Clinical and Experimental Health Sciences

A Comparative Analysis of Obesity Prejudice, Orthorexia Nervosa, and Fatphobia Among Nutrition and Dietetics Students, Clinical Dietitians, and General Population

Mahmut Bodur[1], Melike Nur İpek[1], Gözdenur Tümren[1], Nargiz Mammadova[1]

Ankara University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Ankara, Türkiye.

Correspondence Author: Mahmut Bodur
E-mail: mahmutbodur@ankara.edu.tr

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ABSTRACT

Objective: Weight-related biases, including orthorexia nervosa, fatphobia, and obesity prejudice, are significant social and health issues, particularly within nutrition-related fields. This study aimed to compare these biases among nutrition and dietetics students, clinical dietitians, and the general population.

Methods: This cross-sectional study, conducted between May and July 2024, included 837 participants comprising 301 nutrition and dietetics students (mean age: 19.9 ± 7.5 years), 227 clinical dietitians (mean age: 30.2 ± 9.0 years), and 309 individuals from the general population (mean age: 24.4 ± 7.5 years). Orthorexic tendencies were assessed using the ORTO-11 scale, attitudes toward body weight were measured by the Fatphobia Scale, and obesity-related stigma was evaluated using the GAMS-27 Obesity Prejudice Scale.

Results: Significant differences were observed in orthorexia nervosa tendencies, fatphobia, and obesity prejudice across the groups. Nutrition and dietetics students had the highest orthorexic tendencies, while clinical dietitians had the lowest orthorexic tendencies among the groups ($F=90.114$, $p<.001$). Fatphobia scores were highest in the general population (41.8 ± 5.8), with clinical dietitians scoring the lowest (36.9 ± 4.4; $F=88.577$, $p<.001$). Obesity prejudice was also significantly greater in the general population (79.8 ± 9.6; $F=14.958$, $p<.001$). Correlational analysis indicated a positive association between ORTO-11 scores and fatphobia in clinical dietitians ($r=0.313$, $p<.001$), suggesting that lower orthorexic tendencies are linked to stronger fatphobic attitudes within this group.

Conclusions: In conclusion, these results show the need to integrate targeted education into nutrition programs to promote balanced and flexible dietary health. Further research is essential to develop effective strategies addressing weight bias.

Keywords: Orthorexia nervosa, fatphobia, obesity prejudice, nutrition education, weight stigma

1. INTRODUCTION

The rise in global obesity rates has highlighted both the associated health risks and the social stigma faced by individuals with obesity. Weight bias, which often appears as negative attitudes, stereotypes, and discrimination, is prevalent in various areas of life, including employment, education, and healthcare (1-3). In addition to its psychosocial dimensions, recent evidence suggests that dietary behavior also has measurable effects on metabolic and inflammatory outcomes in individuals with obesity, underscoring the clinical importance of weight-related attitudes (4). Research shows that individuals with obesity frequently encounter stigma and mistreatment, leading to significant psychological distress, reduced quality of healthcare, and worsened health outcomes (5). Within healthcare settings, weight bias can lead to disparities in care, diminishing empathy and resulting in poorer health experiences for individuals with higher body weights (1). Addressing weight stigma is crucial for creating a more equitable healthcare environment and improving outcomes for individuals with obesity (6, 7).

Orthorexia nervosa and fatphobia have received increasing attention as specific forms of weight-related bias, particularly in health and nutrition contexts. Orthorexia nervosa (ON) and fatphobia are two forms of bias related to body weight. ON involves an intense focus on eating only “healthy” foods, often leading to restrictive eating patterns and anxiety around food choices (8). Although ON is not officially classified as an eating disorder, it shares similarities with other forms of disordered eating and has been associated with negative impacts on physical and psychological well-being (8, 9).

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Research suggests that ON tendencies appear more common among those in health-related fields, where nutrition knowledge may encourage rigid attitudes toward food (10-12). The term "fatphobia" is used to describe negative attitudes towards body fat. These attitudes are often based on social beliefs that equate low body weight with good health and moral worth (13). Fatphobic attitudes may lead to stigmatizing behaviors and discriminatory practices, contributing to social exclusion and mental health challenges for individuals with higher body weights (2, 14). Together, orthorexia nervosa and fatphobia contribute to weight bias by promoting restrictive standards for body image and health, which may also influence attitudes within healthcare settings (2, 15).

Professionals in the field of nutrition and dietetics, including students and clinical dietitians, are uniquely positioned to impact public attitudes toward body weight due to their expertise in dietary health. However, research suggests that they are not protected from biases such as obesity stigma, ON and fatphobic attitudes, which can affect their interactions with clients and patients (16, 17). Nutrition students, in particular, may be at increased risk for orthorexia due to their focus on dietary health and "clean eating" ideologies, while clinical dietitians may develop more balanced views through professional exposure and experience in working with a range of body types (18, 19). Understanding the prevalence of these attitudes within and outside the nutrition field is critical for identifying areas for educational and professional interventions to reduce weight bias in healthcare. Therefore, the aim of this study is to evaluate the presence of prejudice towards obesity, orthorexia nervosa tendencies, and fatphobia among nutrition and dietetics students, clinical dietitians, and the general population.

2. METHODS

This cross-sectional study, conducted in Ankara, Turkey, between May and July 2024, aimed to compare obesity prejudice, orthorexia nervosa tendencies, and fatphobia among nutrition and dietetics students, clinical dietitians, and individuals from the general population, aged 20 to 65 years. In the power analysis conducted to determine the required sample size, differences in the Obesity Prejudice Scale scores between groups were considered the primary outcome. Based on a Type I error (α) of 0.05, a study power (β) of 0.85, and an effect size of 0.15, the required sample size was calculated as 271 participants per group. To account for potential dropouts or other unforeseen circumstances, the target sample size was set at 840 participants. This study was approved by the Ethics Committee of Ankara University (56786525-050.04.04/1356448).

2.1. Study Design and Sample Recruiting

The inclusion and exclusion criteria are shown in Table 1. No additional criteria were applied.

Table 1. *Inclusion and exclusion criteria for participant recruiting*

	Undergraduate Dietetic Students (S)	Clinical Dietitians (C)	General Population (G)
Inclusion Criterias	• Being a 1st or 2nd-year student in the Nutrition and Dietetics Department • Willingness to participate in the study	• Having graduated from a Nutrition and Dietetics Department at a university in Turkey and currently working in Ankara, • Having graduated at least 2 years ago, • Being actively employed, • Working in a position that involves direct patient contact, such as a clinic, hospital, or polyclinic.	• Having no formal education related to nutrition, • Not having followed any dietary treatment, • Not having any diagnosed chronic illness by a doctor.
Exclusion Criterias	• Being a 3rd or 4th-year student or a postgraduate student in the Nutrition and Dietetics Department • Not willing to participate in the study	• Not being actively employed, • Not willing to participate in the study, • Not working in a position involving direct patient contact, such as a clinic, hospital, or polyclinic.	• Not willing to participate in the study, • Having received any education related to nutrition or having any course on healthy eating in the formal curriculum.

2.2. Sociodemographic Characteristics

Participants were asked about their age, sex, educational level, and smoking status. Anthropometric measurements were performed following standard procedures, with height measured in the Frankfurt plane and weight obtained using a body composition analyzer (Omron) (20). Physical activity levels were assessed using a 24-hour diary, recording time spent in sleep, light, moderate, and vigorous activities. PAL was calculated as (activity time × MET) / 24, classifying participants as "sedentary" (PAL 1.40–1.69), "moderately active" (PAL 1.70–1.99), or "highly active" (PAL > 2.0) (21).

2.3. Ortorexia Nervosa

The Orthorexia Nervosa Scale–15 (ORTO-15), developed by Donini et al., is a 15-item self-assessment tool designed to evaluate orthorexia nervosa tendencies. It assesses behaviors related to food selection, purchasing, preparation, and consumption based on individuals' perceptions of healthy eating (22). Responses are rated on a 4-point Likert scale, with lower scores indicating a higher risk of orthorexia nervosa. A Turkish validity and reliability study of the ORTO-15 was conducted by Arusoğlu et al., resulting in the ORTO-11 version (23). This version includes 11 items with strong factor loadings.

Table 2. *Sociodemographic characteristics of the participants*

Sociodemographic Characteristics	Students (S) (n=301)		Clinical Dietitians (C) (n=227)		General Population (G) (n=309)		F/χ^2 p
Age, years (x̄±SD)	19.9±7.5[a]		30.2±9.0[b]		24.4±7.5[c]		154.623 < .001**
	S	**%**	**S**	**%**	**S**	**%**	
Gender							
Male	65	15.9	36	21.6	73	23.6	4.978 .083
Female	236	84.1	191	78.4	236	76.4	
Smoking Status							
Yes	49	18.1	41	83.7	70	77.3	4.231 .121
No	252	81.9	186	16.3	239	22.7	
Marital Status							
Single	301	100.0	130	57.3	251	81.2	156.618 < .001**
Married	0.0	0.0	97	42.7	58	18.8	
Education Level							
High School	301	100.0	0	0	90	27.8	252.619 < .001**
Associate degree	0.0	0.0	1	0.4	38	12.3	
Bachelor degree	0.0	0.0	172	75.8	160	51.8	
Graduate degree	0.0	0.0	54	23.8	21	6.8	
PAL values (x̄±SD)	1.85 ± 0.22		1.83 ± 0.21		1.85 ± 0.22		2.825 .467
Physical Activity Levels							
Sedentary	73	24.3	48	21.1	90	29.1	14.555 .024*
Moderate	124	41.2	106	46.7	138	44.7	
Heavy	104	34.6	73	32.1	81	26.2	
BMI (kg/m^2) (x̄±SD)	22.23±3.11[a]		22.20±3.34[a]		23.12±4.10[b]		6.226 < .001**
BMI categories							
Underweight	33	11.0	15	6.6	27	8.7	19.133 < .001**
Normal	221	73.4	177	78.0	199	64.4	
Overweight/Obese	47	15.6	35	15.4	83	26.9	

*The table presents the sociodemographic characteristics of the participants across three groups: Students (S), Clinical Dietitians (C), and General Population (G). Continuous variables are reported as mean ± standard deviation (x̄±SD) and analyzed using one-way ANOVA (F-values). Different letters in the same row indicate statistically significant differences (p < .05) based on ANOVA results. Categorical variables are presented as frequencies and percentages (n, %) and analyzed using Pearson's chi-square (χ^2) test. Statistical significance is indicated as follows: *p < .05, **p < .01.*

2.4. Obesity Prejudice Scale

The Obesity Prejudice Scale consists of 27 items in a 5-point Likert format to identify individuals' prejudices towards obese people. The scale was developed to measure obesity-related prejudices (24). It is rated as 'strongly agree', 'agree', 'neutral', 'disagree', and 'strongly disagree'. Positive items (2, 4, 7, 10, 11, 14, 15, 17, 20, 22, 25, 27) are scored from 5 to 1, starting from 'strongly agree', while negative items (1, 3, 5, 6, 8, 9, 12, 13, 16, 18, 19, 21, 23, 24, 26) are reverse-scored from 1 to 5. The total score range for the 27-item scale is between 27 and 135. The scale is categorized into three levels: prejudice-free (≤68 points), prejudice-prone (68.01-84.99 points), and prejudiced (≥85 points), with higher scores indicating greater levels of prejudice (24).

2.5. Fatphobia Scale

The Fatphobia Scale, developed by Robinson et al. (1993), measures individuals' attitudes towards obesity (25). The Turkish validity and reliability study of the Fatphobia Scale was conducted by Koçak et al. (2005) (26). The scale comprises 14 items rated on a five-point Likert scale, with the total score calculated by dividing the sum of item responses by 14; higher scores (closer to five) indicate stronger fatphobic attitudes, while lower scores (closer to one) reflect weaker fatphobic attitudes.

2.6. Statistical Analyses

In this study, the data collected were analyzed using the SPSS statistical software package. Categorical variables, such as gender and educational status, were expressed as counts (percentages). The normality of data distribution was assessed through visual methods (histogram) and hypothesis tests (Kolmogorov-Smirnov and Shapiro-Wilk tests). Data conforming to a normal distribution were reported as mean ± standard deviation, whereas non-normally distributed data were expressed as median ± interquartile range. Differences between groups in continuous numerical variables were analyzed using one-way analysis of variance (ANOVA), followed by post hoc comparisons

with Bonferroni correction to adjust for multiple testing. A p-value of less than 0.05 was considered statistically significant in all analyses.

3. RESULTS

The sociodemographic characteristics of the study participants, including students (S), clinical dietitians (C), and the general population (G), are summarized in Table 2. The mean ages of the groups were significantly different ($F = 154.623$, $p < .001$), with students averaging 19.9 ± 7.5 years, clinical dietitians 30.2 ± 9.0 years, and the general population 24.4 ± 7.5 years. The majority of participants across all groups were female, with 84.1% of students, 78.4% of clinical dietitians, and 76.4% of the general population being women, though the gender distribution did not differ significantly ($\chi^2 = 4.978$, $p = .083$).

Smoking status also showed no significant difference across groups ($\chi^2 = 4.231$, $p = .121$), with the highest rates among clinical dietitians (18.1%) and the lowest among students (18.1%). Marital status significantly varied between groups ($\chi^2 = 156.618$, $p < .001$), with all students being single (100%), compared to 42.7% of clinical dietitians and 18.8% of the general population being married. Educational levels differed significantly ($\chi^2 = 252.619$, $p < .001$): all students had completed high school, 75.8% of clinical dietitians held a bachelor's degree, and in the general population, 51.8% had a bachelor's degree while 27.8% had completed high school.

In terms of physical activity levels, a significant difference was observed ($\chi^2 = 14.555$, $p = .024$), with 34.6% of students, 32.1% of clinical dietitians, and 26.2% of the general population categorized as heavily active. However, when physical activity was evaluated using estimated PAL values derived from MET-based calculations, no statistically significant differences were found between the groups ($F(2, 825) = 0.76$, $p = .467$), indicating that overall physical activity levels were relatively comparable despite categorical differences. BMI values differed significantly between groups ($F = 6.226$, $p < .001$), with mean BMI values of 22.23 ± 3.11 for students, 22.20 ± 3.34 for clinical dietitians, and 23.12 ± 4.10 for the general population. The majority of participants in all groups were classified as having a normal BMI, with 73.4% of students, 78.0% of clinical dietitians, and 64.4% of the general population in this category ($\chi^2 = 19.133$, $p < .001$).

The main results of the study, including ON, Fatphobia, and Obesity Prejudice scores among students, clinical dietitians, and individuals from the general population, are presented in Table 3. Statistically significant differences were observed in ON scores between groups ($F = 90.114$, $p < .001$). Students had the highest ON scores (29.4 ± 2.1), indicating lower orthorexic tendencies, whereas clinical dietitians had the lowest scores (25.9 ± 3.8), reflecting a greater inclination toward orthorexic behaviors. The general population's scores (26.1 ± 4.1) were intermediate, suggesting a moderate level of orthorexic tendencies.

Fatphobia scores also differed significantly among the groups ($F = 88.577$, $p < .001$). The general population showed the highest fatphobia scores (41.8 ± 5.8), reflecting more negative attitudes toward body weight. In contrast, clinical dietitians (36.9 ± 4.4) and students (37.4 ± 3.8) reported lower levels of fatphobia, with clinical dietitians having the least stigmatizing attitudes.

Obesity Prejudice scores differed significantly among groups as well ($F = 14.958$, $p < .001$). The general population showed the highest levels of obesity prejudice (79.8 ± 9.6), while students (76.2 ± 7.2) and clinical dietitians (76.6 ± 8.9) had comparatively lower scores, suggesting more neutral or less biased attitudes.

Furthermore, the categorical distribution of obesity prejudice levels revealed statistically significant differences ($\chi^2 = 33.263$, $p < .001$). The general population had the highest proportion of individuals classified as having high bias (53.0%), while clinical dietitians had the largest proportion with low bias (43.7%). Students were predominantly classified in the moderate bias category (38.8%). These results indicate that weight-related bias is most pronounced in the general population, whereas clinical dietitians tend to hold more inclusive attitudes.

Table 3. *Comparison of orthorexia nervosa, fatphobia, and obesity prejudice scores among nutrition and dietetics students, clinical dietitians, and general population*

Scales	Students (S) (n=301)	Clinical Dietitians (C) (n=227)	General Population (G) (n=309)	F P
Ortorexia Nervosa (ON) (x̄±SD)	29.4±2.1[a]	25.9±3.8[b]	26.1±4.1[b]	90.114 <.001**
Fatphobia (x̄±SD)	37.4±3.8[a]	36.9±4.4[a]	41.8±5.8[b]	88.577 <.001**
Obesity prejudice scores (x̄±SD)	76.2±7.2[a]	76.6±8.8[a]	79.8±9.6[b]	14.958 <.001**
Obesity prejudice classification				χ^2 /p
Low bias	27 (38.0)	31 (43.7)	13 (18.3)	33.263 / <.001**
Moderate bias	245 (38.8)	162 (25.6)	225 (35.6)	
High bias	29 (21.6)	34 (25.4)	71 (53.0)	

The F and p-values indicate the significance of group differences. Different superscript letters (a, b) denote statistically significant differences between groups as determined by post hoc analysis (p < .05). The chi-square test was used for the classification of obesity prejudice levels.

The correlation matrix presented in Figure 1 and Supplementary table 1 summarizes the relationships between age, BMI, ON scores, Fatphobia scores, and Obesity Prejudice scores among the groups. A significant positive correlation between age and BMI was observed in all groups, with the strongest association found in the general population ($r = 0.456$, $p < .001$), followed by clinical dietitians ($r = 0.273$, $p < .001$) and students ($r = 0.224$, $p < .001$). These results suggest that older individuals tend to have higher BMI values, particularly within the general population. Among clinical dietitians, ON and Fatphobia scores were positively correlated ($r = 0.313$, $p < .001$), indicating that greater orthorexic tendencies may be linked to stronger fatphobic attitudes.

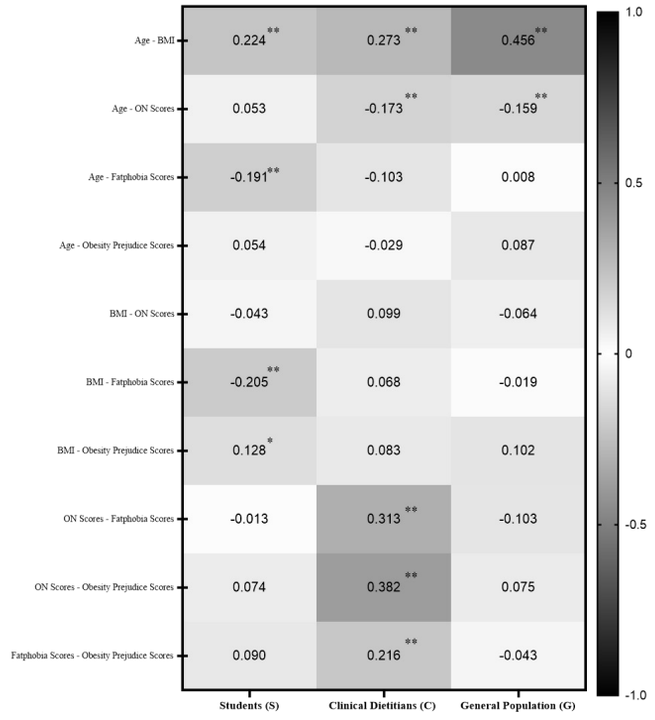

Figure 1. *Correlation matrix of age, bmi, orthorexia nervosa (on) scores, fatphobia scores, and obesity prejudice scores among groups (students, clinical dietitians, and general population)*

*BMI: Body Mass Index, ON: Orthorexia Nervosa, FAT: Fatphobia Scores, OBP: Obesity Prejudice Scores, S: Students, C: Clinical Dietitians, G: General Population, p: Probability Value, r: Correlation Coefficient, *p < .05; **p < .001*

Negative correlations were observed between age and ON scores in both the general population (r = –0.159, p < .001) and clinical dietitians (r = –0.173, p < .001), suggesting that orthorexic tendencies tend to decrease with age. In the student group, BMI was negatively correlated with overall scale scores (r = –0.205, p < .001), implying that students with higher BMI may exhibit lower adherence to the measured constructs. Additionally, among clinical dietitians, a significant positive correlation was found between ON and Obesity Prejudice scores (r = 0.382, p < .001), suggesting that greater orthorexic tendencies may be associated with higher levels of obesity prejudice. A small but significant positive correlation between BMI and Obesity Prejudice scores was also noted in students (r = 0.128, p < .05), indicating a slight trend toward increased weight-based bias among those with higher BMI.

4. DISCUSSION

This study examined obesity prejudice, orthorexia nervosa (ON) tendencies, and fatphobia across three groups: nutrition and dietetics students, clinical dietitians, and the general population. Findings reveal substantial differences among these groups. Clinical dietitians had the highest ORTO-11 scores, reflecting the lowest orthorexic tendencies. However, nutrition students scored the lowest on the ORTO-11 scale, indicating greater orthorexic tendencies. The general population scored between these two groups, suggesting moderate orthorexic tendencies. These results suggest that both professional training and exposure to diverse body types may influence attitudes toward food and body weight, potentially moderating orthorexic tendencies and weight bias.

The increased orthorexic tendencies among nutrition and dietetics students are consistent with previous studies that suggest individuals within nutrition-focused academic environments are more likely to adopt rigid dietary behaviors, especially when body image concerns are also present (16, 17, 27). Nutrition students may face pressure to follow strict dietary practices, which can sometimes lead to obsessive eating behaviors (8, 28). This pressure may be influenced by the concept of “clean eating,” which focuses on avoiding certain foods to maintain purity. Research suggests that this approach can increase anxiety about food choices and promote restrictive eating habits (29, 30). The emphasis on dietary perfection that is often present in nutrition education may unintentionally encourage such behaviours by promoting a rigid attitude towards food. However, recent findings from a Turkish sample suggest that this association may not always be straightforward. In a cross-sectional study conducted among dietitians, although orthorexic tendencies and abnormal eating attitudes were found to be moderately correlated, the authors concluded that nutrition education alone may not necessarily lead to disordered eating patterns (31). To prevent the development of disordered eating patterns among students, nutrition education programmes could include lessons on the importance of flexibility and balance in healthy eating.

Fatphobia and obesity prejudice were most pronounced in the general population, as reflected in higher scores on the fatphobia and obesity prejudice scales compared to clinical dietitians and nutrition students. These findings are aligned with research suggesting that societal norms equate thinness with health and attractiveness, reinforcing negative stereotypes and biases toward individuals with higher body weights (32, 33). The prevalence of fatphobia in society is frequently exacerbated by the presentation of body fat in the media and the establishment of cultural ideals that associate body fat with notions of undesirability or moral inferiority. This, in turn, gives rise to weight-based stigma in a multitude of social contexts, including healthcare, employment, and personal relationships (34, 35). Such biases have been shown to negatively impact the mental health and quality of life of individuals with obesity, leading to increased levels of anxiety, depression, and body dissatisfaction (36, 37). Public health campaigns that challenge harmful weight stereotypes and emphasize the acceptance of body diversity may therefore be beneficial in reducing fatphobia and improving social attitudes toward individuals of all body types.

Clinical dietitians showed more balanced attitudes with the highest ORTO-11 scores, indicating lower orthorexic tendencies, and relatively lower levels of fatphobia and obesity prejudice compared to the general population. This pattern aligns with studies suggesting that professional exposure and training in nutrition may cultivate empathy and a more

comprehensive understanding of the factors that influence body weight, thereby reducing stigmatizing attitudes (17, 32, 38). Dietitians who interact regularly with a range of clients and patients of diverse body types, and who are committed to patient-centered care, will develop more inclusive attitudes. This will help them to reduce the biases that are often present in society (17). Professional training in nutrition and dietetics could further benefit from incorporating modules on weight bias and its implications for healthcare, equipping practitioners with the skills needed to deliver stigma-free care.

In conclusion, this study highlights the need for critical thinking in public health and nutrition education. Future dietitians will need to adopt a balanced and evidence-based approach to nutrition in order to influence public attitudes towards diet and body image. The reduction of weight stigma and the promotion of body diversity are of great public health importance. encourage public campaigns that normalize different body shapes and sizes and highlight the harms of weight stigma can change societal prejudices and promote a more inclusive social environment.

This study has several strengths, including the use of validated and reliable measurement tools, as well as the inclusion of a diverse sample of students, clinical dietitians, and individuals from the general population, which provides group comparisons. It contributes to the literature by exploring biases across different levels of nutrition education. However, the cross-sectional design limits causal interpretations. Although correlation analyses were conducted, regression models were not included due to the weak strength of associations observed between variables, which limited the feasibility of building predictive models. Furthermore, the use of self-reported data and the sampling from a single geographic region may affect the generalizability of the results.

5. CONCLUSION

In conclusion, the study shows significant differences in orthorexic tendencies, fatphobia, and obesity prejudice among students, clinical dietitians and the general population. The results highlight the need for educational interventions to promote more balanced attitudes in nutrition education. Public health strategies should also aim to reduce weight stigma and support body acceptance. Further research is needed to guide effective approaches to reducing weight stigma.

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Design of the study: MB
Acquisition of data for the study: MNİ, NM, GT
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Supplementary Table 1. *Correlation Coefficients Among Age, BMI, Orthorexia Nervosa (ON), Fatphobia (FP), and Obesity Prejudice (OP) Scores by Group*

Variables	Students (n=301)	Clinical Dietitians (n=227)	General Population (n=309)
Age – BMI	.224**	.273**	.456**
Age – ON	.053	-.173**	-.159**
Age – FP	-.191**	-.103	.008
Age – OP	.054	-.029	.087
BMI – ON	-.043	.099	-.064
BMI – FP	-.205**	.068	-.019
BMI – OP	.128*	.083	.102
ON – FP	-.013	.313**	-.103
ON – OP	.074	.382**	.075
FP – OP	.090	.216**	-.043

*ON: Orthorexia Nervosa, FP: Fatphobia, OP: Obesity Prejudice, *p < .05, **p < .001*