

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 ± 1.47 , mean body weight as 60.55 ± 10.01 kg, and mean height as 168.08 ± 7.91 cm. According to calculated BMI values, mean BMI of the all participating students is found as 21.6 ± 2.12 as normal weight (18.5-24.9). EAT-40 points of the **female** was found to be statistically significantly higher in comparison to that of the **male** ($p < 0.05$). 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 **Body Mass Index (BMI)** of the students were calculated in accordance with the
106 formula “Body Weight/(Body Height)² (kg/m²)” based on the obesity classification of World
107 Health Organisation, where data was obtained by the self-declaration of the participants
108 regarding 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 female and 24.8% (n=94) were male.** And 30.3% (n=115) were 1st class students,
122 26.1% (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 ± 1.47 , mean body weight as 60.55 ± 10.01 kg,
125 and mean height as 168.08 ± 7.91 cm. According to calculated BMI values, mean BMI of the
126 all participating students is found as 21.6 ± 2.12 as normal weight (18.5-24.9). Of the included
127 students, **14.0% (n=54) were found to be underweight, 73.6% (n=276) normal weight, 11.6%**
128 **(n=45) overweight** and 0.8% (n=4) obese. Mean BMI of female students was found as

129 19.2±1.83 with normal weight, while as 22.8±3.08 with normal weight in male students.
130 Statistically significant difference was not determined between the BMI values of female and
131 male students ($p>0.05$). Mean ORTHO-11 point of the university students was found to be
132 38.00±3.41 and mean EAT-40 point was 17.92 ±7.76 (Table 3). When we analyse EAT-40
133 points of the university students with respect to gender, it was 21.62±8.35 in female and
134 14.22±7.18 in male (Table 4). EAT-40 points of the female was found to be statistically
135 significantly higher in comparison to that of the male ($p<0.05$). Orthorexia nervosa tendency
136 of the university students was analysed with respect to gender that students were compared in
137 regard to having orthorexia nervosa risk (Table 5). ORTHO-11 points of the male students
138 were found to be statistically significantly higher as compared to that of female students
139 ($p<0.05$). In Table 6, the correlation between the EAT-40 and orthorexia nervosa of the
140 university students were presented. As the points obtained in ORTHO-11 scale decrease, the
141 affinity to disorder increase, for this reason, although the correlation coefficient have negative
142 values they were interpreted as positive, and assessments were implemented duely. As it can
143 be seen in Table 6, a statistically significant difference was found between the university
144 students having signs of eating disorders and displaying orthorexic signs ($r=-.234$, $p<0.001$).

145 4. DISCUSSION

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

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

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

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

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

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

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

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

200 **5. CONCLUSION**

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

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208 **CONFLICT OF INTEREST**

209 The authors declared no conflicts of interest.

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211 This study did not receive any funding and the authors have no financial relationships to
212 disclose.

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

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

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

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

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

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

| | n | Median ±SD |
|-----------------|----------|-------------------|
| ORTHO-11 | 379 | 38.00 ±3.41 |
| EAT-40 | 379 | 17.92 ±7.76 |

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

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

| Gender | Median \pmSD | n | p |
|---------------|----------------------------------|----------|----------|
| Female | 21.62 \pm 8.35 | 285 | <0.05 |
| Male | 14.22 \pm 7.18 | 94 | |

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

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| Gender | Median \pmSD | n | p |
|---------------|----------------------------------|----------|----------|
| Female | 29.40 \pm 3.50 | 285 | <0.05 |
| Male | 46.22 \pm 4.24 | 94 | |

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

| Scales | EAT-40 | ORTHO-11 |
|-----------------|--------|----------|
| EAT-40 | 1 | |
| | - | |
| ORTHO-11 | | -.234 |
| | | .000 |

412 EAT-40 = Eating Attitudes Test-40; ORTHO-11 = Orthorexia Nervosa Assessment Scale
413 * $p < 0.001$

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