Original Article

The relationship between orthorexia nervosa tendencies and OCD symptoms in healthcare professionals

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Abstract

Objectives: Concurrent with the recent popularity of concepts related to organic nutrition, detoxification, healthy living, and natural products of many types, there has been a rise in the incidence of orthorexia nervosa, broadly defined as an excessive preoccupation with healthy eating. This condition is frequently observed among professionals for whom physical appearance is important, as well as doctors, nurses, dieticians, and others with medical knowledge of nutrition. Obsessive-compulsive disorder may accompany orthorexia. The aim of this study was to examine the association between orthorexic tendencies and obsessive-compulsive symptoms among healthcare personnel.

Methods: The sample consisted of 183 male and female healthcare personnel aged 20–65 years who voluntarily participated in the study. A questionnaire was used to determine sociodemographic characteristics. The ORTO-15 scale was used to measure orthorexic tendencies, and the Maudsley Obsessive Compulsive Inventory (MOCI) was used to assess obsessive-compulsive symptoms.

Results: There was a statistically significant relationship between orthorexic tendencies and age, sex, a diagnosis of chronic disease, regular use of medication, and observing a specific diet ($p<0.05$). The mean ORTO-15 score was 37.56±4.42 (female: 37.18±4.36, male: 38.48±4.45). The mean MOCI score was 61.90±6.80, and there was a statistically significant correlation between these values. Analysis of the subscales and the overall score also revealed a statistically significant relationship.

Conclusion: The results revealed a statistically significant difference in orthorexic tendencies based on age and sex ($p<0.05$). No statistically significant relationship was detected in the ORTO-15 scores by body mass index values. A statistically significant difference was detected in the MOCI score according to the marital status, sex, and education variables ($p<0.01$). There was also a statistically significant difference seen in the evaluation of the ORTO-15 score and the MOCI score. The findings indicated an association between orthorexic tendencies and obsessive-compulsive symptoms.

Keywords: Compulsive; healthcare personnel; obsessive; orthorexia nervosa.

Dietary habits vary according to numerous biological, psychological, and sociocultural factors.[1] Adequate nutrition is very important to prevent and treat disease and to maintain good health.[2] Many people adopt specific eating practices as part of an effort to improve their health, and it typically has a positive effect on quality of life.[3] Healthy eating habits are not pathological. However, a focus on diet can become a disorder that includes personality and behavioral dimensions when it becomes an obsession that negatively affects daily life.[4]

Encouraging a healthy diet has been an important factor in efforts to promote general health. Food items are now often labeled as natural and without artificial ingredients or preservatives, and markets that sell natural foods have become common. Media reports now often discuss the benefits of some foods as a means to help prevent cancer and other disease, as well as the risks to the food chain presented by environmental pollution and other concerns. Healthy eating is desirable behavior, however, if it becomes an eating disorder or is as-

What is presently known on this subject?

- Healthy and balanced nutrition has an important role in efforts to improve general health. Eating disorders are known to affect physical and mental health. Orthorexia nervosa is most often seen in professionals who have significant knowledge of nutrition (doctor, nurse, dietitian, etc.) and individuals for whom physical appearance is particularly important (athlete, model, dancer, etc.). Obsessive compulsive behaviors interfere with daily activity and can also have substantial physical and mental health effects. The two conditions may appear together.

What does this article add to the existing knowledge?

- Research examining the relationship between the eating disorder of orthorexia and obsessive-compulsive disorder is limited. This study contributes to the current body of knowledge and may help to define diagnostic criteria and categorization in the Diagnostic and Statistical Manual of Mental Disorders.

What are the implications for practice?

- Greater understanding of orthorexia and the development of diagnostic criteria, as well as the association with obsessive-compulsive symptoms will be valuable to efforts to recognize and treat this disorder. The occurrence among healthcare personnel could have a significant impact on patient care.

sociated with obsessive-compulsive tendencies, it may have severe consequences, such as malnutrition, weight loss, and disruption of social relationships.[5,6] The role of the media is significant and can contribute to anxiety and well-intentioned but rigid or even misinformed diet practices.[7]

Eating disorders have both physical and psychosocial dimensions, and include disruptions in an individual's beliefs related to their eating habits, body weight, physical appearance, and their eating behaviors.[8] The most common eating disorders are anorexia nervosa and bulimia nervosa. Other eating disorders that have been classified as psychiatric disorders include pica, which refers to eating non-nutritive items, and rumination disorder, which involves regurgitating recently eaten food and then either reswallowing it or spitting it out. Research is ongoing to further define and understand atypical eating behaviors.

Dr. Steven Bratman is credited with naming the eating disorder of orthorexia nervosa in 1997, using a combination of the Greek words "ortho" (correct) and "orexis" (hunger, appetite).[9] Orthorexia is characterized by obsessive thoughts regarding food, self-punishment through fasting or excessive exercising, and restrictive eating behaviors. The obsessive thoughts of an individual with orthorexia are related to the quality of food, rather than quantity. Diet plays an outsized role in their self-esteem and becomes an unhealthy focus of life.[4,10,11] While recognition and understanding of orthorexia is increasing, it is not yet represented as a specific category in the Diagnostic and Statistical Manual of Mental Disorders, Fifth edition (DSM-V), but rather within a larger category of food intake disorders.

The growing interest in organic and natural products, detoxification, and other forms of clean and healthy living has been associated with an increase in orthorexia.[12] It is frequently observed among performing artists, athletes, flight attendants, and others for whom physical appearance and body image are important, as well those with medical knowledge of nutri-

tion, such as doctors, nurses, and dieticians. Individuals with orthorexia typically obsessively abstain from eating foods that contain genetically modified organisms (GMOs), packaged products, and foods with trans fats, and excessive amounts of salt or sugar, and so on.[13] Orthorexic individuals will often examine the ingredient labels of products and obsessively ponder about whether they contain carcinogenic materials, hormones, dyes, additives, and other unwanted elements. They frequently prefer to consume many types of food raw and will avoid many items. These habits and the psychological pressure created can lead to weight loss and poor nutrition, as in anorexia nervosa.[14]

The rules established around food become a ritual and can lead to inflexible behavior and substantial precautions to protect their self-care.[15] For example, they often avoid eating in restaurants, since they do not know under what conditions the food is prepared. Social isolation may develop due to their beliefs about which foods are acceptable and an inclination to talk about the subject extensively.[16] They may choose to withdraw and eat alone, as relationships can become a source of concern or anxiety as they may worry others will exert pressure on them to make them eat and prevent them from vomiting. Orthorexic individuals may also impose rigid diets on family members, which may lead to health problems as well as other difficulties. Nutrition has a crucial role in treatment of hospitalized patients. Therefore, if healthcare personnel display orthorexic tendencies, it could have a negative effect on patient recovery.

In obsessive-compulsive disorder, unwanted and recurrent ideas, impulses, and sensations, or obsessions, create an irrepressible, compulsive urge to repeatedly perform certain behaviors as a reaction to the obsession and to relieve anxiety.[17] Obsessive tendencies may be observed in cases of orthorexia. Symptoms may include recurrent and intrusive thoughts about food and health occurring at inappropriate times, deep concerns about contamination and cleanliness, and ritualized behavior when preparing or eating food. The most important distinction between orthorexia and obsessive-compulsive disorder (OCD) is that the obsessions in orthorexia are ego-syntonic, rather than ego-dystonic.[18] Depression, OCD, substance use disorders, and personality disorders frequently accompany eating disorders.[6,19–21]

Though often observed, orthorexia has been largely neglected by scientific research.[3] Orthorexia nervosa should be classified as a new eating disorder or at least a new neuropsychiatric disorder.[22] Recent attention has led to more studies to determine diagnostic criteria and better understand the disorder. The first criteria for orthorexia nervosa were published in 2015 by Moroze.[23] Dunn and Bratman[11] later proposed updating some of the criteria based on the views of specialists from various countries. Healthcare personnel were the subject of this study. The current research is limited and the potential impact on society is important. New studies provide additional information that can help to clarify the criteria.

Secondary objectives of the present research were to determine the rate of orthorexia nervosa in health workers, determine the age and gender groups in which orthorexia is more common, determine the relationship between orthorexia and obsessive-compulsive symptoms, and to consider treatment applications. Medical personnel, especially psychiatric nurses, should be knowledgeable about orthorexia nervosa.

Materials and Method

Type of Research

This was a descriptive, comparative study. The research population consisted of 915 individuals who are doctors, nurses, midwives, medical officers, and medical technicians working Muğla at Sıtkı Koçman Research and Training Hospital in Muğla, Turkey. The sample was selected using the stratified random sampling method. The study group comprised 183 male and female healthcare personnel aged 20–65 years who voluntarily participated in the study.

Data Collection Tools

Personal Data Form

Details of the participants' age, sex, marital status, number of children, height, weight, job title, department of employment, educational level, presence of a diagnosed disease, regular use of medication, and observance of a regular diet, as well as body mass index (BMI) were collected as descriptive characteristics.

Maudsley Obsessive-Compulsive Inventory

The Maudsley Obsessive-Compulsive Inventory (MOCI) was administered to measure obsessive-compulsive symptoms. The Turkish version of the scale is a 37-item true/false questionnaire. Every item is scored 1 point if true, except the 11th item, which is scored 1 if false. The validity and reliability study of this scale was performed by Erol and Savaşır.[24] They identified 3 factors as subscales: cleanliness/meticulousness, obsessive thinking, and checking/slowness. The alpha coefficient for these factors was 0.61, 0.66, and 0.65, respectively. The maximum total subscale score is 37 for obsession, 16 for checking/slowness, and 11 for cleanliness. A score of 11 or less indicates a low probability of obsessive-compulsive symptoms, a score of 13–17 suggests a possible diagnosis of OCD, while a score of 18 or more signifies that an obsessive-compulsive diagnosis is a high probability. There are 14 items related to checking and slowness (2, 4, 6, 8, 14, 15, 16, 20, 22, 23, 25, 26, 28, and 29), 11 items related to cleaning (1, 4, 5, 9, 13, 17, 19, 21, 24, 26, and 27), and 16 items related to obsession (2, 3, 7, 8, 10, 11, 12, 18, 30, 31, 32, 33, 34, 35, 36, and 37).

ORTO-15 Healthy Eating Obsession Test

The ORTO-15 scale created by Donini et al.[4] is an adaptation of the initial questionnaire designed to detect orthorexia developed by Bratman. The ORTO-15 is a commonly used self-assessment tool with 15 items using a 4-point Likert-type scale (always, often, sometimes, never). Low scores reflect healthy eating behavior. Some items pertain to the cognitive domain (1, 5, 6, 11, 12, and 14), some the clinical domain (3, 7, 8, 9, and 15), and some the emotional domain (2, 4, 10, and 13). A validity and reliability test of the Turkish version was performed by Arusoğlu.[16]

Body Mass Index

The BMI, or the ratio of body weight to the square of height, is the most practical method of assessing body weight. The BMI of the study participants was measured and recorded using the standard formula of BMI (kg/m^2) = BW (kg)/Height^2 (m) and classification: ≤18.5: underweight, 18.5–24.9: normal, 25.0–29.9: overweight; and ≥30.0: obese.

Data Collection Process

The participants were informed about the study and provided written, informed consent. One researcher was responsible for collecting the data. The personal data form was completed by the participants, the researcher calculated the BMI, and then the ORTO-15, and MOCI were completed in a face-to-face interview. Contact information was provided for respondents to provide feedback or receive assistance.

Data Analysis

The data obtained from the questionnaire forms were assessed with IBM SPSS Statistics for Windows, Version 22.0 software (IBM Corp., Armonk, NY, USA). A single-sample t-test was used to determine the difference between pair-group means and one-way analysis of variance was used to assess the presence of a difference between multiple group means for the data that showed a normal distribution. The Mann-Whitney U test was used for pairwise comparisons and the Kruskal-Wallis Test was for multiple comparisons of data that did not demonstrate normal distribution. The frequency and percentage, as well as mean±SD or median (minimum-maximum) values were used as descriptive statistics. The Tukey honestly significant difference test was used for post hoc analysis in order to identify differences between groups. The association between the variables of obsessive-compulsive disorder and orthorexia nervosa was investigated using the Pearson correlation coefficient. The values of $p < 0.05$ and $p < 0.01$ were used as levels of statistical significance.

Ethical Considerations

The study was carried out between August 26 and December 26, 2018 in accordance with the Helsinki Declaration and with the approval of the Human Research Ethics Committee of Muğla Sıtkı Koçman University (date: June 26, 2018; no. 180125/106) and the permission of Muğla Sıtkı Koçman Research and Training Hospital (no. 52777206-431.05.03).

Results

Of the study participants, 35.3% were aged 31–40 years, 70.1% were female, 77.7% were married, and 41.8% had 2 children. It was determined that 38.6% had a bachelor's degree and 25.5% had an associate degree, 47.8% were nurses and 25% were doctors, 49.5% worked in the surgical unit and

Table 1. Distribution of descriptive characteristics (n=183)		
	n	%
Age (years)		
20-30	44	23.9
31-40	65	35.3
41-50	61	33.2
≥51	13	7.1
Sex		
Female	129	70.1
Male	54	29.3
Marital status		
Married	143	77.7
Single	40	21.7
Number of children		
None	60	32.6
1	37	20.1
2	77	41.8
3	8	4.3
4	1	0.5
Education level		
High school	3	1.6
Associate degree	47	25.5
Undergraduate	71	38.6
Graduate	14	7.6
Doctorate	48	26.1
Occupation		
Doctor	46	25.0
Nurse	88	47.8
Midwife	22	12.0
Medical officer	10	5.4
Medical technician	17	9.2
Do you have a diagnosed disease?		
Yes	72	39.1
No	111	60.3
Do you regularly take medication?		
Yes	55	29.9
No	128	69.6
Do you follow a diet?		
Yes	14	7.6
No	169	91.8
Do you take vitamin supplements?		
Yes	16	8.7
No	104	56.5
Sometimes	63	34.2

27.7% worked in other units (Table 1). The height of 41.3% of the participants was 161–170 cm and the weight of 26.6% was 61–70 kg. The responses indicated that 21.2% wanted to weigh 54–59 kg, 39.1% had a diagnosed disease, 29.9% regularly took medication, 7.6% maintained a particular diet, and 8.7% took vitamin supplements. The results also revealed that 68.5% of the participants used mass media tools to access information on nutrition, while 57.1% used books and scientific publications, and 5.4% replied that information about proper nutrition never influenced their eating habits, 52.2% responded that it rarely affected their choices, and 12.5% said that it always led to a behavioral change.

Table 2 demonstrates descriptive characteristics of the ORTO-15 and the MOCI. Analysis of the correlation with the ORTO-15 revealed that sex was a significant variable (1.30±0.457) as was the presence of a diagnosed disease (1.61±0.49) ($p<0.05$). Similarly, the MOCI analysis also indicated that sex was a significant variable ($p=0.004$), as was marital status ($p=0.022$), and education ($p=0.008$) (all $p<0.05$).

Table 3 illustrates the ORTO-15 score distribution according to sex. The mean ORTO-15 score of the study group was 37.56±4.42: 37.18±4.36 among females and 38.48±4.45 among males, which was statistically significant ($p<0.05$). The score distribution by age revealed that the mean for participants aged 31–40 years was 38.43±3.972 and 36.57±4.402 for those 41–50 years. The mean MOCI score was 61.90±6.80: 61.05±6.79 among females and 63.91±6.43 among males, which was statistically significant ($p<0.05$). The mean score was 62.49±6.65 for married respondents and 59.78±6.95 for single participants.

Pearson correlation analysis to determine the association between the MOCI and the ORTO-15 yielded values of $r=0.743$ and $p=0.024$, which demonstrated a statistically significant relationship ($p<0.05$) (Table 4). Examination of the ORTO-15 subscales indicated that the mean score for the cognitive domain was 13.39±1.96, while it was 14.83±2.0 for the clinical domain, and 9.33±2.13 for the emotional domain, which were statistically very significant ($p<0.01$). The MOCI subscale score analysis showed that the mean was 26.50±2.74 for the obsessive domain, 17.39±2.27 for the cleaning domain, and 11.17±1.76 for the checking/slowness domain, and these values were also statistically very significant ($p<0.01$).

Discussion

Studies have indicated that groups who often have a greater awareness of healthy nutrition, such as medical school students, doctors, and dieticians, as well as performing artists and others for whom body image is important, are at risk for orthorexia nervosa.[25] This study was carried out in order to determine the association between orthorexia nervosa tendencies and obsessive-compulsive symptoms among healthcare professionals.

Table 2. ORTO-15 and Maudsley Obsessive-Compulsive Inventory scores

	N	Mean±SD	p	Significance level	
Total ORTO-15 scores and significant binary variables					
Age	183	1.30±0.457	.000		
Diagnosed disease	183	1.61±0.49	.000		
Regular medication	183	1.70±0.46	.000	p<0.05	
Follows a diet	183	1.92±0.267	.000		
One-sample t-test.					
Total MOCI scores and significant descriptive characteristics					
Sex	183	1.30±0.457	.004		Z=-2.848
Marital status	183	1.22±0.414	.022	p<0.05	Z=-2.294
Education level	183	3.31±1.166	.008		KW=4
Books/scientific publications as information source	183	1.43±0.496	.038		Z=-2.070

KW: Kruskal-Wallis test; Z: Mann-Whitney U test. MOCI: Maudsley Obsessive-Compulsive Inventory; SD: Standard deviation.

Table 3. ORTO-15 scores by sex and age

	N	%	Mean±SD		Significance level
ORTO-15	183	100	37.56±4.42	<0.05	
Sex					
Female	129	70.1	37.18±4.36	.000	
Male	54	29.3	38.48±4.45	.000	
Age (years)					
20–30	44	23.9	37.86±4.391	F=4.04	
31–40	65	35.3	38.43±3.972	p=0.004	p<0.05
41–50	61	33.2	36.57±4.402		
≥51	13	7.1	36.85±6.012		
One-way analysis of variance.					
MOCI scores by sex and marital status					
MOCI	183	100	61.90±6.80		
Sex				.004	
Female	129	70.1	61.05±6.79		p<0.05
Male	54	29.3	63.91±6.43		
Marital status					
Married	143	77.7	62.49±6.65		
Single	40	22.3	59.78±6.95		

T-test. MOCI: Maudsley Obsessive-Compulsive Inventory; SD: Standard deviation.

In this study, female participants demonstrated more orthorexic tendencies than males (p=0.05). Another study reported that the orthorexia tendency was 2.5 times higher in females than males.[26] It has also been observed that eating disorders are generally seen more often among females, females tend to make healthier food choices, and they demonstrate greater attentiveness to diet.[27] In addition to Donini et al.,[4] Fidan et al.,[6] Dalmaz and Tekdemir Yurtdaş,[17] and Segura-Garcia et al.[9] have also reported that females exhibited a greater orthorexic tendency. Yeşil et al.[28] found that 71.4% of individuals who showed orthorexic tendencies were female and noted a statistically significant difference between sex and orthorexic tendencies.

Our results demonstrated a statistically significant difference between orthorexia nervosa tendencies and the age variable. Though Arusoğlu et al.[5] did not find a relationship to age, Fidan et al.[6] reported a negative correlation between the ORTO-15 score and age, and observed that age might increase orthorexic tendencies. Ergin[8] had similar findings and detected a correlation between the ORTO-15 score and age (p<0.05).

Table 4. Association between the ORTO-15 scale and the MOCI

Scales	Mean±SD	Minimum	Maximum		Significance level
ORTO-15	37.56±4.42	27.00	48.00	r=0.743	
MOCI	61.90±6.80	41.00	73.00	p=.024	p<0.05
Pearson correlation analysis.					
ORTO-15 total score and subscale correlation					
ORTO-15	37.56±4.42	27.00	48.00	.000	
Cognitive	13.39±1.96	9.00	18.00	.000	
Clinical	14.83±2.0	10.00	19.00	.000	p<0.01
Emotional	9.33±2.13	5.00	14.00	.000	
MOCI total score and subscale correlation					
MOCI	61.90±6.80	41.00	73.00	.000	
Obsession	26.50±2.74	18.00	30.00	.000	
Cleaning	17.39±2.27	12.00	22.00	.000	p<0.01
Checking/slowness	11.17±1.76	7.00	20.00	.000	
MOCI: Maudsley Obsessive-Compulsive Inventory.					

In our study, the difference between the age variable and the ORTO-15 scale was statistically significant and advanced statistical analysis revealed that the difference emerged in the 31–40 and ≥51 age groups (p<0.05). It may be noteworthy that 70.1% of the participants in 31–40 age group were females and most of them were mothers, which may contribute to concerns about consumption of food with GMOs and a preference for organic products. A higher orthorexic tendency among older participants may be related to the presence of a chronic disease. Diet programs followed to protect health may also have affected the outcome.

The total mean score of the ORTO-15 scale in our study group was 37.56±4.42. Duran[18] reported a total mean score of 35.7±3.8 and the level of orthorexic tendency was statistically significant, which is consistent with the results of our research.

Obsessive-compulsive symptoms and orthorexic tendencies were identified among healthcare personnel in this study. A significant association was detected between the ORTO-15 scale and the MOCI (p<0.05). Karayılan and Erol[7] observed that obsessive and perfectionist personality traits might bring about a tendency toward the development of OCD and eating disorders, and that the existence of obsessive-compulsive symptoms might be a risk factor for eating disorders. Tatarlar Ercen[12] studied a student population and found a statistically highly significant result between the ORTO-11 and the MOCI (p<0.01). The author concluded that the prevalence of obsessive-compulsive symptoms increased as the orthorexic tendency intensified.

Gezer and Kabaran[29] concluded in their study of 106 female students in a university department of nutrition and dietetics, that as eating behavior disorder risk increased, orthorexia and obsessive-compulsive disorder risk decreased significantly. In addition, the increase of orthorexia nervosa risk was related to increased obsessive-compulsive behavior risk and decreased eating behavior disorder risk. Yıldırım[30] examined the association between obsessive-compulsive disorder and orthorexia nervosa and determined that the regression analysis was statistically significant and that there was high interscale correlation.

Examination of the subscales of the ORTO-15 scale used to measure the orthorexia nervosa tendency revealed a mean score of 13.39±1.96 on the cognitive subscale, 14.83±2.0 on the clinical subscale, and 9.33±2.13 on the emotional subscale. Pearson correlation analysis indicated that the correlations between the general scale and the subscales and among the subscales were statistically very significant (p<0.01).

Analysis of the 3 subscales of the MOCI used to detect obsessive-compulsive symptoms revealed a mean score of 26.50±2.74 for the obsession domain, 17.39±2.27 for the cleaning domain, and 11.17±1.76 for checking/slowness. Correlation analysis determined that there was a statistically very significant association between the scale and the subscales as well as interscale correlation (p<0.01). Individuals who are careful about their diet may be more observant of normative cleanliness rules, which may increase the tendency towards obsessive symptoms. Our results suggest that an increased risk of orthorexia nervosa can be associated with obsessive-compulsive symptoms.

Limitations

This was a single-center study with a relatively small study group limited to healthcare personnel.

Conclusion

This study adds to the limited current knowledge of orthorexia nervosa. We believe that this research offers a meaningful

contribution to the field of mental health. Greater awareness may help to prevent and identify potential difficulty. Early detection and treatment of possible psychiatric conditions, particularly among healthcare personnel, can have a considerable impact.

These issues are receiving greater attention with increased production of food with GMOs and other developments that have led to growing public concern about healthy living. The relevant institutions and organizations should investigate and regulate activity appropriately to provide public confidence and reduce anxiety. Furthermore, multidisciplinary education should be offered to explain and promote a balanced diet and healthy eating habits.

The families of those showing orthorexic tendencies should also be encouraged to complete the ORTO-15 and the necessary psychological support should be made available. Among healthcare personnel, orthorexia could have a significant impact on patient care, and therefore requires proper attention. Behavioral psychotherapy programs have proven to be beneficial in the treatment of eating disorders. The authors recommend that anonymized interim and final reports should be sent to institutions and organizations with personnel who demonstrate a risk of disorder to make them aware that steps should be taken.

More extensive studies of orthorexia nervosa are needed and should also include groups such as teachers, fitness trainers, and athletes as well as examination of the epidemiology. The findings will add to the available literature and aid in the clarification of diagnostic criteria and DSM classification. Prevention and early detection can help to reduce the growing prevalence of orthorexic tendencies.

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