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Prevalence of Orthorexia Nervosa Tendency in Non-obese Population: A Cross-sectional Study

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ABSTRACT

Objectives: The prevalence of eating disorders has increased in the modern population. This study aimed to describe the presence of orthorexia nervosa (ON) tendency in non-obese population.

Methods: Individuals over the age of 18 and with a body mass index below 25 kg/m² who applied to the family medicine outpatient clinics of a tertiary hospital between April 2017 and October 2017 were included. The ORTO-11 scale was applied individuals to assess ON tendency.

Results: A total of 801 participants were included in this study, the mean age was 31.5±10.9 years, and 505 (63.0%) of the participants had an ON tendency. Three hundred two (59.8%) of the participants with ON tendency were female. The frequency of marriage and vitamin supplementation use in participants with ON tendency were 336 (66.5%) and 76 (15.0%), respectively. The presence of ON tendency was significantly different according to be married, female, and vitamin supplementation use (p=0.008, p=0.012 and p=0.007, respectively). The mean ORTO-11 score was 25.8±4.5 in the 18-30 age group, 24.6±4.4 in the 31-50 age group, and 22.6±4.4 in the over 50 age group (p<0.001). A negative correlation was found between ORTO-11 score and age (r=-0.200 and p<0.001).

Conclusion: ON tendency in the non-obese population was found to be at 63%, which is a high value according to the ORTO-11 scale. In our study, an increase in the prevalence of ON tendency was observed in individuals over 50 years of age, those using vitamin supplements, married people and women.

Keywords: Diet, healthy eating, orthorexia



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INTRODUCTION

Eating disorders are serious health concerns that result from early-onset low self-esteem and negative thoughts about food, body weight, and physical appearance.^[1] Orthorexia nervosa (ON) is not currently recognized as a psychiatric disorder in the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5) and the International Classification of Diseases (ICD-10).^[2,3] The term of ON was first used in 1997 by Bratman to describe an obsession for healthy nutrition.^[4] ON is described as having an obsession with the quality of nutrition, eating healthy/pure foods rather than the amount of food consumed, and their fit appearance. In time, it may result in an eating disorder as the diet becomes more compulsive in contemporary society.^[5,6] The interest in the body and the will to keep it healthy have become “obsessive” and sometimes leads to eating behaviors based on the compulsive search for natural and “pure” foods.^[7] A growing number of PubMed articles refer to orthorexia as a keyword with a tendency to increase in publications.^[8]

Depending on the population-based studies, the rate of ON has varied broadly between 1% and 90%.^[9] The highest rates were found in populations with excellent nutritional knowledge and general health conscience. Different studies suggest that age, education level, gender, occupation, body mass index (BMI), having an eating disorder, personality factors, such as perfectionism, etc., are some of the risk factors on the etiology of ON.^[9-14]

This study was aimed to determine the presence of ON tendency and related factors in non-obese participants.

METHOD

The study was a cross-sectional research that encompassed 801 individuals aged over 18 years with a BMI under 25 kg/m² who were admitted to the family medicine clinics of a tertiary hospital between April 2017 and October 2017. ON prevalence in general literature (1%–90%) is in a wide range.^[8] A total of 801 participants were included in this study according to the pilot sampling calculations based on an estimated error of $\pm 4\%$, effect size 0.25, alpha error 0.05, and power 0.95.

A face-to-face survey, which consisted of sociodemographic data and the ORTO-11 scale. A digital scale (TESS RP-LCD300, Turkey) was used to measure weight (kg) and height (cm). BMI was calculated by the formula kg/m².

ORTO-11 Scale: Donini et al. developed ORTO-15 (15 items) scale based on the orthorexia questionnaire by Bratman and determined the cutoff as 40 points.^[15,16] The ORTO-15 was translated and validated in Turkish (11 items) as the ORTO-11 scale by Aruřođlu in 2008. Based on the study by Fidan et al., the optimal cutoff score for the Turkish version of the ON questionnaire was 27 points, while the Polish, Spanish, and German versions of the ORTO-15 have a 24-point, 25-point, and 27-point cutoff, respectively.^[7,11,17,18] A score lower than 27 points describes ON tendency. The total score of ORTO-11 is between 0 and 44 points.^[15]

Individuals with a known diagnosis of eating disorder or chronic disease were excluded in the study.

The analysis was performed using SPSS 22.0 software program. Normality control was performed using Kolmogorov Smirnov test, histogram, and Q-Q plot. Frequency, percentage, mean, and standard deviation values were used as descriptive statistics. Student T-test was used comparing scores between the two groups and ANOVA test with Bonferroni correction was used comparing scores between the three groups. Chi square test was used for categorical variables. The relationship between the continuous variables was examined using Pearson's correlation test. The significance level was accepted as $p < 0.05$ in all analyses.

RESULTS

A total of 801 participants were included in the study and 452 (56.4%) of the participants were female. The mean of age and the mean BMI were 31.5 ± 10.9 years and 22.1 ± 2.2 kg/m², respectively. The mean ORTO-11 score of the sample was 25.1 ± 4.5 points. The presence of ON tendency was revealed in 505 (63.0%) participants. Sociodemographic and anthropometric characteristics of the participants according to the presence of ON tendency were summarized in Table 1.

The mean height of men with and without ON tendency measured 176.8 ± 6.8 cm and 178.4 ± 5.9 cm, respectively ($p = 0.022$). Besides, the mean ages were 34.3 ± 12.5 years and 29.7 ± 10.0 years, respectively ($p < 0.001$). The mean age of the women with and without ON were 32.0 ± 10.8 years and 28.6 ± 8.4 years, respectively ($p < 0.001$).

The mean ORTO-11 score was 25.8 ± 4.5 in the 18-30 age group, 24.6 ± 4.4 in the 31-50 age group, and 22.6 ± 4.4 in the over 50 age group ($p < 0.001$). The scores of ORTO-11 scale according to the age groups are summarized in Table 2.

A negative correlation was found between ORTO-11 score and age ($r = -0.200$ and $p < 0.001$). Although there was a relationship between ORTO-11 score and height and weight, no relationship was found between BMI and ORTO-11 score ($r = 0.120$ and $p = 0.001$; $r = 0.080$ and $p = 0.030$; $p = 0.680$ respectively).

DISCUSSION

In this study, the prevalence of ON tendency was observed as 63% in non-obese individuals. In addition, the prevalence of ON tendency was observed to be higher in older age, married, regular use of vitamin supplements, and female.

The ON tendency was obtained 57.6% and 45.5% by Ramazotti et al. and Bosi et al., respectively, using the ORTO-15 tool.^[15,19] A Spain study using the ORTO-11 showed a 25.2% ON tendency.^[20] Turkish studies found that ON rates were higher than 40% in dieticians, 43.6% in medical students, 73.5% in nursing students, 75.4% in yoga practitioners and 81.8% in opera singers.^[11-13,21-23] In our study, the prevalence of ON tendency was found to be 63%, being among the higher rates in the broad range of literature.

Participants with ON tendency in both gender of our study had a higher age than others, especially above 50 years old. One reason for the relationship between older age and ON presence may be the high sensitivity of aging toward health and nutrition. Although there are studies showing

Table 1. Sociodemographic and anthropomic characteristics of the participants according to the presence of orthorexia nervosa tendency

	Orthorexia Nervosa Tendency		p
	Presence (n=505)	Absence (n=296)	
Age (years)	32.9±11.6	29.2±9.2	<0.001*
Height (cm)	169.0±9.1	170.1±9.4	0.003*
Weight (kg)	63.5±10.2	64.8±11.4	0.110*
BMI (kg/m ²)	22.1±2.1	22.0±2.21	0.320*
Age groups			
18-30 years old	248 (49.1)	188 (63.5)	<0.001†
31-50 years old	205 (40.6)	98 (33.1)	
>50 years old	52 (10.3)	10 (3.4)	
Gender			
Male	203 (40.2)	146 (49.3)	0.012†
Female	302 (59.8)	150 (50.7)	
Marital status			
Single	169 (33.5)	127 (42.9)	0.008†
Married	336 (66.5)	169 (57.1)	
Level of education			
Primary/Secondary school	103 (20.4)	45 (15.2)	0.190†
High school	165 (32.7)	102 (34.5)	
University	237 (46.9)	149 (50.3)	
Vitamin supplementation			
Presence	76 (15.0)	25 (8.4)	0.007†
Absence	429 (85.0)	271 (91.6)	

BMI: Body mass index.

Data is presented as mean±standart deviation and n (%).

*Student t test, †Chi square test.

Table 2. The scores of ORTO-11 scale according to the age groups

Age groups	p	95% CI	
		Lower Bound	Upper Bound
Aged 18-30 years			
Aged 31-50 years	<0.001	0.466	2.064
Aged above 50 years	<0.001	1.751	4.651
Aged 31-50 years			
Aged 18-30 years	<0.001	-2.065	-0.466
Aged above 50 years	0.006	0.447	3.425
Aged above 50 years			
Aged 18-30 years	<0.001	-4.651	-1.751
Aged 31-50 years	0.006	-3.425	-0.447

CI: Confidence Interval.

Data is presented as mean±standart deviation.

ANOVA test with Bonferroni correction.

small positive and small negative associations between age and orthorexic eating behaviors, the evidence is rather inadequate.^[9]

Another research suggests that concomitant marital, intimate, and romantic difficulties are associated with eating disorders and are likely to be a maintaining factor.^[24] Authors found that marital status was not associated with increased body dissatisfaction. However, when controlling for age, gender, BMI, and self-esteem, body dissatisfaction was significantly related to marital dissatisfaction. Erkin et al. determined that the marital status and the presence of chronic illness significantly affected the ON tendency of yoga practitioners.^[23] This result was similar to our results. It was believed that since married people may have a more regular eating habit than singles, they may have increased their efforts to eat healthily.

A novel study has shown that shorter and more masculine men reported greater height dissatisfaction.^[25] Men with

ON tendency in our study had a shorter height than those without ON tendency. Therefore, we inferred those shorter men might have a higher ON tendency due to dissatisfaction; but body dissatisfaction was not evaluated in this present study.

The results indicate that attitudes toward healthy eating and ON tendency are more common in the female.^[8,20] Likewise, it was demonstrated that females had more orthorexic tendencies than males. High frequency for ON tendency among females has been reported by many studies.^[19,26,27] However, some articles have noted a greater prevalence among males, whereas others have found no relationship.^[5,11,28-30]

For people with ON, "healthy" eating behaviors are accompanied by other health behaviors that include regular dietary supplement use and complementary medicine techniques.^[31] In our study, ON tendency was significant for regular supplement users more than nonusers.

The most important limitation of this study was that orthorexia tools could not be recommended for ON's measurement but may be useful in measuring orthorexic tendencies.^[32] Therefore, we preferred to use the term "ON tendency" than "ON." The strength of this study was that the ORTO-11 shows higher reliability in comparison with ORTO-15 used in previous literature.^[33]

CONCLUSION

ON tendency in the non-obese population was found to be at 63%, which is a high value according to the ORTO-11 scale. In our study, an increase in the prevalence of ON tendency was observed in individuals over 50 years of age, those using vitamin supplements, married people and women. Future studies containing patterns of other variables like personality, occupation, body dissatisfaction, marital stress, and eating attitudes may help to assess orthorexia-related factors.

Disclosures

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Ethics Committee Approval: The approval for the research was obtained from Gaziosmanpaşa Taksim Training and Research Hospital Clinical Research Ethics Committee (Approval Date: Mar 22, 2017 and Approval number: 29). Informed consent was obtained from all individuals before providing the questionnaire.

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