

Evaluation of the recipient and donor in organ transplantation in terms of orthorexia nervosa

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Abstract. – OBJECTIVE: The aim of this study is to evaluate recipients and donors undergoing organ transplantation in terms of orthorexia nervosa.

SUBJECTS AND METHODS: The population of the study consisted of individuals over the age of 18 who were donors or recipients undergoing organ transplantation at the Organ Transplantation Centre of Research-Application Hospital of Gaziantep University in Turkey (n=74). A questionnaire consisting of 3 parts was used as a data collection tool. While the first part includes questions that ask socio-demographic characteristics of the participants and constitute the independent variables of the study (21 questions), the second and third parts include the Orthorexia Nervosa-15 (ORTO-15) and the Eating Attitude Test (EAT-40), respectively.

RESULTS: Based on the cut-off point of the ORTO-15 scale, it was determined that while 78.4% (n=58) of the participants were normal in terms of orthorexia nervosa, 21.6% (n=16) were orthorexic. In terms of the cut-off point of EAT-40, 37.8% (n=28) of the participants did not have an eating disorder and 62.2% (n=46) suffered from an eating disorder. The ORTO-15 mean ranks were high in those who were females ($p=0.035$), were suffering from chronic diseases ($p=0.002$), did not consume fast food ($p=0.004$), were making arrangements before eating their daily meals ($p=0.018$), and were doing regular physical activity ($p=0.042$).

CONCLUSIONS: Consequently, it was determined that those who were females, were suffering from chronic diseases, were making arrangements before eating their daily meals and were doing regular physical activity showed a more orthorexic tendency. It is recommended for healthcare professionals to determine the orthorexic tendency level of patients, who are female, suffer from chronic diseases, adhere to a regular diet and do a regular physical activity, and evaluate the whole patient group in terms of eating disorders while healthcare professionals conduct early diagnosis screenings of the patients (recipient/donor) in the organ transplantation process or referring them.

Key Words:

Organ transplant, Donor, Orthorexia nervosa, Eating attitude, Risk factors.

Introduction

The term orthorexia nervosa (ON) is derived from two Greek words, orthos (=right) and orexis (=hunger), denoting an obsession with healthy food and proper nutrition. Steven Bratman introduced it in the literature for the first time in 1997 to describe an excessive obsession with healthy eating^{1,2}. According to Bratman³, ON consists of two phases. The first is the following of healthy food diets to promote health, and the other is an obsessive restriction of diet. Bratman³ describes ON as follows; one makes an effort to absolutely adhere to a diet and to restrict his/her diet progressively after a certain extent in order to promote health or to prevent diseases. The person adopts the idea that he/she enjoys an advantage over people who consume more unhealthy food when compared to the food in his/her diet, and all his/her life values undergo such a transformation. Bratman³ briefly states that orthorexia, unlike other eating disorders, focuses on the quality of food rather than its quantity. In the following process, this definition was divided into two as healthy and pathological orthorexia. In healthy orthorexia, the motivation lies in the health-related consequences of what is eaten; whereas, in pathological orthorexia, the person uses dietary behavior to regulate his/her weight gain and emotions⁴.

ON is characterized by excessive attention to consuming healthy food, diets consisting of pure food, prolonged preoccupation with food preparation, negative thoughts about food containing additives and thus loss of function in daily life^{5,6}. Eating disorders are constantly increasing and as having a healthy life becomes more and more important today, this brings new eating disorders.

This leads to the need to prevent new health problems in the future and to eliminate the disorders in eating behaviors specific to the individual⁷. It is necessary to identify those in the risk group, determine the frequency of orthorexia nervosa and examine its relationship with nutritional status. In order to treat this disorder of people in this risk group, it is necessary to organize various training and awareness-raising activities by professionals working in this field. Patients undergoing organ transplantation are among the risk groups^{4,7}. Therefore, it is important to examine the degree of psychosocial impact in order to determine the psychological support and treatment requirements of patients waiting for organ transplantation.

The aim of this study is to evaluate the orthorexia nervosa condition of recipients and donors undergoing organ transplantation.

Subjects and Methods

Design of the Study

Quantitative method was used in the study. The data were collected using descriptive cross-sectional method at the Organ Transplantation Centre of a Training and Research Hospital in Gaziantep between March and June 2022.

Population and Sample of the Study

The population of the study consisted of individuals over the age of 18 who were donors or recipients undergoing organ transplantation at the Organ Transplantation Centre of Research-Application Hospital of Gaziantep University in Turkey. After the data were collected from the participants (n=74) who were reached between March and June 2022 and participated voluntarily in the study, post-hoc power analysis was performed to see whether or not the sample size was sufficient. In the analysis, tail(s), effect size, and α are taken as one, 0.3, and 0.05. The power (1- β err prob) was found to be 0.84 in the calculation⁸. Individuals who were literate, donated at least one organ or underwent at least one organ transplantation, and donated an organ or underwent

organ transplantation at least six months ago were included in the study. Individuals who had a cognitive-sensory disability, were diagnosed with a psychiatric disorder, were substance abusers, participated in any psychological support group, and experienced the death of someone at least six months ago were excluded from the study. Organ donation decreased due to the COVID-19 pandemic; therefore, transplantations from cadavers came to a standstill. Therefore, all transplantations were performed with a living donor. Therefore, the sample group consisted of only living recipients and donors between the specified dates.

Data Collection Tools

A questionnaire with 3 parts, prepared upon the literature review, was used as data collection tool in the study. While its first part includes questions that ask socio-demographic characteristics of the participants and constitute the independent variables of the study (21 questions), the second and third parts include the Orthorexia Nervosa-15 (ORTO-15) and the Eating Attitude Test (EAT-40). Both scales were dependent variables of the study.

Orthorexia Nervosa-15 (ORTO-15)

It is a 15-item self-assessment scale revised by Donini et al⁹ to evaluate the tendency to Orthorexia Nervosa. Arusoğlu¹⁰ conducted its Turkish validity and reliability study and reported its Cronbach Alpha coefficient as 0.62. The items are scored as follows (Table I).

The items investigate the obsessive behaviors of individuals in choosing, purchasing, preparing and consuming foods that they consider healthy and aim to assess them both emotionally and rationally. The scale has three subscales: Healthy Eating Concerns (HEC) (1, 3, 4, 10-13), Food Choice and Eating Attitudes and Behaviors (FCEAB) (2, 5, 8, 9), and Food Choice and Value (FCV) (6, 7, 14, 15). The lowest and highest scores of the scale are 15 and 60 points, respectively. In the scale, respondents who get a score ≤ 33 points are defined as "orthorexic". The higher the score, the more the eating behavior approaches normal sensitivity from hypersensitivity.

Table I. Orthorexia Nervosa-15 (ORTO-15) scale scores.

	Always	Often	Sometimes	Never
2, 5, 8, 9	4	3	2	1
3, 4, 6, 7, 10, 11, 12, 14, 15	1	2	3	4
1, 13	2	4	3	1

Eating Attitudes Test (EAT-40)

It is a self-report scale developed by Garner and Garfinkel¹¹ (1979) to evaluate a wide spectrum of attitudes and behaviors related to anorexia nervosa. Its Turkish validity and reliability study was conducted by Savaşır and Erol¹² (1989). The test consists of 40 items, which are rated using a six-point Likert-type scale ranging from “always” to “never”. The items are scored as follows (Table II).

The items are evaluated in terms of pathology by giving 3 points for always and never options and 2 and 1 points for the other options. The highest score of the test is 120 points. The discrimination score for the diagnosis of anorexia was determined as 30, and a score ≥ 30 is directly related to eating disorders. The Cronbach’s Alpha reliability coefficient of the scale was reported as .70 in the study by Savaşır and Erol¹².

Data Collection

The patients who agreed to participate in the study gave their consents by marking “I agree to participate in the study” on the form. The questionnaires were sent to the patients *via* Google Forms so that the data were collected online.

Statistical Analysis

The data of the study were analyzed using the IBM Statistical Package for the Social Sciences-22 (SPSS-22, IBM Corp., Armonk, NY, USA) statistical program. Error checks were made. In statistical evaluations, numbers and percentages were given, normality of dependent variables was analyzed and then it was decided to apply nonparametric tests. Correlation analysis was performed to identify the correlation between numerical variables. The value of $p < 0.05$ was accepted as a statistical significance level.

Results

Table III shows the socio-demographic characteristics of the participants. 19 of the participants were housewives (25.7%), 11 were workers (14.9%), 4 were civil servants (5.4%), 19 were students (25.7%), 3 were retired (4.1%), 6 were

self-employed (8.1%), and 12 (16.2%) were engaged in other jobs. The participants were asked what affected them the most so far. Three (4.1%) said death, 6 (8.1%) said accident, 30 replied as disease (40.5%), 13 (17.6%) stated financial struggles, and the remaining (29.7) said various events.

Based on the cut-off point of the ORTO-15 scale, it was determined that 78.4% (n=58) of the participants had a normal sensitivity and 21.6% (n=16) were orthorexic. Based on the cut-off point of EAT-40, 37.8% of the participants did not suffer from an eating disorder (n=28); whereas 62.2% (n=46) had an eating disorder. Table IV shows the score distributions of the scales and their subscales used in the study.

Table V shows the characteristics that make a difference on the distribution of both ORTO-15 and EAT-40 scores of the participants. The perception of income level, smoking habit, presence of a family member waiting for an organ transplant, dietary adherence, eating snacks between meals, thinking that one is eating properly, and the level of paying attention to diet did not make any difference on both scales ($p > 0.05$). The ORTO-15 mean ranks were high in those who were female ($p = 0.035$), had chronic diseases ($p = 0.002$), did not consume fast food ($p = 0.004$), were making arrangements before eating their daily meals ($p = 0.018$), and were doing regular physical activity ($p = 0.042$). On the other hand, the EAT-40 mean ranks were high in those who were males ($p = 0.001$), had a high level of education ($p = 0.021$), suffered from no chronic diseases ($p = 0.029$), ate 4-5 meals a day ($p = 0.046$) and did not make any arrangement what to eat on a daily basis ($p = 0.016$).

Table VI shows the correlation between the scales used in the study. As can be seen, BMI was correlated with both the ORTO-15 variable (negative and weak) and the age variable (positive moderate). In addition, the BMI had a negative, weak correlation with the EAT-40.

Discussion

While healthy nutrition is essential for protection from diseases and maintaining well-being, rapid

Table II. Eating Attitudes Test (EAT-40) scale scores.

	Always	Very often	Often	Sometimes	Rarely	Never
1, 18, 19, 23, 27, 39	0	0	0	1	2	3
2-17, 20-22, 24-26, 28-38, 40	3	2	1	0	0	0

Table III. Some socio-demographic and nutritional characteristics of the participants (N=74).

Characteristics		Number	Percentage
Age range 30.39±10.31 (14.00-51.00)	25 years and under	29	39.2
	26 years and older	45	60.8
Gender	Female	33	44.6
	Male	41	55.4
BMI 23.89±6.09 (13.84-39.73)	Slim	9	12.5
	Normal	36	48.6
	Over-weight	20	27.0
	Obese	7	9.5
Educational background	Illiterate	7	9.5
	Primary school	16	21.6
	Secondary school	19	25.7
	High school	25	33.8
	University	7	9.5
Perception of economic situation	Low	31	41.9
	Moderate	36	48.6
	High	7	9.5
Smoking	Never	50	67.6
	Sometimes	17	23.0
	Addictive	7	9.5
Presence of a chronic illness	No	29	39.2
	Yes	45	60.8
The status of having a family member waiting for an organ transplant	No	62	83.8
	Yes	12	16.2
Eating frequency	1-2 meals a day	6	8.1
	3 meals a day	66	89.2
	4-5 meals a day	2	2.7
A consistent diet	Yes	9	12.2
	No	65	87.8
Habit of eating snacks between meals	Frequently	7	9.5
	Sometimes	40	54.1
	None	17	36.5
Frequency of fast food consumption	1 time per day	2	2.7
	1-2 times per week	19	25.7
	1 time per month	16	21.6
	None	37	50.0
The status of thinking about whether to eat properly	Yes, I eat properly	58	78.4
	No, I do not eat properly	16	21.6
The status of planning daily food in advance	Yes	26	35.1
	No	48	64.9
The status of paying attention to the diet	Highly	20	27.0
	Normally	42	56.8
	Slightly	8	10.8
	Never	4	5.4
The status of doing physical activity	I never do	12	16.2
	I take regular walks	22	29.7
	I sometimes take a walk	32	43.2
	I go to the gym	2	2.7
	I am a professional athlete	6	8.1

urbanization, globalization, and changes in lifestyle have led to radical changes in the eating habits of people. The presence of news saying that some

foodstuffs contain dyes and hormones and are carcinogenic, making many programs on healthy eating and preparing to eat foods properly, and creating a

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Table IV. Score distribution of ORTO-15 and its subscales and EAT-40 (N=74).

	ORTO-15	HEC	FCEAB	FCV	EAT-40
Mean±SD	37.67±4.26	18.01±3.45	8.32±2.57	11.33±2.7	72.06±49.59
Median	38.50	18.50	8.00	11.00	107.00
Minimum	29.00	12.00	4.00	6.00	7.00
Maximum	44.00	24.00	15.00	16.00	140.00
95% CI	36.38-38.66	17.21-18.81	7.72-8.91	10.69-11.98	60.57-83.55

ORTO-15: Orthorexia Nervosa Questionnaire, HEC: Healthy Eating Concerns, FCEAB: Food Choice and Eating Attitudes and Behaviours, FCV: Food Choice and Value, EAT-40: Eating Attitudes Test.

Table V. ORTO-15 and EAT-40 score distributions according to some characteristics of the participants (N=74).

Characteristics		ORTO-15 Mean Rank	Test value	EAT-40 Mean Rank	Test value
Gender	Female	43.36	U=483.00 p=0.035	17.00	U=0.00 p=0.001
	Male	32.78		54.00	
Educational background	Illiterate	25.43	KW=6.634 p=0.157	22.57 ^{a,b}	KW=11.588 p=0.021
	Primary school	43.75		27.28 ^{c,d}	
	Secondary school	31.34		40.95	
	High school	42.44		41.52 ^{a,c}	
	University	34.36		52.07 ^{b,d}	
Presence of chronic disease	Yes	39.84	U=584.50 p=0.002	30.66	U=454.00 p=0.029
	No	35.99		41.91	
Eating frequency	1-2 meals a day	29.50	KW=4.610 p=0.100	49.00	KW=16.167 p=0.046
	3 meals a day	39.08		35.55 ^a	
	4-5 meals a day	9.50		67.50 ^a	
Frequency of Fast food consumption	1 time per day	4.50 ^{a,b}	KW=13.356 p=0.004	59.50	KW=4.193 p=0.241
	1-2 times per week	26.95 ^c		42.47	
	1 time per month	37.88 ^a		37.31	
	None	44.54 ^{b,c}		33.84	
The status of planning daily food in advance	Yes	45.52	U=415.50 p=0.018	29.35	U=412.00 p=0.016
	No	33.16		41.92	
The status of doing physical activity	I never do	46.50	KW=9.936 p=0.042	37.83	KW=4.615 p=0.329
	I take regular walks	30.09 ^a		33.14	
	I sometimes take a walk	35.38 ^b		37.34	
	I go to the gym	41.50		35.50	
	I am a professional athlete	56.67 ^{a,b}		54.33	

^{a, b, c, d, e} indicate the groups from which the difference originates. ORTO-15: Orthorexia Nervosa Questionnaire, EAT-40: Eating Attitudes Test.

Table VI. The correlation between some characteristics of the participants and their ORTO-15 and EAT-40 scores * (N=74).

Variable		Age	BMI	ORTO-15	EAT-40
Age	rho	1.00			
	p				
BMI	rho	.597**	1.00		
	p	.001			
ORTO - 15	rho	-.269*	.086	1.00	
	p	.020	.464		
EAT - 40	rho	-.131	-.274*	-.141	1.00
	p	.267	.018	.232	

* Spearman's correlation analysis, *: Significant correlation at the level of 0.05, **: Correlation at the level of 0.01.

perfect body image in the media have paved the way for the development of orthorexia nervosa^{13,14}.

One of the most important points to be considered after organ transplantation, especially kidney transplant, is nutrition. Immunosuppressive drugs pose a risk for the development of chronic diseases such as diabetes mellitus, hypertension, and hyperlipidemia. In order to prevent chronic diseases after transplantation and to maintain kidney functions, patients should follow healthy eating habits¹⁵. When examining from this perspective, recipients and donors undergoing organ transplantation need to follow a healthy diet in order to maintain a healthy life, leading to a risk in terms of orthorexia nervosa. The ON tendencies of 74 recipient and donor volunteer participants in the organ transplantation process were evaluated using ORTO-15 and EAT-40. The questionnaire was applied to the participants to determine their orthorexia nervosa status. Thirty-three (25.7%) of the participants were females and 29 (39.2%) stated that they had chronic diseases.

In the present study, it was determined that while 78.4% (n=58) of the participants had a normal sensitivity, 21.6% (n=16) were orthorexic. In the literature, it has been reported that the prevalence of ON shows different patterns across various groups of the society. The prevalence of ON in the general population ranges between 6.9-57.6%^{16,17}. It varies between 35% and 57.8% among high-risk groups in the society (healthcare professionals, artists)¹⁸.

Results of the present study indicated that ORTO-15 mean rank was high in those who were females ($p=0.035$) and doing regular physical activity ($p=0.042$). Some international studies^{19,20} conducted in different parts of the society have reported that those who are females and do regular physical activity generally tend to be more orthorexic^{21,22}.

The prevalence of eating attitude disorder varies between 3.5 and 84.5%. The prevalence of eating attitude disorder may vary from society to society²³⁻²⁵. In the present study, it was observed that 62.2% (n=46) of the participants had an eating disorder. Also, the EAT-40 mean rank was higher in those who were males ($p=0.001$) and had a high educational level ($p=0.021$). In the literature^{26,27}, it is seen that women's eating attitudes are riskier compared to men and some studies²⁸ also reported that low educational level was correlated with abnormal eating attitudes.

When considering the correlation between the scales used in the study, it was found that BMI was correlated with both the ORTO-15 variable (negative and weak) and the age variable (positive moderate).

Restrictive diets applied by individuals with a high body mass index (BMI) to lose weight may lead to excessive obsession with healthy eating²⁹. Different results regarding age, which is a risk factor for orthorexia nervosa, have been reported in the literature. There are studies^{21,22,30} reporting in younger individuals, their orthorexic tendency increases. In addition, the BMI variable had a negative weak correlation with the EAT-40 variable. In the literature, it has been reported³¹⁻³⁴ that being healthy and wanting to look fit as well as eating disorders may cause individuals to have negative outcomes.

Limitations

The limitation of the study is that the study was conducted in a single center; therefore, the findings cannot be generalized to the society.

Conclusions

Consequently, it was determined that those who were females, had chronic diseases, were making arrangements before eating their daily meals and did regular physical activity showed more orthorexic tendencies. It is recommended for healthcare professionals to determine the orthorexic tendency level of patients who are female, have chronic diseases, adhere to a regular diet and do regular physical activity, and evaluate the whole patient group in terms of eating disorders, while healthcare professionals conduct early diagnosis screenings of the patients (recipient/donor) in the organ transplantation process or referring them.

Authors' Contributions

Conceptualization, A.B. (Cor. Aut.); methodology A.B. (Cor. Aut.); formal analysis, A.B; and A.B; investigation, A.B; and A.B; resources, A.B; and A.B; data curation, A.B; and A.B; writing-original draft preparation, A.B. (Cor. Aut.); writing-review and editing, A.B; and A.B. All authors read and agreed to the published version of the manuscript.

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Conflict of Interest

The authors declare no conflict of interest.

Ethics Approval

The study was conducted in accordance with the Declaration of Helsinki. Approval of the Ethics Committee of the

Gaziantep Islam Science and Technology University (protocol 2022/93 approval date: 03.03.2022) was taken for the study.

Informed Consent

Informed consent was obtained from all the subjects participating in the study.

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Availability of Data and Materials

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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