Original article

The effect of nutrition education given to healthcare professionals on orthorexia nervosa

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Summary. *Objective:* This study was conducted to determine the effect of nutritional education given to healthcare professionals on Orthorexia Nervosa. *Methods*: Within the scope of the study, 111 volunteer health professional working in a private health institution received nutrition education. Before the education, the questionnaire form and ORTO-15 scale were applied to the participants by face-to-face interview technique, and their anthropometric measurements were taken by the researcher. ORTO-15 scale was applied again after the education. *Results*: Of the individuals who participated in the study, 75.7% were female, 24.3% were male and the mean age was 32.75±10.37 years. The mean BMI of the participants was 24.94±4.03 kg/m2, and the mean BMI of males was significantly higher compared to females ($p<0.05$). While the mean ORTO-15 score before the education was 37.35±3.62, it increased to 42.51±4.01 after the education ($p<0.001$). According to the pre-education ORTO-15 scores of the participants, 11.7% of them had orthorexia, and this rate was only 0.9% after the education. *Conclusion*: At the end of the study, it was determined that providing nutrition education to healthcare professional had a positive effect on them in terms of overcoming orthorexia. Nutritionists should give nutrition education with wide participation that includes different groups to decrease the tendency towards orthorexic behaviors in society.

Keywords: Nutrition, Nutrition education, Orthorexia nervosa, Healthcare professional.

Introduction

There has been an apparent awareness of the favorable effects of healthy nutrition in the community recently. The obsession of these behavior patterns related to healthy eating causes a negative result in health and life quality. This condition is defined as orthorexia nervosa (1).

Since the diagnostic criteria are unspecified in the "Diagnostic and Statistical Manual of Mental Disorders" (DSM-5) guide, orthorexia nervosa is among the unclassified eating behavior disorders that have yet been unidentified as a disease (2).

Orthorexic individuals show a similar tendency to anorexia nervosa patients in terms of weight loss, amenorrhea, and a restrictive diet. They do not perceive energy as a criterion in food selection, but they care about whether food is "healthy or unhealthy." In studies conducted with Orthorexic individuals, it is observed that these people generally indicated that they lost weight as a result of their healthy eating efforts and that they did not possess any weight-related efforts (3, 4).

The type of nutrition that adopted by orthorexic individuals includes goals like maintaining and improving health, treating the disease and losing

weight. However, this diet, which affects the life of the individual, as a result, can cause nutritional deficiency and eating behavior disorder, which pose a threat to health (5). It is suggested that the news in the media for healthy nutrition and natural foods are among the reasons for the widespread prevalence of orthorexia nervosa (6). In many studies, the increase in the frequency of orthorexia nervosa has been associated with eating disorders prevalence. Besides, it has been determined that individuals who follow a unique method of gaining/losing weight are at risk for orthorexia and obsessive-compulsive disorder. Reducing this risk is possible through preventions to reduce the frequency of orthorexia nervosa. One of these preventions, and perhaps the most important, is to educate people about it (7). The fact that the motivating power underlying the orthorexia nervosa is multidirectional and also makes the treatment of the disease difficult (8). To focus on nutritional education to increase the variety and amount of food consumed by individuals constitutes the components required in the treatment of orthorexia nervosa (9). It is comprehended that education level and nutrition education have a positive relationship with orthorexia nervosa (10, 11). The purpose of this study is to determine the effect of nutrition education given to healthcare professionals known to have higher nutritional knowledge than the other segments in society on orthorexia nervosa.

Materials and Methods

The research was carried out between June and December 2019 with the participation of 111 volunteer healthcare professionals working in a private hospital. The population of the study consisted of 155 medical staff working in the hospital. The number of samples was calculated as 111 people with a 5% margin of error and a 95% confidence interval.

This research was carried out under the Helsinki Declaration. Before developing the research, ethics committee approval from Istanbul Okan University dated June 12, 2019, and number 4 decision, approval letter dated May 27, 2019, and voluntary consent form were received from the hospital where the research was conducted.

At the beginning of the research, a questionnaire consisting of questions about the socio-demographic characteristics, and the ORTO-15 scale was applied by using the face-to-face interview technique. The height and weight measurements of the participants were taken by the researcher. Bodyweight (kg) was divided by the square of the height (m2) and the body mass index (BMI) was calculated.

The ORTO-15 scale was developed by Donini et al. to evaluate orthorexic symptoms (12). Turkish validity and reliability study of the scale was done by Arusoğlu (8). The items in the scale examine the obsessive behavior of individuals as well as choosing, purchasing, preparing and consuming foods that they think are healthy. Some items question the "cognitive-rational area", one part "clinical area", and the other "emotional area" to provide an emotional and rational evaluation within the scope of the scale. The cut-off point of the scale was reported as 33 points. While the scores obtained from the scale of "33 points" and below are defined as "orthorexic", it is evaluated that eating behavior approaches from hypersensitivity to normal in proportion to the increase in scores (8,12).

At the beginning of the study, a nutritional education was given to the participants after the questionnaire form and the ORTO-15 scale was applied and their anthropometric measurements were taken. Participants were divided into 4 groups with a maximum of 30 people. Each group received face to face nutrition education with an average of one hour with 3 repetitions at 3 weeks intervals. Nutritional education included nutrition-health relationships, food groups and needs, nutritional habits and food selection. ORTO 15 scale was reapplied by reaching the participants two months after the educations were completed.

Statistical Analyses

IBM SPSS Statistics 22 program was used to evaluate the data obtained from the research. In descriptive statistical analysis, frequency, percentage, mean and standard deviation values were found. Normal dispersion suitability of continuous variables was analyzed with the Kolmogorov-Smirnov test. Mann

Whitney U and Spearman's rho test were used in the data not suitable for normal distribution. Pearson Correlation was used in the data suitable for normal distribution. Dependent Sample t-Test and General Linear Model Repeated Measures ANOVA were used for repeated measurements. The significance level was evaluated as $p<0.05$.

Results

In this study, 75.7% (n=84) of the individuals participating in the study are female and 24.3% (n=27) are male and the mean age is 32.75±10.37 years. 51.4% (n=57) of the participants are married. At the beginning of the study, there was no significant relationship between the scores of the participants' ORTO-15 scale, and gender, and marital status ($p>0.05$).

According to the ORTO-15 scale, while orthorexia was detected in 11.7% of the participants (n=13) pre-education, this rate was found to be only 0.9% (n=1) on post-education.

A comparison of the scores of participants on the ORTO-15 scale before and after nutrition education is given in Table 1. While the mean ORTO-15 score pre-education was 37.35±3.62, it increased to 42.51±4.01 on post-education ($p<0.001$).

The mean weight of the participants was 69.64±13.26 kg, and the mean weight of the men (82.55±8.22 kg) was found to be significantly higher than women (65.49±11.84 kg) ($p<0.001$). The mean BMI of the participants was 24.94±4.03 kg/m^2 and the mean BMI of men (26.32±2.33 kg/m^2) was significantly higher than women (24.50±4.36 kg/m^2) ($p<0.05$).

The scores of the participants' pre-education and post-education on the ORTO-15 scale and the difference in points, and the relationship between age, weight, and BMI are given in Table 2. While a very weak negative correlation was found between age and post-education ORTO-15 scale, no significant relationship was found between pre-education scores and age ($p>0.05$).

Before and after nutrition education the scores of participants' ORTO-15 scale were compared according to gender, and marital status. There was no significant relationship between the scores of the participants' pre-education and post-education and the difference on the ORTO-15 scale, and gender, and marital status ($p>0.05$).

Table 1. Evaluation of the scores of participants on the ORTO-15 scale on pre-education and post-education (n=111)

ORTO-15 score	$\bar{x}$	SD	t	p[1]
Pre-education	37.35	3.62	-16.518	0.0001*
Post-education	42.51	4.01		
The difference of pre-education and post-education	5.15	3.28		

*p<0.001, [1]Paired Sample t-Test

Table 2. Relationship between the scores of participants on the ORTO-15 scale on pre-education and post-education, age, weight and BMI (n=111)

Variable	Pre-education		Post-education		The difference of pre-education and post-education	
	r	p	r	p	r	p
Age (year)	-0.128	0.182[2]	-0.196*	0.039[2]	-0.052	0.588[2]
Weight (kg)	-0.153	0.109[2]	-0.181	0.057[2]	-0.038	0.690[2]
BMI (kg/m^2)	-0.101	0.293[1]	-0.064	0.502[1]	-0.071	0.458[2]

[1]Pearson Correlation, [2]Spearman's rho, *p<0.05

Discussion

Orthorexia Nervosa is an "eating behavior disorder characterized by a pathological obsession for natural and healthy nutrition" (13). The results of the studies investigating the frequency of orthorexia nervosa differ according to the researched groups. In the study of Varga (14), it was concluded that the tendency to orthorexia nervosa does not differ by gender. However, some studies show that men are more prone to orthorexic symptoms than women (6, 12, 15, 16), and in some studies the tendency of women to orthorexia was higher than men (17-18). In the study of anlıer (19), it was found that the tendency to orthorexia was 2.5 times higher in women than in men. Some studies' results have been shown that marital status affects the tendency of orthorexia nervosa. In the study conducted by Arusoğlu (20), the tendency of married individuals to orthorexia nervosa is higher than that of single individuals. On the other hand, as a result of the study of Ernst (11), it was concluded that most of the individuals with ON symptoms were single, childless, white participants in the first year of marriage. Considering the results, it does not seem possible to reach a definitive conclusion about the prevalence of orthorexia nervosa by gender and marital status.

Some studies have indicated that dietitians have a high risk of orthorexia nervosa (21-23). In various surveys, it has been concluded that the frequency and likelihood of orthorexia increase, especially among healthcare professionals (24, 25). However, in a study, it was determined that there was no difference between the health professional participants and the participants who are not health professional (26). As a result of some studies, it has been determined that as the symptoms related to eating disorders increase, orthorexic tendencies increase and awareness should be raised around students about orthorexia nervosa. It is discussed that nutritional education should be included in formal education programs to gain proper eating habits and indirectly increase their quality of life (4, 7, 27, 28).

The most important one of the preventions to decrease the frequency of orthorexia nervosa is nutrition education (29). Some studies have shown that nutrition education improves nutritional knowledge and nutritional status, and this increase improves nutritional selection (10, 30). With this study, it was aimed to evaluate the effect of providing nutrition education to healthcare professionals who have higher nutritional knowledge than the other sections of society on orthorexia nervosa.

At the beginning of the study, orthorexia was found in 11.7% of the participants and this rate was found to be only 0.9% after the education. While the mean of the scores of the ORTO-15 scale increased from pre-education on post-education ($p<0.001$). Thus, as a result of the research, it was discovered that nutrition education was effective in improving orthorexic tendencies in health professionals. The absence of a similar study examining the effect of nutritional education on orthorexia nervosa and the determination of the positive effect of education as a result of the research constitutes the strengths of this research.

While a very weak correlation was detected between the participants' scores from the ORTO-15 scale post-education and their ages ($p<0.05$), there was no significant relationship between pre-education scores and post-education scores and age ($p>0.05$). Similarly, in some studies, it was discovered that age did not affect on orthorexia symptoms (17, 20, 31). However, in Ergin's (26) study, it was found that orthorexic trends differ according to age groups. As a result of the study carried out by Acar-Tek (24) with 52 healthcare professionals, it was found that individuals with higher age had more orthorexic tendencies.

There was no statistically significant difference between the scores of the participants' pre-education and post-education on the ORTO-15 scale, and the difference in points, and weight and BMI ($p>0.05$). Similarly, in some studies, it was concluded that there was no significant relationship between BMI and orthorexia nervosa (25, 32-34).

Conclusion

As a result of the study, it was concluded that nutrition education has a positive effect on orthorexia in healthcare professionals. The decrease in the presence of orthorexia nervosa before and after nutrition education and the statistically significant increase in the

scores obtained from the ORTO-15 scale after nutrition education is important in terms of revealing the importance of nutrition education in adults and its positive effects on orthorexia. Considering nutrition education studies for healthy nutrition were carried out with children and adolescents in general, the effects of the research on orthorexia nervosa by providing healthy nutrition education for adults are among the strengths of the research. However, since the research was conducted with healthcare staff working in a single hospital, the effects of nutritional education on orthorexia nervosa should be investigated by studies with larger populations and different occupational groups since the results of the research are limited to the participants in the sample group.

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