

## **Original Research Article**

### **Determining Orthorexia Nervosa Tendency Among the Students of Health Sciences**

**Faculty: The Case of Artvin Coruh University**

**Short title: Orthorexia Nervosa Tendency**

#### **ABSTRACT**

Eating disorders is a general term used for grouping all the problems related to eating attitudes under one title and for expressing these problems. Orthorexia nervosa (ON), also known as “obsession of healthy eating” recently happened to be the research topic of clinicians worldwide. In this study, it was aimed to evaluate the tendency of ON among university students. The research population was comprised of 379 university students in the departments of nutrition and dietetics with nursing. The data was collected by the survey form questioning some of the socio-demographic and anthropometric properties of the students; and as for the data collection tool, ON tendency was determined by ORTHO-11 test and the information regarding anorexia and bulimia nervosa was gathered by “Eating Manner Test (EAT-40). Mean age of the students was found as  $20.09 \pm 1.47$ , mean body weight as  $60.55 \pm 10.01$  kg, and mean height as  $168.08 \pm 7.91$  cm. According to calculated BMI values, mean BMI of the all participating students is found as  $21.6 \pm 2.12$  as normal weight (18.5-24.9). EAT-40 points of the girls was found to be statistically significantly higher in comparison to that of the boys ( $p < 0.05$ ). ORTHO-11 points of the male students were found to be statistically significantly higher as compared to that of female students ( $p < 0.05$ ). Eating disorders will tend to increase as long as the concepts of beauty, good look and appeal are based on low body mass index. We also believe that the young population who are most influenced by such popular tendencies need to acquire truly healthy nutrition habits through training and increase their quality of life.

34 **Keywords:** Eating Attitudes Test-40, ORTHO-11, University Students

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## 36 **1.INTRODUCTION**

37 Eating disorders is a general term used for grouping all the problems related to eating attitudes  
38 under one title and for expressing these problems. Eating disorders are among the diseases  
39 inherited from prehistoric times to the present, with a rapidly increasing prevalence. The  
40 change in aesthetic perception along with the concepts of weakness, attractiveness and  
41 slimness that affect the people psychologically has led to an increase in eating disorders. The  
42 fashion sense claiming that it is more attractive and beautiful to be thin and slim whereas  
43 overweight reflects an older and repulsive look is more effective on female population in  
44 particular [1,2].

45 Orthorexia nervosa (ON), also known as “obsession of healthy eating” recently  
46 happened to be the research topic of clinicians worldwide. The term Orthorexia Nervosa was  
47 first used in 1997 and it consists of the combination of the words ‘orthos’ (correct,  
48 appropriate) and ‘orexia’ (appetite) of ancient Greek [3,4]. Bratman, the coiner of Orthorexia  
49 Nervosa, who also described himself as a patient in the process of healing orthorexia, stated  
50 that the intent of these patients was not slimness, unlike the other cases of eating disorders [5].  
51 Although ON is not categorized in the same group of eating disorders with anorexia nervosa  
52 and bulimia nervosa, as the diagnostic criteria are specified and more and more studies on  
53 ON are made, relevant information is getting accumulated [6]. Under the light of such  
54 information, ON is recognised as an eating disorder characterized by consumption of healthy  
55 foods, and it is regarded as a natural dietary consumption interfering in the personal life of the  
56 individual [7].

57 Actually, ON is not pathologic. However, as it turns into a kind of excessive or long  
58 term effort or as it leads to adverse effects in daily life, then healthy nutrition obsession can  
59 reportedly be regarded as a disorder associated with personality and behavioral dimensions as  
60 well [8]. In case of Orthorexia Nervosa, the individuals obsessively refrain from artificial  
61 colors and tastes, preservative agents, pesticide residues or genetically modified materials,  
62 unhealthy oils, salt/sugar containing nutrients and food having such ingredients. These people  
63 gradually develop their own rules and limit themselves with a peculiar dietary regimen [9].  
64 Since the quality of the food of such people gradually overwhelm their private lives and social

65 relations, the individuals with ON disorder become isolated and lonely in the course of time  
66 [10,11].

67 The obsession of eating healthy foods prevailing in all social groups have recently  
68 become more dominant particularly among young population. For this reason, in this study, it  
69 was aimed to evaluate the prevalence of ON among university students.

## 70 **2. MATERIALS AND METHODS**

71 The study was cross-sectional and it was conducted between March and May 2018, with the  
72 students of Health Sciences Faculty Nutrition-Dietetic and Nursing Departments of Artvin  
73 Coruh University. There are 320 students in the Nursing Department and 260 students in the  
74 Nutrition-Dietetic Department of the mentioned faculty. A total of 184 students from  
75 Nutrition-Dietetic Department and 195 students from Nursing Department were included in  
76 the study. The research population was comprised of 379 students in the first 4 classes of  
77 these departments. The surveys of totally 379 students were considered for assessment where  
78 115 students were from 1st classes, 99 from 2nd classes, 121 from 3rd classes and 44 from 4th  
79 classes, respectively. Written approval of the Ethics Committee of Artvin Coruh University  
80 was obtained before commencing the study. In the study, the data was collected by the survey  
81 form questioning some of the socio-demographic and anthropometric properties of the  
82 students; and as for the data collection tool, ON tendency was determined by ORTHO-11 test  
83 [12,13] and the information regarding anorexia and bulimia nervosa was gathered by  
84 “Eating Manner Test (EAT-40) [14].

85 “ORTHO-11 test” is an assessment scale comprising 15 items. The items are written in  
86 such a way that the answers can be expressed in a 4 grade format and in the present time. In  
87 the scale, the individuals are asked to express themselves by selecting one of the options of  
88 “always”, “frequently”, “sometimes” and “never” regarding frequency of the feelings  
89 described in the items. Each item is graded by one of the 1, 2, 3 and 4 points. One can get 15  
90 points at minimum and 60 points at maximum out of the test. As it can be understood, the  
91 ones favouring healthy eating, namely orthorexic ones, will get lower points out of this test.  
92 According to the result of the ORTHO-11 test, those with 40 points and below are defined as  
93 “Orthorectic” (having extremely sensitive eating behaviors). Eating behavior is approaching  
94 normal as the score increases.

95 Eating Attitude Test (EAT-40) is a self-report scale composed of 40 items, developed  
96 for objective assessment of anorexia indications. The items are scored on a 6-point Likert-

97 type scale. The items have taken the format of multiple-choice and 6-point scale as “always”,  
98 “frequently”, “usually”, “sometimes”, “seldom”, and “never”, in its second version. The  
99 assessment from pathology point of view is implemented by assigning 3 points for both  
100 extreme answers, and 2 and 1 points for other options. Total point is obtained by adding the  
101 points for each answers, and its minimum value is 40 whereas maximum is 120. The obtained  
102 point is proportional to eating disorder pathology. Thirty points and above imply risk for  
103 having eating disorder. In EAT-40 risk profiles, in case of EAT-40 total point is less than 21 it  
104 is regarded as low-risk, between 21-30 it is medium-risk and above 30 is high-risk.

105 BMI of the students were calculated in accordance with the formula “Body  
106 Weight/(Body Height)<sup>2</sup> (kg/m<sup>2</sup>)” based on the obesity classification of World Health  
107 Organisation, where data was obtained by the self-declaration of the participants regarding  
108 their weight and height [15].

### 109 **2.1. Statistical Analysis**

110 The data obtained from the questionnaire was evaluated by the SPSS (The Statistical Package  
111 for The Social Sciences) 20.0 program. In order to assess whether there is a difference  
112 between more than two or more group averages, ANOVA one-sided variance analysis was  
113 used. In statistical analyses, in case where sample size proves inadequate, Pearson Chi-  
114 Square test results were used. In case of normally distributed variables, Independent Samples  
115 T-test was used, among parametric comparison tests.  $p < 0.05$  level was regarded as  
116 statistically significant.

## 117 **3. RESULTS**

118 Totally 379 students of Artvin Coruh University, Health Sciences Faculty participated in the  
119 study where 48.5% (n=184) were from Nutrition and Dietetics Department and 51.5%  
120 (n=195) were from Nursing Department (Table 1). Of the included students 75.2% (n=285)  
121 were girls and 24.8% (n=94) were boys. And 30.3% (n=115) were 1st class students, 26.1%  
122 (n=99) were 2nd, 31.9% (n=121) were 3rd and 11.6% (n=44) were 4 th class students.

123 The ages and the anthropometric data of the participating students are shown in Table  
124 2. Mean age of the students was found as  $20.09 \pm 1.47$ , mean body weight as  $60.55 \pm 10.01$  kg,  
125 and mean height as  $168.08 \pm 7.91$  cm. According to calculated BMI values, mean BMI of the  
126 all participating students is found as  $21.6 \pm 2.12$  as normal weight (18.5-24.9). Of the included  
127 students, 14.0% (n=54) were found to be slim, 73.6% (n=276) normal, 11.6% (n=45) slightly  
128 obese and 0.8% (n=4) obese. Mean BMI of female students was found as  $19.2 \pm 1.83$  with

129 normal weight, while as  $22.8\pm 3.08$  with normal weight in male students. Statistically  
130 significant difference was not determined between the BMI values of female and male  
131 students ( $p>0.05$ ). Mean ORTHO-11 point of the university students was found to be  
132  $38.00\pm 3.41$  and mean EAT-40 point was  $17.92 \pm 7.76$  (Table 3). When we analyse EAT-40  
133 points of the university students with respect to gender, it was  $21.62\pm 8.35$  in girls and  
134  $14.22\pm 7.18$  in boys (Table 4). EAT-40 points of the girls was found to be statistically  
135 significantly higher in comparison to that of the boys ( $p<0.05$ ). Orthorexia nervosa of the  
136 university students was analysed with respect to gender and the male and female students  
137 were compared in regard to having nervosa risk (Table 5). ORTHO-11 points of the male  
138 students were found to be statistically significantly higher as compared to that of female  
139 students ( $p<0.05$ ). In Table 6, the correlation between the EAT-40 and orthorexia nervosa of  
140 the university students were presented. As the points obtained in ORTHO-11 scale decrease,  
141 the affinity to disorder increase, for this reason, although the correlation coefficient have  
142 negative values they were interpreted as positive, and assessments were implemented duely.  
143 As it can be seen in Table 6, a statistically significant difference was found between the  
144 university students having signs of eating disorders and displaying orthorexic signs ( $r=-.234$ ,  
145  $p<0.001$ ).

#### 146 **4. DISCUSSION**

147 Media, dieticians and psychiatrists worldwide are drawing attention to a new type of eating  
148 disorder for a long time. The individuals with orthorexia nervosa having the obsession of  
149 healthy eating spend a big deal of their time for thinking about their food, shopping, preparing  
150 and consuming the kind of food they consider healthy. The individual feels that his/her own  
151 type of eating manner is the only possible option and his/her own choice ranks the topmost  
152 level in comparison to the other people [16,17]. Gradually in time, the individuals with ON  
153 would even prefer a kind of hunger by their own strict dietary regimens and abstain from  
154 eating if they are not sure that the food is healthy. Food selection of the university students  
155 and their eating manners are influenced by various biological, psychological and sociocultural  
156 factors. In our study, healthy eating obsession of the students in Health Sciences Faculty were  
157 evaluated by ORTHO-11 and EAT-40 tests.

158 It was demonstrated in the study of Korinth et al. [18] that the students studying in  
159 nutrition related branches have a more explicit tendency for healthy eating in comparison to  
160 their colleagues in other branches. Again in the same study, those students had the inclination  
161 of limiting their food intake for their body weight control and their disposition for healthy

162 nutrition would increase as their knowledge of nutrition increased. In the study of Meister  
163 [19] where the tendency of university students to orthorexia nervosa was investigated,  
164 ORTHO-11 scale revealed higher ON tendency among female students than male students. In  
165 the study of McInerney-Ernst [20] in Poland on the university students aged between 18-25  
166 years, 68.55% of the female students and 43.18% of the male students were determined to  
167 have tendency for ON.

168 Also in our study that we implemented ORTHO-11 and EAT-40 scales, the results  
169 were compliant with the literature. When we evaluated ORTHO-11 results in general, our  
170 students displayed orthorexic properties. When we evaluated with respect to gender,  
171 ORTHO-11 scores of the girls were statistically significantly higher than that of the boys. The  
172 fact that the greater number of our female student than male students had an effect on our  
173 overall ORTHO-11 results. While evaluating EAT-40 results, we found a lower level risk  
174 result for boys but a higher level risk for girls. Besides, increase in the risk of ON was found  
175 to be related with the decrease in the risk of eating manner disorder, in our study results.

176 While interpreting our results in regard to the factor of gender, the reason that eating  
177 disorders are more prevalent in females than males can be attributed to the physical changes  
178 they experience in their adolescent phase. In this period, body fat ratio shows changes which  
179 leads to significant changes in outer appearance and most of the women begin putting on  
180 weight in this phase. This fact removes the individual from the ideal size imposed by the  
181 society [21,22].

182 In the study of Arslantas et al. [23] on university students, it was reported that the  
183 university students are under a higher risk regarding disorders in eating manners. Since  
184 women were in majority in their study sample, this risk was expressed higher. In the study of  
185 Unalan et al. [24] to determine eating manners of the university students studying in Health  
186 College, potential eating disorder ratios of female students were found to be significantly  
187 different than those of male students. Also in the study by Altug et al. [25] EAT-40 test was  
188 applied on female students and it was reported that the students displayed eating manner  
189 disorders. In the same study, the disorder in eating manners and behaviours was related with  
190 the factors such as conservatism and perfectionism of the parents.

191 The studies conducted in our country as well as the other countries reveal similar  
192 results. When we evaluate the results in the literature, we can state that the prevalence of  
193 orthorexia nervosa is increasing and this increase is particularly based on the slimness of the  
194 ideal women concept. Printed press as well as audiovisual media is also effective all around

195 the world in describing slim, aesthetic and thin image frequently in recent years regarding  
196 concept of beauty [20,26]. Additionally, the information we come across everyday in media  
197 and in our neighbourhood about the dietary regimens and products, and the fact that some of  
198 these products contain carcinogenic ingredients such as additives, colorifying materials and  
199 hormones, may also be one of the reasons that increase the prevalence of orthorexia nervosa,  
200 in our opinion.

## 201 **5. CONCLUSION**

202 In conclusion, when we evaluate the studies conducted in our country as well as in the other  
203 countries, we have the conviction that eating disorders will tend to increase as long as the  
204 concepts of beauty, good look and appeal are based on low body mass index. Meanwhile, we  
205 also believe that the young population who are most influenced by such popular tendencies  
206 need to acquire truly healthy nutrition habits through training and increase their quality of  
207 life.

## 209 **CONFLICT OF INTEREST**

210 The authors declared no conflicts of interest.

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213 disclose.

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290 **Table 1.** Distribution of demographic data of the participating university students

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<b>Demographic features</b>	<b>n</b>	<b>%</b>
<b>Gender</b>		
Female	285	75.2
Male	94	24.8
<b>Department</b>		
Nutrition and Dietetic	184	48.5
Nursing	185	51.5
<b>University class</b>		
First class	115	30.3
Second class	99	26.1
Third class	121	31.9
Fourth class	44	11.6
<b>Residence</b>		
Home	110	29.0
Dorm	269	71.0
<b>Smoking</b>		
Yes	68	17.9
No	311	82.1
<b>Alcohol consumption</b>		
Yes	51	13.5
No	328	86.5

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307 **Table 2.** Age and anthropometric data of the participating university students

	<b>Median ±SD</b>	<b>n</b>
<b>Age</b>	20.09±1.47	379
<b>Weight</b>	60.55±10.01	379
<b>Height</b>	168.08±7.91	379
<b>BMI</b>	21.6±2.12	379
Female BMI	19.2±1.83	285
Male BMI	22.8±3.08	94

308 Abbreviation: BMI; body mass index, SD; standart deviation

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329 **Table 3.** ORTHO-11 ve EAT-40 points of the university student

	<b>n</b>	<b>Median ±SD</b>
<b>ORTHO-11</b>	379	38.00 ±3.41
<b>EAT-40</b>	379	17.92 ±7.76

330 Abbreviations: EAT-40; Eating Attitudes Test-40, ORTHO-11; Orthorexia Nervosa Assessment Scale,  
331 SD; standart deviation

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357 **Table 4.** Comparison of Eating Manner states of the of the university students

<b>Gender</b>	<b>Median <math>\pm</math>SD</b>	<b>n</b>	<b>p</b>
<b>Female</b>	21.62 $\pm$ 8.35	285	<0.05
<b>Male</b>	14.22 $\pm$ 7.18	94	

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384 **Table 5.** Comparison of ORTHO-11 results of the university students with respect to gender

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<b>Gender</b>	<b>Median <math>\pm</math>SD</b>	<b>n</b>	<b>p</b>
<b>Female</b>	29.40 $\pm$ 3.50	285	<0.05
<b>Male</b>	46.22 $\pm$ 4.24	94	

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411 **Table 6.** Comparison of Orthorexia Nervosa states of the university students with respect to  
412 risk groups

Scales	EAT-40	ORTHO-11
<b>EAT-40</b>	1	
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<b>ORTHO-11</b>		-.234
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413 EAT-40 = Eating Attitudes Test-40; ORTHO-11 = Orthorexia Nervosa Assessment Scale

414 \* $p < 0.001$

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