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Orthorexia nervosa and eating disorder symptoms in dietitians in the United States

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Abstract

Background—Dietitians are trained to identify optimal food choices for clients based on medical state and lifestyle. Orthorexia nervosa (ON) is a proposed disorder related to obsessions about eating healthfully; eating disorders (ED) are serious mental illnesses with symptoms related to eating, body image, and self-esteem. Both ON and EDs are more common amongst dietitians than the general population.

Objective—This study examined the prevalence of ON and EDs in dietitians in the United States and, amongst this sample, assessed whether the presence of ON symptoms related to symptoms of EDs, including weight, shape, eating, and restraint.

Design—A cross-sectional design compared responses for participants after dividing into three groups: those scoring at-risk for ON, those with a current or past ED, and a comparison group.

Participants—A sample of 2,500 registered dietitians were invited to complete surveys electronically; 636 responses were received.

Main Outcome Measures—Scores on the ORTO-15 and Eating Disorder Examination Questionnaire (EDE-Q) determined prevalence of ON and EDs. Differences in these measures, and body mass index (BMI) were compared in the three groups.

Statistical Analyses—Analysis of Variance (ANOVA) and Chi-square analyses compared the groups.

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CONFLICT OF INTEREST

All authors report no biomedical financial interests or potential conflicts of interest.

Results—For the entire sample, scores on the ORTO-15 suggested 49.5% were at risk for ON, and scores on the EDE-Q suggested 12.9% were at risk for an ED, with 8.2% of dietitians self-disclosing treatment for an ED. Both the group disclosing ED treatment and the group at risk for ON had a lower mean BMI, lower scores on the ORTO-15 and higher scores on the EDE-Q and all its subscales than the comparison group.

Conclusions—Clarifying the relationship between ON and EDs is warranted, as ON symptoms appear to be associated not only with disturbances in eating but also with elevated shape and weight concerns.

Keywords

orthorexia nervosa; eating disorders; dietitians; prevalence; clinicians

INTRODUCTION

Orthorexia nervosa (ON) is a term defined as the “fixation on righteous eating” coined in 1997 by Steven Bratman, MD.[1] ON is characterized by obsessive thoughts about food, self-punishment with fasts or over-exercise, restrictive eating behaviors, and a belief that one’s self-esteem is based on dietary choices. Individuals that develop ON may initiate a quest for a healthier lifestyle but then dysfunctional, compulsive beliefs about food emerge that then impair health, work, and social functioning.[2,3] As ON is not yet an established psychiatric diagnosis, the specific constellation of psychiatric symptoms necessary to separate lifestyle choices related to eating healthfully (not ON) from pathological behaviors and obsessions surrounding eating healthfully (potential for ON) are not fully established.[2,3]

In contrast to ON, eating disorders (ED) have established diagnostic criteria that include dysfunctional feeding behaviors, cognitive problems related to self-esteem and body-image, and body weight is significantly low (for anorexia nervosa only).[4] Individuals with ON appear to share traits for both EDs as well as obsessive-compulsive disorder.[5,6] Dunn and Bratman proposed diagnostic criteria for ON as an obsessional preoccupation with healthy foods paired with impairment of physical or mental health because of the obsession, and the lack of a different mental illness, an established medical problem, or religious belief leading to the behaviors.[3] Based on those proposed criteria, individuals with ON deny a desire for and lack the weight loss characteristic of anorexia nervosa. However, the relationship between ON and EDs have not been determined; this study sought to address this gap in the literature by examining whether symptoms of ON were related to symptoms of EDs in a population of registered dietitians.

A better understanding of the relationship between ON and EDs may help to reduce risk of EDs and to improve treatments for ON. EDs have substantial medical complications, with anorexia nervosa showing the highest mortality rate of any psychiatric illness.[7–9] If risk for ON is related to risk for EDs, utilization of interventions that reduce the development of EDs amongst individuals at high risk for ON may reduce incidence of EDs. Additionally, effective treatments for EDs exist, with evidence supporting medications, family therapy, and cognitive behavioral therapy.[10–12] Currently, there is little evidence to support specific treatments or interventions for ON.[13]

Thinking about food choices is a large part of both the work of a dietitian as well as part of the pathology of ON and EDs. An increased prevalence of EDs has been reported amongst dietitians.[14–20] More recently, ON has also been observed to be more common in dietitians than the general population, although there have been no studies of this in the United States.[21–23] Because both ON and EDs are common in dietitians, this population was selected to consider whether these problems are related.

There were two major study goals. First, determination of the prevalence of risk for ON and EDs amongst a sample of dietitians was motivated by a desire to consider how work as a dietitian might impact food behaviors and cognitions in the United States. Using the same population, a second objective was to determine if the different types of symptoms common in EDs, including restraint, eating concerns, shape concerns, and weight concerns, were also present in ON. Clarification of the relationship between these illnesses may help in the treatment and prevention of both ON and EDs. Together, these questions construct a framework connecting professional work as a dietitian with the individual mental health of these clinicians.

METHODS

Participants

The Institutional Review Board at UT Southwestern Medical Center approved this study. The Commission on Dietetic Registration provided a random sample of 2,500 email addresses of registered dietitians from throughout the United States. Each dietitian received an emailed invitation to participate through Mail Chimp, which provided a de-identified link to a survey in Google Forms. Participation demonstrated consent; identifying information was not collected. Dietitians currently pregnant, breastfeeding, or unable to read English were excluded. Participation was voluntary, and participants were not compensated for their participation.

Instruments

Participants reported if they had obtained any type of treatment for a current or previous ED (selecting from anorexia nervosa, bulimia nervosa, binge-eating disorder, and eating disorder not otherwise specified), how long they had been a dietitian, provided self-reports for both current height and weight, as well as their low and high weights as adults, age, and dietary constraints (selecting from no dietary restrictions, low fat, low carbohydrate, gluten-free, vegetarian, vegan, paleo, mediterranean).

The ORTO-15 is a validated, 15 item questionnaire designed to determine risk of ON.[24] A high risk of ON is seen as a score below 40 with higher scores (maximum of 60 points) indicative of normal eating behavior.[5,24] Questions included on the ORTO-15 consider the impact of eating beliefs in terms of health (e.g., Are you willing to spend more money to have healthier food?), ruminative behaviors (Does the thought of food worry you for more than three hours a day?), and self-esteem (Do you think that the conviction to eat only healthy food increases self-esteem?).

The Eating Disorder Examination Questionnaire (EDE-Q) includes 28 items that measures eating disordered cognitions and behaviors occurring over the past 28 days, providing a Global score and 4 sub-scales (Eating Concern:e.g., Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in?), Shape Concern:Has your shape influenced how you think about yourself as a person?), Weight Concern:Have you had a strong desire to lose weight?), and Dietary Restraint:Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight?).[25] Increased ED behavior is indicated with higher scores, with a score above 2.5 considered a sensitive and specific threshold to identify clinically-relevant symptoms of an ED amongst non-clinical samples.[26,27]

Analysis

The percentage of participants scoring below 40 on the ORTO-15 were reported as at high risk for ON and the percentage of participants scoring above 2.5 on the EDE-Q were reported as at high risk for an ED. The participants were then divided into three groups: D-ED (dietitians reporting current or past treatment for an ED), D-ON (dietitians with a score less than 40 on ORTO-15), and D-HC (dietitians in healthy comparison group, with a score greater than or equal to 40 on ORTO-15 and no self-report of ED treatment). Analysis of Variance (ANOVA), followed by Bonferroni-corrected pairwise comparisons, and Chi-square analyses comparing the groups were completed in IBM Statistical Package for Social Sciences (SPSS, v.23).[28] A Mann Whitney U test was conducted when Levene's test assumption of equal variances of the populations were not equal. Results of parametric comparisons among the study groups were reported as no differences were observed with the non-parametric test. Weight or height was missing for five participants; these subjects were excluded for the body mass index analyses. As there were only 21 male participants (9 in the D-HC, 12 in the D-ON, and 0 in the D-ED groups), all analyses were repeated without the men, but there were no significant differences.

RESULTS

There were 684 participants that responded, but 48 were excluded for pregnancy, breastfeeding or unable to read English, resulting in a total of 636 dietitians (615 women and 21 men) that completed the questionnaires. For the primary aim, prevalence of risk for ON amongst all dietitians, 49.5% scored at a high risk of ON, with the mean ORTO-15 score for all participants at 39.3 ± 3.6 points, and a range of 23–49. Amongst all dietitians, 12.9% of the entire group scored at the high risk for an ED, with the mean EDE-Q test score for all participants 1.21 ± 1.0 with a range of 0 – 4.62.

Based on the grouping criteria (Table 1), 8.2%of participants were in the D-ED group (reported treatment for ED), 44.6% were in the D-ON group (ORTO-15 less than 40), and 47.2% remained in the D-HC group (no treatment for ED and ORTO-15 greater than or equal to 40). Within the D-ED group, twenty-nine women reported receiving treatment for anorexia nervosa, sixteen for bulimia nervosa, fifteen for an eating disorder not otherwise specified and eleven for binge-eating disorder. The D-ON and D-ED groups reported more

dietary restrictions than the D-HC group, but there were no group differences related to gender, ethnicity, race or clinical experience.

For the secondary aim, the relationship between ON and ED symptoms, both the D-ED and the D-ON groups had higher scores on the EDE-Q and all its subscales, and a lower current body mass index and lowest adult body mass index compared to the D-HC group (Table 2). Amongst the EDE-Q subscales, the effect-size of the group differences for both the D-ED and the D-ON groups compared to the D-HC groups were greatest for restraint, lowest for weight concern, and similar for the eating concern and shape concern. For the D-ED group, 59.6% scored below 40 points on the ORTO-15. Different percentages of clinically significant ED symptoms were found for the groups (global EDE-Q ≥ 2.5; D-HC, 6%; D-ON, 18%; D-ED, 25%, $t = 25.97$, $p < 0.001$; HC < D-ON & D-ED).

DISCUSSION

This study reports both a high prevalence for risk for ON and risk for EDs amongst dietitians in the United States. Previous researchers have found high frequencies of prevalence for ON in dietitians, ranging from 41.9%–81.9% in surveys of 117 to 396 dietitians in other countries.[21–23] This work replicates and extends that work to a United States sample.

In addition, symptoms of ON were closely related to symptoms of EDs in this population. Earlier studies have shown that the ORTO-15 and EAT-40 correlate.[22,29] Here, the D-ON and D-ED groups had higher scores for every subscale of the EDE-Q6 than the D-HC group, demonstrating that ON involves not only the expected associations related to eating choices (assessed in the EDE-Q, eating concern) and control (EDE-Q, restraint) but also includes cognitive preoccupations about body shape (EDE-Q, shape) and weight (EDE-Q, weight).

Because EDs significantly increase mortality, the many similarities amongst the D-ON and D-ED groups are worrisome.[7–9] Determination of whether ON is also associated with physiological ailments observed in EDs, such as gastroparesis, cardiac arrhythmias, electrolyte disturbances, infertility, and osteopenia is an important next step for further evaluation of this proposed illness and to motivate treatment for ON.[30] ON has been proposed to serve both a coping strategy for more severe EDs like anorexia nervosa and bulimia nervosa, but may also be a risk factor for a future ED.[23,31,32]

For dietitians, there may be additional challenges related to having a professional function that involves evaluation of eating choices and separation of one’s personal beliefs surrounding food. In EDs, recovered therapists can be quite empathetic, but utilizing one’s own experience effectively in the treatment of others is a complex psychotherapeutic tool that requires maturity and insight about one’s own biases, with recovery of the provider thought to be important for success as a care provider.[33–35] Unfortunately, 12% of the dietitians that did not report ever obtaining treatment of an ED (combined D-HC and D-ON groups) scored above the screening threshold suggestive of a current ED.[26,27] ED professionals that have not fully recovered may have a high risk for relapse for themselves, and may not even be aware of their own cognitive biases.[34,35]

Cognitive biases in ON and EDs include internal beliefs related to both food (such as, fat is bad) and self-worth (such as, I am only a good person if I am thin).[36,37] In a study using scripted information about hypothetical clients, dietitians have demonstrated weight biases about both diet quality and health of obese clients relative to non-obese.[38] Future research comparing whether biases in dietitians are related to their own ON and ED symptoms, as well as studies examining the outcomes for clients of dietitians with and without ON are needed to determine if there are clinical consequences for patients related to their provider having ON and/or an ED. These differences may need to be evaluated in relation to both the provider (ON or not) and the illness that the client is seeking care for (ex. diabetes, obesity, or ED).

There are several important limitations to this work. This is a study of dietitians only, and its relevance to a general population is unknown. The sample size of 636 was obtained from a survey response rate of only 27%. Choosing to participate is a bias that might increase or decrease responses from dietitians with ON. Personality traits were not assessed in this study, nor could the clinical significance of being at-risk for ON or ED be established in these participants. The validity of the ORTO-15 as a screening tool is also debated, but no other measure has been widely utilized.[39] Another limitations is that D-ED group included all EDs and women in the DED group could be at any stage of recovery or illness in their disease. As such, it is somewhat surprising that this eclectic sample of multiple EDs had so many similarities with the D-ON group, but this may relate to the fact that cognitions related to eating healthfully are a unifying factor in EDs amongst this specialized population of experts on this topic.

More work is needed to fully understand how ON is related to EDs and other mental illnesses and their relationship to the dietetic profession. Importantly, this work cannot distinguish whether individuals with pre-existing EDs and/or ON are more likely to choose careers as dietitians from a potential risk of development of an ED or ON due to the work of being a dietitian that necessitates consideration of optimal food choices. Longitudinal studies assessing ON and ED symptoms before beginning training as a dietitian and after working in the field are needed to answer that question. Targeted approaches to reduce the development of EDs and ON amongst dietitians may be worth exploration. For example, cognitive dissonance programs have been shown to be successful in reducing shape and weight stigma in high schools and college students, by reducing valuation surrounding the “thin ideal”, and decreasing rates for later development of ED symptoms amongst its participants.[40,41] Incorporation of these type of interventions into the training programs for dietitians might have long-term benefits for the mental health of these professionals, potentially reducing development of ON and EDs.

In conclusion, dietitians self-reported symptoms suggesting a prevalence of 49.5% for ON and 12.9% for EDs, and the presence of ON symptoms was associated with all the types of ED symptoms queried. This suggests that ON may not be simply about healthy eating or obsessive control, but may also include heightened valuation of shape and weight amongst dietitians. Future studies to assess whether individuals with ON progress to EDs are needed, and evaluation of the efficacy of established interventions to prevent and treat EDs on the emergence of ON may be helpful.

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Table 1

Characteristics of 636 dieticians responding to an online survey assessing the prevalence and effects of orthorexia nervosa and eating disorders in dieticians

	D-HC[a] (n = 300)	D-ON[a] (n = 284)	D-ED[a] (n = 52)	Statistical Comparisons[b]	
	n (%)	n (%)	n (%)	X^2	*p*
Gender				2.62	0.27
Female	291 (97.0)	272 (95.8)	52 (100)		
Male	9 (3.0)	12 (4.2)	0 (0.0)		
Ethnicity/Race				13.96	0.30
Caucasian	265 (88.9)	251 (89.0)	50 (96.2)		
Hispanic	14 (4.7)	10 (3.5)	0 (0.0)		
Asian	7 (2.3)	14 (5.0)	1 (1.9)		
African American	7 (2.3)	5 (1.8)	0 (0.0)		
Other	5 (1.7)	1 (0.4)	1 (1.9)		
Years as RD				11.65	0.17
0–5 years	54 (18.0)	73 (25.7)	14 (26.9)		
6–10 years	34 (11.3)	27 (9.5)	4 (7.7)		
11–20 years	69 (23.0)	64 (22.5)	15 (28.8)		
21–30 years	67 (22.3)	69 (24.3)	12 (23.1)		
>30 years	76 (25.3)	51 (18.0)	7 (13.5)		
Dietary Restrictions				54.80	<0.001
None	233 (77.7)	157 (55.3)	23 (44.2)		
One Restriction	43 (14.3)	80 (28.2)	16 (30.8)		
Two Restrictions	21 (7.0)	32 (11.3)	8 (15.4)		
Three Restrictions	3 (1.0)	9 (3.2)	5 (9.6)		
Four Restrictions	0 (0.0)	6 (2.1)	0 (0.0)		

[a]D-HC, healthy comparison dietitians (ORTO > 40 and no eating disorder (ED) treatment); DON, dietitians at risk for orthorexia nervosa based on ORTO-15 score < 40; D-ED, dietitians reported lifetime treatment for an eating disorder.

[b]Chi-square Analyses

Table 2

Comparisons of measures of food and body perceptions and behaviors in healthy comparison dietitians, dietitians at risk for orthorexia nervosa, and dietitians reporting lifetime treatment for an eating disorder[a]

	D-HC[b] (n = 300)		D-ON[b] (n = 284)		D-ED[b] (n = 52)		Statistical Comparisons[c]			
Measure	**Mean (SD)**	**Range**	**Mean (SD)**	**Range**	**Mean (SD)**	**Range**	***F***	***p***	η^2	**Post-Hoc Comparisons (*Cohen's d*)[d]**
ORTO-15	42.1 (1.9)	40–49	36.6 (2.4)	25–39	38.3 (4.2)	23–46	396.75	<0.001	0.56	NA[e]
EDE-Q, Global	0.97 (0.84)	0–4.36	1.40 (1.11)	0–4.62	1.55 (1.27)	0–4.36	16.32	<0.001	0.05	D-HC < D-ON (−0.44) & D-ED (−0.53)
EDE-Q, Restraint	0.74 (0.88)	0–4.20	1.32 (1.21)	0–5.20	1.43 (1.39)	0–5.00	24.41	<0.001	0.07	D-HC < D-ON (−0.54) & D-ED (−0.59)
EDE-Q, Eating concern	0.35 (0.58)	0–4.40	0.61 (0.95)	0–4.20	0.81 (1.25)	0–4.80	11.09	<0.001	0.02	D-HC < D-ON (−0.33) & D-ED (−0.47)
EDE-Q, Weight concern	1.31 (1.18)	0–5.00	1.69 (1.43)	0–5.60	1.83 (1.49)	0–5.00	7.42	0.001	0.02	D-HC < D-ON (−0.29) & D-ED (−0.39)
EDE-Q, Shape concern	1.48 (1.24)	0–5.38	1.96 (1.54)	0–5.89	2.15 (1.61)	0–5.00	10.72	<0.001	0.03	D-HC < D-ON (−0.34) & D-ED (−0.47)
Current BMI[f]	25.2 (5.0)	17.7–46.9	24.0 (4.3)	16.6–47.1	23.7 (4.4)	17.0–37.8	3.87	0.02	0.01	D-HC > D-ON (0.25) & D-ED (0.32)
Lowest Adult BMI[g]	21.0 (2.8)	12.9–35.8	20.7 (3.0)	14.4–36.7	19.6 (2.8)	14.0–29.4	5.02	0.007	0.02	D-ED < D-ON (0.38) & D-HC (0.50); D-ON < D-HC (0.11)
Highest Adult BMI[g]	27.0 (5.6)	18.3–49.5	26.2 (5.2)	17.8–60.5	26.5 (5.7)	19.1–44.8	1.86	0.16	0.006	NA

[a] Orthorexia Nervosa questionnaire (ORTO-15), Eating Disorder Examination Questionnaire (EDE-Q), Body Mass Index (BMI)

[b] D-HC, healthy comparison dietitians (ORTO > 40 and no eating disorder (ED) treatment); D-ON, dietitians at risk for orthorexia nervosa based on ORTO-15 score < 40; D-ED, dietitians reported lifetime treatment for an ED.

[c] Statistical comparisons were done using Analysis of Variance (ANOVA)

[d] If the ANOVA showed a significant group difference, the significant ($p < 0.05$) Bonferroni post-hoc comparisons are provided, in conjunction with the effect size (Cohen's d) for that comparison.

[e] The ORTO-15 score defined the D-HC and D-ON groups, so all comparisons were significant but not meaningful.

[f] Statistical comparison included age as a covariate.

[g] BMI was not available for 5 participants.