

## The evaluation of orthorexia nervosa tendency in primary health care workers

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### ABSTRACT

**Purpose:** The purpose of the current study was to assess the tendency and frequency of orthorexia nervosa (ON) among primary health care workers. At the same time, it was our special purpose to evaluate its relation with eating attitude disorders and obsessive-compulsive symptoms.

**Materials and methods:** This cross-sectional study was conducted with the participation of primary health care workers in Istanbul, Turkey, in September-October 2016. The total number of 202 primary health care workers were composed of physicians and nurses. We reached 72.2% (n=156) of the research population. Participants completed a questionnaire inquiring about sociodemographic characteristics, and also three scales, namely ORTO-11, Eating Attitude Test-40 (EAT-40), and Maudsly Obsessive-Compulsive Inventory (MOCI).

**Results:** The mean ORTO-11 score of the participants was 26.8±4.8. The ORTO-11 score was

higher in the physicians (27.8±4.62) than in the nurses (25.8±5.01) (p=0.018). Therefore, physicians tend to have less tendency for ON. There was a low but statistically significant correlation between the scores of ORTO-11 and EAT-40 (rho=- 0.299 and p<0.001) and MOCI (rho=-0.261 and p=0.001). EAT-40 and MOCI (rho=0.192 and p=0.016) scores were found to be statistically significant at low correlation.

**Conclusions:** The tendency of ON, eating attitude disorder and obsessive-compulsive symptoms were found to be higher in nurses as compared to physicians as far as occupational groups were concerned. There can be a relation between ON tendency and eating attitude disorders and obsessive-compulsive symptoms.

**Keywords:** orthorexia nervosa; eating attitude disorders; obsessive-compulsive symptoms; primary health care workers

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## **INTRODUCTION**

Eating disorders (EDs) are characterized by changes in eating behaviour that may be related to a number of psychosocial factors such as culture, habits, lifestyle, low self-esteem, poor empathy, and obsessions [1]. EDs are defined in DSM-5 as resulting in a change in consumption or absorption of food and permanent impairment in eating-related behaviours leading to a significant impairment in physical health and psychosocial functioning [2]. EDs have eight subcategories as Pica, Rumination Disorder, Avoidant / Restrictive Food Intake Disorder, Anorexia Nervosa (AN), Bulimia Nervosa (BN), Binge-Eating Disorder, Other Specified Feeding or Eating Disorder and Unspecified Feeding or Eating Disorder [2].

In recent years, there has been an increasing number of researches on 'Orthorexia Nervosa' (ON), which is claimed to be a new eating disorder. The term ON was first used by Bratman and Knight in 1997 in the United States to define healthy nutrition. Orthorexia is derived from the Latin word 'orthos' which means correct and 'orexis' meaning hunger. This term is used for 'obsession with healthy and proper nutrition' [3]. According to Steven Bratman, orthorexia has two stages. The first stage is the selection of healthy nutrition that can be described as innocent. In the second stage, a healthy diet is no longer illogical and scientific and goes to dietary choices that do not meet the standards and turn into unhealthy obsessions. Excessive concerns about the materials and techniques used during the preparation of meals, which are common in orthorexic individuals, can eventually lead to obsession, loss of social relations, and emotional dissatisfaction [4].

Orthorexia nervosa is not yet included in DSM-5 as an independent diagnostic category [2]. However, there are some similarities and differences with other ED. It can lead to malnutrition and weight loss like AN. Unlike AN and BN, orthorexic individuals engage their minds about healthy and pure consumption, instead of the amount or physical appearance of the food they eat. They spend a lot of time observing strict rules and worrying about food, similar to obsessive-compulsive symptoms. As a result, social functioning can be negatively affected. Therefore, it can be of concern to recognize people who have orthorexia nervosa [5]. For this purpose, Donini et al. developed a questionnaire called the ORTO-15 test, to measure healthy nutrition obsession [6].

Studies have shown that the prevalence of ON varies between countries, even between different populations in the same country. The prevalence of obsession with healthy nutrition was found to be between 6.9% and 57.6% in the general population in Italy [7,8]. In a study conducted on opera artists in Turkey, the prevalence of orthorexia nervosa was found to be 56.4% [9]. The ORTO-15 is the most

widely used instrument to evaluate orthorexia nervosa, although previous studies obtained inconsistent results about its psychometric properties [10]. It should be considered while interpreting the results on prevalence rates. Eating behaviours might vary depending on the culture, habits, and lifestyle. Therefore, a new concept, orthorexia nervosa, can be affected by these differences.

Multidisciplinary primary health care teams face a range of nutritional issues on which they are required to provide advice. They are considered a trusted source of nutritional advice. Patients view general practitioners as the main source of information about nutrition. Nurses have an important role in providing nutritional advice. Previous studies have revealed differences in knowledge, attitudes, and behaviours about nutrition between two occupational groups. Also, differences in eating behaviours of doctors and nurses may be important when advising patients on nutrition. Problematic eating behaviours may also change the approach of health professionals to patients [11]. However, no study has been found on this subject.

ON is not an independent diagnostic category and it is not included in eating disorders such as anorexia nervosa or obsessive-compulsive disorder. ON is reported as exhibiting some symptoms which overlap with ED and obsessive-compulsive disorders [12]. In order to show a similar relationship in primary health care workers who work in Turkish culture, we used EAT-40 and MOCI to measure eating attitude disorders and obsessive-compulsive symptoms.

The purpose of the current study was to assess the tendency and frequency of orthorexia nervosa among primary health care workers. At the same time, it was our special purpose to evaluate its relation with eating attitude disorders and obsessive-compulsive symptoms.

## **MATERIALS AND METHODS**

### **Participants**

This cross-sectional study was conducted with the participation of primary health care (PHC) workers in the province of Kartal in Istanbul, which constituted our research community in September-October 2016. Istanbul is Turkey's most populated city. Kartal is located on the Anatolian side of Istanbul and consists of inhabitants with various socioeconomic backgrounds. It hosts about half a million people. There are a total of 26 Primary Health Care Clinics and a Community Health Care Center within the scope of primary health care services in the province of Kartal. The total number of 202 primary health care workers working in those 26 Primary Health Care Clinics and the Community Health Care Center constituted our study population. Out of all 202 PHC workers, 36 individuals could not be reached for various reasons and 10 persons

refused to participate in the study. Thus, we could reach 72.2% (n=156) of the research population. Among PHC workers, 79 (50.6%) were physicians and 77 (49.4%) were nurses.

Informed consent was taken from all participants before starting the questionnaire. Ethics approval for our study was granted by the Ethical Committee of Marmara University School of Medicine. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

## **Measures**

The data were collected using a face-to-face questionnaire. The questionnaire lasted approximately 20 minutes. The first part of the questionnaire was about the sociodemographic and some other characteristics of the participants. Gender, occupation, marital status, age, duration of work experience, number of children, and perception of income status were some of these. We preferred to ask for participants' perception of income status on a scale from 0 to 10. '0' means 'I have very low income' and '10' means 'I have very high income'. Because the response rate would be lower when the participants' incomes were asked and they had similar incomes within the same profession group. Answers concerning regular physical activity were also self-reported. In addition, height and weight were also the participants' self-perceptions, that is height and weight measurements were not made. Participants were also asked about being on diet or not during the past year, their status of smoking, perceptions of being healthy or not, and the declaration of the presence of a diagnosed illness. After the first part, the following three scales were included in the questionnaire.

### *ORTO-11*

Donini et al. developed the ORTO-15 scale in 2005 to assess the ON trend in Italy [6].

ORTO-15 was improved from orthorexia questionnaire which included ten questions and was developed by Bratman in 2000 [3].

The items inquired about the behaviour of individuals in choosing, purchasing, preparing, and consuming nutrients that they regarded as healthy. Low scores indicated an increase in orthorexic tendency. Turkish validity and reliability study of the ORTO-15 scale was conducted by Arusoğlu et al. [13].

The Turkish version of the scale consisted of eleven items and each item was scored on a 4-point Likert scale. Participants responded to items in the form of 'always, often, sometimes, or never.' Items that reflected orthorexic tendency scored smaller points, while items that reflected the

tendency toward normal eating behaviour scored greater points. Points for each item ranged from 1 to 4.

The maximum total score on the ORTO-11 scale was 44. Low scores indicated an increase in orthorexic tendency [10].

In the study of Donini et al. the cut-off point for ORTO-15 is 40 [6]. However, no cut-off point for ORTO-11 has been identified.

### *Eating Attitude Test-40 (EAT-40)*

It was developed by Garner and Grafinkel in 1979 to measure eating behaviours and attitudes of anorexic patients as well as possible problematic eating behaviours of normal individuals [14]. High scores indicated problematic eating behaviours and attitudes. Turkish validity and reliability study of EAT-40 were conducted by Erol and Savaşır in 1989 [15]. In our study we also used EAT-40; however, we did not use any cut-off point.

### *Maudsly Obsessive Compulsive Inventory (MOCI)*

It was developed by Hodgson and Rachman in 1977 to measure the type and prevalence of obsessive-compulsive symptoms [16]. Turkish validity and reliability study of MOCI were conducted by Erol and Savaşır in 1988 [17]. High scores indicated that the severity of obsessive-compulsive symptoms increases. In our study we also used MOCI; however, we did not use any cut-off point, either.

## **Statistical methods**

The normality distribution of the data was evaluated by the Kolmogorov-Smirnov test. Categorical variables were shown by frequency and percentages. Mann-Whitney U test was used as a non-parametric test in order to compare scores since the quantitative variables did not fit the normal distribution. A non-parametric Spearman correlation test was performed to evaluate the correlation of ORTO-11, EAT-40, MOCI, and some other continuous variables. For  $X \pm Y$ ; X means mean and Y means standard deviation. The level of statistical significance was accepted as  $p < 0.05$  in our study.

## **Ethical concerns**

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Local ethics committee approval (09.2016.466) and written informed consent from each healthy volunteer were obtained prior to the investigation. This article does not contain studies with animals performed by any of the authors.

## RESULTS

In the study, 28.2% (n=44) of participants were females and 71.8% (n=112) were males. They were in the age range of 23-65 years and their mean age was 38.1±8.4 years. When we evaluate the distribution of participants' BMI; 59.6% (n=93) healthy weight, 26.9% (n=42) overweight, 12.2%

(n=19) obese and 1.3% (n=2) underweight. While the majority of participants (78.2%) were married, 50.6% were physicians and 49.4% were nurses. The average duration of work experience was 14.3±8.5 years. Participants' self-ratings of their perception of income status had an average score of 5.3±1.63 out of 10 (Table 1 shows socio-demographic characteristics).

**Table 1.** Socio-demographic characteristics of participants

Socio-demographic characteristics		n	%
Sex	Male	44	28.2
	Female	112	71.8
Occupation	Physician	79	50.6
	Nurse	77	49.4
Marital status	Married	122	78.2
	Single	20	12.8
	Divorced-Widowed	14	9.0
Age/Years (mean±SD)		38.2 ± 8.4	
Duration of work experience / Years (mean±SD)		14.3 ± 8.5	
Number of children (mean±SD)		1.1 ± 0.88	
Perception of income status (mean±SD)		5.3 ± 1.63	

Looking at the distribution of perceptions of participants about their own weight; 50.6% (n=79) could be considered as having normal weight, while 36.5% (n=57) could be interpreted as having somewhat overweight. Around 34.6% (n=54) stated that they had been on a diet during the past year. Although 42.9% (n=67) declared to have a disease diagnosed by a physician, 73.7% (n=115) thought that they were healthy. Therefore, some people who have a disease diagnosed by a physician stated that they felt healthy. Around 28.2% (n=44) of participants stated that they were current smokers.

The maximum score was 44 could be obtained from the ORTO-11 scale.<sup>13</sup> In our study, the mean ORTO-11 score of the participants was 26.94±4.48 (mean±sd) points. As the scores decreased orthorexic tendency is expected to increase. In our study, ORTO-11 scores changed between 16 and 38 points. Since no cut-off point for ORTO-11 existed we could not interpret our results using any cut-off point. ORTO-11 scores of participants were compared with various variables. Statistically, a significant difference was observed only among occupational groups ( $p=0.018$ ). No statistical difference was observed in other sociodemographic characteristics ( $p>0.05$ ). The ORTO-11 score was found to be higher in the physicians (27.8±4.62) as compared to the nurses (25.8±5.01). To this end, physicians had less tendency for orthorexia nervosa (Table 2).

The mean scores of the EAT-40 scale were 11.3±8.1 and 14.4±8.77 for physicians and nurses, respectively. According to the EAT-40 scale, high scores indicated problematic eating behaviour and attitude.<sup>15</sup> Therefore, the risk of developing an eating attitude disorder according to the EAT-40 scale in physicians was observed to be lower than in nurses and this was found to be statistically significant ( $p=0.003$ ). Furthermore, the mean scores of the MOCI scale were calculated to be 8.2±5.07 and 12.8±6.07 for physicians and nurses, respectively. Thus, obsessive-compulsive symptoms were lower in physicians and this was found to be statistically significant ( $p<0.001$ ) (Table 2).

Table 3 shows the results of the correlation analysis between ORTO-11, EAT-40, MOCI scales, and some other continuous variables. There was a low but statistically significant correlation between the scores of ORTO-11 and EAT-40 ( $\rho=-0.299$  and  $p<0.001$ ) and MOCI ( $\rho=-0.261$  and  $p=0.001$ ). EAT-40 and MOCI ( $\rho=0.192$  and  $p=0.016$ ) scores were found to be statistically significant at low correlation. In addition, the only sociodemographic variable was the perception of income status which had a statistically significant correlation with ORTO-11 ( $\rho=0.235$  and  $p=0.003$ ). As the perception of income status increased, ORTO-11 scores also increased indicating less tendency of orthorexia nervosa.

**Table 2.** Comparison of participants' sociodemographic characteristics with ORTO-11, EAT-40 and MOCI scale scores

Sociodemographic characteristics		ORTO-11		EAT-40		MOCI	
		Mean	SD	Mean	SD	Mean	SD
Sex	Male	27.6	5.19	12.0	8.79	7.9	4.74
	Female	26.5	4.76	13.1	8.48	11.4	6.21
	<i>p</i> value	0.408		0.217		<b>0.001</b>	
Occupation	Physician	27.8	4.62	11.3	8.10	8.2	5.07
	Nurse	25.8	5.01	14.4	8.77	12.8	6.07
	<i>p</i> value	<b>0.018</b>		<b>0.003</b>		<b>&lt;0.001</b>	
Regular physical activity	Yes	25.5	5.71	15.8	9.83	11.0	5.99
	No	27.4	4.43	11.6	7.68	10.2	6.06
	<i>p</i> value	0.057		<b>0.005</b>		0.484	
Marital status	Married	26.9	5.06	12.7	8.17	10.5	5.97
	Not married	26.7	4.32	13.2	9.94	10.4	6.33
	<i>p</i> value	0.592		0.513		0.781	
Being on diet during the past year	Yes	26.3	4.28	13.2	8.14	10.9	5.54
	No	27.1	5.19	12.6	8.80	10.2	6.29
	<i>p</i> value	0.176		0.540		0.363	
Perception of health status	Healthy	27.1	5.09	12.5	8.16	10.2	6.12
	Not healthy	26.2	4.31	13.7	9.63	11.2	5.76
	<i>p</i> value	0.188		0.889		0.248	
Presence of any health problem diagnosed by a physician	Yes	26.4	5.50	14.0	8.53	10.7	5.64
	No	27.2	4.40	11.9	8.51	10.3	6.33
	<i>p</i> value	0.530		0.088		0.295	
Current smoker	Yes	27.1	5.31	12.9	10.1 1	10.2	6.14
	No	26.7	4.75	12.8	7.91	10.5	6.01
	<i>p</i> value	0.957		0.423		0.496	

**Table 3.** Correlation between age, duration of work experience, number of children, income status and ORTO-11, EAT-40 and MOCI scale scores

		ORTO-11	EAT-40	MOCI	Age	Duration of work	Number of children	Perception of income status
ORTO-11	<i>rho</i>		<b>-0.299</b>	<b>-0.261</b>	0.037	-0.064	-0.036	<b>0.235</b>
	<i>p</i> value		<b>&lt;0.001</b>	<b>0.001</b>	0.642	0.429	0.653	<b>0.003</b>
EAT-40	<i>rho</i>	<b>-0.299</b>		<b>0.192</b>	<b>0.215</b>	<b>0.266</b>	0.066	-0.143
	<i>p</i> value	<b>&lt;0.001</b>		<b>0.016</b>	<b>0.007</b>	<b>0.001</b>	0.41	0.076
MOCI	<i>rho</i>	<b>-0.261</b>	<b>0.192</b>		<b>-0.227</b>	<b>-0.159</b>	-0.012	-0.13
	<i>p</i> value	<b>0.001</b>	<b>0.016</b>		<b>0.004</b>	<b>0.048</b>	0.882	0.105
Age/Years	<i>rho</i>	0.037	<b>0.215</b>	<b>-0.227</b>		<b>0.879</b>	<b>0.375</b>	0.078

## DISCUSSION

This cross-sectional study was conducted in Istanbul with primary health care workers. The participants' ORTO-11 average score was approximately 27 where the maximum score that could be obtained from the ORTO-11 scale being 44 and as the scores decreasing orthorexic tendency is being expected to increase [13]. Since the above-

mentioned reference did not use any cut-off point we analyzed our frequency of orthorexia nervosa according to being below the average as in the study of Fidan et al. and Almeida et al. [18,19]. 46.8% of the primary health care workers were rated below the average. The ORTO-11 test was used by Fidan et al. in their study with medical students in Erzurum in 2010. The prevalence of ortorexia was found to be 36.9% [18]. The reason for the higher tendency of

orthorexia in health care workers as compared to medical students may be that they are more knowledgeable on healthy nutrition since they have completed some kind of curriculum which most possibly included healthy nutrition.

There are other prevalence studies in Turkey carried out by using the ORTO-15 test. The prevalence of orthorexia nervosa was found 45.5% in the study that was conducted on physicians in Ankara by Bosi et al. and 56.4% among opera artists and ballet dancers by Aksoydan and Camci, 41.9% among dieticians in Ankara by Asil and Sürücüoğlu [9,20,21]. In studies conducted in different countries, the prevalence of orthorexia nervosa varies between 6.9% and 81.9%. One reason for the difference in prevalence rates may be the use of the ORTO-15 scale, which has weaker psychometric properties than ORTO-11. Prevalence was found to be lower in studies conducted on the general population as compared to our study. Prevalence emerged to be higher in high-risk populations as compared to our study population [22].

No statistically significant difference appeared when ORTO-11 scores were evaluated according to sex. While there was no difference in the risk of developing eating attitude disorder, obsessive-compulsive symptoms were found to be higher in females. Although it is reported that females have more eating disorders such as AN and BN than males, no evident finding of orthorexia nervosa being more frequent in females could be detected. Resembling our study some studies reported no statistically significant difference between females and males. On the contrary, some studies reported a higher tendency in males [23].

In our study, we did not find a significant correlation between age and ON tendency. The correlation between ON tendency and age in literature is not clear [22]. Similar to our study, in the study performed by Bağcı Bosi et al., no difference was found when the age variable was grouped and analyzed [20]. However, in a study conducted among Turkish medical students, the ON tendency was found to be higher among those under 21 years of age [18]. On the contrary, in the study by Donini et al., ON tendency was found to be related to older age [5].

In our study, the tendency of orthorexia nervosa, eating attitude disorder and obsessive-compulsive symptoms were found to be higher in nurses as compared to physicians as far as occupational groups were concerned. In some studies, it was reported that ON tendency was higher in individuals with lower educational levels [22]. A lower ON tendency in physicians compared to nurses might be explained by their higher educational level.

In our study no relation between the tendency for orthorexia nervosa and other variables namely regular physical activity status, current

smoking, self-perception of the participants about their weights, the status of being on diet or not during the past year. Although Fidan et al. found negative correlations between body mass index (BMI) and orthorexia nervosa scores, most studies did not find a relation between ON and BMI [18]. In a study conducted on adolescents in Poland, it has been demonstrated that active lifestyle and extracurricular activities including sports, drama, music, and chess are related to increased orthorexic tendency [24]. Almeida et al. demonstrated that 61% of individuals who scored positive for ON in ORTO-15, “always” exercise more than 3 times per week, in contrast with only 31.2% of individuals who exercise at this frequency in the negative ON group. Their data does not reveal how this exercise frequency is related to ON or to an obsession with health in general, only that there is some correlation [19]. Oberle et al. suggested in a recently published study that individuals with ON tendencies are internally driven to engage in physical activity as these strong motivations lead to exercise addiction and a compulsive need to follow a rigid schedule of intensive exercise and Rudolph also found a positive correlation between ON and exercise addiction in the context of German fitness sports [25,26]. It is also known that less exercise is associated with a less healthy eating attitude. It has been shown that dieting is associated with a lower orthorexic tendency in the study of Bağcı Bosi et al. [20].

We found that ORTO-11, EAT-40 and MOCI have statistically significant correlations. As the ORTO-11 score decreased, EAT-40 and MOCI scores increased. Therefore, it can be commented that the tendency of orthorexia nervosa has a relation with the risk of developing eating attitude disorder and the severity of obsessive-compulsive symptoms. This relation was also evaluated in the study performed by Arusoglu et al. and similar results were obtained [13]. In their study conducted in 2005, Donini et al. reported that the scores from the orthorexia scale did not depend on the obsessive-compulsive tendencies assessed by the Minnesota Multiphasic Personality Inventory (MMPI), and therefore the items that assess obsessive-compulsive symptoms should be added to the scale [6]. MMPI generally evaluates anxiety and does not directly elicit the presence of obsessive-compulsive symptoms. However, MOCI was developed only to evaluate obsessive-compulsive symptoms.

In the study performed by Fidan et al. EAT-40 scale was used to evaluate eating attitude. The maximum score that could be taken from the scale was taken as 40 and the cut-off point as 30. Thus, it was observed that orthorexia nervosa tendency was higher when the score was over 30 points. Similar to our results, in Fidan’s study, as tendency of orthorexia nervosa increased, the score of eating attitude disorder increased [18].

There was only a measurement method in Turkey called ORTO-11 about orthorexia nervosa when we carried out our work. The ORTO-15 is the most widely used instrument to measure ON across the studies. We are aware that results about its internal structure have been inconsistent across different validation studies in several languages. Missbach et al. concluded that the German version of the ORTO-15 "is only a mediocre tool for assessing orthorexic tendencies" and Roncero et al. concluded that "the ORTO, used in most of the studies as if it were considered the gold standard, is not very golden" [10,27]. A new study called "Bidimensional Structure of the Orthorexia: Development and Initial Validation of a New Instrument" suggests the Teruel Orthorexia Scale (TOS) instead of ORTO-15 or the other versions of it. In this study, Barrada and Roncero expanded the conceptualization of orthorexia to include both problematic and non-problematic aspects of healthy eating [12]. Thus, the next step of our interest in orthorexia nervosa can be a study on the validation of TOS in Turkish.

The most important strength of our study is that it suggests a relation between orthorexia nervosa tendency, eating attitude disorder and obsessive-compulsive symptoms. Orthorexia nervosa is a new concept in the literature, the researchers selected eleven items with a factor load of 0.50 and above in the Turkish version of the scale [13]. The Cronbach's alpha coefficient indicating the internal consistency of the scale was 0.44 for ORTO-15 and 0.62 for Turkish ORTO-11. The literature reveals a few studies that examined the psychometric properties of ORTO-11. The internal consistency of the Spanish version of ORTO with the 11 items was adequate ( $\alpha=0.74$ ). This result agrees with the Hungarian version ( $\alpha=0.82$ ), which shares the same structure. However, in the Portuguese and German versions, with other item structures, the internal consistency was not adequate ( $\alpha<0.70$ ) [10]. Thus, the internal consistency was found to be statistically satisfactory for the Turkish language version. So, the ORTO-11 questionnaire is likely to be reliable and valid.

After collecting the data, information was provided to participants about orthorexia nervosa. In addition, a preliminary assessment of eating attitude and obsessive-compulsive symptoms were conducted, and participants were informed about their tendencies on these issues and guided on behalf of related measures.

## CONCLUSIONS

The tendency of orthorexia nervosa, eating attitude disorder and obsessive-compulsive symptoms were found to be higher in nurses as compared to physicians as far as occupational groups were concerned. More powerful analytical studies should be conducted to explain the reason for these

differences between physicians and nurses. The tendency of orthorexia nervosa has a relation with the risk of developing eating attitude disorder and the severity of obsessive-compulsive symptoms. ORTO-11 is the only measurement tool in Turkey to assess orthorexia nervosa tendency and its internal structure is different among studies. Therefore, the Teruel Orthorexia Scale should be considered to validate in Turkish.

## LIMITATIONS

Our research has some limitations. Firstly, our study population consists of only primary health care workers. Therefore, the results cannot be generalized. Secondly, although a major part of the population is included in the study, it is conducted merely in a single province in Istanbul, Turkey. In addition, length and weight information is learned by the person's own statement. Also, participants' perceptions of income status may not reflect the actual situation.

Further studies involving a larger number of participants and also the general population and/or in the risk groups should be performed on the basis of measurement methods with good psychometric properties. Different socioeconomic levels and occupations that are thought to be related to orthorexia nervosa should also be further investigated. There is also a need for comparative studies to assess cultural influences.

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## Conflicts of interest

The authors declare that they have no conflicts of interest.

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