Makalenin Geliş Tarihi: 26.06.2021
1. Hakem Rapor Tarihi: 11.07.2021
2. Hakem Rapor Tarihi: 16.07.2021
Kabul Tarihi: 24.07.2021

ORTHOREXIA NERVOSA IN UNIVERSITY STUDENTS AND ITS RELATIONSHIP WITH BODY IMAGE PERCEPTION (*)

(Araştırma Makalesi)

Merve İNCE PALAMUTOĞLU(**) - Meltem İNCE YENİLMEZ(***)

Abstract

The level of academic studies into orthorexic characters and actions has increased within the past five years. However, the studies are still founded on descriptive information, which produced various inconsistent results and prevalent data. The connection between orthorexia and socio-cultural context has been investigated poorly and is still yet to be understood fully. 554 tertiary-level students tested by using a protocol that includes conscious participation and informed consent during the research. In addition, the participants completed the ORTO-15 interpreted to our local language, the Eating Attitude Test – YTT-40, which assesses eating attitude, the Maudsley Obsessive Compulsive Questionnaire – MOCL, which assesses symptoms on obsessive-compulsive disorders, and the form for personal information. The results showed that there were no visible gender disparities in the ORTO-15. However, male participants recorded lower scores, which is means greater severity, and are connected to lower pathological patterns of eating as symptoms and behaviours, whereas, among the female students, there were lower obsessive-compulsive signs and pathological body image discomfort. Therefore, more studies that have to do with the connection between Orthorexia Nervosa and obsessive-compulsive symptoms, will be useful to know the causality.

Keywords: *Orthorexia Nervosa, Obsessive-compulsive symptoms, Disordered eating patterns, Body Image Perception, Eating Disorders*

*) Bu çalışma Yaşar Üniversitesi Proje Değerlendirme Komisyonu (PDK) tarafından kabul edilen BAP102 no'lu ve "Yaşar Üniversitesi öğrencilerinde yeme alışkanlıkları, beden kütle indeksi, yaş ve cinsiyet arasındaki ilişki" başlıklı proje kapsamında desteklenmiştir"

**) Öğr. Gör., Afyonkarahisar Sağlık Bilimleri Üniversitesi, Beslenme ve Diyetetik Bölümü, Diyetetik Anabilim Dalı, (e-posta: dytmerveince@gmail.com)
ORCID ID: https://orcid.org/0000-0002-7953-742X

***) Doç. Dr., Yaşar Üniversitesi, İşletme Fakültesi, Ekonomi Bölümü
(e-posta: meltem inceyenilmez@gmail.com). ORCID ID: https://orcid.org/0000-0002-4689-3196

Üniversite Öğrencilerinde Ortoreksiya Nervoza ve Beden İmgesi Algısı ile İlişkisi

Özet

Son beş yılda ortoreksik karakterlere ve eylemlere yönelik akademik çalışmaların düzeyi artmıştır. Bununla birlikte, çalışmalar hala çeşitli tutarsız sonuçlar ve yaygın veriler üreten tanımlayıcı bilgilere dayanmaktadır. Ortoreksiya ve sosyo-kültürel bağlam arasındaki bağlantı zayıf bir şekilde araştırılmıştır ve henüz tam olarak anlaşılamamıştır. 554 yükseköğretim düzeyindeki öğrenci, araştırma sırasında bilinçli katılım ve bilgilendirme protokolu kullanılarak test edilmistir. Ayrıca Türkce'ye tercüme edilen ORTO-15, yeme tutumunu ölçen Yeme Tutum Testi – YTT-40, obsesif-kompulsif bozukluk belirtilerini değerlendiren Maudsley Obsesif Kompulsif Anketi – MOCL ve kisisel bilgi formunu doldurmuşlardır. Sonuçlar, ORTO-15'te görünür bir cinsiyet eşitsizliği olmadığını göstermektedir. Bununla birlikte, erkek katılımcılar, daha yüksek şiddet anlamına gelen daha düşük puanlar kaydetmistir ve semptom ve davranış olarak daha düşük patolojik yeme kalıplarıyla bağlantılıyken, kız öğrenciler arasında daha düşük obsesif-kompulsif belirtiler ve patolojik beden imajı rahatsızlığı ile sonuclanmıştır. Bu nedenle Ortoerksiya Nervosa ile obsesif-kompulsif belirtiler arasındaki bağlantı ile ilgili daha fazla çalışma yapılması nedenselliğin bilinmesinde faydalı olacaktır.

Anahtar Kelimeler: *Ortoreksiya Nervoza, Obsesif kompulsif belirtiler, Düzensiz yeme durumları, Beden Imajı Algısı, Yeme Bozuklukları*

1. Introduction

The talk on the interdependence between health and diet is prevalent, and warnings on the dangers of unhealthy eating habits invoke a strong response from people to look for food and eating behaviors that promise health.

The awareness of the need for healthy eating has markedly increased over the years (Brytek-Matera, 2012) while this now among the basic issues of Western communities (Chaki, Pal and Bandyopadhyay, 2013). For a sustainable healthy lifestyle, the WHO (2020) advised the consumption of plenty of vegetables and fruits, reducing salt, sugars, and fats intake while encouraging exercising. But, in certain people, trying to eat healthily might indicate obsessive signs.

Known as "Orthorexia Nervosa", it is a psychological obsession that makes the person concerned and anxious about eating healthy foods (Bratman, 1997). One of the primary characteristics of Orthorexia Nervosa (ON) is accuracy in selecting food, which is focused on the purity and quality of the food, its origin, whether it contains additives or artificial preservatives (Parra-Fernandez, Rodriguez-Cano, Onieva-Zafra, Perez-Haro, Casero-Alonso, Fernandez-Martinez, and Notario-Pacheco, 2018). ON typically begins as a worry for one's health and is then closely followed by conscious efforts to gain health through dieting but abnormally causes serious negative effects such as impaired social

activeness, deterioration of quality of life, and malnutrition (Maghetti, Cicero, D'Ignazio, Vincenzi, Paolini,. and Lucchin, 2015).

Diet then becomes the primary focus in the interest and thoughts of people which causes distress with eating with severe restrictions from certain foods and subsequent lack of enjoyment of food. There is also the co-existence of anxiety and the strong urge to control the type of food consumed (Fidan, Ertekin, Isikay and Kirpinar, 2010). Other signs include strong eating preferences and strict food eating routines (Koven and Senbonmatsu, 2013) a strong desire to increase self-realization and self-esteem by controlling one's food intake (Segura-Garcia et al., 2015).

At times, this can also be connected with an unintentional loss of weight, apparently without the wish to lose weight instead due to the forced idea of the benefits of eating healthily. However, presently, there is insufficient evidence for grouping ON as a distinguished nosological entity since there is no well-known connection between anorexia nervosa and ON. Moroze, Dunn, Holland, Yager, and Weintraub (2015) suggested first the criteria for formal diagnostic, and later it was Dunn and Bratman (2016) that had proposed the new ones, which is recommended as a guide for future studies shown in Table 1. The ON criteria proposed should be seen as "working criteria". At the same time, there are expected reviews and adjustments sooner in the future, instead of evidence that ON is distinct from anorexia nervosa.

The criteria of Dunn and Bratman (2016) does not add body uneasiness, which means a multifaceted construct, which includes dissatisfaction with general weight/body appearance, withdrawal and obsessive self-monitoring attitude, feelings of disconnecting from your own and worried about certain parts of your body. But, as is stated by the author, no research in this area currently exists. However, there are exciting results noticed on the connection between negative feelings towards one's body image and ON (Runfola, Von Holle, Trace, Brownley, Hofmeier, Gagne, and Bulik, 2013; Carvalheira, Godinho, and Costa, 2017).

For example, the research done by Varga and Ma'te' (2009) revealed a positive connection between negative feelings towards one's body image and ON; at the expression of orthorexia features, the negative feelings about one's body image became worse. Research carried out by Brytek-Matera, Donini, Krupa, Poggiogalle, and Hay (2016) suggests that orthorexia attitudes were connected with negative feelings of body image in students despite their strong feelings about the right and healthy food selections.

The latest diagnostic method shows signs of obsessive-compulsive behavior, which Koven and Abry (2015) had previously reviewed and which Koven and Senbonmatsu (2013) had demonstrated. However, with the obsessive-compulsive disorder, still, orthorexia Nervosa also gets described with the evidence of ongoing obsession (e.g. always thinking about meal preparation), repeating tasks (e.g. routine meal preparation, weighing food products), disturbances in social functioning and lacking perceived life quality due to cognitive intrusions (Kinzl, Hauer, Traweger, and Kiefer, 2006).

Of importance notice is the fact that regardless of a majority of obsessive-compulsive disorder signs (intrusive obsessive thinking and compulsive, repetitive habits) are seen as ego-dystonic (thoughts, habits, feelings, and values of a person that are acceptable and aligned with the ego's goals and needs), with orthorexia these are seen as ego-syntonic (the feelings, values, behaviours, and thought of a person that is described as unacceptable, detached, and not aligned with the ego's goals and needs) (Bratman and Knight, 2000). One more issue that has not been investigated fully with literature regarding differences in gender and the role of gender in the manifestation and development of ON.

Discoveries with regards to sexually connected evidence of obsession with eating healthily are not consistent: certain studies discovered that males have a more tendency to score higher with the ORTO-15 test compared to females (Donini, Marsili, Graziani, Imbriale, and Cannella, 2004; Donini, Marsili, Graziani, Imbriale, and Cannella, 2005; Ramacciotti, Perrone, Coli, Burgalassi, Conversano, Massimetti, and Dell'Osso, 2011; Missbach, Hinterbuchinger, Dreiseitl, Zellhofer, Kurz, and Konig, 2015) whereas different other results showed that the qualifications for obsession with eating healthily were predominantly met by the female participants, which highlights one more time the gap on the studies which links ON and gender. Healthy nutrition in the 21st century is now among the essential elements while addressing health issues. Foods are classified under unnatural or natural. Shopping malls that sell natural foods are now all over the place.

On a d**aily** basis, we get news on environmental pollution and how they affect food to protect our health, causes and prevention of cancer in the public media. However, habits on healthy eating are not a type of illness or disease, but an extreme concern about eating healthily, spending a lot of time to prepare your food, loss of normal function because of the condition in our everyday life could be seen as a type of disease that relates to both personality and behavior. Traditions, behaviors, everyday lifestyle and eating behaviours are rapidly changing. With this change, there is now a basis for multiple researches and formal meetings about whether certain behavioural patterns that went unnoticed in the past and have not been considered until now are now being manifested as pathological or the one particular pathology that could be close.

With a look at history, it can be seen that many types of eating disorders have existed for many years, while both bulimia nervosa (BN) and anorexia nervosa (AN) just got inputted into the formal systems of classification in recent times (Andersen and Yager, 2005). Similarly, while it had previously been thought of as just disorders that pertain to industrialized cultures only, now it has been known that the condition is present in every culture well acquainted with the notion of the" ideal modern woman" shape, and this idea is rapidly spreading.

This example tries to make us understand. However, it was omitted from the previous classification systems after the disorder diagnostic criteria were discovered. Although, in contrast, the studies about that disorder increased, there was also a corresponding

increase in the knowledge about this subject matter. Orthorexia as a word was formed from two words; **Orthos** – which means right, and **Orexis,** which means appetite. Thus, the word orthorexia is used to describe the obsession with the right and healthy nutrition. It was Steven Bratman that first described Orthorexia Nervosa (Babicz-Zielińska, 2006). The condition got a definition back in 1997 (Mathieu, 2005). However, the condition orthorexia Nervosa (ON) is still a discovery that researchers try to concentrate the attention and think if it should be defined as a disorder (Bratman, 2011). There remains a controversy whether orthorexia should be considered a subcategory of obsessive-compulsive or anorexia nervosa disorder or a new distinct disorder (Baĝci-Boci, Çamur, and Güler, 2007). Each time we observe close-looking features of the anorexia nervosa and the orthorexia Nervosa; the urge to be perfect, continuous high anxiety, intensely trying to be in control, and excess weight loss. People that are anorexic and orthorexic are well-oriented to achieve high. They see obedience to their eating diets as a sign of self-discipline, and failing to adhere to this makes them unable to control themselves. Unsimilar to orthorexia, eating problems like bulimia nervosa and anorexia nervosa are quantitatively expressed (for instance, the quantity of food eaten). Thus, the objective of the current study was at first to check the occurrence of orthorexic habits and characters (as evaluated by the ORTO test; then later described as ON in the text, to help maintain conciseness) in the sample containing university students, to check the relationship between ON, eating rhythms (measured by using EAT-26) socio-demographic factors, and personality characters (examined with the use of TCI) in all the sample; and further, to check the potential cross-cultural dissimilarities with eating patterns and ON within the sample (Kummer, Dias, and Teixeira, 2008).

We propose that the prevalence of ON and eating pattern differences could show eating habits as a reflection of pressures of cultural normative. According to available research discoveries, we proposed these hypotheses:

H1: The ORTO-15 score between the male and female students shows no difference.

H2: Through the suggestion of other people, reporting connections between eating habits and obsessive food control, ORTO-15 scores get connected with eating disturbances that are less pathological within the male and female students.

H3: The connection between negative feelings towards one's image and the ORTO-15 scores was suggested by past discoveries [25]. The ORTO-15 scores will then be connected with the uneasiness of the body in females.

2. Research Ethics

During the writing process of the study titled "Orthorexia Nervosa in University Students and its Relationship with Body Image Perception", scientific, ethical and quotation rules were followed. Citations to different studies have been made in accordance with APA standards.

3. Methodology

This research is an online-based study that involves students from Yasar University between the period of April-May 2021. The study was observed only on students willing to volunteer. Therefore, there was a voluntarily informing of every student to completely obta**in** their consent. The Eating Attitude Test (Anoreksiya nervozal), shortened as (YTT – 26) and which comprises 26 questions, (ORTO-15) which comprises 15 questions and a Personal Information survey which comprises 21 questions were given to about 554 students that were willing to take part in the analysis. Descriptive statistics got used for the data that were collected in this manner. The Form for Personal Information which the researcher had produced comprises of 21 different items, and the details of the participant such as height, gender, age, present weight, the status of diet application, desired weight, sources for nutritional information, and so on comprises of questions asked for information to be obtained.

As the items inputted in the Form for personal information, the factors cultivated in the study had been considered in alignment with the literature concerned. The Eating Attitude Test (YTT-26) is a self-reporting scale that is used globally to evaluate behaviours associated with problematic eating (Kartal and Aykut, 2019). This scale comprises 26 questions and the answers, which are assessed with a six-stage Likert form. The steps involve – "Always (3), Very often (2), often (1), sometimes, rarely and never (0)" (Erguney-Okumus and Sertel-Berk, 2020).

The scale's last question is scored with the opposite method. Points obtained from the scale range from 0 as the minimum point and 78 as the maximum points (Kartal and Aykut, 2019). If the EAT-26 scale comes with a total score of less than 20, this is normal. People who have a score of over or equal to 20 are described with eating behaviour disorder. Thus, higher scores indicate higher risks of getting an eating behaviour disorder (Brytek-Matera et al., 2016). The Orthorexia Nervosa evaluation test (ORTO-15) had been developed and adjusted with the help of Donini et al. (2005) of about the 10-question Orthorexia Nevrosa short form questions that Bratman prepared (Gramaglia, Brytek-Matera, Rogoza, and Zeppegno, 2017).

Certain questions were taken off and replaced by different other questions (Brytek-Matera et al., 2017). In its natural form, the ORTO-15 scale is a tool for self-assessment developed to evaluate the possibility of having Orthorexia Nervosa. This scale comprises 15 questions, while the answers are assessed using a four-staged Likert form like "always (4), often (3), sometimes (2), never (1)". With this scale, the 2nd, 5th, 8th, and 9th questions (the 1st, 3rd, 4th, 6th, 7th, 10th, 11th, 12th, 14, and 15th questions) have a reverse score. Answers which show distinguishing criteria with anorexia got a score of about "1", while the answers that tend to have the usual eating habit got a score value of "4".

This research is an online-based survey that involves student of Yasar University and took place between April-May 2021. The research was done only on the students that volunteered. Every student was voluntarily informed, and their consent was obtained.

The shortened form of the Eating Attitude Test (YTT-26), which comprises 26 questions, the Orthorexia Nervosa (ORTO-15), which comprises 15 questions and the Personal Information form, which comprises 21 questions, were focused on 554 students that agreed to take part in this survey. Descriptive statistics were applied to the data collected in this manner (SPSS 26.0). This ORTO-15 test [16] is a self-reporting survey with a 4-point Likert-like scale that has the following assessments: (Always, Often, Sometimes, Never) and includes 15 multiple-choice elements. This is the first verified instrument that has been proposed for the evaluation/assessment of the ON and the prevalence estimation [16]. These items are used to address the selection, the consumption, the preparation, the effect, and the habits thought about to be nutritious food. The elements that were scored as 1 shows a tendency of orthorexia. In contrast, the ones with a score of 4 points reflect the typical eating habit (lower scores indicate increased ON features). It is important to note that this ORTO-15 is defined as a scoring test with reversed values; so, the lower scores indicate increasing pathological habits.

The final scores for a certain study verified the significant usefulness of the ORTO-15 test, which holds only for tests in the 40 points threshold score; this ORTO-15 test comes with a 100% sensitivity value, it comes with a 73.6% specificity value, a 17.6% positive predictive value, and a 100% negative predictive value, whereas, it has a threshold score of 35 points (Dell'Osso, 2016). The test has an 86.5% efficacy, and high specificity of about 94.2%, as well as a high negative predictive value of 91.1%.

Though it was Donini et al. (2005) that had proposed various cut-offs (\35, \40), a score of \35 in ORTO 15 score has been detected to make sure of the most excellent predictive capability which correctly identifies symptoms of orthorexia among the cut-offs. In this current study, (\35), the most limiting threshold had been used to confirm the highest accuracy to identify orthorexic tendencies among the university student population. In this current research, the Italian variant for the ORTO-15 test was used.

4. Results

The research was done with the involvement of 554 university students. Of these, 364 (65.7%) were female, while 190 (34.3%) were male. They had an age range of between 18 and 25 and studied at Yasar University; this is indicated in Table 1.

The student mean age of (X^{-} ±SD) (min:18-max:25) among the 554 students involved in the research was 20.36±1.76. The distribution of age of the students that took part in the research was shown in table 2. It was used to find the degree of incidence and signs of ON with answers provided by the students who took part in the research for the ORTO-15 test. When the students' scores from the ORTO-15 test were evaluated, the lowest score was discovered to be 24 while the highest score was found to be 52.

By the time that the mean ORTO-15 score had been compared based on gender, there was no statistically substantial difference that was discovered between the participation age in the questionnaire based on the gender ($p>0.05$).

Table 1: Gender Distribution Table of Individuals (%)

Gender	n	%
Men	190	34.3
Women	364	65.7
Total	554	100.0

Table 2: Distribution of Students by Age

Age (Finished age)	Men (n=190)		Women (n=364)		Total (n=554)		P
	n	%	n	%	n	%	
18	21	11,1	54	14,8	75	13,5	
19	33	17,4	86	23,6	119	21,5	
20	53	28,0	91	25,0	144	26,0	
21	36	18,4	53	14,6	89	16,1	0,163
22	15	7,9	39	10,7	54	9,7	
23	16	8,4	16	4,4	32	5,8	
24	11	5,8	18	4,9	29	5,2	
25	5	2,6	7	1,9	12	2,2	

Table 3: Distribution of Students according to Body Mass Index (BMI) Classification

Body Mass Index (BMI) classification		n	%	P
Weak	<18,5	90	16,2	
Healthy	18,5 - 24,9	348	62,8	
slightly fat	25,0 - 29,9	94	17,0	0,001
Fat	≥30	22	4,0	
	Total	554	100,0	

Most of the students taking part in the research (62.8%) were discovered to come with a normal body mass index. Furthermore, their body mass index distribution was discovered to significant statistically ($p<0.001$).

Table 4: Health Status Distribution of Students by Gender

Health situation	Men (n=190)		Women (n=364)		Total (n=554)		P
	n	%	n	%	n	%	
Illness status set by doctor							
Yes	14	7,3	29	8,0	43	7,8	0,650
No	176	92,7	335	92,0	511	92,2	
Diagnosed disease *	**n=14**		**n=29**		**n=43**		
Asthma	3	21,4	9	31,0	12	27,9	0,279
Anemia	0	-	2	6,9	2	4,7	
Mediterranean fever	0	-	3	10,3	3	7,0	
Reflux	3	21,4	2	6,9	5	11,6	
fatty liver	2	14,3	0	-	2	4,7	
thyroid disease	1	7,1	2	6,9	3	7,0	
Insulin Resistance	1	7,1	4	13,8	5	11,6	
Diabetes (Type 2)	2	14,3	0	-	2	4,7	
Hypertension	1	7,1	0	-	1	2,3	
celiac disease	0	-	1	3,4	1	2,3	
polycystic ovary syndrome	0	-	5	17,2	5	11,6	
Musculoskeletal system	1	7,1	1	3,4	2	4,7	
Any diet program applied for the disease *	**n=14**		**n=29**		**n=43**		
Yes	7	50,0	10	34,5	17	39,5	0,129
No	7	50,0	19	65,5	26	60,5	

*Evaluated on individuals with a diagnosed disease.

- Percentages (%) are calculated based on the number of individuals with the diagnosed disease.

The distribution of the participant's general status of health by gender is presented in Table 4. Out of about 92.2% of the total students examined, the doctor never diagnosed a disease. This means that about 8.0 of women and 7.3% of men were diagnosed with

a disease. Diseases like reflux and asthma were recorded in men (21.4%); about 31% of women were inflicted with asthma, and about 17.2% of the women were inflicted with polycystic ovary syndrome. It was discovered that about 50% of all the men and about 39.5% of all the women followed a routine diet program to help improve the diagnosed diseases they have.

Table 5: Vitamin-mineral Use Status of Students by Gender

Vitamin-mineral Usage	**Men (n=190)**		**Women (n=364)**		**Total (n=554)**		**P**
	n	**%**	**n**	**%**	**n**	**%**	
Vitamin-Mineral Use							
Yes	58	30,5	124	34,1	182	32,9	0,793
No	132	69,5	240	65,9	372	67,1	
Reason for using vitamin-mineral support *	**n=58**		**n=124**		**n=182**		
be healthier	20	34,5	37	29,8	12	27,9	0,000
be resistant to diseases	17	29,3	57	46,0	2	4,7	
increase body weight	3	5,2	0	-	3	7,0	
Increasing body muscle ratio	11	19,0	0	-			
feeling energetic	7	12,1	30	24,2	5	11,6	

*Evaluated on individuals using vitamin-mineral supplements.

- Percentages (%) are calculated according to the number of individuals using vitamin-mineral supplements.

The distribution of people and how they use vitamin-mineral supplements is presented in Table 5. It was discovered that about 32.9% of these people took vitamin-mineral for support. Whereas the distribution of men who use vitamin-minerals was 30.5%, the use in women was discovered to be about 34.1%. There was a complete lack of statistically substantial difference to connect the use of vitamin-mineral for support and gender ($p>0.05$).

Think about why people use vitamin-mineral as supplements by gender, with most of the men (34.5%) choosing to be healthier, whereas most women (46.0%) reported that they choose to enhance their immunity against diseases. There was a substantial connection between gender and why they prefer minerals and vitamins ($p=0.000$). The student's distribution based on their ORTO-15 scores is presented in Table 6.

Table 6: Gender Distribution Table According to ORTO-15

ORTO-15	Men (n=190)		Women (n=364)		Total (n=554)		P
	n	%	n	%	n	%	
Normal (>33)	141	74.2	258	70.9	399	72.0	0.407
Ortoreksik (≤ 33)	49	25.8	106	29.1	155	28.0	

Based on the ORTO-15 scale, there was noticed the orthorexic effect in the participants of the study (72%). Considering orthorexia frequency in terms of gender, the same rates in both genders were observed with the absence of a statistically substantial difference (p>0.05). In contrast, about 29.1% of all women have orthorexia, with this rate in men being about 25.8%.

Tablo 7: BMI Distribution Table According to ORTO-15

ORTO-15	Normal >33		Ortoreksik ≤ 33		Total		P
BKI	n	%	n	%	n	%	
<18,5	47	11,8	43	27.7	90	16,2	0.000
18,5 - 24,9	253	63,4	95	61.3	348	62,8	
25,0 - 29,9	83	20,8	11	7,1	90	17,0	
≥30	16	4,0	6	3,9	22	4,0	
Total	399		155		554		

When the rate of occurrence of orthorexia due to body mass index in the participants (of the study) was examined, the result showed that the students who have a normal body mass index (BMI 18.5-24.9%) had the highest value (61.3%). In contrast, the incidence rate for orthorexia came out the lowest (3.9%) among the students whose body mass index was fat (BMI 30). A statistically substantial connection was discovered between the body mass index and orthorexia (p=0.000).

5. Conclusion

Due to this, with this research, orthorexia, as a concept is just beginning to gain some ground in literature, was evaluated using a large sample. It was further revealed that obsessive-compulsive habits and eating attitude disorder might affect orthorexia. Whereas no known difference was recorded between the people being different based on BMI concerning orthorexic tendencies, it was seen that an increased BMI might lead to a tendency to develop orthorexia. There was no study discovered in the literature that was done with many samples and assessed the psychometric characteristics of the scale like this.

However, but apart from these research strengths, also we have certain inevitable weaknesses. In the first case, because "orthorexia" is a concept that is still new, the external methodology that enables the basis for comparison have not been established within the literature. This research had been done with a scale developed according to certain characteristics, and its connection with different other variables that were considered to be related theoretically was investigated.

This condition comprises the inevitable and is the point in the research that is the most open. But it should be noted that the literature knowledge is created with the advancement of pioneering studies and deficiencies. Additionally, more comprehensive researches on the ORTO-15 would be needed. With further studies in the future, it could be seen whether those people that are considered to have "orthorexic" features that are clinic can make any difference by using the ORTO-15 score. Since orthorexia tendencies can be distinguished, the points that are meant to be sorted with the treatment should also be differentiated. For instance, perhaps it is due to the desire to be subtle with these people.

It could be important to deal with the assumptions that might cause the need to eat "natural foods" rather than the underlying basic assumptions and diversify the treatment methodologies created for identified eating disorders concerning the requirements of the group of people that are orthorexia. So, a statistically substantial difference was discovered between the orthorexic tendency of the university students and symptoms of obsessive-compulsive disorder and indicated a positive relationship. A higher orthorexia Nervosa risk can be connected with a higher obsessive-compulsive disorder risk and eating problems. Additionally, it has been established that people who apply any technique to lose/gain weight are predisposed to risks such as obsessive and orthorexia compulsive disorder and eating disorders. In agreement with the results, it has been suggested that students increase their awareness of nutrition, and people who risk having them should get the needed assistance.

There is still the need for bigger research about orthorexia Nervosa by using various sample groups. The research limitation is that gender is not seen as being the causative factor because of the limited amount of make students that took part in the research. Furthermore, the student's body mass indexes were not considered during collecting data for the surveys.

References

Andersen, A.E. and Yager, J. (2005). Eating disorders. Comprehensive Textbook of Psychiatry. In B Sadock, V Sadock (9th Ed.), *Kaplan and Sadock's Comprehensive Textbook of Psychiatry* (2005-2021). Philadelphia: Lippincott Williams & Wilkins.

Babicz-Zielińska, E. (2006). Role of psychological factors in food choice: A review. *Pol J Food Nutr Sci., 15/16*(4), 379–384.

Baĝci-Boci, A.T., Çamur, D. and Güler, C. (2007). Prevalence of orthorexia nervosa in resident medical doctors in the faculty of medicine (Ankara, Turkey). *Appetite, 49*(3), 661–666.

Bratman, S. (1997). Original essay on orthorexia. 1997. Retrieved from http://www.orthorexia.com/original-orthorexia-essay/

Bratman, S. (1997). *Health food junkie*. *Yoga J, 136*, 42–50.

Bratman, S. and Knight, D. (2000). *Health food junkies*. *Orthorexia nervosa: overcoming the obsession with healthful eating*. New York: Broadway Books.

Brytek-Matera, A. (2012). Orthorexia nervosa—an eating disorder, obsessive-compulsive disorder or disturbed eating habit? *Arch Psychiatr Psychother 14*(1), 55–60.

Brytek-Matera, A., Donini, L.M., Krupa, M., Poggiogalle, E and Hay, P. (2016). Erratum to: Orthorexia nervosa and self-attitudinal aspects of body image in female and male university students. *J Eat Disord, 4*, 16.

Brytek-Matera, A., Czepczor-Bernat, K., Jurzak, H. *et al*. (2019). Strict health-oriented eating patterns (orthorexic eating behaviours) and their connection with a vegetarian and vegan diet. *Eat Weight Disord 24*, 441–452.

Carvalheira, A., Godinho, L. and Costa, P. (2017). The impact of body dissatisfaction on distressing sexual difficulties among men and women: the mediator role of cognitive distraction. *J Sex Res 54*(3), 331–340.

Chaki, B., Pal, S. and Bandyopadhyay, A. (2013). Exploring scientific legitimacy of orthorexia nervosa: a newly emerging eating disorder. *J Hum Sport Exerc, 8*(4),1045–1053.

Dell'Osso, L., Abelli, M., Carpita, B., Pini, S., Castellini, G., Carmassi, C., and Ricca, V. (2016). Historical evolution of the concept of anorexia nervosa and relationships with orthorexia nervosa, autism, and obsessive–compulsive spectrum. *Neuropsychiatr Dis Treat, 12*, 1651–1660.

Donini, L.M., Marsili, D., Graziani, M.P., Imbriale, M., and Cannella, C. (2004). Orthorexia nervosa: a preliminary study with a proposal for diagnosis and an attempt to measure the dimension of the phenomenon. *Eat Weight Disord*, *9*(2),151–157

Donini, L.M., Marsili, D., Graziani, M.P., Imbriale, M. and Cannella, C. (2005) Orthorexia nervosa: validation of a diagnosis questionnaire. *Eat Weight Disord, 10*, e28–e32

Dunn, T.D. and Bratman, S. (2016). On orthorexia nervosa: a review of the literature and proposed diagnostic criteria. *Eat Behav, 21,* 11–17.

Erguney-Okumus, F. E. and Sertel-Berk, H.O. (2020). Yeme tutum testi kısa formunun (YTT-26) üniversite örnekleminde Türkçeye uyarlanması ve psikometrik özelliklerinin değerlendirilmesi. *Psikoloji Çalışmaları, 40*(1), 57-78.

Fidan, T., Ertekin, V., Isikay, S., Kirpinar, I. (2010). Prevalence of orthorexia among medical students in Erzurum. *Compr Psychiatry, 51*(1),49–54.

Gramaglia, C, Brytek-Matera, A., Rogoza, R., and Zeppegno, P. (2017) Orthorexia and anorexia nervosa: two distinct phenomena? A cross-cultural comparison of orthorexic behaviours in clinical and non-clinical samples. *BMC Psychiatry, 17*, 75.

Kartal, F.T. and Aykut, M.K. (2019). Üniversite öğrencilerinde sosyal fizik kaygısı ve depresyonun yeme bozukluğu riski ile ilişkisi. *Beslenme ve Diyet Dergisi, 47*(2), 20-29.

Kinzl, J.F., Hauer, K., Traweger, C., and Kiefer, I. (2006). Orthorexia nervosa in dieticians. *Psychother Psychosom*, *75*(6), 395–396

Koven, N.S. and Senbonmatsu, N. (2013). A neuropsychological evaluation of orthorexia nervosa. *Open J Psychiatr, 3*, 214–222.

Koven, N.S. and Abry, A.W. (2015). The clinical basis of orthorexia nervosa: emerging perspectives. *Neuropsychiatr Dis Treat, 11*, 385–394

Kummer, A., Dias, F.M. and Teixeira, A.L. (2008). On the concept of orthorexia nervosa. *Scand J Med Sci Sports, 18*(3), 395–396

Maghetti, A., Cicero, A.F.G., D'Ignazio, E., Vincenzi, M., Paolini, B. and Lucchin, L. (2015). Orthorexia prevalence among health care professionals involved in nutrition education: the ADI-O study. *Mediterr J Nutr Metab, 8*,199–204.

Mathieu, J. (2005). What is orthorexia? *J Am Diet Assoc., 105*(10), 1510–1512.

Missbach, B., Hinterbuchinger, B., Dreiseitl, V., Zellhofer, S., Kurz, C. and Konig, J. (2015). When eating right, is measured wrong! A validation and critical examination of the ORTO-15 Questionnaire in German. *PLoS One, 10*(8), e0135772.

Moroze, R..M, Dunn, T..M, Holland, J.C., Yager, J. and Weintraub, P. (2015). Microthinking about micronutrients: a case of transition from obsessions about healthy eating to near-fatal 'orthorexia nervosa' and proposed diagnostic criteria. *Psychosomatics, 56*(4), 397–403.

Parra-Fernandez, M.L., Rodriguez-Cano, T., Onieva-Zafra, M.D., Perez-Haro, M.J., Casero-Alonso, V., Fernandez-Martinez, E. and Notario-Pacheco, B. (2018). Prevalence of orthorexia nervosa in university students and its relationship with psychopathological aspects of eating behaviour disorders. *BMC Psychiatry, 18*,364.

Ramacciotti, C.E., Perrone, P., Coli, E., Burgalassi, A., Conversano, C., Massimetti, G. and Dell'Osso, L. (2011). Orthorexia nervosa in the general population: a preliminary screening using a self-administered questionnaire (ORTO-15). *Eat Weight Disord, 16*(2), e127–e130.

Runfola, C.D., Von Holle, A., Trace, S.E., Brownley, K.A., Hofmeier, S.M., Gagne, D.A., and Bulik, C.M. (2013). Body dissatisfaction in women across the lifespan: results of the UNC-SELF and Gender and Body Image (GABI) studies. *Eur Eat Disord Rev, 21*(1),52–59.

Segura-Garcia, C., Ramacciotti, C., Rania, M., Aloi, M., Caroleo, M., Bruni, A., Gazzarrini, D., Sinopoli, F. and De Fazio, P. (2015). The prevalence of orthorexia nervosa among eating disorder patients after treatment. *Eat Weight Disord, 20*(2),161–166.

Varga, M. and Ma´te´, G. (2009). *Eating disturbances in orthorexia nervosa*. XIII annual meeting of the European Association for Consultation-Liaison Psychiatry and Psychosomatics (EACLPP) XXVIII European Conference on Psychosomatic Research (ECPR): A selection of the best abstracts submitted. *J Psychosom Res, 68*, 672–673.

World Health Organization (2002). *Global strategy on diet, physical activity and health*. Geneva: World Health Organization.