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Mediator Roles of Perfectionism and Self-Critical Rumination in the Relationship Between Perceived Maternal Rejection and Orthorexia: A Model Testing in a Female Sample

Algılanan Anne Reddi İle Ortoreksiya Arasındaki İlişkide Mükemmelliyetçiliğin ve Öz-Eleştirel Ruminasyonun Aracı Rolü: Kadın Örnekleminde Bir Model Testi

Burcu Korkmaz Yayın[1], Ceren Ceylan Ergun[1]

[1]Bursa Uludağ University, Bursa

ABSTRACT

Orthorexia nervosa (ON) refers to a pathological obsession with healthy eating characterized by a restrictive diet, ritualized eating patterns, and strict avoidance of foods believed to be unhealthy or unclean. On the other hand, healthy orthorexia (HO) is defined as an interest in healthy eating and a tendency to eat healthy foods. This study aimed to investigate the relationships between the ON, HO, maternal rejection, perfectionism, self-critical rumination, and body attitude in the women sample. 445 female students from diverse universities in Turkey was attended to our study. Participants completed questionnaires regarding ON and HO, body attitude, maternal rejection, perfectionism, and self-critical rumination. The results showed that negative body attitudes could not predict both HO (B=-.008, SE=.039, p=.791) and ON (B=.008, SE=.032, p=.835). However, perfectionism and self-critical rumination had mediator roles in the relationship between ON and HO with maternal rejection, despite this relationship was positive for ON (B = .014, Boot SE = .007, 95% Boot CI [.003, .029]), but negative for HO (B = -.023, Boot SE = .010, 95% Boot CI [-.042, -.008]). Not a negative body attitude, but maternal rejection, perfectionism, and self-critical rumination played roles in developing orthorexic tendencies.

Keywords: Orthorexia nervosa, healthy orthorexia, maternal rejection, perfectionism, rumination

ÖZ

Ortoreksiya nervoza (ON), kısıtlayıcı bir diyetle, belirli bir yeme örüntüsü ritüeliyle ve sağlıksız olduğu ya da temiz içerikli olmadığı düşünülen yiyeceklerden katı bir şekilde kaçınma ile belirgin, sağlıklı beslenmeye ilişkin bir obsesyon olarak tanımlanmaktadır. Diğer yandan Sağlıklı Ortoreksiya (SO) sağlıklı yemeye yönelik bir ilgi ve sağlıklı yiyecekler yeme eğilimi olarak görülmektedir. Bu çalışmada bir kadın örnekleminde ON, SO, anne reddi, mükemmeliyetçilik, öz-eleştirel ruminasyon ve beden tutumu arasındaki ilişkilerin incelenmesi hedeflenmiştir. Türkiye'nin farklı üniversitelerinde öğrenim gören 445 kadın öğrenci çalışmamıza katılmıştır. Tüm katılımcılar ON, SO, beden tutumu, anne reddi, mükemmeliyetçilik ve öz-eleştirel ruminasyon değişkenlerini ölçen ölçüm araçlarını doldurmuşlardır. Sonuçlar olumsuz beden tutumunun SO'yu (B=-,008, SE=,039, p=,791) ve ON'yi (B=,008, SE=,032, p=,835) yordamadığını göstermiştir. Ek olarak anne reddi ile ON ve SO arasındaki ilişkilerde mükemmeliyetçiliğin ve öz-eleştirel ruminasyonun aracı rolü bulunmaktadır. Ancak mükemmeliyetçilik ve öz-eleştirel ruminasyon aracı değişken olduğunda anne reddi ile ON arasındaki ilişkinin yönünün pozitif (B = ,014, Boot SE = ,007, 95% Boot CI [,003, ,029]), SO arasındaki ilişkinin yönünün ise negatif (B = -,023, Boot SE = ,010, 95% Boot CI [-,042, -,008]) olduğu sonucuna ulaşılmıştır. Bu çalışmanın bulgularına göre ortoreksiya eğilimlerinin gelişiminde bedene yönelik olumsuz tutumların değil; ancak algılanan anne reddinin, mükemmeliyetçiliğin ve öz-eleştirel ruminasyonun rolü bulunmaktadır.

Anahtar sözcükler: Ortoreksiya nervoza, sağlıklı ortoreksiya, anne reddi, mükemmeliyetçilik, ruminasyon

Address for Correspondence: Burcu Korkmaz Yayın, Bursa Uludağ Üniversitesi Fen Edebiyat Fakültesi Psikoloji Anabilim Dalı, Bursa, Türkiye **E-mail:** burcukorkmaz@uludag.edu.tr
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Introduction

The concept of orthorexia nervosa (ON) was first proposed by Bratman (1997) which refers to 'a pathological obsession with healthy eating characterized by a restrictive diet, ritualized eating patterns, and strict avoidance of foods believed to be unhealthy or unclean', leading to a disordered eating behavior that results in an exaggerated focus on food driven by the search for 'extreme purity' (Bratman 1997, Donini et al. 2004, Koven & Abry 2015). Despite being driven by the desire to eat pure and healthy foods, people with ON may have nutritional deficiencies, medical complications, unintended weight loss, and poor quality of life (Donini et al. 2004, Koven & Abry 2015, Bratman 2017, Brytek-Matera et al. 2017). Some studies have claimed that ON has similarities with other eating disorders and obsessive-compulsive disorder (OCD) (Borgida 2011, Oberle et al. 2020). In anorexia and bulimia nervosa, people's minds are preoccupied with the amount, while individuals with ON concern about the quality of food (Chaki et al. 2013, Varga et al. 2014). ON is seen as also similar to OCD in that individuals with ON employ with healthy eating and have compulsions, obsessions, and rituals about what, how, and when they eat (Donini et al. 2004, Borgida 2011, Brytek-Matera et al. 2017, Oberle et al. 2020).

Some opinions suggest that a distinction should be made between ON and 'healthy orthorexia' (HO) (Barrada & Roncero 2018). Individuals with HO spend a significant amount of time and money buying healthy food, and planning and preparing nutrition. On the other hand, the ON refers to the pathological obsession with pure foods, and the healthy eating habits of individuals may go beyond normal (Brytek-Matera 2012). The mechanism behind the development of orthorexic tendencies is needed to be understood, but studies are limited.

Parental rejection is defined by Rohner and Rohner (1981) as the lack of warmth and affection from parents towards their children. Considering the role of family that is both a risk and a protective factor in eating disorders (Erriu et al. 2020, Ramalho et al. 2021) and poor motherhood contributes to disordered eating (Prescott & Le Poire 2002), the role of maternal rejection in the development of ON needed to be evaluated.

Perfectionism is a concept that is characterized by the efforts of the individual with the desire for self-realization (Hollander 1965). It was stated that perfectionist individuals have high expectations from themselves and their social environment (Smith et al. 2019). Researchers have suggested that perfectionism can be seen as a potential risk factor for ON (Pratt et al. 2021) as well as a potential risk factor for the development and maintenance of eating disorders (Bardone-Cone et al. 2010, Brown et al. 2012).

Bratman and Knight (2000) stated that in ON, in contradistinction to other eating disorders, individuals do not tend to exhibit negative body image attitudes (Brytek-Matera et al. 2018). In other words, individuals with ON are not expected to exhibit body restlessness, body dissatisfaction, and concerns about their bodies (Dunn & Bratman 2016). Some studies supporting this view did not find a significant relationship between body dissatisfaction and ON symptoms (Moroze et al. 2015, Bundros et al. 2016, Topçu and Arıcak 2019). Nevertheless, there are findings indicating that there is a positive relationship between negative body attitudes and ON (Brytek-Matera et al. 2015, Barnes & Caltabiano 2016, Barthels et al. 2021).

Self-critical rumination is conceptualized as a repetitive judgment that causes embarrassment and self-worthlessness (Smart et al. 2016, Martinez-Sanchis et al. 2021). The relationships between eating disorders and both rumination (Palmieri et al. 2021) and self-critical rumination (Thew et al. 2017) were observed in the associated literature, despite limited studies could be found.

As can be seen in the light of the summarized literature, studies examining the relationships between perceived maternal and orthorexia variables are limited. In addition, no study examining the role of negative body attitude, perfectionism and self-critical rumination in the prediction of both healthy orthorexia and orthorexia nervosa was found. In this study, the mediating role of negative body attitude, perfectionism, and self-critical rumination in the relationship between perceived maternal rejection and healthy orthorexia and orthorexia nervosa will be examined for the first time. Accordingly, we hypothesized that maternal rejection, perfectionism, negative body attitudes, and self-critical rumination have positive associations with ON, but negative associations with HO in women. We also aimed to test a theoretical model, and evaluate whether the models of HO and ON differ in terms of these variables in a women sample.

Methods

Sample

Since serial mediators were used in this study and the boostrapping method was preferred in the analysis, Monte Carlo Power Analysis for Indirect Effects (Schoemann et al 2017) method was used to determine the sample size.

In this analysis, the target power was determined as .95. According to the results of Monte Carlo Power Analysis, it was seen that the minimum number of participants that should be used with these criteria was 212. In our study, there were 445 participants in total. This indicated that the sample size of this study was sufficient.

In order to reach as homogeneous group as possible, our exclusion criteria were determined as being male, being over 35 years old, and not being a student enrolled in a university. Therefore, although a total of 520 people were reached, 75 people who met the exclusion criteria were not included in the analysis. To sum, a total of 445 women aged 18-34, mostly undergraduate students, enrolled in universities in Turkey, took part in the study. The mean age of the sample was 22.3 (SD= 3.04). The departments of the students and the universities they were enrolled in varied. Of these female undergraduate students, 26.1% were in the first, 18.4% were in the second, 16.4% were in the third, 18.2% were in the fourth year of their undergraduate education, and 4.9% were in their fifth or more year. In addition, 11% of the sample consisted of a master and 4.9% of doctoral students. 92.8% of the women in the sample were single and 6.1% were married. The remaining 1.1% reported their relationship status as 'other'.

Procedure

Before starting the study, ethical permissions were obtained from Bursa Uludağ University Ethics Committee (Date: 25.02.2022, No: 2022-02/31). All measures were uploaded to a payment free online data collection system (www.surveey.com) by the authors of the study. In addition, before proceeding with the data collection, the authors completed the scales independently to test whether there were any technical, grammatical or structural problems in the scales which were transferred to the online data collection system. In the data collection link, there were six screens (one for each scale) in total. Participants were required to answer all of the items and questions. IP addresses were controlled in order to prevent double (or more) attendance of any participant. The completion of measurement tools took approximately 15 minutes. Participants responded to a hundred and three scale items in a self-report type, including the questions in the demographic information form. Participants were not allowed to go back to previous screens (with the help of the settings in the data collection system). Participation to the study was completely voluntary, and no reward (points, money, gifts, etc.) was given to any participant. The link of the study was first shared on the social media account named Instagram with the following message: '*Below, the link of a study which is conducted by Dr. Burcu KORKMAZ YAYIN and master student Ceren CEYLAN ERGUN from Bursa Uludag University was shared. Within the scope of this study, data will be collected from female university students and it is aimed to examine the relationships between women's eating patterns and some psychological variables. The completion of the scales takes about 15 minutes. Your participation is very valuable for a scientific study. You can access the survey by clicking the link below, fill them out and share them with your university student female acquaintances. Thank you for your attention*.'. The link of the study was shared on the Instagram accounts of the researchers along with this message's Turkish version, and people with a large number of followers were asked to share the link of the study. No fee was paid to any sharer for this purpose, only a sapling was donated for one sharing. After this stage, the link of the study was sent to the e-mail addresses of Bursa Uludağ University students by the 'Press and Public Relations Unit' of the Bursa Uludag University. Finally, the link of the study was shared in student communication groups through some volunteer undergraduate students.

An informed consent form was provided to all participants before starting to complete the scales. No identity information was asked from the participants, they were informed that the data obtained will be considered anonymous, and a note was also shared that they could withdraw from the study at any time. All data were collected online. Because the sampling method of the study was snowball, the participants were from diverse universities and departments of Turkey. After completing the scales, all participants were presented with an informational text explaining the objectives of the study. It was also shared that the participants could contact the researchers and could obtain information about the findings.

Measures

Demographic Information Form

With this form was prepared by the researchers, and it was aimed to learn the demographic information of the participants. In this direction, the participants were asked questions about their gender (in order to exclude non-female participants from the data set), age, educational status, perceived socioeconomic level (with low, medium, and high options), height and weight information, and whether they had ever dieted or not.

Teruel Orthorexia Scale (TOS)

The scale developed by Barrada and Roncero (2018) aims to measure ON and HO. The original scale, consisting of 17 items in total, is in a 4-point Likert style. The internal consistency coefficient and the test-retest correlation coefficient of the first subscale of TOS, which is HO are .85 and .73, respectively. The second subscale aims to measure ON, and the internal consistency coefficient is .81, while the test-retest reliability coefficient is .82 for this subscale. The Turkish adaptation of the scale was carried out by Asarkaya and Arcan (2021), and the results confirmed that the Turkish version of the scale has a two-factor structure as in the original. The cronbach's alpha internal consistency coefficients of the Turkish version of TOS were calculated as .86 for the HO and .81 for the ON subscale. It was also concluded that the validity of the scale was also acceptable.

Parental Acceptance Rejection Questionnaire Short Form/ Mother Form (PARQ-SF-MF)

The scale was developed by Rohner (2005) to evaluate the memories of the participants about parental acceptance-rejection in childhood. The short form, which consists of 24 items, is completed separately for the mother and father, but within the scope of this study only the mother form was presented to all participants. In the original study, the internal consistency coefficient of the factors was found above .81, and the results of confirmatory factor analysis confirmed the four-factor structure. The Turkish version of PARQ-SF was studied by Dedeler, Akün, and Durak-Batıgün (2017). According to the researchers, the internal consistency coefficient of the subscales of the PARQ-SF-MF varied between .75 and .96. In addition, the results of the confirmatory factor analysis confirmed the four-factor structure of the scale. The permissions for using the Turkish version of PARQ-SF were obtained from Rohner via email, before starting this study.

Almost Perfect Scale (APS)

Developed by Slaney and Johnson (1992) and revised by Slaney et al. (1996, 2001), APS is used to evaluate the perfectionism levels of individuals. The scale is in a 7-point Likert style, and consists of 23 items. Cronbach's alpha internal consistency coefficients of the APS factors were between .82-.91. APS adapted to Turkish by Sapmaz (2006), and it was concluded that Turkish APS had 4 factors, whose Cronbach's alpha internal consistency values were between .72-.83.

Self-Critical Rumination Scale (SCRS)

The scale, developed by Smart et al. (2016), measures the self-critical rumination variable, which refers to focusing one's attention on one's shameful aspects and self-worth. SCRS, which consists of 10 items, is in a 4-point self-report Likert style. The internal consistency coefficient was found as .92, and the scale had a single factor structure. It was concluded that the Turkish version of the SCRS, which was adapted into Turkish by İngeç et al. (2021) and whose psychometric properties were examined, had also a single-factor structure. The internal consistency coefficient of the Turkish version of the scale was .89; the test-retest reliability coefficient was also found to be .89.

Body Attitude Test (BAT)

The scale was developed by Probst et al. (1995) to evaluate the attitudes of people about their bodies, and to evaluate the preoccupation with body shape. BAT is a self-report test and has 20 items in a 5-point likert type. According to researchers, the test has a good reliability with .93 cronbach alpha coefficient. In addition, it is thought as a valid and practical measurement tool. This questionnaire was adapted to Turkish by Şahin et al. (2020) and their results showed that the Turkish version of the scale was also reliable (test-retest reliability score is .95, cronbach alpha coefficient is .82).

Statistical Analysis

In the study, Pearson Product-Moment Correlation analysis was carried out in order to examine the relationships between the variables. With a simple regression analysis, it was tested whether the variables of the study predicted the Body Mass Index (BMI). Moreover, participants that dieted or non-dieted were compared with a t-test in terms of these variables. SPSS 28 was used during the statistical analyzes. In addition, the Process Macro of Hayes (2013) was extended to the SPSS program in order to conduct the mediator analysis. Through this extension developed by Hayes (2013), it is possible to examine the mediating role of one or more variables in the relationship between the independent variable and the dependent variable. Because Process Macro uses boostrapping during analysis, it is robust against the problems that can be encountered in social sciences such as violation of normality distribution (Hayes 2013). It can also display direct, indirect and total effects. For these reasons, it was decided to use Hayes' Process Macro in our study.

Results

Before proceeding with further analysis, the demographics of the sample were evaluated in general. The results showed that 26.3% of the participants repoted their income level as low, 70.3% as average, and 3.4% as high. Besides, the mean BMI score of the women was 22.19 (SD= 3.90). In addition, only perceived maternal rejection (R^2= .04, B= 1.41, t= 4.04, p< .001), self-critical rumination (R^2= .02, B= .65, t= 2.96, p= .003), HO (R^2= .03, B= -1.19, t= -3.90, p< .001), and ON (R^2= .01, B= .86, t= 2.27, p=.023) predicted the BMI score of women. Also, 70.3% of the participants stated that they followed any diet to lose weight with their intentions. Dieted and non-dieted women were compared according to the variables of the study, and a significant difference was found only for ON variable (t(291.14)= 3.10, p= .001, 95%CI [.053, .237]. In other words, it was seen that dieted women scored higher in ON subscale of TOS. The frequencies of sociodemographic variables were presented in Table 1.

Table 1. Frequencies of the perceived socioeconomical status (SES), diet experience, and the body mass index (BMI) of the participants

	Category	**Frequency (Percent)**
SES	Low	26.3
	Middle	70.3
	High	3.4
Diet	Yes	70.3
	No	29.7
BMI	Extremely Obese	0.2
	Obese	4.7
	Overweight	13.5
	Normal	69
	Underweight	12.4

It was also found that the perfectionism scale had the highest scores among participants (M=4.49, SD= 1.00, SE=.047). The mean of the HO was 2.172 (SD=.595, SE=.028), and of the ON was 1.483 (SD=.489, SE=.023), which indicated that the participants scored higher on the HO (Table 2).

Table 2. Descriptive statistics of the variables

	N	**Mean**	**Standard Deviation**	**Standart Error**
Healthy Orthorexia	445	2.172	.595	.028
Orthorexia Nervosa	445	1.483	.489	.023
Maternal Rejection	445	1.547	.522	.248
Perfectionism	445	4.490	1.000	.047
Self-critical Rumination	445	2.572	.832	.039

According to the Pearson Product-Moment Correlation analysis, there were no significant relationships between the BAT and HO (r=.010, p=.835) and ON (r=-.013, p=.791). It was also tested if the BAT predicts HO and ON, again, we could not find any significant relationship. For example, BAT explained zero percent of the variance on HO (B=-.008, SE=.039, p=.791), and on ON (B=.008, SE=.032, p=.835). We decided to exclude the body attitude variable from the models for the reason of these insignificant results and zero variance explained by BAT.

Table 3. Correlations between healthy orthorexia, orthorexia nervosa, maternal rejection, perfectionism, and self-critical rumination

	1	**2**	**3**	**4**
Healthy Orthorexia	-			
Orthorexia Nervosa	.452**			
Maternal Rejection	-.045	.199**		
Perfectionism	.077	. 247**	.220**	
Self-critical Rumination	-.100*	.261**	.323**	.527**

*p < .05; **p < .001

The correlation analysis showed that there was a significant and positive relationship between the subscales of TOS. In other words, as the HO scores increased, the ON scores also increased (r=.452, p<.001). It also observed that there were significant and positive relationships between ON and maternal rejection, perfectionism, and self-critical rumination (r=.199, p<.001; r=.247, p<.001; r=.261, p<.001, respectively). There were positive and significant relationships between maternal rejection and perfectionism (r=.220, p<.001), maternal rejection and self-critical rumination (r=.323, p<.001), and perfectionism and self-critical rumination (r=.527, p<.001). There was only one significant but negative correlation between HO and self-critical rumination (r=-.100, p<.05).

However, HO did not show any significant relationship with the maternal rejection (r=-.045, p=.343) and perfectionism (r=.077, p=.104). These results indicated that despite ON being correlated with all these variables, HO was found only to be negatively correlated with self-critical rumination (Table 3).

Figure 1. The associations between the maternal rejection and healthy orthorexia through perfectionism and self-critical rumination

*p<.05

To test the mediator roles of perfectionism and self-critical rumination in the relationship between maternal rejection and HO, a mediation analysis was performed using The Process Model with 5000 bootstrapping samples (Hayes 2013). The results showed that maternal rejection significantly predicted perfectionism (B=.420, SE=.089, p=.000, 95%CI [.246, .595]). Furthermore, maternal rejection and perfectionism predicted self-critical rumination (B=.347, SE=.064, p=.000, 95%CI [.221, .473]; B=. 399, SE=.033, p=.000, 95%CI [.333, .464], respectively). It was also observed that perfectionism and self-critical rumination predicted HO (B=.108, SE=.041, p=.001, 95%CI [.043, .172]; B=-.134, SE=.041, p=.000, 95%CI [-.214, -.054], respectively). It was concluded that maternal rejection did not predict HO (B=-.028, SE=.056, p=.625, 95%CI [-.138, .083]) which showed that the direct association was not significant. However, the indirect association between the maternal rejection and HO through the perfectionism and self-critical rumination was significant (B=-.023, Boot SE= .010, 95%Boot CI [-.042, -.008]), which indicated that perfectionism and self-critical rumination played a full-mediator role. In other words, there was found a negative association between maternal rejection and HO if the mediators perfectionism and self-critical rumination were included in the model (Figure 1). At the same time, this constructed model was statistically significant (F (2,442)=5.150, p=.002) and the variance explained by the model was 3%.

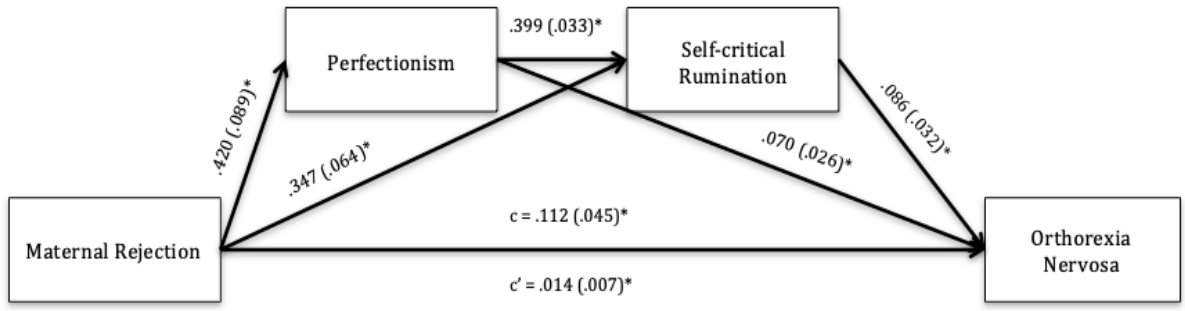

Figure 2. The associations between the maternal rejection and orthorexia nervosa through perfectionism and self-critical rumination

*p<.05

The second hypothesized model aimed to investigate whether perfectionism and self-critical rumination had mediator roles in the relationship between maternal rejection and ON by using The Process Model with 5000 bootstrapping samples (Hayes, 2013). First, it was found that ON was significantly predicted by perfectionism (B =.070, SE=.026, p=.008, 95%CI [.019, .121]), self-critical rumination (B=.086, SE=.032, p=.008, 95%CI [.023, .150]), and maternal rejection (B=.112, SE=.045, p=.013, 95%CI [.024, .200]). The indirect effect of maternal rejection on ON was also significant (B=.014, Boot SE=.007, 95%Boot CI [.003, .029]), as the direct effect (Figure 2). Besides, the results indicated that as maternal rejection increased, ON scores also increased both with and without the mediators. According to researchers (Zhao et al. 2010, Hair et al. 2021), if the direct and indirect effects are both significant, the mediator variable(s) had a partial mediation (complementary) role in the

relationship between the independent and dependent variables. In sum, it was concluded that there were partial mediator roles of perfectionism and self-critical rumination in the relationship between maternal rejection and ON (F(3,441)=15.839, p=.000), and the model explained 10% of the variance.

Discussion

In this study, it was aimed to examine the relations between perceived maternal rejection and orthorexia. The starting point of the study is to contribute to the discussions on whether orthorexia is a psychological disorder (Vandereycken 2011, Janas-Kozik et al 2012, Dunn & Bratman 2016, Strahler et al 2018, Cena et al 2019, Ryman et al 2019), the views defend that it will take place in the next versions of the DSM (Gramaglia et al 2022), and the knowledge that tries to explain the mechanism of the development of orthorexic attitudes and behaviors. Researchers who consider orthorexia to be a mental health problem refer to eating disorders and obsessive-compulsive disorder (Brytek-Matera 2012, Koven & Abry 2015, Łucka et al 2019, Zickgraf et al 2019, Yakın et al 2020, Meule & Voderholzer 2021, Zagaria et al 2022) commonly. In particular, patterns such as obsessively thinking about eating healthy meals, abnormally avoiding foods that are thought to be unhealthy, ritualistic food preparation, and feeling guilty after eating unhealthy foods can be seen as important variables that may be associated with orthorexia. However, the word 'nervosa' in the commonly used phrase 'orthorexia nervosa' gives the impression that it is an eating disorder rather than an OCD. Numerous studies have found a significant relationship between eating disorders and body image and body satisfaction (Klemchuck et al 1990, Adams et al 1993, Rosen 1996, Cash & Deagle 1997, Stice 2002, Stice & Shaw 2002, Tylka 2004, Brannan & Petrie 2008). In this study, hypotheses were developed that positive correlations could be found between negative body attitude and the nervosa subscale of the orthorexia scale, and negative relationships with the healthy orthorexia subscale. However, the results had been surprising: neither orthorexia nervosa nor healthy orthorexia sub-dimensions were found to be significantly associated with negative body attitudes. Moreover, the variance that negative body attitude could explain on both ON and HO was found to be zero. These results are consistent with studies that concluded that there is no relationship between body image and orthorexia nervosa (Moroze et al 2015, Bundros et al 2016, Topçu & Arıcak 2019, Yıldırım 2020). According to Brytek-Matera et al. (2018), orthorexia nervosa may be differentiated from other eating disorders by not feeling any anxiety about body weight and shape. However, caution is necessary for interpreting the results; because researchers do not fully agree on the content of the concept of orthorexia and the possible diagnostic criteria if it will be included in the next version of the DSM. Therefore, the difficulties related to the operational definition and measurement of the orthorexia concept should be considered in this study, as in all studies.

Disentangling orthorexia variable as healthy and unhealthy is one of the most current discussion in the associated literature. According to Barrada and Roncero (2018), healthy orthorexia should be defined as an interest in healthy eating and a tendency to eat healthy foods. Compared to orthorexia nervosa, which includes dysfunction and many distressing symptoms, healthy orthorexia seems to indicate a more common condition. Today campaigns aimed to prevent health problems in order to prolong the human lifespan, easy access to various foods, and advancement in scientific knowledge on nutrition, may explain why some people prefer healthier foods in their daily lives. Making such a distinction may also serve as a response to the overdiagnosis criticism of DSMs. Although DSMs generally use a categorical (present or absent) diagnostic system, examining the orthorexia phenomenon on a dimension, healthy at one end and nervosa at the other, may contribute much more to both scientific studies and the field of practice. In this sense, it seems important for researchers to direct their attention to the healthy orthorexia component too and to focus on studies on dimensional approaches. Accordingly, TOS, which is a newly developed (Barrada & Roncero 2018) and whose psychometric properties have been studied quite recently in a Turkish sample (Asarkaya & Arcan 2021) is important to study in the direction of this distinction.

Another hypothesis of this study was that there was a positive and significant relationship between maternal rejection and ON, and negative and significant relationship with HO. The results partially supported our hypothesis. It is noteworthy that there are significant relationships between maternal rejection and eating disorders (Dominy et al 2000, Herraiz-Serrano et al 2015) and OCD (Lennertz et al 2010, Zhang et al 2022). While the maternal rejection predicted orthorexia nervosa, which causes psychological difficulties and impairs functionality, it did not predict healthy orthorexia, which expresses a healthy eating orientation. Therefore, it can be suggested that this multifinality (a developmental history can lead to several outcomes, Howe 2011) effect of maternal rejection creates a context in which orthorexia nervosa is also an outcome.

One of the variables most associated with orthorexia nervosa in the literature is perfectionism (Barnes & Caltabiano 2017, Muno 2020, Novara et al 2021, Brytek-Matera et al 2022, Novara et al 2022, Pratt et al 2022).

Perfectionism is also associated with symptoms of other eating disorders (Hewitt et al 1995, Bulik et al 2003, Castro-Fornieles et al 2007, Bardone-Cone et al 2010) and OCD (Rhéaume et al 1995, Frost & Steketee 1997, Bouchard et al 1999, Coles et al 2003). Brown et al (2012) claimed that disordered eating attitudes were associated with perfectionism; because people set high standards for themselves, and these high standards led to the strict follow-up of the rules for eating. In fact, according to him, these strict rules become more and more strict and prohibitive; the person thus be more and more interested in eating and food-related issues. Indeed, as can be seen from our results, there were significant relationships between ruminative thinking style and orthorexia. In other words, both perfectionism and self-critical rumination variables were also significantly associated with orthorexia, just as they were with other eating disorders and OCD symptoms. Moreover, these variables also mediated the existing relationship between maternal rejection and orthorexia nervosa. Although there might be significant relationships between healthy orthorexia and these variables, it was noteworthy that the indirect relationship between maternal rejection and healthy orthorexia was negative in the model. Therefore, the model showed that as maternal rejection increased, healthy orthorexia scores decreased when the mediators were perfectionism and self-critical rumination in female participants.

This research has some limitations. Although our hypothesis is to examine it in a female sample, it is necessary and important to test and repeat the findings of this study in larger samples. However, the strength of our study is emphasizing the variables in the etiology of both eating disorders and OCD were tested in our models. Brytek-Matera (2012) stated that orthorexia, unlike other eating disorders, was about focusing on the quality of the food, not the quantity. In addition, people with orthorexia tendencies do not focus on thinness as much as on anorexia or bulimia, as indicated in our study. In fact, some researchers found significant associations between orthorexia nervosa and OCD (Costa & Hardan-Khalil 2019), and argued that orthorexia nervosa was an OCD symptomatology that focused on eating habits rather than an eating disorder (Brytek-Matera 2012). However, it is similar to eating disorders in that people's lives were shaped around eating and dieting behavior was used as a part of their identity (Zamaro et al 2005), and some researchers concluded that orthorexia nervosa could be seen as an eating disorder (Łucka et al 2019). Our findings also indicated that the variables were seen as important predictors of both eating and obsessive-compulsive disorders predicted orthorexia patterns. The level of rejection that people perceive from their mothers explains orthorexia patterns through the perfectionism and self-critical rumination they have developed. In addition, it is seen that similar factors play a role in the development of healthy orthorexia and orthorexia nervosa, but as can be expected, the direction of the relationship differs in healthy orthorexia. With this aspect, this study provides support for the explanations of the etiology of orthorexia nervosa, which is predicted to be a new diagnosis, and the opinions presented regarding which diagnosis group it will be in.

Conclusion

Limited studies showed some relationships between parental acceptance–rejection, perfectionism, rumination, and ON; however, evaluating the difference between HO and ON in terms of these hypothetically predictive factors was unexamined. Moreover, the associations that were found by researchers between attitudes toward the body and orthorexia tendencies were quite inconsistent. This study supported the studies that could not find any significant relationship between the negative body attitude and orthorexia constructs, which are HO and ON. In addition, maternal rejection, perfectionism, and self-critical rumination had separately predicted ON. On the other hand, perfectionism and self-critical rumination were mediators in the relationship between maternal rejection and ON. However, the directions of these relationships were negative when the HO was evaluated in terms of these constructs. This study showed that ON was positively correlated with psychological variables that were found to be associated with other eating disorders and OCD. This study contributed to the literature which aims to discuss whether orthorexia tendencies indicate psychopathologies, and which has the goal of explaining the mechanism behind the ON and HO.

To conclude, it is known that parental attitudes play an important role in the emergence of many disorders. Perceived maternal rejection can also be considered one of the most challenging experiences. As can be seen from our results, orthorexia nervosa scores increase as the perceived maternal rejection increases. At the same time, it can be seen that orthorexia nervosa was also predicted by perfectionism and self-critical rumination. As our study showed, orthorexia nervosa is associated with these variables, which also have a place in the etiology of both OCD and eating disorders as discussed. This is a preliminary, but an innovative study, which tests the role of maternal rejection in the orthorexic tendencies. In future studies, it is important to reexamine the roles of perfectionism and self-critical rumination, especially perceived maternal rejection in the development of orthorexia nervosa. On the other hand, it is also important that the relationship between maternal rejection and healthy orthorexia is negative when the mediators are perfectionism and self-critical rumination. This indicates

that the distinction between healthy orthorexia and orthorexia nervosa has a great importance. As can be seen, there may be different mechanisms in the emergence of these two orthorexia types, which seem to be related to each other. Since the separation of orthorexia into healthy and unhealthy is quite new, different studies are needed in the future.

It has been observed that studies conducted in our country, Turkey, are generally carried out to determine the frequency of orthorexia nervosa. For example, Oğur et al (2015) concluded that 41.3% of university students had a tendency to orthorexia nervosa. In fact, Garipoğlu et al (2019) worked with nutrition and dietetics students in their study and showed that the tendency for orthorexia nervosa in their sample reached approximately 77%. Some researchers point out that this prevalence of orthorexia nervosa may appear as an important health problem in the future (Öcal et al 2020). These striking results also reveal and highlight the importance of spreading studies explaining the emergence of orthorexia tendencies.

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