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Original article

Determination of health status perception and orthorexia nervosa tendencies of Turkish yoga practitioners: a cross-sectional descriptive study

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Summary. As part of the yoga the possibility that excessive attention paid by practitioners to diet and food quality is expected. This study was aimed to determine health status perception and orthorexia nervosa tendencies of yoga practitioners. This cross-sectional descriptive study was conducted at three yoga centers in Izmir. The population of the study consisted of 153 people registered in yoga centers between March and May 2017. The data were collected using a personal information form (11 questions), Perception of Health Status Scale and Orthorexia Nervosa (Orto-11) Scale. While perceived physical health was "good" for 68.0% of the participants, the mean perceived health score was 1.94±0.54. The mean score of Orto-11 Scale was 24.05±4.36. It was determined that the perceived health of those who were married and non-smoker were higher than the orthorexia tendencies of the individuals who were married and had the chronic illness ($p<.001$). More than half of yoga practitioners perceived their physical health as "good". It was determined that the perceived health status of those who were married and non-smokers were higher. It was found that the vast majority of yoga practitioners was at risk in terms of orthorexia. Some factors like marital status and the presence of chronic illness significantly affected orthorexia nervosa tendencies of yoga practitioners.

Key words: Orthorexia nervosa, yoga practitioners, health status, perception

Introduction

Nutritional intake is a physiological, sociological and psychological phenomenon (1). Orthorexia nervosa (ON) refers to a pathological obsession concerning healthy nutrition obsession or the desire to consume healthy food (2,3). The term "orthorexia" was first defined in a non-scientific yoga journal by Bratman (1997) with joining the Greek words 'orthos' (correct, appropriate) and 'orexia' (appetite). Even though orthorexia is similar to known eating disorders, consuming only "pure" and "healthy" foods are in the forefront in orthorexia rather than the desire to lose weight (2). Transformation of this desire to excessive effort mentally and behaviorally also resembles obsessive-compulsive disorder (4). It is stated that depression, anxiety, perfectionist tendencies and stress can accompany ON as in other eating disorders (5). While health promotion, treatment of a disease or loss of weight are the priorities in the basis of orthorexia, then this nutrition style starts to be the most important part in the lives of orthorectic individuals. Thus, they are having healthy eating obsession in order to protect and promote health (6). Obsessional behaviors related to orthorexia are related to the content of the food consumed rather than its' amount (7). In the orthorexia nervosa, the person controls everything he/she eats exaggeratedly. He/she examines the package of the products for hours and thinks hard exaggeratedly whether the product contains any carcinogenic substance, hormone, dye, and addictive substance (2,3). In this illness which can also lead to impaired social functioning, in-

dividuals maintain their lives on within the frame of strict rules about healthy eating (8,9). As a result of orthorexia, various behaviors based on insisting on eating only raw vegetables and eating food in a certain color are exhibited. Therefore, orthorexia nervosa does not only mean that the individual is obsessive about healthy eating but also uses certain cooking methods and eats only certain foods (10). Although DSM-V (Diagnostic and Statistical Manual of Mental Disorders-V, 2013 (DSM-V 2013) by American Psychiatric Association revised and expanded diagnostic categories, some eating disorders such as orthorexia were neglected (8,11). Although it is not formally recognized as a separate diagnostic category, ON is stated to have similarities and differences with other eating disorders having serious consequences. It is seen that ON can lead malnutrition or weight loss as in anorexia nervosa (AN), but unlike AN and bulimia nervosa, people are very much engaged in eating healthy and pure foods instead of the amount of consumed food and slim appearance (12). Indeed, even though there are currently no clinical guidelines for this purported disorder, ON is being considered as detrimental to human health, because it brings about excessive focus on food, health, behavior, etc (3,5).

While the prevalence of those showing orthorectic tendency ranged from 6.9% (4) to 57.6% in the general population (13), it was reported to range between 28-30% in sporters (14); to be 45.5% in physicians (15); 81.8% in opera artists (16) and 81.9% in dieticians (6). The groups having a high risk for orthorexia nervosa (ON) are women, adolescents, sport(wo)men, students having health education (7,9,15,17-24), yoga practitioners (5,26), primary care physicians (15,18) and performing artists (16) and different sociodemographic characteristics are reported in different studies. In terms of the culture within yoga activities, these activities often require self-discipline lifestyle modifications such as healthier eating habits (5). In the studies conducted with yoga practitioners, it has been reported that 55.2% of the participants and 33.1% of males have unhealthy weight control behaviors (26). Valera et al. (2014) reported that yoga teachers to avoid excessive reference to a healthy diet, which is natural component of yoga practice. The same study noted that the possibility that excessive attention paid by practitioners to diet and food quality as part of the yoga system (5). Yoga practitioners thought to have high awareness about healthy nutrition have strict rules about eating. In this respect, yoga practitioners can be thought to be at risk of ON. However, there has been no study about the issue in the literature.

From this point of view, this study was designed based on the following questions;

1. What are the levels of health status perceptions of yoga practitioners?

2. What are the levels of the orthorexia nervosa tendencies of yoga practitioners?

3. What are the factors associated with orthorexia nervosa tendencies of yoga practitioners?

The aim of the study was to determine the health status perceptions and orthorexia nervosa tendencies of yoga practitioners.

Methods

Setting

The study was conducted in three yoga centers in Karşıyaka town in Izmir city which is located in the western part of Turkey. All yoga centers (n:3) in Karşıyaka town included to the study.

Study design and participants

The study was designed as a cross-sectional descriptive type. The population of the study consisted of 153 people registered to yoga centers between March and May 2017. Non-probability sampling was used and the sample included 118 volunteers. The rate of participation was 77.1%.

Inclusion criterias of the study were;

1. Yoga users were defined by yoga use at least half-hour per week/ at least one month

2. Eligibility requirements were being at least 18 years of age

3. Accepting to participate in the study and giving verbal consent.

Approval from the scientific ethics committee of Ege University (date: 01.02.2017, protocol no: 04-2017) to collect the data, and the application permission from three yoga centers located in Izmir to carry out the study were obtained. Verbal informed consent

was obtained from all individual participants included in the study.

Instruments

Personal information form: The form prepared in accordance with the literature (27-29) by the researchers has a total of 11 questions about the individuals' personal characteristics (age, gender, occupation, marital status, smoking status, presence of a chronic disease, diet, status of being vegan, status of being vegetarian and BMI (height, weight)).

Perception of Health Status Scale: The original scale developed by Davis, Avery, and Donald (1978), the scale is adapted to the Turkish language by Esin and Erdogan (30). The scale has only one item, "How do you perceive your current health status?", which is answered by selecting "very good" (1 point), "good" (2 points), "poor" (3 points), or "very poor" (4 points). When assessing the scale, 4 is considered the lowest score, and 1 the highest. Cronbach alpha was 0.89. (30).

Orthorexia Nervosa (Orto-11) Scale: This scale was developed to determine the healthy eating obsessions in individuals. Its' original version, ORTO-15 scale, was developed by Donini et al. in Italy (4). Donini et al. developed the ORTO-15 scale by developing and changing the statements in the Orthorexia short form with 10 questions prepared by Bratman (3). Turkish adaptation of the scale was conducted by Arusoglu (8) and it was adapted as ORTO-11. The scale contains 11 items. Each expression is evaluated with a 4-point Likert-type rating. In the scale, the individuals were asked to state how often they feel themselves as described in the items by marking one of the options as "always," "frequently", "sometimes", and "never". When "1" point is given to the answers thought to be distinguishing for Orthorexia, "4" points are given to the responses showing normal eating behavior tendency. The cut-off value of ORTO-11 was reported to be 27 by Arusoğlu (31). Low scores obtained from the scale indicate that the risk of orthorexia nervosa or orthorectic tendency is increasing (8,10). The Cronbach's Alpha value of the scale was 0.82 (8,9) and the Cronbach's Alpha coefficient was found as 0.86 in this study. The participants' body mass index (BMI) was calculated based on their self-reported height and weight and categorized using the BMI groups defined by the World Health Organization (32).

Data analysis

In the assessment of data, Kolmogorov-Smirnov test was applied for normal distribution suitability in addition to the number, percentage, mean distributions from descriptive statistics. The test showed that the values of the scale were not normally distributed (Kolmogorov-Smirnov Z=2.63, p=0.034). In between-group comparison, Mann Whitney U test for two groups and Kruskal Wallis test for more than two groups from non-parametric tests were used. Statistical significance level was accepted as $p < 0.05$. Statistical analysis was performed using SPSS 22.0 (Statistical Program Social Sciences) packaged software.

Results

Profile of yoga practitioners

Of the yoga practitioners included in the study, the mean age was 30.48±9.19 years (range: 18-56), 92.4% were female, and 72% were single. 34.75% of the participants stated that they had a health-related profession. Of the participants, 89.8% stated that they were the non-smoker, 80.5% had no chronic diseases, 12.71% were in diet, 11% stated that they were vegetarian and 6.8% stated that they were vegan (Table 1). The body mass index of the yoga practitioners was 20.55±1.80 kg/m^2 in females and 24.3±1.59 in males, respectively (Table 2).

Perception of Health Status and ORTO-11 scores of yoga practitioners

Perceived physical health was "good" for 68.0% and "very good" for 32% of the participants. The mean perceived health score was 1.94±0.54 (minimum:1, maximum: 4). When the mean scores of the sample group from Orto-11 Scale were examined, the mean score was determined as 24.05±4.36 and 75.4% of the yoga practitioners (n:89) were found to be risky in terms of ON.

The mean perceived health status scores were 1.96±0.54 in females and 1.66±0.50 in males (Table 2). No statistical difference was found between the

variables of the mean perceived health status score and gender, BMI group, chronic disease, dieting, being vegetarian and vegan (p>0.05).

The distribution of Perception of Health Status Scale and ORTO-11 scores by some socio-demographic variables

When the characteristics and the health status perception mean scores of the participants were compared, it is found that the health status perception of those who were married (U=939.000; p<.001) and non-smoker (U=310.500, p<.001) were higher (Table 3).

Table 1. Socio-demographic variables of the yoga practitioners (n:118)

Variables	n	%
Gender		
Female	109	92.4
Male	9	7.6
Relationship		
Married	33	28.0
Single	85	72.0
Health-related profession		
Yes	41	34.75
No	77	65.25
Chronic diseases		
Yes	23	19.5
No	95	80.5
Smoker		
Yes	12	10.2
No	106	89.8
Doing diet		
Yes	15	12.71
No	103	87.29
Vegeterian		
Yes	13	11.0
No	105	89.0
Vegan		
Yes	8	6.8
No	110	93.2

ORTO-11 mean score of the participants was found as 24.05±4.36. Orto-11 mean score was 24.13± 4.34 for the female's and 23.04 ±4.82 for the male's. There was no statistical difference between Orto-11 mean score and the variables such as gender, BMI group, smoking, dieting, being vegetarian and vegan (p>0.05). When the participants' characteristics and Orto-11 mean scores were compared, it was determined that the orthorexia tendencies of those who were married (U=797.00; p<.001) and had chronic disease (U=570.50; p<.001) were higher (Table 3).

There was no correlation in between perception of health status and ORTO-11 (r=.156)

Discussion

The tendency of being healthy-healthism which is both a social and political movement ensures that individuals take responsibility to avoid risk factors detrimental to the health of individuals and turn to regular exercise and healthy eating behaviors to reach optimal health (33). Healthy eating today is one of the most important approaches for health promotion (15). The nutrition style of individuals varies according to many biological, psychological and sociocultural factors (10,14,18). When the literature is examined it is seen that the risk of orthorexia nervosa which is defined as the obsession of healthy eating. Orthorexia is more common particularly in models who are careful about being in a certain weight, dancers, yoga practitioners, sporters, healthcare professionals and especially in dietitians (5,6,14-16). This study was conducted to determine the health status perception and orthorexia nervosa tendencies of yoga practitioners.

Table 2. Antropometric values of the yoga practitioners (X ± SD)

Measures	Male (n:9)			Female (n:109)		
	X ± SD	Min	Max	X ± SD	Min	Max
Years	36.3±3.84	28.00	40.00	30.0±9.35	18.00	56.00
Weight (kg)	85.00±1.73	82.00	87.00	56.94±5.49	42.00	70.00
Height (cm)	1.87±0.61	1.75	1.93	1.66±0.06	1.48	1.78
*BMI (kg/m^2)	24.3±1.59	22.60	27.80	20.55±1.80	15.20	27.10

**BMI: Body mass index, SD:Stardard deviation*

The vast majority of the individuals participating in the study were female (92.4%) and aged between 18-56 years. Similarly, it was reported in previous studies that the yoga practitioners were predominantly female and aged between 21 and 44 years. Results of this study are similar to the literature (34-36). Notably, yoga use was higher among young adult women.

Yoga is described as a holistic system that unifies, harmonizes, and strengthens the mind, body, and spirit (37). It has been proposed that the popularity of yoga may be largely attributable to its psychophysiological effects, which attenuate the stress response and improve emotional stability and regulation, leading to a greater feeling of well-being and improving quality of life (38). According to the results of the study, variables like the practitioners' gender, occupation, BMI, presence of a chronic disease, dieting and being vegan/vegetarian did not affect their health status perceptions ($p \geq 0.05$), it was an important result that the health status perceptions of those who were married and non-smoker were higher than those who were not married and smoker. In another study, 46.3% of yoga users reported their health as "very good" or "excellent" (38.8%) (35). In the same study, yoga users agreed that yoga improved their health regardless of their gender (35). A study reported that yoga practitioners had the desire of having a better health status (34). The results of the present study confirm previous reports indicating that people improve their health and feel better by practicing yoga (25, 34).

Table 3. The distribution of Health Status Scale and ORTO-11 scores by some socio-demografic variables.

		HEALTH STATUS PERCEPTION			ORTO 11		
Variables	**n**	**Mean±SD**	**Test**	**p**	**Mean±SD**	**Test**	**p**
Gender							
Female	109	1.96±.54	U=366.000	0.116	24.13±4.34	U=392.00	.316
Male	9	1.66±.50			23.04±4.82		
Relationship							
Married	33	1.66±.59	U=939.000	**<0.001***	21.84±3.10	U=797.00	**.000***
Single	85	2.04±.48			24.90±4.50		
Health-related profession							
Yes	41	1.91±.33	U=421.00	0.265	24.35±1.31	U=361.60	.172
No	77	1.92±.74			24.61±0.64		
BMI Group							
<18.4	9	2.11±.78			22.55±6.12		
18.5-24.9	105	1.92±.53	χ^2=.996	0.608	23.96±4.21	χ^2=6.011	.050
25.0-29.9	6	2.00±-			27.83±1.83		
Smoker							
Yes	12	2.00±.49	U=310.500	**<0.000***	23.66±4.65	U=565.50	.528
No	106	1.41±.66			24.09±4.35		
Chronic diseases							
Yes	23	2.00±.42	U=1019.000	0.534	21.26±4.31	U=570.50	**.000***
No	95	1.92±.56			24.72±4.12		
Doing diet							
Yes	15	2±-	U=637.00	0.626	22.07±3.75	U=468.00	.064
No	103	1.93±.57			24.29±4.39		
Vegeterian							
Yes	13	1.92±.49	U=652.500	0.915	23.92±4.36	U=681.50	.993
No	105	1.94±.55			24.06±4.39		
Vegan							
Yes	8	2.12±.35	U=363.000	0.308	26.62±4.56	U=284.00	.094
No	110	1.93±.55			23.86±4.31		

*χ^2:Kruskal Wallis, U=Mann Whitney U test, * p<.001*
BMI: Body mass index, SD:Stardard deviation

The popularity of yoga is growing in western countries and also in Turkey (25). Sport for All Federation (39) in Turkey continues its activities with the slogan of "live with yoga, yoga is for all ages". It is stated in the literature that yoga practitioners are a high-risk group in terms of orthorexia tendency (13,25,40). Indeed, the first recorded reference to ON was in a lay publication, Yoga Journal (2). Valera et al. (2014) reported in their study that ON prevalence of yoga practitioners was 86% (5). Similar to the literature, three quarters (75%) of yoga practitioners were found to be ON risky in this study. Since healthy eating is a standard component of yoga practice in yoga practitioners, this is evaluated as an expected result (5). When examining the variables that can affect ON tendency of yoga practitioners, in the present study, it was found that ON tendencies were higher in married individuals than the single ones and in those who had chronic illness than those who did not. Similarly, it was stated in the dissertation study by Arusoğlu (2006) that married individuals had higher ON tendencies than the single ones (8). In another study, no relationship was found between orthorectic individuals and marital status (4). This result suggested that it was important to examine the marital status of individuals as one of the important factors affecting ON risk. It was stated in another study that university students who had chronic illness showed higher orthorectic tendencies than the university students who had no chronic illness (41). In another study, it was stated that the presence of chronic disease did not make any difference in terms of orthorexia tendency (8). In the literature, there are limited studies on how the presence of both marital status and chronic disease affects the orthorexia and the differences in the results of this study indicate the need for studies in larger sample groups for the relevant variables.

Strengths and limitations

While the results of this study are striking, it has some limitations. The lack of a control group and the usage of a self-reported health status as the only other dependent variable is the most important limitation in this study. The results of the study were based on self-reported data. Body mass index was calculated based on their self-reported weight and height. Anonymous internet surveys are at risk for recall bias and deception. Despite these limitations, the results of this study are compelling.

Conclusion

With ancient roots in India, yoga has evolved over two millennia from a discipline of mind and body for spiritual goals to a global practice aimed at maintaining physical health and psychological well-being. In this study, a vast majority of the yoga practitioners were women aged between 18-56 years. It was found that male and female yoga practitioners had a normal weight. More than half of the yoga practitioners perceived their physical health as "good" and the remaining ones perceived theirs as "very good". It was determined that the health status perceptions of individuals who were married and non-smoker were higher. The marital status and the presence of chronic illness significantly affected the orthorexia nervosa tendencies of yoga practitioners. It was also determined that individuals, especially who were married and had chronic illness had high ON risks. Several studies on large cohorts are needed to clarify the prevalence of ON and its pathophysiological consequences.

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