

Orthorexia and Eating Attitudes in Health Sciences Students

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ABSTRACT

Background: The prevalence of eating disorders and orthorexia nervosa has steadily increased and this situation may lead to severe physical, psychological, and social disorders. **Aim:** The aim of this study was to investigate the prevalence of disordered eating attitudes and orthorexia tendencies among university students studying in various Health Sciences departments in Turkey. **Subjects and Methods:** The study subjects were selected from Health Sciences Faculty students. Among the students who accepted the study, 639 people were reached by simple random sampling method. The EAT-40 and ORTO-15 which are validated instruments for the screening of abnormal eating behaviors and orthorexia nervosa respectively, were used as measurement tools. **Results:** The majority of the students who participated in the study were found to exhibit orthorexic tendencies, and male students had a higher orthorexic tendency in comparison to female students ($p = 0.022$). More specifically, the students studying in the Department of Nutrition and Dietetics had lower orthorexic tendencies compared with the students from other departments. There was no significant relationship between BMI values and the mean ORTO-15 scores, whereas the mean EAT-40 score was found to increase statistically significantly with increased BMI ($p = 0.038$). There was a statistically significant difference between the departments and classes in terms of mean EAT-40 scores, whereas no difference was found regarding gender. **Conclusion:** Orthorexia nervosa is a common problem for university students studying in health-related departments. Interestingly, the orthorexic tendencies of girls and students studying in the Nutrition and Dietetics department were found to be lower in this study. It was determined that all students except the Nutrition and Dietetics department had orthorexia tendencies. More comprehensive studies are needed to better understand orthorexia nervosa and healthy lifestyle interaction.

KEYWORDS: *EAT-40, nutrition, orthorexia nervosa, ORTO-15, university students*

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INTRODUCTION

The term orthorexia (ortho: correct, orexis: appetite) was first introduced in 1997 by Dr. Steve Bratman as an “obsession with eating pure, healthy and correct food to improve one’s health”. The Diagnostic and Statistical Manual of Mental Disorders (DSM-V) by the American Psychiatric Association (APA) defines anorexia nervosa, bulimia nervosa, and other unexplained eating disorders. Although orthorexia nervosa, which has received considerable scientific attention in recent years, is among eating disorders that cannot be named otherwise and have no specific description, it is still

being debated whether it should be identified as an eating disorder or not.^[1-3]

Orthorexia is a condition that targets a “perfect health lifestyle” rather than having worries about an increase in body weight, which involves strict diet control based on healthy nutrition.^[4] Obsessive and compulsive features of orthorexia nervosa can develop into a pathological state.^[5] This may bring about physical, social, and

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psychological consequences.^[6] Participants with symptoms of orthorexia nervosa increasingly isolate themselves from life, tend to adopt a standard and harsh lifestyle, refuse to associate with people who do not understand their choices, and stay obsessively away from food that is overly salty or overly sugary or genetically modified, containing coloring, sweetening, preservative agents, pesticide residues or unhealthy fat.^[7] The kitchen tools and kitchen environment used to prepare the dishes also become part of their obsessive ritual for them.^[8-10]

In orthorexia, which has important dietary restrictions, serious reductions in body weight may be observed in some cases, and this is reported to possibly lead to anorexia nervosa.^[11] As a result, it ends up with the ground for many diseases such as impaired renal function,^[12] cardiovascular diseases,^[13] liver diseases,^[14] gastrointestinal diseases^[15], and dermatological problems.^[16]

Those with a history of anorexia nervosa, young women, bodybuilders, or athletes are risky groups for orthorexia. In the treatment of orthorexia, a disciplined team of doctors, physiotherapists, and dietitians should be involved. Drug therapy can also be applied to some patients.^[4,8]

This study aimed to determine the tendency of university students in Health sciences departments, towards orthorexia nervosa and eating disorders.

MATERIALS AND METHODS

Sample and procedure

The study subjects were selected from Health Sciences Faculty students; G Power 3 program was used to determine the minimum number of subjects to be sampled. According to the results of this analysis, when the reference values in the studies that are closest to the design of the study are taken into consideration, it was determined that it is sufficient to reach 600 individuals in the 80% confidence interval.^[6,7,17] Among the students who accepted the study, 639 people were reached by simple random sampling method. The number of female students in all departments was high. Grade 4 students were not included in the study because they were in a hospital internship. Students who had not received nutritional education were not included in the study too. So, the sample frame for the study consisted of 2nd and 3rd-year Health Sciences Faculty students from Nutrition and Dietetics, Nursing, Midwifery, Child Development, Social Work, and Health Management departments. This study was conducted according to the guidelines laid down in the Declaration of Helsinki, and all procedures involving human subjects were approved by the Ethics Committee of Ankara University (Ethics approval code 12/134).

Data collection

The study data were collected through a questionnaire form after obtaining the necessary permissions from the university administration. The questionnaire form administered to the students participating in the study involved questions from ORTO-15 and EAT-40 scales. In addition, the body weights and height measurements of the students were taken. The body weights of the students were measured in the mornings on empty stomachs and without shoes while wearing light clothes. The measurements were conducted via an electronic scale with a 0.1 kg sensitivity while the heights were measured without shoes via a wall-mounted stadiometer with a 0.1 cm sensitivity. The body Mass Indexes (BMI) of the mothers were evaluated according to the standards of the World Health Organization (WHO). Mothers with BMI values between 18.5 and 24.9 kg/m² were classified as normal while those who were between 25.0 and 29.9 kg/m² were classified as overweight in addition to those with ≥ 30.0 kg/m² who were classified as obese. Body Mass Index (BMI) was calculated using body weight and height. Body mass index (BMI) (kg/m²) was evaluated according to World Health Organization (WHO) standards. Underweight was diagnosed when the BMI was less than 18.5 kg/m²; normal weight when the BMI was between 18.5–24.9 kg/m²; whereas overweight was diagnosed when the BMI was between 25.0–29.9 kg/m²; and when BMI exceeded 29.9 kg/m², then participants were classified as obese.

Instruments

ORTO-15

The ORTO-15 scale was developed to identify orthorexia nervosa individuals Donini *et al.*^[3] developed the scale, Arusoğlu *et al.* determined the reliability and validity of the Turkish version.^[15] It is a valid and reliable scale that intends to detect orthorexia in individuals. The scale consists of 15 items responded as “always”, “often”, “sometimes”, and “never” to evaluate the obsessive attitudes of individuals in choosing, purchasing, preparing, and consuming food.^[11] Individuals with a score of less than 40 are considered orthorexic, while individuals with a score of 40 or greater are considered to exhibit normal eating behaviors.^[3]

Eating attitudes test (EAT-40)

The eating Attitude Test (EAT-40) is a scale designed to measure eating attitudes and behaviors of patients with eating disorders and the symptoms of possible eating disorder attitudes in healthy individuals. The EAT-40 index contains 40 items, each with 6 possible ordinal answers that determine the final test score. On the EAT-40 scale, the scores are classified as follows: 30 and

above is “high risk” (abnormal eating behavior), between 21 and 30 is “moderate risk”, and below 21 is “low risk”.^[19] Savaşır and Erol^[20] determined the reliability and validity of the EAT-40 for the Turkish population.

Statistical analysis

Statistical Package for the Social Sciences-21 (SPSS-21) software program was utilized for data analysis. Kolmogorov–Smirnov and Shapiro-Wilk tests were used to assess the normality of the data. Kruskal Wallis Analysis was used to analyze the differences between the means of ORTO-15 and EAT-40 scores of students in more than three groups that did not show normal distribution, and median and interquartile range (IQR) values were given. The posthoc test was used to determine the differences between the groups in the data where there was significance according to the Kruskal Wallis test. The Mann-Whitney U test was used to evaluate the differences between the mean scores of the two groups that did not show normal distribution, such as gender, grade, ORTO-15, and EAT-40 scores. The confidence interval was established as 95% for all statistical analyses.

RESULTS

Table 1 gives the socio-demographics of the students who participated in the study. Eighty-eight point 7 percent (88.7%) of the participants were females and 11.3% were males. The highest proportion 24.1% of the participants were from the nursing department, the majority, 56.0% of the students were 2nd-year students, while the mean age was 20.6 ± 1.1 years (18-27 years).

The ORTO-15 scores for the overall sample were 38.0 (4.0). When examined according to the departments, the ORTO-15 score was higher (less orthorexia nervosa tendencies) in students from Nutrition and Dietetics department than the other departments (p < 0.01).; in female students (39.0) than boys (37.0); and in the third-grade students (39.0) than second-year students (38.0) (p < 0.023) [Table 2].

The EAT-40 scores of the participants were 16.0 (11.0) for the whole sample. According to the evaluation of the EAT-40 scores of the students [Table 3], there was a statistically significant difference regarding all departments (p = 0.001). The EAT-40 scores of the students from the Child Development department were higher than those of students from other departments, and this difference was found to be statistically significant as a result of the posthoc tests (p = 0.021). When evaluated according to gender, the mean EAT-40 scores of female students were higher than those of male students, but this difference was not statistically significant (p = 0.192). The scores of the second-year students were higher than those of third-year students (p = 0.040).

When the relationship between mean ORTO-15 and EAT-40 scores and BMI was evaluated in Table 4, no statistically significant relationship was found

Table 1: Socio-demographics of subjects

Variable	N	%
Gender		
Female	567	88.7
Male	72	11.3
Department		
Nursing	154	24.1
Midwifery	121	18.9
Nutrition and dietetics	91	14.3
Child development	71	11.1
Social work	121	18.9
Health management	81	12.7
Year of study		
Second	358	56.0
Third	281	44.0

Table 2: Mean ORTHO-15 scores by department, gender, and year

	n	Median (IQR)	P
ORTO-15 score			
Nursing	154	39.0 (5.0)	<0.001*
Midwifery	121	38.0 (5.0)	
Nutrition and dietetics	91	40.0 (4.0)	
Child development	71	38.0 (5.0)	
Social work	121	38.0 (4.0)	
Health management	81	37.0 (5.0)	
Gender			0.022**
Female	567	39.0 (5.0)	
Male	72	37.0 (4.0)	
Year			0.023**
Second	358	38.0 (5.0)	
Third	281	39.0 (5.0)	

*: Kruskal Wallis, **: Mann Whitney U

Table 3: Mean EAT-40 scores by department, gender, and year

	n	Median (IQR)	P
EAT 40 score			
Nursing	154	17.0 (12.0)	0.001*
Midwifery	121	16.0 (10.0)	
Nutrition and dietetics	91	14.0 (7.3)	
Child development	71	19.0 (8.8)	
Social work	121	16.5 (12.0)	
Health management	81	17.0 (18.0)	
Gender			0.192**
Female	567	16.0 (11.0)	
Male	72	14.0 (10.0)	
Year			0.040**
Second	358	17.0 (11.0)	
Third	281	15.0 (11.0)	

*: Kruskal Wallis, **: Mann Whitney U

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Table 4: Mean ORTO 15 and EAT 40 scores by BMI values

Score	BMI <25	BMI ≥25	P*
Median (IQR)			
ORTO-15	38.0 (4.0)	39.0 (4.0)	0.783
EAT-40	16.0 (10.0)	19.0 (13.3)	0.038

*: Mann Whitney U

Table 5: Mean EAT-40 scores according to the ORTO-15 classifications of the participants

Score	ORTO-15		P*
	≥40 Median (IQR)	<40 Median (IQR)	
EAT-40	16.1 (9.0)	19.9 (12.0)	<0.001

*: Mann Whitney U

between ORTO-15 scores and BMI values, whereas EAT-40 score was found to increase as BMI values increased ($p = 0.038$).

As seen in Table 5, the mean ORTO-15 score was determined to be higher in the group with a high risk of eating disorder behavior ($p = 0.000$).

DISCUSSION

Orthorexia nervosa is defined as an obsessive pathological behavioral disorder characterized by keeping away from foods that individuals regard as unhealthy according to their nutrients and contents.^[21] Young women and health professionals are risk groups for orthorexia nervosa.^[17,22,23] While individuals with an ORTO-15 score that is lower than 40 are considered to have a high tendency towards orthorexia, those with a score of 40 or higher are thought to show normal eating behaviors. In this study, it was found that all the participants exhibited orthorexic tendencies and that male students had more orthorexic tendencies than female students. The mean ORTO-15 scores of female students (39.0) were found to be statistically significantly higher than those of male students (37.0). Similarly, in a study conducted on medical students, the orthorexic tendencies of male students were found to be higher than those of female students.^[17] In a study on medical doctors, the orthorexic tendencies of women were found to be higher than those of boys.^[7] No definite results about orthorexic tendencies were reached according to the findings of the study.

Although the tendency towards eating attitude disorder was higher in females in comparison to males, there was no statistically significant difference between them ($p = 0.192$). In a similar study conducted on university students, the mean EAT-40 score of male students were found to be 17.2 ± 11.0 while it was

found to be 17.7 ± 9.5 in female students. There was no statistically significant difference between genders and EAT-40 scores.^[24] In a study carried out on Health College students, the mean EAT-40 scores of female students were found to be significantly higher than those of male students.^[25] Similarly, in a study conducted in another health school, possible eating disorder behaviors of female students were significantly higher than those of male students.^[26] According to the review of the related literature, it was determined that the tendency towards eating disorder behavior exhibited a difference by gender.

In a study conducted by Donini *et al.*,^[3] 41.9% of dietitians were reported to have an orthorexic tendency, and in a similar study carried out in Brazil, the mean ORTO-15 scores of dietitians were reported to be 36.1 ± 3.7 .^[3,21] Gezer and Kabaran found the average ORTO-11 score of female students in the Nutrition and Dietetics department as 30.7 ± 4.45 .^[27] In this study, the ORTO-15 score was determined as 38.0 (4.0) and the EAT-40 score was found as 16.0 (11.0) in the general sample. According to these findings, while the students had an orthorexic tendency in general, the eating disorder was found in the group with 'low risk'.

In a study by Korinth *et al.*,^[28] the orthorexic tendencies of students in the Nutrition and Dietetics department were found to be not different from those of the students in other departments. In this study, the orthorexic tendencies of the students in the Nutrition and Dietetics department were found to be lower than those of the students in other departments ($p < 0.05$). Fidan *et al.*, reported that the EAT-40 score of 89.6% of the medical students in their study was in the 'low risk' group.^[18] Likewise, the EAT-40 score of the general student population in this study was in the 'low risk' group.

Body mass index is one of the important factors affecting the orthorexic tendency of a person.^[29,30] In this study, there was no statistically significant relationship between BMI value and orthorexic tendency. Although there were studies with similar results,^[15,30,31] some studies reported that as the BMI value increased, the orthorexic tendency increased as well. Fidan *et al.* found that there was a significant relationship between BMI groups and ORTO score and that as BMI increased, orthorexic tendency increased, too.^[18] Also, Gezer and Kabaran stated that as the BMI value increased, the ORTO score increased significantly.^[27] The EAT-40 score assessment of the participants revealed that the whole group was in the "low risk" group, but that the risk increased as the BMI value increased ($p = 0.038$). Similarly, there were studies reporting that as the BMI value increased, the EAT-40 score increased significantly.^[27,32] The reasons

for the variability of the study results may be due to the differences in the number of samplings, age, gender, and socio-cultural levels.

In this study, the ORTO-15 score was higher in the group with a high risk of eating disorder behavior ($p = 0.000$). Accordingly, as the risk of eating behavior disorder increased, the risk of obsessive-compulsive behavior with orthorexia nervosa increased in a statistically significant manner. This finding was in parallel with those of other studies.^[15,22,33] Similar to our study, Asil *et al.*^[22] found their study that dietitians with ORTO-15 scores less than 40 points had significantly higher scores for EAT-40. In other words, it has been concluded that dietitians with eating behavior disorders tend to be orthorexic.

The limitations of this study include the lack of sufficient sample size, the absence of a control group with which we can compare students studying in health sciences, the diagnosis of orthorexia nervosa and eating disorders relied only on tests, with no interview participants, and the inability to work with a psychologist or a psychiatrist. Planning future studies with larger samples and conducting with individuals diagnosed with orthorexia nervosa and control groups, will facilitate access to clearer information on this situation.

CONCLUSION

Obsession with healthy eating can cause deterioration in general health, especially in young people, and therefore it can lead to undesirable psychological and physiological consequences. In this study, all of the university students studying at the Faculty of Health Sciences were found to have an orthorexic tendency. Protective strategies such as providing nutritional education and controlling broadcasts about health and nutrition by experts are recommended.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

- American Psychiatric Association (APA). Diagnostic and Statistical Manual of Mental Disorders (DSM-5). 5th ed. Washington; American Psychiatric Association; 2013. p. 225-9.
- Brytek-Matera A, LonySchiltz L. Association between attitudes towards body image, negative emotions about one's own body and self-state representations in a clinical sample of eating disordered women. *Archives of Psychiatry and Psychotherapy* 2011;2:37-43.
- Donini L, Marsili D, Graziani M, Imbriale M, Cannella C. Orthorexia nervosa: Validation of a diagnosis questionnaire, eating and weight disorders-studies on anorexia. *Bulimia Obes* 2005;10:28-32.
- Marazziti D, Presta S, Baroni S, Silvestri S, Dell'Osso L. Behavioral addictions: A novel challenge for psychopharmacology. *CNS Spectr* 2014;19:486-95.
- Varga M, Thege BK, Dukay-Szabó S, Túry F, van Furth EF. When eating healthy is not healthy: Orthorexia nervosa and its measurement with the ORTO-15 in Hungary. *BMC Psychiatry* 2014;14:59-70.
- Brytek-Matera A, Donini LM, Krupa M, Poggiogalle E, Hay P. Orthorexia nervosa and self-attitudinal aspects of body image in female and male university students. *J Eat Disord* 2015;3:2.
- Bosi ATB, Çamur D, Güler Ç. Prevalence of orthorexia nervosa in resident medical doctors in the faculty of medicine (Ankara, Turkey). *Appetite* 2007;49:661-6.
- Bartrina JA. Orthorexia or when a healthy diet becomes an obsession. *Arch Latinoam Nutr* 2007;57:313-5.
- Sánchez FG, Rial BR. Orthorexia nervosa. A new eating behavior disorder? *Actas Espanolas Psiquiatr* 2005;33:66-8.
- Bratman S, Knight D. *Health FoodJunkies: Orthorexia Nervosa: Overcoming the Obsession with Healthful Eating*. 1st ed. Broadway, New York; 2001.
- Ramacciotti C, Perrone P, Coli E, Burgalassi A, Conversano C, Massimetti G, *et al.* Orthorexia nervosa in the general population: A preliminary screening using a self-administered questionnaire (ORTO-15). *Eat Weight Disord* 2011;16:127-30.
- Stheneur C, Bergeron S, Lapeyraque AL. Renal complications in anorexia nervosa. *Eat Weight Disord* 2014;19:455-60.
- Kim S, Cho H, Kim M, Ko Y. Sudden cardiac arrest due to acute gastric dilatation in a patient with an eating disorder. *Emerg Med J* 2009;26:227-8.
- De Caprio C, Alfano A, Senatore I, Zarrella L, Pasanisi F, Contaldo F. Severe acute liver damage in anorexia nervosa: Two case reports. *Nutrition* 2006;22:572-5.
- Donini L, Marsili D, Graziani M, Imbriale M, Cannella C. Orthorexianervosa: Validation of a diagnosis questionnaire, eating and weight disorders studies on anorexia. *Eating and Weight Disorders* 2005;10:28-32.
- Whitehead WE. Delayed gastrointestinal transit times in anorexia nervosa and bulimia nervosa. *Gastroenterology* 1991;101:1320-4.
- Strumia R. Dermatologic signs in patients with eating disorders. *Am J Clin Dermatol* 2005;6:165-73.
- Fidan T, Ertekin V, Işıkay S, Kırpınar I. Prevalence of orthorexia among medical students in Erzurum, Turkey. *Compr Psychiatry* 2010;51:49-54.
- Garner DM, Garfinkel PE. The eating attitudes test: An index of the symptoms of Anorexia Nervosa. *Psychol Med* 1979;9:273-9.
- Savasir I, Erol N. Eating attitude test: Anorexia nervosa symptoms index. *Turk J Psychol* 1989;7:19.
- Alvarenga M, Martins M, Sato K, Vargas S, Philippi ST, Scagliusi F. Orthorexia nervosa behavior in a sample of Brazilian dietitians assessed by the Portuguese version of ORTO-15. *Eat Weight Disord* 2012;17:29-35.
- Asil E, Sürücüoğlu MS. Orthorexia nervosa in Turkish dietitians. *Ecol Food Nutr* 2015;54:303-13.
- Batıgün AD, Utku Ç. Investigation of the relationship between eating attitude and anger in a group of young people. *Turk J Psychol* 2006;21:65-78.
- Sanlier N, Yassibas E, Bilici S, Sahin G, Celik B. Does the rise in eating disorders lead to increasing risk of orthorexia nervosa? Correlations with gender, education, and body mass index. *Ecol Food Nutr* 2016;55:1-13. doi: 10.1080/03670244.2016.1150276.
- Ulas B, Uncu F, Uner S. Possible eating disorder frequency and affecting factors in health school students. *Inönü Univ J Health Sci* 2013;2:15-22.

26. Unalan D, Oztop DB, Elmalı F, Ozturk A, Konak D, Pırlak B, *et al.* The relationship between eating attitudes and healthy lifestyle behaviors of a group of health school students. *J Turgut Ozal Med Center* 2009;16:75-81.
27. Gezer C, Kabaran S. The risk of orthorexia nervosa among female students of nutrition and dietetics. *SDU J Health Sci Inst* 2013;4:14-22.
28. Korinth A, Schiess S, Westenhoefer J. Eating behaviour and eating disorders in students of nutrition sciences. *Public Health Nutr* 2010;13:32-7.
29. Sanlier N, Biyikli AE, Biyikli ET. Evaluating the relationship of eating behaviors of university students with body mass index and self-esteem. *Ecol Food Nutr* 2015;54:175-85.
30. Cinosi E, Matarazzo I, Marini S, Acciavatti T, Lupi M, Corbo M, *et al.* Prevalence of orthorexia nervosa in a population of young Italian adults. *Eur Psychiatry* 2015;30:1330.
31. Valera JH, Ruiz PA, Valdespino BR, Visioli F. Prevalence of orthorexia nervosa among ashtanga yoga practitioners: A pilot study. *Eat Weight Disord* 2014;19:469-72.
32. Abbate-Daga G, Gramaglia C, Malfi G, Piero A, Fassino S. Eating problems and personality traits. An Italian pilot study among 992 high school students. *Eur Eat Disord Rev* 2007;15:471-8.
33. Poyraz CA, Tüfekçioğlu EY, Özdemir A, Baş A, Kani AS, Erginöz E, *et al.* Relationship between orthorexia and obsessive-compulsive symptoms in patients with generalised anxiety disorder, panic disorder and obsessive compulsive disorder. *Yeni Symposium* 2015;53:22-6.