Original Research Article

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Determining Orthorexia Nervosa Tendency Among the Students of Health Sciences
Faculty: The Case of Artvin Coruh University

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Short title: Orthorexia Nervosa Tendency

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ABSTRACT

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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 and 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 buliminia nervosa was gathered by "Eating Manner-Attitude Test (EAT-40). Mean age of the students was found as 20.09±1.47 years, mean body weight as 60.55±10.01 kg, and mean height as 168.08±7.91 cm. According to calculated BMI values, mMean BMI of the all participating students iwas found as $21.6\pm2.12\frac{???}{kg/m^2}$ as normal weight (18.5-24.9 $\frac{???}{?}$). 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). (what the authors concluded according to results of the study? Below sentences are general informations but not the conclusion of this study!! Eating disorders will tend-seemed to get 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 trends need to acquire truely healthy nutrition habits through training and increase their quality of life.

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

1.INTRODUCTION

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

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

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

Since the quality of the food of such people gradually overwhelm their private lives and social relations, the individuals with ON disorder become isolated and lonely in the course of time [10,11].

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

2. MATERIALS AND METHODS

 This e study was cross-sectional study and it was conducted between March and May 2018, with the students of Health Sciences Faculty Nutritionand -Dietetics and Nursing Departments of Artvin Coruh University. There are 320 students in the Nursing Department and 260 students in the Nutrition-Dietetic Department of the mentioned faculty. A total of 184 students from Nutrition and Dietetic Department and 195 students from Nursing Department were included in the study. (How sample selection was performed? Why other students were excluded? Was there any exclusion criteria?) The research population was comprised of 379 students in the first 4 classes of these departments. The surveys of totally 379 students were considered for assessment where 115 students were from 1st classes, 99 from 2nd classes, 121 from 3rd classes and 44 from 4th classes, respectively. Written approval of the Ethics Committee of Artvin Coruh University was obtained before commencing the study. (Ethics Committe report number/date must be included) In the study, 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 [12,13] and the information regarding anorexia and buliminia nervosa eating disorders was gathered by "Eating Manner-Attitude Test (EAT-40) [14].

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

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Eating Attitude Test (EAT-40) is a self-report scale composed of 40 items, developed for objective assessment of anorexia indications. The items are scored on a 6-point Likert-type scale. The items have taken the format of multiple-choice and 6-point scale as "always", "frequently", "usually", "sometimes", "seldom", and "never", in its second version. The assessment from pathology point of view is implemented by assigning 3 points for both extreme answers, and 2 and 1 points for other options. Total point is obtained by adding the points for each answers, and its minimum value is 40 whereas maximum is 120. The obtained point is proportional to eating disorder pathology. Thirty points and above imply risk for having eating disorder. In EAT-40 risk profiles, in case of EAT-40 total point is less than 21 it is regarded as low-risk, between 21-30 it is medium-risk and above 30 is high-risk.

BMI of the students were calculated in accordance with the formula "Body Weight/(Body Height)² (kg/m²)" based on the obesity classification of World Health Organisation, where data was obtained by the self-declaration of the participants regarding their weight and height [15].

2.1. Statistical Analysis

statistically significant.

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

- Totally 379 students of Artvin Coruh University, Health Sciences Faculty participated in the study where 48.5% (n=184) were from Nutrition and Dietetics Department and 51.5% (n=195) were from Nursing Department (Table 1). Of the included students 75.2% (n=285) were girls and 24.8% (n=94) were boys. And 30.3% (n=115) were 1st class students, 26.1% (n=99) were 2nd, 31.9% (n=121) were 3rd and 11.6% (n=44) were 4 th class students.
 - The ages and the anthropometric data of the participating students are shown in Table 2. Mean age of the students was found as 20.09±1.47 <u>years</u>, 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 <u>???</u> ats normal weight <u>range</u>

(18.5-24.9???). Of the included—students, 14.0% (n=54) were found to be slim,?? 131 underweight?? 73.6% (n=276) normal, 11.6% (n=45) slightly obese ?? overweight?? (what 132 are the BMI ranges) and 0.8% (n=4) obese. Mean BMI of female students was found as 133 19.2±1.83?? with normal weight, while as 22.8±3.08 with normal weight in male students. 134 Meaning of the sentences must be corrected!! Statistically significant difference was not 135 determined between the BMI values of female and male students (p>0.05). Mean ORTHO-11 136 point of the university students was found to be 38.00±3.41 and mean EAT-40 point was 137 17.92 ±7.76 (Table 3). When we analyse EAT-40 points of the university students with 138 respect to gender, it was 21.62±8.35 in girls and 14.22±7.18 in boys (Table 4). EAT-40 points 139 of the girls was found to be statistically significantly higher in comparison to that of the boys 140 (p<0.05). Orthorexia nervosa (what??) of the university students was analysed with respect to 141 gender and the male and female students were compared in regard to having nervosa risk?? 142 (Table 5). ORTHO-11 points of the male students were found to be statistically significantly 143 higher as compared to that of female students (p<0.05). In Table 6, the correlation between 144 the EAT-40 and orthorexia nervosa of the university students were presented. As the points 145 obtained in ORTHO-11 scale decrease, the affinity to disorder (which disorder??) increase, 146 147 for this reason, although the correlation coefficient have negative values they were interpreted as positive, and assessments were implemented duely. As it can be seen in Table 6, a 148 statistically significant difference was found between the university students having signs of 149 150 eating disorders and displaying orthorexic signs (r=-.234, p<0.001). What were the percents of students exceeding cut of points of both tests (EAT 40 and Ortho 151 11). And how it was changed according to sex? 152 153 What were the prevalence of ON and ED since the author aimed to determine the prevalence

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156 4. DISCUSSION

of ON and ED.

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157 Media, dieticians and psychiatrists worldwide are drawing attention to a new type of eating

Correlations of BMI with Ortho-11 and EAT points might be valuable

disorder for a long time. (ON has not been accepted as an eating disorder yet (APA 2015). It

is thaught to be possibly an Obsessive Compulsive Disorder). The individuals with orthorexia

nervosa having the obsession of healthy eating spend a big deal of their time for thinking

about their food, shopping, preparing and consuming the kind of food they consider healthy.

The individual feels that his/her own type of eating manner is the only possible option and

his/her own choice ranks the topmost level in comparison to the other people [16,17]. Gradually in time, the individuals with ON would even prefer a kind of hunger by their own strict dietary regimens and abstain from eating if they are not sure that the food is healthy. Food selection of the university students and their eating manners are influenced by various biological, psychological and sociocultural factors. In our study, healthy eating obsession of the students in Health Sciences Faculty were evaluated by ORTHO-11 and EAT-40 tests.

 It was demonstrated in the study of Korinth et al. [18] that the students studying in nutrition related branches have a more explicit tendency for healthy eating in comparison to their colleagues in other branches. Again in the same study, those students had the inclination of limiting their food intake for their body weight control and their disposition for healthy nutrition would increase as their knowledge of nutrition increased. In the study of Meister [19] where the tendency of university students to orthorexia nervosa was investigated, ORTHO-11 scale revealed higher ON tendency among female students than male students. In the study of McInerney-Ernst [20] in Poland on the university students aged between 18-25 years, 68.55% of the female students and 43.18% of the male students were determined to have tendency for ON.

Also in our study that we implemented ORTHO-11 and EAT-40 scales, the results were compliant with the literature. When we evaluated ORTHO-11 results in general, our students displayed orthorexic properties. When we evaluated with respect to gender, ORTHO-11 scores of the girls were statistically significantly higher than that of the boys. (What are the prevalences of ON for both gender? And also ED risk according to EAT 40 for both gender?) The fact that the greater number of our female student than male students had an effect on our overall ORTHO-11 results. While evaluating EAT-40 results, we found a lower level risk result for boys but a higher level risk for girls. Besides, increase in the risk of ON was found to be related with the decrease in the risk of eating manner disorder(what is this?), in our study results.

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

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

The studies conducted in our country as well as the other countries reveal similar results. When we evaluate the results in the literature, we can state that the prevalence of orthorexia nervosa is increasing and this increase is particularly based on the slimness of the ideal women concept. Printed press as well as audiovisual media is also effective all around the world in describing slim, aesthetic and thin image frequently in recent years regarding concept of beauty [20,26]. Additionally, the information we come across everyday in media and in our neighbourhood about the dietary regimens and products, and the fact that some of these products contain carcinogenic ingredients such as additives, colorifying materials and hormones, may also be one of the reasons that increase the prevalence of orthorexia nervosa, in our opinon.

5. CONCLUSION

In conclusion, when we evaluate the studies conducted in our country as well as in the other countries, we have the conviction that eating disorders will tend to increase as long as the concepts of beauty, good look and appeal are based on low body mass index. Meanwhile, we also believe that the youg population who are most influenced by such popular tendencies need to acquire truely healthy nutrition habits through training and increase their quality of life. These are all general comments of the literature. Author must state here what messages they want to give according to results of their study. To do this, they complate some analyses and knowledges lacking in this manuscript (some of that I am pointed out on the paper)

CONFLICT OF INTEREST

The authors declared no conflicts of interest.

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- 228 disclose.
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Table 1. Distribution of demographic data of the participating university students

Demographic features	n	%
Gender		
Female	285	75.2
Male	94	24.8
Department		
Nutrition and Dietetics	184	48.5
Nursing	185	51.5
University class		
Firsth 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

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

	Median ±SD	n
Age (year)	20.09±1.47	379
Weight (kg)	60.55±10.01	379
Height (cm)	168.08±7.91	379
BMI (kg/m²,	21.6±2.12	379
Female BMI	19.2±1.83	285
Male BMI	22.8±3.08	94

Abbrevation: BMI; body mass index, SD; standart deviation

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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

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

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Table 4. Comparison of Eating Manner states?? of the of the university students

Gender	Median ±SD	n	р
Female	21.62 ±8.35	285	<0.05
Male	14.22 ±7.18	94	

EAT test points according to sex??

Table 5. Comparison of ORTHO-11 <u>test points</u> results of the university students with respect to gender

Gender	Median ±SD	n	р
Female	29.40 ±3.50	285	<0.05
Male	46.22 ±4.24	94	

Table 6. Comparison of Orthorexia Nervosa states of the university students with respect to risk groups (What does it mean??)

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

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

 <u>Instead of this table, correlation of BMI and also age with Ortho 11 and EAT 40 points is recommended.</u>

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