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Detection of Orthorexia Nervosa with the Turkish Version of ONI in Dietitians: A Pilot Study

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ABSTRACT

Objective: Orthorexia Nervosa (ON) is defined pathological condition in which righteous eating obsession. It is known that dietitians may be trend to ON in developing healthy eating habits as a result of nutrition education and dietetic practices. This study aimed to determine ON tendency and eating attitude with the Orthorexia Nervosa Inventory (ONI), which includes all diagnostic criteria, in dietitians in the risk group for ON. **Materials and Methods:** This cross-sectional study was carried out in December 2022 and February 2023 among 206 dietitians in Turkey. Participants completed questionnaire related to individual characteristics, ONI, and Eating Attitude Test-26 (EAT-26). **Results:** The mean score of ONI in dietitians was 37.5±9.7. The total score of ONI and the median value of all ONI sub-dimensions were statistically significantly higher in dietitians with abnormal eating behavior. There is a positive moderate relationship between the total score of EAT-26 and the total score of ONI ($r=0.502$, $p<0.01$). The total score of EAT-26 is positively correlated with ONI sub-dimensions and total score of ONI. On the other hand, this study does not support nutritional education's concerns that increased preoccupation with healthy eating may lead to disordered eating patterns. **Conclusion:** More longitudinal, prospective studies are needed to assess whether ON and eating disorders progress in dietitians. These studies are very important because dietitians also provide counseling to other people in the field of nutrition and affect their nutrition programs.

Keywords: Orthorexia nervosa, Eating disorders, Eating attitude, Dietetians, Nutritionists

Diyetisyenlerde ONE'nin Türkçe Versiyonu ile Ortoreksiya Nervoza Tespiti: Pilot Bir Çalışma

ÖZ

Amaç: Ortoreksiya Nervoza (ON), sağlıklı yeme takıntısının olduğu patolojik bir durumdur. Diyetisyenlerin beslenme eğitimi ve diyetetik uygulamaları sonucunda sağlıklı beslenme alışkanlığı geliştirmede ON'a yönelebilecekleri bilinmektedir. Bu çalışma, ON için risk grubunda yer alan diyetisyenlerde tüm tanı ölçütlerini içeren Ortoreksiya Nervoza Envanteri (ONE) ile ON eğilimi ve yeme tutumunu belirlemeyi amaçlamıştır. **Gereç ve Yöntem:** Bu kesitsel çalışma, Aralık 2022 ve Şubat 2023 tarihlerinde Türkiye'deki 206 diyetisyen arasında gerçekleştirilmiştir. Katılımcılar; demografik özellikler, ONE ve Yeme Tutum Testi-26 (YTT-26) ile ilgili anketi doldurmuştur. **Bulgular:** Diyetisyenlerde ortalama ONE skoru 37.5±9.7 puandır. Anormal yeme davranışı olan diyetisyenlerde, ONE total puanı ve ONE alt boyutlarının medyan değeri istatistiksel olarak anlamlı derecede yüksektir. YTT-26 total puanı ile ONE total puanı arasında pozitif yönde orta düzeyde bir ilişki vardır ($r=0.502$, $p<0.01$). YTT-26 total puanı da ONE puanı ve ONE alt boyutları ile pozitif yönde ilişkilidir. Öte yandan, bu çalışma, beslenme eğitiminin sağlıklı beslenme ile artan meşguliyetin düzensiz yeme modellerine yol açabileceği yönündeki endişelerini desteklememektedir. **Sonuç:** Diyetisyenlerde ON ve yeme bozukluklarının ilerleyip ilerlemediğini değerlendirmek için ileriye dönük boylamsal çalışmalara ihtiyaç vardır. Diyetisyenler, insanlara beslenme alanında danışmanlık verdiği ve onların beslenme programlarını etkilediği için bu çalışmalar oldukça önemlidir.

Anahtar Kelimeler: Ortoreksiya nervoza, Yeme bozuklukları, Yeme tutumu, Diyetisyen, Beslenme uzmanı

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INTRODUCTION

Orthorexia nervosa (ON) was first described by Dr. Steven Bratman in 1997 as a pathological condition associated with strict adherence to righteous eating (Bratman, 1997). Individuals with ON prefer pure foods by removing food additives, colorants, excess fat, salt, and genetically modified foods from their diets (Koven & Abry, 2015; Sánchez & Rial, 2005). These individuals spend a lot of time planning, purchasing, and preparing menus using pure foods. They also avoid eating outside and with other people. Their constant preoccupation with their diet causes nutritional problems such as malnutrition and excessive weight loss (Oberle et al., 2017) and psychiatric disorders (Dunn & Bratman, 2016; Strahler et al., 2018).

Orthorexia nervosa has always been the subject of research since its definition. The diagnostic criteria and basic mechanisms are still controversial. There is no consensus among researchers on whether ON is an eating disorder or a type of obsessive-compulsive spectrum disorder (Kummer et al., 2008). Currently, ON is not included in the International Classification of Diseases (ICD-10) and the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5) (Hyrnik et al., 2016). However, four consensus diagnostic criteria for ON have been proposed by some researchers in the latest research (Barthels et al., 2015; Dunn & Bratman, 2016; Moroze et al., 2015). The first criterion involves focusing on concerns about the quality and composition of meals. The second criterion includes impairments in physical, social, academic, occupational, and/or other areas of life due to obsessive preoccupations. The third criterion consists of the occurrence of this disorder independent of the worsening of symptoms of any psychotic disorder. The fourth criterion includes that this obsessive behavior is not related to religious beliefs or diagnosed food allergies or diseases requiring a special diet (Moroze et al., 2015). Various tools are available to assess ON, but the most widely used in the literature is ORTO-15 (Cena et al., 2019; Dunn & Bratman, 2016). The Bratman Orthorexia Test, the Duesseldorf Orthorexia Scale, and the Eating Habits Questionnaire are other scales developed to measure ON. None of these scales have an item evaluating the physical deterioration criteria. Considering all these criteria, Oberle et al. (2020) developed the Orthorexia Nervosa Inventory (ONI). Epidemiological studies for ON report a 6-89% prevalence due to these questionable tools (Dunn & Bratman, 2016). It has been determined that there is a higher tendency to ON in adolescents (Gkiouleka et al., 2022), individuals who do regular exercise (Malmborg et al., 2017), nutrition and dietetics department students, or dietitians (Abdullah, Al Hourani, & Alkhatib, 2020) compared to the general population. The tendency of dietitians to be high is due to the fact that they may feel pressure to develop healthy eating habits as a result of the nutrition education and dietetic practices they receive. And it has been reported that the ideology of thinness can lead to eating disorders such as the obsession with healthy eating (Mahn & Lordly, 2015). The high reporting rate of ON among dietitians may cause problems in the future as they counsel others on nutrition.

In this study, it was aimed to determine ON tendency and eating attitude with the ONI, which includes all diagnostic criteria, in dietitians in the risk group for ON.

MATERIALS AND METHODS

Study type

This cross-sectional study was conducted on dietitians living in Turkey between December 2022 and February 2023.

Study group

Participants were invited to the study via the Turkish Dietitians Association mail group and social media groups for dietitians (WhatsApp, Instagram). Data from dietitians who accepted the study was collected through an online questionnaire created in Google Docs. Individuals who received at least four years of undergraduate education in nutrition and dietetics and could read and understand Turkish were included in the study. Pregnant and lactating women and individuals with any chronic disease (such as psychiatric diseases) diagnosed by a doctor were excluded from the study. A written consent form about the study was sent to the individuals, and their voluntary consent was obtained electronically. No compensation was provided for dietitians who completed the questionnaire. Open-ended questions were asked to validate that the answers were given by different dieticians.

Dependent and independent variables

The dependent variable of this research is the orthorexia nervosa tendency. The independent variables are gender, marital status, Body Mass Index (BMI), educational status, eating attitude, and skipping meals.

Procedures

Participants were asked to fill out a questionnaire for their sociodemographic characteristics and anthropometric measurements, and to complete the ONI, and Eating Attitude Test-26 (EAT-26). BMI was calculated with the formula body weight (kg)/height^2 (m^2) using body weight (kg) and height (m) data (WHO, 2010).

Orthorexia Nervosa Inventory (ONI)

Including four consensus diagnostic criteria by researchers, Oberle et al. (2020) developed a 24-item Orthorexia Nervosa Inventory (ONI). The Turkish validation of the ONI was carried out by Kaya et al. (2021). The scale consists of three sub-dimensions: “behaviors”, “impairments”, and “emotions” and is a 4-point Likert type. As the scale score increases, the tendency for ON also increases. The Cronbach alpha coefficient for this study was determined to be 0.918.

Eating Attitude Test-26

The Eating Attitude Test, consisting of 40 items, was developed by Garfinkel and Garner (1979) to determine eating attitude. Later, a short form of 26 items was developed by Garner et al., (1982) for the psychometric properties and practical use of the scale. It was adapted into Turkish by Ergüney-Okumuş and Sertel-Berk (2020). The scale is a six-point Likert type. A total score of 20 or above indicates deterioration in eating attitudes. The scale has three sub-dimensions (Preoccupation with eating, Restriction, and Social Pressure) and is a 6-point Likert type. The Cronbach alpha coefficient for this study was determined to be 0.913.

Statistical analysis

The Kolmogorov-Smirnov test is used to determine whether continuous data follow a normal distribution. Normal continuous data are reported as mean and standard deviation (SD); abnormal continuous data are reported as median (minimum, maximum). Categorical data are expressed as numbers (n) and percentages (%). The Mann-Whitney U test was performed between two nonparametric groups, and the Kruskal-Wallis test was performed between multiple groups. Pearson correlation was used to assess the association between variables. $p<0.05$ was considered statistically significant. Statistical analysis was performed using SPSS version 26 (IBM Corp., 2019).

Ethical considerations

In the conduct of this study, the principles of the guidelines in the Declaration of Helsinki. The Ondokuz Mayıs University Clinical Research Ethics Committee approved all procedures (Approved no: B.30.2.ODM.0.20.08/750).

RESULTS

A total of 206 individuals, 196 women (95.1%) and 10 men (4.9%), aged between 20 and 58 years, participated in this study. The distribution of descriptive characteristics among individuals is given in Table 1.

The total score of ONI and the median value of all ONI sub-dimensions were statistically significantly higher in individuals with abnormal eating behavior (Table 2).

Table 1. Sociodemographic characteristics of the sample

Variables	**n (%) or mean±SD**
Age (years)	26.2±6.6
Gender	
Male	10(4.9)
Female	196(95.1)
Marital status	
Single	170(82.5)
Married	36(17.5)
Education	
Bachelor's degree	138(67.0)
Master's/doctorate degree	68(33.0)
Smoking status	
Yes	20(9.7)
No	186(90.3)
BMI (kg/m^2)	21.5±2.6
Underweight (<18.5)	13(6.3)
Normal (18.5-24.9)	171(83.0)
Overweight (≥25.0)	22(10.7)
Physical activity status	
Inactive or insufciently active	56(27.2)
Lightly active	107(51.9)
Moderate active	40(19.4)
Highly active	3(1.5)
ONI	37.5±9.7
EAT-26 [median(min-max)]	7(0-64)

BMI: Body Mass Index, ONI: Orthorexia Nervosa Inventory, EAT-26: Eating Attitude Test-26

Table 2. Distribution of orthorexia nervosa inventory scores by eating attitude disorder

Variables	Normal eating behavior [median(min-max)]	Abnormal eating behavior [median(min-max)]	p
ONI (Total)	34(24.70)	48(31.71)	**< 0.001***
ONI Behaviors	16(9.29)	20(14.30)	**< 0.001***
ONI Impairments	10(10.29)	15(10.30)	**< 0.001***
ONI Emotions	7(5.17)	11(5.19)	**< 0.001***

*p<0.05, ONI: Orthorexia Nervosa Inventory, The distribution of the data is given as the median (minimum, maximum).

Eating attitude and ONI scores of individuals are similar according to gender, marital status, education level, smoking, and BMI (p>0.05) (Table 3). The EAT-26 median value scores of individuals who skipped breakfast and dinner were found to be higher than those who did not skip the median value (p<0.05).

Table 3. The Relationship of individuals' descriptive characteristics, BMI, and meal skipping status with EAT-26 and ONI

Variables	ONI (Total) [median(min-max)]	p	EAT-26 (Total) [median(min-max)]	p
Gender		0.616		0.853
Male	39(24.68)		8.5(3.14)	
Female	35(24.71)		7(0.64)	
Marital status		0.676		0.876
Single	35(24.71)		7(0.64)	
Married	35(24.68)		7(1.40)	
Education level		0.621		0.653
Bachelor's degree	35(24.71)		7(0.64)	
Master's/doctorate degree	35(24.70)		7(1.37)	
BMI		0.618		0.592
Underweight	33(25.48)		8(1.25)	
Normal	35(24.71)		7(0.64)	
Overweight	36.5(24.70)		10(1.37)	
Skipping breakfast		0.581		**0.036***
Yes	34(28.71)		10(2.64)	
No	35(24.70)		7(0.62)	
Skipping lunch		0.835		0.564
Yes	36(24.68)		8(0.57)	
No	35(24.71)		7(0.64)	
Skipping dinner		0.180		**0.032***
Yes	40(32.49)		25(1.64)	
No	35(24.71)		7(0.62)	
Skipping snacks		0.618		0.431
Yes	35(24.71)		7(0.40)	
No	35(24.70)		7(0.64)	

*p<0.05, BMI: Body Mass Index, ONI: Orthorexia Nervosa Inventory, EAT-26: Eating Attitude Test-26

There is a moderate positive relationship between the EAT-26 and the ONI (r=0.502, p<0.01) (Table 4). The total score of EAT-26 is positively correlated with ONI sub-dimensions and the total score of ONI. In addition, the total score of ONI is positively correlated with EAT-26 sub-dimensions. In this study, no relationship was found between BMI and scores of the EAT-26 and the ONI.

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Table 4. The relationship between ONI and EAT-2

	EAT-26	EAT-1	EAT-2	EAT-3	ONI-1	ONI-2	ONI-3
ONI	0.502**	0.459**	0.533**	0.237**			
EAT-26					0.404**	0.449**	0.467**
EAT-1					0.308**	0.414**	0.520**
EAT-2					0.536**	0.408**	0.416**
EAT-3					0.202**	0.257**	0.141*

*p<0.05, **p<0.01, ONI: Orthorexia Nervosa Inventory, ONI-1: ONI Behaviors sub-dimension, ONI-2: ONI Impairments sub-dimension, ONI-3: ONI Emotions sub-dimension, EAT-26: Eating Attitude Test-26, EAT-1: EAT-26 Preoccupation with eating sub-dimension, EAT-2: EAT-26 Restraint sub-dimension, EAT-3: EAT-26 Social pressure sub-dimension

DISCUSSION

Orthorexia nervosa is a pathological condition in which eating healthy becomes an obsession, which has been extensively studied lately. It is also associated with the eating attitude of the obsession with healthy eating. In this study, it was aimed to determine the ON tendency and related factors among dietitians. To the best of our knowledge, this is the first study to address ON in dietitians with the newly developed ON scale among in the literature.

There are few studies examining ON among nutrition and dietetics students and dietitians. In these studies, the ORTO-15 scale was mostly used to detect ON (Dunn & Bratman, 2016). In a study of dietitians in the United States, the prevalence of ON was 49.5%. The mean ORTO-15 score for all participants in this study was 39.3±3.6 (Tremelling et al., 2017). In a study conducted with nutrition students and nutritionists in Jordan, the prevalence of ON was found to be between 31.8% and 72.0% (Abdullah et al., 2020). In a study using the Bratman Test for Orthorexia Nervosa in nutrition and dietetics students in Germany, the ON rate was determined to be 12.8% (Kinzl et al., 2006). The prevalence of ON was found to be 72.2%, and the mean score of ORTO-15 was 38.58±0.27 on nutrition and dietetics department students in Turkey (Çobanoğlu & Akman, 2021). In a study conducted in Ankara, Turkey, the ON rate was found to be 41.9% and the mean score of ORTO-15 was 39.7±3.7 (Asil & Sürücüoğlu, 2015). Among the limitations of these studies is that the cut-off score of the ORTO-15 scale differs in the studies. In addition, recent studies argue that the use of the cut-off score in the ORTO-15 scale is incorrect (Rogoza & Donini, 2022). Because the use of the cut-off score in the scales for ON, whose diagnostic criteria are not fully clear, is criticized. In our study, the mean score of ONI was found to be 37.5±9.7. Contrary to the ORTO-15 scale, the tendency of ON increases as the score increases in the evaluation of this scale. The cut-off point was not calculated in the assessment of this scale, but the cut-off point can be 72 points compared to other scales. (Oberle et al., 2020). In this study, the maximum ONI score was 71 points. This result shows that dietitians' comprehensive and detailed education on nutrition did not lead to an obsession with healthy eating, unlike other studies.

Studies have associated ON symptoms with eating disorders. Previous studies have found a relationship between ON and eating attitude (Agopyan et al., 2019; Asil & Sürücüoğlu, 2015; Tremelling et al., 2017). This study found a similar relationship between EAT-26 and ON. And the ONI sub-dimensions and EAT-26 sub-dimensions are also related. The relationship between ON and eating attitude shows that it is not only dependent on food (avoiding sugary and fatty foods, etc.) but also on self-worth (fear of getting fat) (Cooper & Fairburn, 2011; Pugh & Waller, 2016). Similarly, a Spanish study showed that the Eating Attitude Test (EAT-26) detects abnormal eating behaviors with four components: social pressure, preoccupation with food, purging behaviors, and food awareness, and then it can detect orthorexic behaviors (Rogoza, Brytek-Matera, & Garner, 2016). In addition, similar to other studies, it was found that those who skipped meals had impaired eating behaviors. Although in turn, dietary pathology may drive these behaviors and be responsible for these associations.

Previous studies have had mixed findings between BMI and ON. While some previous studies found a significant relationship between BMI and ON (Asil & Sürücüoğlu, 2015; Fidan et al., 2010; Oberle et al., 2017), some studies did not find a significant relationship (Abdullah et al., 2020; Agopyan et al., 2019; Aksoydan & Camci, 2009; Çobanoğlu & Akman, 2021). In this study, no relationship was found between ON and BMI. 83% of the participants in this study were in the normal BMI range. For this reason, it is thought that such a result was obtained by the participants.

Limitations and strengths of the research

This study has several significant limitations. First, the study is a cross-sectional study of dietitians in Turkey only, and we have no indication as to whether the results can be generalized to different countries and different cultural contexts. The sample size and the number of male participants are small. Despite these limitations, this study also has important strengths. As far as we know, this is the first study in Turkey and the literature to investigate the prevalence of ON, especially among members of the nutrition field, with the newly developed ONI.

CONCLUSIONS

The mean score of ONI in dietitians was 37.5±9.7. There is a positive and moderate relationship between the total score of the ONI and the EAT-26. And no relationship was found between ON and BMI. The most commonly used scale for the prevalence of ON in the literature is ORTO-15. This scale has been criticized for being the first developed, not meeting the consensus criteria defined by academicians, having different cut-off values, and having an inconsistent factor structure. In this study, the tendency for ON was determined by ONI, which is one of the recently developed scales including consensus diagnostic criteria. On the other hand, this study does not support nutritional education's concerns that increased preoccupation with healthy eating may lead to disordered eating patterns. More longitudinal, prospective studies are needed to assess whether orthorexia nervosa and eating disorders progress in dietitians. These studies are critical because dietitians also counsel other people in the field of nutrition and affect their nutrition programs.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Author Contributions

Plan, design: SK, ZU, FPÇ; **Material, methods and data collection:** SK, ZU; **Data analysis and comments:** SK, ZU; **Writing and corrections:** SK, ZU, FPÇ.

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