** | 0.215** | 0.264** |
| | p | | 0.000 | 0.002 | 0.000 | 0.003 | 0.000 | 0.000 |

Spearman Correlation Coefficient was used; *p<0.001; **p<0.05

**Table 4.** Hierarchical Regression Analysis Results for Predicting EAT-40 Scores

| | R | $R^2$ | TSH | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | $\Delta R^2$ | $\Delta F$ | $sd_1$ | $sd_2$ | p |
| Model 1 | 0.258 | 0.067 | 6.57 | 0.067 | 22.972 | 1 | 321 | 0.000 |
| Model 2 | 0.312 | 0.097 | 6.48 | 0.030 | 10.794 | 1 | 320 | 0.001 |

Notes. TSR = Estimated Standard Error, sd = Degrees of Freedom

**Table 5.** Hierarchical Regression Analysis Results for Predicting MOCI Scores

| | B | Standard Error | ß | t | p |
|---|---|---|---|---|---|
| **Model 1** | | | | | |
| Constant | 26.909 | 2.261 | | 11.903 | 0.000 |
| ORTO-11 | -0.374 | 0.078 | -0.258 | -4.793 | 0.000 |
| **Model 2** | | | | | |
| Constant | 21.571 | 2.757 | | 7.825 | 0.000 |
| ORTO-11 | -0.262 | 0.084 | -0.181 | -3.120 | 0.002 |
| EAT-40 | 0.135 | 0.041 | 0.191 | 3.285 | 0.001 |

ism [14,18].

Orthorexia Nervosa is characterized by an obsessive focus on healthy eating, leading to restrictive dietary practices that can negatively impact physical and mental health. The significant correlations between ON and various obsessive-compulsive symptoms support the hypothesis that ON may be a manifestation of obsessive-compulsive disorder. Individuals with ON often display behaviors such as excessive washing, checking, and a need for symmetry, which are also common in OCD. This suggests that the rigid and perfectionistic traits seen in OCD may drive the dietary restrictions and obsessive focus on food quality seen in ON [7].

Furthermore, the findings that female students had higher ON scores compared to male students are consistent with literature [21-24] indicating that women are more likely to develop eating disorders and exhibit higher levels of health-related anxiety. This gender difference may be attributed to societal

pressures and cultural norms that place a higher emphasis on physical appearance and dietary control among women [3]. Gender differences in ON prevalence can be explained through both sociocultural and psychological mechanisms. Women are often subjected to greater societal pressure regarding body image and idealized health standards, leading them to develop more restrictive dietary habits [25]. Additionally, evolutionary perspectives suggest that females may be more prone to food selectivity and dietary control due to historical roles in food preparation and childcare [26]. In contrast, men with ON tendencies often exhibit a focus on muscle-building and high-protein diets, which may stem from fitness culture and masculinity ideals [27]. This difference suggests that while women may be more vulnerable to ON due to societal and aesthetic concerns, men's ON tendencies may be driven by performance-oriented goals, such as increasing muscle mass and optimizing physical endurance. Understanding these differential risk factors is essential for developing gender-specific interventions targeting ON prevention.

These findings are consistent with previous studies that have demonstrated a link between ON and both eating disorders and OCD. For example, a study by Varga et al. reported that orthorexic tendencies were positively associated with obsessive-compulsive traits and disordered eating behaviors. They found that individuals with high levels of ON often exhibited traits such as perfectionism, rigidity, and a heightened focus on dietary control, which are also prevalent in OCD [28].

Similarly, research by McComb and Mills found that individuals with high levels of orthorexic behaviors often exhibit obsessive-compulsive characteristics. Their study highlighted that orthorexic individuals tend to display significant anxiety related to food purity and cleanliness, mirroring the compulsive behaviors seen in OCD. This reinforces the idea that ON may be best understood within the context of obsessive-compulsive spectrum disorders [4].

Moreover, the significant correlations between ON and disordered eating attitudes observed in this study are in line with findings by Dunn and Bratman, who reported that orthorexic behaviors are often accompanied by restrictive eating patterns and a preoccupation with body image. They suggested that the extreme dietary practices seen in ON could potentially lead to nutritional deficiencies and adverse health outcomes, similar to those seen in other eating disorders [29].

In addition, studies by Koven and Abry have emphasized the psychological and social consequences of ON, such as social isolation, increased stress, and a negative impact on quality of life. They argued that the obsessive focus on dietary purity could disrupt social interactions and daily functioning, further highlighting the clinical significance of addressing ON in various populations, including university students [30].

### *Strengths and Limitations*

One of the strengths of this study is the large sample size, which enhances the generalizability of the findings. Additionally, the use of validated scales such as ORTO-11, MOCI, and EAT-40 ensures the reliability and validity of the measurements. The comprehensive approach to measuring various dimensions of eating attitudes, obsessive-compulsive symptoms, and orthorexic behaviors provides a holistic understanding of the relationships among these variables.

However, several limitations should be noted. The study's cross-sectional design prevents the establishment of causality. Longitudinal studies are needed to determine whether orthorexic tendencies lead to disordered eating attitudes and obsessive-compulsive symptoms over time. Furthermore, the sample was limited to pharmacy students from a single university, which may limit the generalizability of the results to other populations. Future research should include diverse student populations from different universities and academic disciplines to enhance the external validity of the findings.

Another limitation is the reliance on self-reported data, which may be subject to social desirability bias. Participants may have underreported or overreported their symptoms and behaviors to align with perceived social norms or to present themselves in a favorable light. Using a combination of self-report measures and objective assessments could provide a more accurate picture of the prevalence and impact of ON.

### *Applications and Recommendations*

The findings of this study have several practical implications. Given the significant associations between ON, disordered eating attitudes, and obsessive-compulsive symptoms, healthcare providers


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and educators must recognize and address orthorexic behaviors among students. Interventions should focus on promoting a balanced approach to healthy eating without encouraging extreme dietary restrictions or obsessive behaviors.

Educational programs that emphasize the importance of a balanced diet and the risks associated with extreme dietary practices could help prevent the development of ON. Additionally, integrating mental health support services within academic institutions can provide students with access to resources and counseling to address obsessive-compulsive tendencies and disordered eating behaviors.

For future research, longitudinal studies are needed to establish causality and examine the long-term effects of orthorexic behaviors on mental health. Exploring the effectiveness of different interventions in reducing orthorexic tendencies and improving overall well-being is also crucial. Studies should investigate the potential benefits of cognitive-behavioral therapy, mindfulness-based interventions, and other therapeutic approaches in managing ON and related symptoms.

In summary, this study highlights significant relationships between Orthorexia Nervosa, disordered eating attitudes, and obsessive-compulsive symptoms among pharmacy students. These findings underscore the importance of recognizing and addressing orthorexic behaviors to prevent potential negative impacts on mental health. Future research should continue to explore this complex relationship and develop effective interventions to support individuals exhibiting orthorexic tendencies. The study was approved by the Ethics Committee of Istanbul Okan University (Decision No: 17, Date: May 10, 2023). All participants provided informed consent, and the study adhered to the ethical principles outlined in the Declaration of Helsinki.

## Conflict of Interest

The authors declare no conflict of interest.

## Statement of Contribution of Researchers

C.G.: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. S.A.: Writing – review & editing, Writing – original draft, Software, Methodology, Formal analysis, Supervision, Conceptualization.

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