

Orthorexia nervosa predisposition and eating behaviors in hypertension patients: A case-control study

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ABSTRACT

The aim of this case-control study is to evaluate whether there is a difference between individuals with hypertension and healthy individuals in terms of orthorexia nervosa and eating attitudes. This case-control study was conducted with hypertension patients (n=218) and healthy individuals (n=226) who met the research criteria in an internal medicine clinic and outpatient clinics of a university hospital between April and June 2021. The data were collected with face-to-face interview method by using "Descriptive Information Form", "Orthorexia Nervosa-11 (ORTO-11) Scale" and "Eating Attitude Scale (EAT-26)". ORTO-11 score of HT patients was found as 26.39 ± 4.96 , while ORTO-11 score of healthy individuals was found as 27.58 ± 4.26 . EAT-26 score of HT patients was found as 9.87 ± 7.88 , while EAT-26 score of healthy individuals was found as 8.31 ± 7.31 . Statistically significant difference was found between mean ORTO-11 and EAT-26 scores of groups ($p < 0.05$). Mean scores of 59% of HT patients and 41% of healthy individuals were found to be below $ORTO-11 \leq 27$. Mean scores of 14.2% of HT patients and 10.1% of healthy individuals were found to be above $EAT-26 \geq 20$. In the regression analysis, EAT-26 ($\beta = -0.401$, $p < 0.05$) variable was found to have a negative and significant effect on ORTO-11. Higher orthorexia and eating disorder risk was found in hypertension patients when compared with healthy individuals. In addition, it was found that abnormal eating behaviour caused individuals to show more orthorexia behaviour.

Keywords: Hypertension, orthorexia nervosa, eating behaviours, eating disorders, ORTO-11, case-control studies.

Introduction

Hypertension ranks first among the risk factors that cause death in adults throughout the world. Experts predict that this situation will continue in 2040 and hypertension is considered as the most important public health problem for adult population. Prevalence studies conducted throughout the world to find out the prevalence of hypertension have shown that 25-35% of the adult population have this disease (1,2).

Hypertension, which can be controlled with early diagnosis and has serious complications when it cannot be controlled, can be stabilised with appropriate nutritional methods (3,4). However, the pressure that patients feel about complying with the diet for the treatment and optimal management of hypertension may cause the development of negative eating attitude in patients

(5,6). Eating attitude is defined as all behaviours that occur when individuals' eating behaviour becomes subjective by gaining repetition and continuity (7). When the deterioration in attitude is repeated continuously, eating behaviours that may cause eating disorders occur (8). Not being able to cope with positive or negative emotions may cause dietary and eating disorders (9). It is stated in literature that eating attitudes and behaviours of individuals with chronic diseases such as hypertension may be significantly affected (10). Considered from this point of view, the pressure patients feel about following a recommended diet for the rest of their lives for the treatment and optimal management of hypertension may cause them to develop harmful thoughts and attitudes about food and body weight and to develop unsuitable eating behaviours in the long run (11,12). In a study

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conducted by Durat et al. (11), it was reported that individuals with hypertension have more eating disorders when compared with healthy individuals. In another study conducted, eating disorder was found in hypertension patients and it was noted that this condition should be considered in the clinical follow-up of patients (6). For this reason, individuals with hypertension may feel more concern than healthy individuals about protecting and developing their existing health and preventing it from getting worse (5). When individuals with chronic diseases become more concerned about their health, feelings of control over their health and perfectionism may be triggered. This may lead individuals to experience psychological problems such as orthorexia (13).

Orthorexia nervosa (ON) was defined as “a pathological obsession for healthy diet” (14,15). It has been stated in literature that this disease may be triggered with the desire to cope with chronic diseases, proper nutrition, mental problems, problems related with life and the recommendations of health professionals for all these negativities (16). Orthorexia usually starts as an innocent attempt to improve and promote health, with the purposes of treating a chronic disease or losing weight. However, this situation turns into a severe indulgence in determining what individuals will eat, in food preparation rules, in chosen nutrition styles and examining the content of food and it reveals the feeling of guilt for failure in chosen eating style (14,17). Individuals with chronic diseases may be more obsessed with healthy eating than healthy individuals. In addition, this obsession brought about by the thought of healthy eating may prevent individuals from eating in environments outside the home and this may lead to social isolation (18). When the literature was reviewed, although studies in which eating disorders of hypertension patients were evaluated were found (5,6), no studies were found in which ON was evaluated in this patient group. For this reason, the present study was conducted with this group to evaluate the orthorexia behaviours and eating attitudes of individuals with hypertension. The aim of this study is to compare the ON and eating attitudes in hypertension patients and individuals with no chronic disease.

Material and Methods

Type of study: This is a case-control study.

Place and time of the study: The study was conducted in internal medicine clinic and

outpatient clinics of a university hospital in between April and June 2021.

Population and Sample of the Study:

Population of the study consisted of hypertension patients who referred to internal medicine clinic and outpatient clinics of a university hospital in Elazığ and healthy individuals. G-Power 3.1.9.4 program was used for sample size calculation. Post-hoc power analysis showed that the study had a confidence interval of 95%, a significance of 0.05, an effect size of 0.17 and a power of 0.80. These values show that the sample size is at desired level (19). According to the calculation, 226 individuals who met the research criteria and agreed to participate in the study were assigned to the patient group, and 218 individuals who met the research criteria and agreed to participate in the study were assigned to the healthy group.

The sample of the study consisted of individuals who applied to the internal clinics and outpatient clinics of the hospital with a diagnosis of hypertension (n=218) and individuals who applied to the internal outpatient clinics of the hospital for outpatient treatment (n=226). Patients and healthy individuals in the sample of this study fulfil the inclusion criteria within the specified date range.

Inclusion criteria for hypertension patients

- Being older than 18 years of age
- Being a hypertension patient for at least 6 months
- Ability to communicate adequately
- Not having psychiatric problems
- Volunteering to participate in the study

Inclusion criteria for healthy individuals

- Being older than 18 years of age
- Not having hypertension disease
- Not having diabetes mellitus, chronic renal failure or coronary artery disease, which are risk factors for hypertension
- Ability to communicate adequately
- Not having psychiatric problems
- Volunteering to participate in the study

Data Collection Tools: The data were collected by using “Descriptive Information Form”, “Orthorexia Nervosa-11 (ORTO-11) Scale” and “Eating Attitude Scale (EAT-26)”.

Descriptive Information Form: This form prepared by the researchers is an 18-item form which includes participants’ sociodemographic features (age, gender, marital status, educational

level, working status, income status, etc.), health, disease (year of disease, height, weight, exercise status, etc.) and nutritional habits (eating herbal products, eating organic products, dieting, etc.).

Orthorexia Nervosa (ORTO-11) Scale: It was developed by Donini et al. (20) to evaluate the tendency to ON. Turkish validity and reliability study was conducted by Arusoğlu et al. (21). The scale has 11 items, and it is 4-Likert type. The questions research obsessive behaviours of individuals in choosing, purchasing, preparing, and consuming the foods they consider as healthy. The answers which had distinguishing criteria for orthorexia were given “1” point, while the answers which showed normal eating behaviours tendency were given “4” points. Only question 8 is reversely scored in the scale; the maximum possible score in the scale is 44, while the minimum possible score is 11 and 25% was determined as the cut-off point. According to this, values below 27 were evaluated as orthorexia (21,22). In the Turkish validity and reliability study, Cronbach alpha value was 0.62 (21). In the present study, Cronbach alpha was found as 0.63.

Eating Attitude Scale (EAT-26): EAT-26 form was used to determine the eating behaviour levels of the participants. It is a 6-Likert type scale developed by Garner et al. (23) to determine the risk of eating disorders. Turkish validity and reliability study was conducted by Devran and Kızıltan (24). In EAT-26 test, the results are determined by evaluating the sum of the scores of 26 items. In the first 25 questions, the response “always” is scored as 3 points, the response “often” is scored as 2 points, “usually” is scored as 1 point and the responses “rarely” and “never” are scored as 0 and the question 26 is scored as just the opposite. The minimum possible score in the scale is 0, while the maximum possible score is 78 and 20 points is used as the cut-off point for EAT-26. While individuals who get 20 and higher points are evaluated as individuals with “abnormal eating behaviour”, those who get lower than 20 are evaluated as individuals with “normal eating behaviour” (23,24). In the Turkish validity and reliability study, Cronbach alpha value was 0.70 (24). In this study, Cronbach alpha was found as 0.80.

Data Collection: Data were collected through face-to-face interviews with HT patients who applied to internal medicine clinics and outpatient clinics and with individuals who did not have chronic disease (checked from medical records). The data were collected through face-to-face interview method. It took 10-15 minutes to fill in

the form. While collecting the data, the required precautions were applied (mask, distance, and hygiene) considering the COVID-19 pandemic conditions.

Evaluation of data: The data were evaluated in SPSS 25 program. Descriptive statistics of the variables were given as percentage, number, standard deviation and mean. Chi-square analysis was used in comparing the descriptive characteristics between HT patients and healthy individuals (categorical measurements), Mann Whitney-U test was used in the comparison of ORTO-11 and EAT-26 between HT patients and healthy individuals, Kurtosis and Skewness coefficients were used in the examination of normality distribution of data and Cronbach α coefficient was used to determine internal consistency. Multiple linear regression analysis was made for significant predictors in each group in ORTO-11 and EAT-26. $p < 0.05$ value was considered as statistically significant in all statistical comparisons.

Ethical considerations of the study: Approval from the non-interventional ethics committee of a university (26.02.2021 dated and 2021/02 numbered) and permission from the institution in which the study was conducted (24.03.2021 dated and 1832 numbered) were obtained for this study. The individuals included in the study were explained about the aim and method of the study and their verbal consents were taken. This study was conducted in line with the ethical standards of the Declaration of Helsinki. Volunteering participants were included, and personal identity information was kept confidential.

Results

According to Table 1, the patient and control groups were similar in terms of some sociodemographic factors, such as gender, income status, having an unhealthy diet, having information about healthy diet, and the state of exercising ($p > 0.05$). On the other hand, the patient and control groups were different in terms of some factors, such as age, marital status, educational status, working status, eating herbal products, eating organic products, body mass index, whether unhealthy diet is a cause of hypertension, and the state of dieting, and the differences between these groups were statistically significant ($p < 0.05$).

According to Table 2, it was found that 59% of the individuals in the patient group and 41% of the individuals in the healthy group were

Table 1: Distribution of The Participants' Sociodemographic Features, Health States and Nutritional Habits (n=444)

Features	Group		p	
	Healthy (n=218) n (%)	Patient (n=226) n (%)		
Gender	Female	129 (59.2%)	143 (63.3%)	X2=0.786
	Male	89 (40.8%)	83 (36.7%)	p=0.375
Marital status	Married	97 (44.5%)	167 (73.9%)	X2=39.785
	Single	121 (55.5%)	59 (26.1%)	p=0.001*
	Illiterate	2 (0.9%)	43 (19%)	
Educational status	Literate	2 (0.9%)	46 (20.4%)	
	Primary education	5 (2.3%)	49 (21.7%)	X2=214.608
	High school	21 (9.6%)	45 (19.9%)	p=0.001*
	Undergraduate	158 (72.5%)	40 (17.7%)	
Working status	Postgraduate	30 (13.8%)	3 (1.3%)	
	Yes	144 (66.1%)	72 (31.9%)	X2=51.943
Income status	No	74 (33.9%)	154 (68.1%)	p=0.001*
	Income<expense	53 (24.3%)	62 (27.4%)	X2=3.811
	Income=expense	111 (50.9%)	125 (55.3%)	p=0.149
Eating herbal products	Income>expense	54 (24.8%)	39 (17.3%)	
	Yes	190 (87.2%)	151 (66.8%)	X2=25.771
Eating organic products	No	28 (12.8%)	75 (33.2%)	p=0.001*
	Yes	173 (79.4%)	159 (70.4%)	X2=4.769
Having an unhealthy diet	No	45 (20.6%)	67 (29.6%)	p=0.029*
	Yes	118 (54.1%)	114 (50.4%)	X2=0.604
Having information about healthy diet	No	100 (45.9%)	112 (49.6%)	p=0.437
	Yes	136 (62.4%)	128 (56.6%)	X2=1.521
	No	82 (37.6%)	98 (43.4%)	p=0.217
Body mass index	Weak (<18,5)	13 (5.9%)	3 (1.3%)	
	Normal (18,5-24,9)	126 (57.7%)	97 (42.9%)	
	Overweight (25-29,9)	62 (28.4%)	75 (33.2%)	X2=30.697
	Obese (30-34,9)	14 (6.4%)	47 (20.8%)	p=0.001*
	Morbid Obese (35-39,9)	3 (1.6%)	4 (1.8%)	
Is unhealthy diet a cause of hypertension	Yes	186 (85.3%)	154 (68.1%)	X2=18.258
	No	32 (14.7%)	72 (31.9%)	p=0.001*
The state of dieting	Yes	34 (15.6%)	61 (27%)	X2=8.567
	No	184 (84.4%)	165 (73%)	p=0.001*
The state of exercising	Yes	65 (29.8%)	61 (27%)	X2=0.436
	No	153 (70.2%)	165 (73%)	p=0.509
		Mean±SD		
Age		30.37±10.19	52.7±15.1	u=6461.50
Hypertension diagnosis year			9.93±8.01	p=0.001*

x²=Chi-Square Test, u= Mann Whitney U Test, *p<0.05

Table 2: Comparison of ORTO-11 and EAT-26 Scores According To Groups

Scales	Healthy (n=218) n (%)	HT patient (n=226) n (%)	p
ORTO 11 ≤ 27	80 (41%)	115 (59%)	X ² =9.069, p=0.003*
ORTO 11 > 27	138 (55.4%)	111 (44.6%)	
ORTO-11**	27.58±4.26	26.39±4.96	u=21075.50, p=0.008*
EAT-26 < 20	196 (89.9%)	194 (85.8%)	X ² =1.719, p=0.190
EAT-26 ≥ 20	22 (10.1%)	32 (14.2%)	
EAT-26***	8.31±7.31	9.87±7.88	u=21187.50, p=0.011*

*p<0.05, **ORTO-11= Orthorexia Nervosa Scale, *** EAT-26= Eating Attitude Test, HT= Hypertension, x²=Chi-Square Test, u= Mann Whitney U Test

Table 3: The effects of EAT-26 on ORTO-11 levels for HT patients

Model	Variables	B	S.Error	Univariable		
				Standard (B)	t	p
1(HT patient)	EAT-26***	-0.297	0.037	-0.472	-8.018	0.001

F=14.766 R=0.537 R²= 0.288 p<0.05

ORTO-11= Orthorexia Nervosa Scale, EAT-26= Eating Attitude Test, HT= Hypertension

orthorexia. Additionally, a statistically significant difference was found between the average total ORTO-11 scores of the patient and healthy groups (p<0.05). It was found that 14.2% of the individuals in the patient group and 10.1% of the individuals in the healthy group had abnormal eating behaviour. Additionally, the average score of the total EAT-26 in the patient and healthy group were 9.87 and 8.31, respectively. The difference between these findings is statistically significant (p<0.05).

When the table 3 is examined, dependent variable of the model ORTO-11 explains 28.8% of the total variance (p<0.05). It can be seen that EAT-26 variable has a significant predictive effect on ORTO-11. Accordingly, as the mean score of the EAT-26 variable increases, the mean score of the ORTO-11 variable decreases (p<0.05).

Discussion

Orthorexia disposition and eating behaviour disorders have emerged as variables that affect diet significantly in recent years. Since it is thought that these situations will become more common and affect the society more in the future, it is very important to make the society conscious and inform individuals with a multidisciplinary approach (25). The desire of the patients to cope with the existing chronic disease and to treat the disease may cause ON (16), and in this process, deterioration in the eating behaviour of the

patients may be observed (10). In fact, when the findings of our study were evaluated, it was seen that those with hypertension were more at risk for deterioration in eating behaviour and orthorexia problems than healthy individuals. It was also found that increased orthorexia had negative effects on eating behaviour. In this section, the findings obtained from our study are discussed in the light of the literature.

In this study, ORTO-11 score of HT patients was 26.39 and 59% of these were found to have the risk of getting obsessed with healthy nutrition (ON). In the study conducted with Type-2 diabetes patients, ON risk was found in 52.1% of the patients (26). In another study conducted on women with breast cancer, it was found that 22.3% of the patients with an ORTO-11 score of 40.5 and higher had risk of ON (27). It was reported that DASH (dietary approaches to stop hypertension) diet, which was rich in vegetables and fruit, which included high fat, low saturated fat and low fat milk and dairy products decreased blood pressure effectively (28). Strict dietary restrictions and eating plans are defined as the core of ON (29). An individual who has ON may want to stay away from all kinds of sugar, trans fatty acids, saturated fats, red meat, dairy products, gluten, non-organic food and processed food (30). Individuals with ON spend their extra time outside of meals searching for food, measuring and weighing food and making future meal plans (31). In this study, ON risk of HT

patients was found to be higher when compared with healthy individuals and the difference between them was found to be significant. Similar to our study, in a case-control study conducted with breast cancer patients, ON risk of patients was found to be higher when compared with healthy individuals (27). In the control of hypertension disease, dietary (reducing salt consumption, a diet low in saturated fat and trans-fat and high in vegetable and fruit intake) or other lifestyle changes have a significant place (32,33). All these reasons may cause HT patients to have higher risk of ON than healthy individuals in order to protect and improve their existing health and to prevent it from getting worse (5).

In this study, EAT-26 score of HT patients was 9.87 and 14.2% of these patients were found to have abnormal eating disorder. In a study conducted by Durat et al. (11) on HT patients, EAT-26 score was found as 21.82. In a study by Durat et al. (18), 24.4% of the patients were reported to have a risk of abnormal eating disorder. In this study, HT patients were found to have higher risk of eating disorder behaviour when compared with healthy individuals and the correlation between them was found to be significant. Similar to the results of our study, in the case-control study conducted on hypertension patients, Durat et al. (18) found that the patients had higher risk of eating disorder behaviour when compared with healthy individuals. Excessive weight and high salt intake are important risk factors for HT (28). Patients' non-compliance with the recommended diet may have a negative effect on the course and symptom management of chronic diseases such as HT (5). Individuals' diet lists, weight control and their focus on dietary restrictions may cause eating disorder to develop (34). When all these are considered, it is an expected result for hypertension patients in our study to have higher risk of eating behaviour disorder when compared with healthy individuals.

In the study, hypertension patients with abnormal eating behaviours were found to show more orthorexia behaviour. Different studies conducted also show that eating attitude is disrupted when orthorexia tendencies increase (35,36). Since diet has a psychological aspect as well as a physiological aspect, eating disorders today show the psychological aspect of diet (37). Individuals with eating disorder are found to have obsession with body weight, being afraid of getting fat, an excessive desire to lose weight, negative thoughts about the postural appearance of the body and accompanying affective disorders (38,39). Some

researchers stated that anxiety about bodily appearance may lie behind the healthy diet of individuals with ON (40). In our study, it was found that 55.8% of individuals with hypertension had a BMI of >25 (35.7% of healthy individuals had a BMI of >25). Individuals with hypertension should be targeted to reach the ideal weight. If they have a BMI higher than normal, they should lose weight.

Limitations of Study: The study has two limitations. The first one is that the study was conducted in a single centre. The second is that homogeneity of important confounding factors such as age and BMI between the patient and control groups could not be ensured. In this context, there is a need for multicentre studies in which homogeneity is ensured between patients and controls in terms of these two confounding factors.

In the study, when compared with healthy individuals, hypertension patients were found to have higher orthorexia and eating disorder risk. In addition, individuals with abnormal eating behaviour were determined to show more orthorexia behaviours.

In line with these results, training programs and seminars should be organized to raise awareness of HT patients about healthy diet obsession. More care should be taken when providing information to patients experiencing lots of dietary restrictions due to HT and they should be followed often in terms of eating behaviours. During the training of patients, the topics of healthy eating, preparing, and cooking food should be emphasized, and incorrect or incomplete information should be corrected. Since such an eating disorder is a new concept, effective treatment methods should be developed to decrease the problem effectively. Repeating similar studies with hypertension and other chronic diseases will create awareness on the issue among healthcare professionals.

Ethical Approval: Approval from the ethics committee of Istanbul Sabahattin Zaim university (26.02.2021 dated and 2021/02 numbered) and permission from the institution in which the study was conducted (24.03.2021 dated and 1832 numbered)

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References

1. Ministry of Health. Clinical Protocol for Hypertension [Internet]. Ankara; 2020 [cited 2021 Jul 30]. Available from: https://sbu.saglik.gov.tr/Ekutuphane/kitaplar/hipetansiyon_kp_20200723.pdf
2. Aydoğdu S, Güler K, Bayram F, Altun B, Derici Ü, Abacı A, et al. 2019 Turkish Hypertension Consensus Report. *Türk Kardiyol Dern Arsivi-Archives Turkish Soc Cardiol*. 2019;47(6):535–46.
3. Akman C, Aksit E. The Clinical Features of the Hypertension Patients Who Apply to Emergency Service and Investigation of Factors Affecting Frequency of Application to the Emergency Service. *Celal Bayar Üniversitesi Sağlık Bilim Enstitüsü Derg*. 2020;1(1):17–23.
4. WHO. Hypertension [Internet]. 2021 [cited 2021 Aug 1]. Available from: <https://www.who.int/news-room/fact-sheets/detail/hypertension>
5. Durat G, Erol A, Çevirme A, Kaynak Ö, Yıldız C. Correlation Between Dietary Applications in Hypertensive Patients and Eating Disorders. *Türkiye Klin J Heal Sci*. 2016;1(2):88–94.
6. Durat G, Yıldız C, Erol A. Comparison of Eating Pathology in Patients Diagnosed with Diabetes and Hypertension. *Türkiye Klin J Heal Sci*. 2017;2(1):7–12.
7. Kumcağız H, Şahin C, Alakuş K, Akbaş M. The Role of Hope and Negative Thoughts in Predicting Eating Attitudes. *Int J Eurasia Soc Sci*. 2017;8(29):939–54.
8. Gürcan N, Kolburan ŞG. The Relationship between the Eating Habits, Self-Perception and Life Satisfaction of Female University Students. *Aydın J Humanit Soc*. 2018;4(2):17–34.
9. Akdevelioğlu Y, Yörüsün TÖ. Investigation of Some Factors Related to Eating Attitudes and Behaviors of University Students. *J Gazi Univ Heal Sci*. 2019;4(1):19–28.
10. American Psychiatric Association. What are Eating Disorders? [Internet]. 2021 [cited 2021 Aug 1]. Available from: <https://psychiatry.org/patients-families/eating-disorders/what-are-eating-disorders>
11. Fadienko GD, Nikiforova Y V. Algorithm of Diagnosis Eating Disorders and Nutritional Status in Patients With Nonalcoholic Fatty Liver Disease, Obesity and Hypertension. *World Sci*. 2016;10(14):23–6.
12. Shim J-S, Heo JE, Kim HC. Factors associated with dietary adherence to the guidelines for prevention and treatment of hypertension among Korean adults with and without hypertension. *Clin Hypertens*. 2020;26(1):5.
13. Akkök E, Tekin ZD, Ozdemir MA, Yıldız E, Alibeyoğlu Bİ, Altunkaya H, et al. Health Communication and Nutrition Disorders. *Euroasia J Math Eng Nat Med Sci*. 2022;9(25):9–21.
14. Dunn TM, Bratman S. On orthorexia nervosa: A review of the literature and proposed diagnostic criteria. *Eat Behav*. 2016;21:11–7.
15. Sengul R, Hocaoglu C. What is Orthorexia Nervosa? Diagnostic and Therapeutic Approaches. *Kahramanmaraş Sutcu Imam Univ Fac Med*. 2019;14(2):101–4.
16. Kaźmierczak-Wojtaś N, Patryn R, Zagaja A, Drozd M, Niedzielski A. Prevalence and Characteristics of Orthorectic Disorders in Adolescence and Young People: Polish Preliminary Studies. *Nutrients*. 2021;13(5):1568.
17. Cena H, Barthels F, Cuzzolaro M, Bratman S, Brytek-Matera A, Dunn T, et al. Definition and diagnostic criteria for orthorexia nervosa: a narrative review of the literature. *Eat Weight Disord - Stud Anorexia, Bulim Obes*. 2019;24(2):209–46.
18. Yılmaz MN, Dundar C. The relationship between orthorexia nervosa, anxiety, and self-esteem: a cross-sectional study in Turkish faculty members. *BMC Psychol*. 2022;10(1):82.
19. Capik C. Use of confirmatory factor analysis in validity and reliability studies. *J Anatolia Nurs Heal Sci*. 2014;17(3):196–205.
20. Donini LM, Marsili D, Graziani MP, Imbriale M, Cannella C. Orthorexia nervosa: Validation of a diagnosis questionnaire. *Eat Weight Disord - Stud Anorexia, Bulim Obes*. 2005;10(2):e28–32.
21. Arusoğlu G, Kabakçi E, Köksal G, Merdol TK. Orthorexia nervosa and adaptation of ORTO-11 into Turkish. *Turkish J psychiatry*. 2008;19(3):283–91.
22. Niedzielski A, Kaźmierczak-Wojtaś N. Prevalence of Orthorexia Nervosa and Its Diagnostic Tools—A Literature Review. *Int J Environ Res Public Health*. 2021;18(10):5488.
23. Garner DM, Olmsted MP, Bohr Y, Garfinkel PE. The Eating Attitudes Test: psychometric features and clinical correlates. *Psychol Med*. 1982;12(4):871–8.

24. Devran BS, Kızıltan G. An Investigation of Dietary Habits, Eating Attitudes and Behaviours in Adolescents and Adults from Eastern Anatolia Region in Turkey. *Başkent University Fac Heal Sci J.* 2018;2(2):47–60.
25. Karadağ MG, Elibol E, Yıldırım H, Akbulut G, Çelik MG, Değirmenci M, et al. Sağlıklı Yetişkin Bireylerde Yeme Tutum ve Ortorektik Davranışlar ile Obezite Arasındaki İlişkinin Değerlendirilmesi. *Gazi Med J.* 2016;27(3):107–14.
26. Atalay NG. A determination of the relations between orthorexia nervosa, abnormal eating attitudes and biochemical, anthropometric measurements in Type 1 diabetic adult patients on carbohydrate counting therapy. Ankara:Başkent University; 2015.
27. Aslan H, Aktürk Ü. Demographic characteristics, nutritional behaviors, and orthorexic tendencies of women with breast cancer: a case–control study. *Eat Weight Disord - Stud Anorexia, Bulim Obes.* 2020;25(5):1365–75.
28. Ilgaz A, Özer Z. Effect of Exercise on Blood Pressure in Hypertensive Individuals: A Systematic Review. *MN Cardiol.* 2017;24(1):31–41.
29. Varga M, Thege BK, Dukay-Szabó S, Túry F, van Furth EF. When eating healthy is not healthy: orthorexia nervosa and its measurement with the ORTO-15 in Hungary. *BMC Psychiatry.* 2014;14(1):59.
30. Oberle CD, Klare DL, Patyk KC. Health beliefs, behaviors, and symptoms associated with orthorexia nervosa. *Eat Weight Disord - Stud Anorexia, Bulim Obes* [Internet]. 2019;24(3):495–506.
31. Håman L, Barker-Ruchti N, Patriksson G, Lindgren E-C. Orthorexia nervosa: An integrative literature review of a lifestyle syndrome. *Int J Qual Stud Health Well-being.* 2015;10(1):26799.
32. Bazzano LA, Green T, Harrison TN, Reynolds K. Dietary Approaches to Prevent Hypertension. *Curr Hypertens Rep.* 2013;15(6):694–702.
33. Ozemek C, Laddu DR, Arena R, Lavie CJ. The role of diet for prevention and management of hypertension. *Curr Opin Cardiol.* 2018;33(4):388–93.
34. Quick VM, Byrd-Bredbenner C, Neumark-Sztainer D. Chronic Illness and Disordered Eating: A Discussion of the Literature. *Adv Nutr.* 2013;4(3):277–86.
35. Çulhacı GD, Durat G. Correlation of orthorexic tendencies with eating attitude and obsessive compulsive symptoms. *J Hum Sci.* 2017;14(4):3571–9.
36. Koven N, Abry A. The clinical basis of orthorexia nervosa: emerging perspectives. *Neuropsychiatr Dis Treat.* 2015;11:385–94.
37. Meneton P, Kesse-Guyot E, Fezeu L, Galan P, Hercberg S, Ménéard J. Distinctive unhealthy eating pattern in free-living middle-aged hypertensives when compared with dyslipidemic or overweight patients. *J Hypertens.* 2013;31(8):1554–63.
38. Büyük ET, Duman G. Evaluation of Eating Habits and Behaviors of High School Students Attending Different Schools. *J Pediatr Res.* 2014;1(4):212–7.
39. Devran BS. An Investigation of Dietary Habits, Eating Attitudes and Behaviours in Adolescents and Adults from Eastern Anatolia Region in Turkey. Ankara:Başkent University; 2014.
40. Brytek-Matera A, Czepczor-Bernat K, Olejniczak D. Food-related behaviours among individuals with overweight/obesity and normal body weight. *Nutr J.* 2018;17(1):93.