Scientific Research Publishing

Open Journal of Psychiatry, 2024, 14, 287-299
https://www.scirp.org/journal/ojpsych
ISSN Online: 2161-7333
ISSN Print: 2161-7325

Racial and Ethnic Differences in Orthorexia Nervosa Symptomatology and Other Disordered Eating

Dilan H. Arreguin, Kendria S. Shields-Rhodes, Melissa L. Harel, Crystal D. Oberle

Department of Psychology, Texas State University, San Marcos, TX, USA
Email: oberle@txstat.edu

How to cite this paper: Arreguin, D.H., Shields-Rhodes, K.S., Harel, M.L. and Oberle, C.D. (2024) Racial and Ethnic Differences in Orthorexia Nervosa Symptomatology and Other Disordered Eating. *Open Journal of Psychiatry*, **14**, 287-299.
https://doi.org/10.4236/ojpsych.2024.144016

Received: April 29, 2024
Accepted: June 11, 2024
Published: June 14, 2024

Abstract

While some research has explored racial and ethnic differences in disordered eating, this study may be the first to examine these differences in orthorexia nervosa, involving obsessive-compulsive thoughts and behaviors concerning healthy eating, which negatively impact one's life. Adult participants, recruited from college courses and social media, completed an online survey with the Orthorexia Nervosa Inventory (ONI) and the Eating Attitudes Test-26 (EAT-26). Regarding racial and ethnic background, 743 were White, 249 were Hispanic, 87 were Black, 61 were Asian or Pacific Islander, and 110 were biracial/multiracial. A MANCOVA revealed that the racial and ethnic groups did not differ on the ONI subscales assessing orthorexic behaviors, impairments, and emotions, after accounting for gender, BMI, and EAT-26 total scores that were covariates. In contrast, a second MANCOVA did reveal group differences on the EAT-26 subscales, after accounting for gender, BMI, and ONI total scores that were covariates. Black participants scored significantly lower than the other racial and ethnic groups on the subscale assessing dieting behaviors characteristic of anorexia nervosa, and the subscale assessing binge-eating and purging behaviors characteristic of bulimia nervosa. Further, Hispanic participants scored significantly lower than White participants on the latter subscale. These findings suggest that while orthorexic symptomatology does not differ based on race and ethnicity, a Black race and Hispanic ethnicity may be protective factors against disordered eating, perhaps related either to cultural norms concerning body image or to the resiliency and social support among the Black and Hispanic communities.

Keywords

Race, Ethnicity, Orthorexia, Disordered Eating

1. Introduction

Minority stress theory posits that the stress associated with the internal awareness and experience of one's minority status (e.g., minority race or ethnicity) may be related to eating disorders [1]. More specifically, attempts to cope with the stress associated with the experience of visible minority status and the acculturative process may be maladaptive in the case of substance misuse and disordered eating behaviors such as emotional eating and binge eating [2]. Thus, further investigation into racial and ethnic disparities with regard to disordered eating is essential to gain insights into the multifaceted nature of participants' identities in relation to important health behaviors. Previous research may overlook crucial protective factors against disordered eating that have yet to be recognized in psychology. Alternatively, there may be a lack of understanding regarding how disordered eating may vary based on the intersectionality of an individual's identity, including factors such as race, ethnicity, gender, sexuality, and socioeconomic status [3]. Due to the predominant representation of White participants, especially in studies concerning anorexia nervosa (AN) [4], previous research has not adequately explored racial and ethnic differences within disordered eating. Nonetheless, recent investigations have illuminated the presence of bulimia nervosa (BN) and binge eating disorder (BED) among individuals of various racial and ethnic backgrounds [5] [6]. Lastly, while racial and ethnic differences are perceived differently worldwide, underrepresented populations exist globally and should be explored to enhance our understanding of disordered eating.

1.1. Disordered Eating among Racial and Ethnic Minorities

Contrary to minority stress theory, racial and ethnic identity has been described as a protective factor for eating disorders, primarily due to social support within their family [7]. Such social support among Black and Hispanic women may be a buffer from acculturative stress and decrease the personal relevance of thin-ideal pressures typically associated with White appearance ideals [8]. However, results are inconclusive when examining specific types of eating disorders, their prevalence, and symptomatology among different racial and ethnic groups [9].

Regarding people of Asian backgrounds, past research reveals that Asian Americans do not differ from White, Black, or Hispanic Americans on lifetime or past-year diagnoses of either AN, BN, or BED [5]. Yet, compared to White Americans, Asian Americans were shown to have a greater lifetime and past-year presence of any binge-eating behaviors [5]. These findings were the same for both men and women. Thus, while Asian Americans do partake in a certain amount of disordered eating behaviors, they do not seem to be at greater risk than other racial or ethnic groups for the more severe eating disorders.

When exploring people of Hispanic backgrounds, the findings of previous research differ based on the eating disorder. Compared to White Americans, Hispanic Americans had lower lifetime diagnoses of AN and equivalent lifetime di-

agnoses of BED [5] [10]. However, the findings pertaining to BN are mixed, with some studies showing no difference between White and Hispanic Americans on lifetime diagnoses of BN [5] [6], and other studies showing that Hispanic Americans had higher lifetime diagnoses of BN than White Americans [10]. A systematic review of studies investigating racial and ethnic differences in binge eating revealed that most studies found no differences among Hispanic, White, and Black Americans on sub-clinical binge eating behaviors [11]. Taken together, these past research findings suggest that although Hispanic ethnicity may be a protective factor against AN, Hispanic Americans may potentially be at heightened risk for BN.

Regarding people of Black backgrounds, the research findings vary as a function of gender and type of eating disorder. For American women, Black women had lower lifetime diagnoses of AN and equivalent lifetime diagnoses of BN and BED in comparison to White women, along with no differences in comparison to Asian and Hispanic women [5]. In contrast, for American men, Black men had higher lifetime diagnoses of BN and equivalent lifetime diagnoses of AN and BED in comparison to White men, along with no differences in comparison to Asian and Hispanic men [5]. Regarding subclinical levels of disordered eating, whereas research shows no differences between Black and White Americans when men and women are combined in the same sample [12], other research found that Black women exhibited lower levels of disordered eating behaviors than White women [13]. Thus, a Black woman intersectional identity seems to be a protective factor against disordered eating behaviors, particularly those associated with AN.

1.2. Orthorexia Nervosa

Orthorexia nervosa (ON) is a term that was initially derived from the Greek "right" and "appetite" to describe an obsession with "correct" eating [14]. Not currently classified as a disorder in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) [15], ON is a proposed condition where an individual pursues an extreme diet, increasing time and effort to plan, prepare, and consume foods deemed purely healthy [16]. Moreover, four common symptoms have been overwhelmingly agreed upon among researchers and clinicians [16] [17]. The first is an obsessive preoccupation with the purity or healthfulness of food accompanied by rigid dietary rules and restrictions to abstain from foods that the individual deems to be impure, unhealthy, or toxic. The second is an experience of emotional distress such as shame, guilt, and anxiety from violations of their dietary rules. The third is an experience of psychosocial impairments such as impaired interpersonal relationships and impaired concentration due to preoccupation with the diet. The fourth is an experience of physical impairments due to a lack of nutrition from extreme dietary restrictions. Unfortunately, by the time that health problems develop due to an eating disorder, the disordered thinking (regarding the need for a rigid and restrictive diet, the perceived dangers of most foods, and the drive to obtain or maintain unrea-

listic body ideals) is so ingrained in the individual, that they find it extremely difficult to change their diet and overcome the eating disorder [16] [17].

To our knowledge, only one study has examined ethnic differences in ON [18]. The results show that Hispanic Americans scored higher than non-Hispanic Americans on the Bratman orthorexia self-test [19]. Unfortunately, the study did not include a sufficient sample of some racial groups (e.g., only 10 Black participants) to conduct an analysis of racial differences. In addition, the Bratman self-test is lacking in reliability and validity in comparison to some of the other measures of ON [20].

1.3. Purpose of the Current Study

Past research reveals many factors associated with the development of eating disorders, including a distorted body image related to internalization of the thin ideal (predominantly among women) or the muscular ideal (predominantly among men), as well as the presence of a mood or anxiety disorder (often comorbid with BN or BED) or obsessive-compulsive disorder (often comorbid with AN or ON) [6] [8] [21]. However, past research on disordered eating has often ignored racial and ethnic influences. The current study aims to fill this gap in the research, exploring potential racial and ethnic differences in ON symptomatology, as well as general disordered eating behaviors including excessive unhealthy dieting behaviors associated with AN, as well as binging and purging behaviors associated with BN. Based on past research, it is expected (a) that Asian Americans will not differ from the other racial and ethnic groups on either unhealthy dieting behaviors associated with AN or binging and purging behaviors associated with BN, (b) that Black and Hispanic Americans will have lower levels of unhealthy dieting behaviors associated with AN than White Americans, and (c) that Hispanic Americans may have slightly higher levels of binging and purging behaviors associated with BN than White Americans. Given the lack of past research investigating ON differences, we have no a priori hypotheses regarding potential racial or ethnic differences in ON symptomatology.

2. Method

2.1. Participants

The principal focus of this study was to investigate whether ON symptomatology differed across racial and ethnic groups (White, Black, Hispanic, Asian or Pacific Islander, and biracial or multiracial). A power analysis using G*Power revealed that with a standard α criterion of 0.05, a minimum sample size of 305 participants (61 per group) would be optimal for detecting group differences with a medium effect size. Two methods of recruitment were used to help achieve a sufficient sample size based on the a priori power analysis. First, recruitment emails were sent to undergraduate students enrolled in multiple nutrition courses and psychology courses at Texas State University. Second, participants were recruited through social media advertisements on Twitter, Reddit, Facebook, and

Instagram. The audience interests for these advertisements were set to target both healthy eaters (e.g., "clean eating", "healthy eating", "paleo") and normal or unhealthy eaters (e.g., "Cooking Panda", "desserts", "comfort food"). The only exclusionary criterion was an age of less than 18 years. The recruitment emails and social media advertisements indicated that participants completing the eating-habits survey would have the option of providing their email address for entry into a raffle for an opportunity to win one of ten $25 Amazon gift cards.

2.2. Procedure and Materials

For this study, which was approved by the Institutional Review Board of Texas State University, participants provided informed consent and then completed an online survey through Qualtrics. In attempt to prevent bots, the "Prevent multiple submissions" and "Bot detection" features of the Qualtrics survey were enabled. The survey began with a demographic questionnaire, followed by measures of ON and disordered eating. The demographic questionnaire included questions asking about gender identity (three response options: man, woman, and nonbinary or genderqueer), race and ethnicity (six response options: White, Black, Hispanic or Latino/a/x, Asian or Pacific Islander, biracial or multiracial, and other), age, weight and height for calculation of body mass index (BMI), and past or current eating disorder diagnosis (five response options: no, yes—anorexia nervosa, yes—bulimia nervosa, yes—binge eating disorder, and yes—other).

ON was assessed with the Orthorexia Nervosa Inventory (ONI) [21], which is comprised of 24 statements about eating, to which participants use a 4-point scale (ranging from 1 = "not at all true" to 4 = "very true") to indicate how true each statement is for them based on their current eating habits. The ONI includes three subscales: 1) Behaviors with nine statements relevant to following a restrictive diet believed to be healthy and pure (e.g., "I follow a health-food diet rigidly, only eating what my diet allows and not allowing myself any deviations from this diet"), 2) Impairments with 10 statements relevant to either physical impairments (e.g., "The stricter I become with my diet, the more I seem to experience one or more physical symptoms such as fatigue, faintness, heart racing, nausea, diarrhea, pain, etc.") or psychosocial impairments (e.g., "My healthy eating is a significant source of stress in my relationships"), and 3) Emotions with five statements relevant to extreme emotional distress with feelings of shame and anxiety in response to violations of the restrictive diet (e.g., "When I stray from my healthy diet, I can only think about what a failure I am"). Regarding the reliability of the ONI, Cronbach's alpha was 0.94 for the overall ONI and ranged from 0.88 to 0.90 for its three scales in the original validation study [21].

Disordered eating was assessed with the Eating Attitudes Test-26 (EAT-26) [22] that is comprised of 26 statements about eating, to which participants use a 6-point scale (ranging from 1 = "never" to 6 = "always") to indicate how often they do or feel what is indicated in the statement. The EAT-26 includes three subscales: 1) Dieting with 13 statements relevant to dieting for weight loss (e.g.,

"I engage in dieting behaviors," "I am terrified about being overweight"), 2) Bulimia and Food Preoccupation with six statements relevant to binging/purging behaviors or preoccupation with food (e.g., "I vomit after I have eaten," "I feel that food controls my life"), and 3) Oral Control with seven statements relevant to self-control with eating (e.g., "I display self-control when I am around food," "I avoid eating when I am hungry"). Regarding reliability of the EAT-26, Cronbach's alpha was 0.90 for the overall EAT-26 and ranged from 0.83 to 0.90 for its three scales in the original validation study [22].

2.3. Data Analysis

First, a MANCOVA was conducted to assess whether the racial and ethnic groups differed in their scores on the three ONI subscales (Behaviors, Impairments, and Emotions) after controlling for three covariates that have been related to ON symptomatology in past research: gender, BMI, and EAT-26 Total scores. Second, a MANCOVA was conducted to assess whether the racial and ethnic groups differed in their scores on the three EAT-26 subscales (Dieting, Bulimia and Food Preoccupation, and Oral Control) after controlling for three covariates: gender, BMI, and ONI Total scores. For both MANCOVAs, Pillai's Trace F test was used for the omnibus test due to its robustness to heterogeneous variances, Fisher's LSD tests were used for the post-hoc tests in the case of a significant omnibus test, and η_p^2 was used as the measure of effect size with a value of 0.01 considered a small effect, 0.06 a medium effect, and 0.14 a large effect. A standard alpha criterion of 0.05 was used to determine statistical significance.

3. Results

Although data were recorded for 1784 respondents, the data were removed for 24 with a Qualtrics ReCAPTCHA score of 0.5 or below (*i.e.*, flagged as a bot), from 474 who did not complete the survey, and from 36 whose reported race and ethnicity was "other", leaving data for 1250 participants. Regarding gender, 917 (74%) were women, 252 (20%) were men, and 80 (6%) were nonbinary or genderqueer. Regarding race and ethnicity, 743 (59%) were White, 249 (20%) were Hispanic or Latino/a/x, 87 (7%) were Black, 61 (5%) were Asian or Pacific Islander, and 110 (9%) were biracial or multiracial. Regarding age, participants ranged from 18 to 78 years old (M = 23.45, SD = 9.82). Regarding eating disorder history, 1042 (83%) had never been diagnosed with an eating disorder, 103 (8%) had been diagnosed with AN, 37 (3%) had been diagnosed with BN, 34 (3%) had been diagnosed with BED, and 34 (3%) had been diagnosed with another unspecified eating disorder.

The first MANCOVA analyzed the differences between the racial and ethnic groups on the ONI Behaviors, Impairments, and Emotions subscales (see **Table 1**). Gender, BMI, and EAT-26 Total scores were included as covariates. The omnibus test revealed that race/ethnicity did not have a significant relationship with ONI scores after accounting for the covariates, F (12, 3618) = 1.36, p = 0.180,

η_p^2 = 0.004. Pairwise comparisons were not conducted because the omnibus test was non-significant.

The second MANCOVA analyzed the differences between the racial and ethnic groups on the EAT-26 Dieting, Bulimia and Food Preoccupation, and Oral Control subscales (see Table 2). Gender, BMI, and ONI Total scores were included as covariates. The omnibus test revealed that race/ethnicity had a significant relationship with EAT-26 scores, $F(12, 3618) = 2.72$, $p = 0.001$, $\eta_p^2 = 0.01$. For the subsequent tests of between-subjects effects, first, the group differences were significant for the Dieting subscale, $F(4, 1206) = 3.23$, $p = 0.012$, $\eta_p^2 = 0.01$. Black participants scored significantly lower on this subscale in comparison to White participants ($\Delta M = -3.53$, $SE = 1.07$, $p = 0.001$, 95% CI [−5.64, −1.43]), Hispanic or Latino/a/x participants ($\Delta M = -2.32$, $SE = 1.17$, $p = 0.047$, 95% CI [−4.61, −0.03]), and biracial or multiracial participants ($\Delta M = -3.58$, $SE = 1.35$, $p = 0.008$, 95% CI [−6.22, −0.94]). Black participants also scored lower than the Asian or Pacific Islander participants, although this difference did not quite reach statistical significance ($\Delta M = -2.96$, $SE = 1.57$, $p = 0.060$, 95% CI [−6.04, 0.12]). Second, the group differences were also significant for the Bulimia and Food Preoccupation subscale, $F(4, 1206) = 6.34$, $p < .001$, $\eta_p^2 = 0.02$. Black participants scored significantly lower on this subscale in comparison to White

Table 1. Estimated marginal means for orthorexia symptomatology as a function of race/ethnicity.

Race/Ethnicity	*n*	*M* (*SE*) for ONI Subscales		
		Behaviors	Impairments	Emotions
White	720	16.48 (0.19)	14.09 (0.15)	9.65 (0.09)
Black	81	17.08 (0.56)	15.53 (0.45)	9.82 (0.27)
Hispanic or Latino/a/x	246	16.64 (0.32)	14.30 (0.26)	10.01 (0.32)
Asian or Pacific Islander	60	16.40 (0.65)	14.02 (0.53)	9.70 (0.32)
Biracial or multiracial	107	15.93 (0.48)	13.62 (0.39)	9.56 (0.24)

Note: Gender, BMI, and EAT-26 Total scores were included as covariates in the model.

Table 2. Estimated marginal means for disordered eating behaviors as a function of race/ethnicity.

Race/Ethnicity	*n*	*M* (*SE*) for EAT-26 Subscales		
		Dieting	Bulimia	Oral Control
White	743	37.86 (0.34)	13.66 (0.17)	16.79 (0.19)
Black	87	34.32 (1.02)	11.55 (0.50)	16.46 (0.56)
Hispanic or Latino/a/x	249	36.64 (0.58)	12.66 (0.29)	15.92 (0.32)
Asian or Pacific Islander	61	37.29 (1.19)	13.37 (0.58)	16.87 (0.66)
Biracial or multiracial	110	37.91 (0.88)	14.12 (0.43)	17.22 (0.49)

Note: Gender, BMI, and ONI Total scores were included as covariates in the model.

participants ($\Delta M = -2.11$, $SE = 0.53$, $p < .001$, 95% CI [−3.14, −1.08]), Asian or Pacific Islander participants ($\Delta M = -1.81$, $SE = 0.77$, $p = 0.019$, 95% CI [−3.32, −0.31]), and biracial or multiracial participants ($\Delta M = -2.57$, $SE = 0.66$, $p < .001$, 95% CI [−3.86, −1.28]). Black participants also scored lower than the Hispanic or Latino/a/x participants, although this difference did not quite reach statistical significance ($\Delta M = -1.11$, $SE = 0.57$, $p = 0.052$, 95% CI [−2.24, 0.01]). White participants, in addition to scoring higher than Black participants, scored significantly higher on this scale than Hispanic or Latino/a/x participants ($\Delta M = 1.00$, $SE = 0.33$, $p = 0.003$, 95% CI [0.35, 1.64]). Finally, the groups did not significantly differ on the Oral Control subscale, $F(4, 1206) = 1.83$, $p = 0.121$, $\eta_p^2 = 0.01$.

4. Discussion

4.1. Racial and Ethnic Differences for ON

This study evaluated the impact of racial and ethnic differences in ON symptomatology and disordered eating behaviors (dieting, bulimia and food preoccupation, and oral control). Regarding the former, to the best of our knowledge, no study has examined racial differences in ON symptomatology, and only one study has examined ethnic differences in ON symptomatology [18], finding that Hispanic Americans scored higher than non-Hispanic Americans on the Bratman orthorexia self-test [19]. However, Bratman and Knight indicated that the 10-item measure was only meant to be used as an informal self-test, and research has indicated that the Bratman self-test is lacking in reliability and validity in comparison to the ONI and to some of the other measures of ON [20]. Using the ONI, the current study found that the racial and ethnic groups did not significantly differ in ON symptomatology, after controlling for gender, BMI, and other disordered eating attitudes.

One possible explanation of this finding is that BMI and disordered eating attitudes are correlated with ON, regardless of racial and ethnic differences. Regarding body weight and size, higher BMI tends to positively correlate with higher ON symptomatology [18] [23] [24]. This relationship may be due to body image, dieting, and weight loss culture. In societies with more prevalent dieting cultures, individuals are more likely to experience distorted body image and an extensive desire to engage in behaviors that reduce weight or affirm healthy eating choices, thus leading to a higher obsession with clean eating and greater ON symptomatology [24] [25]. Similarly, greater distorted eating attitudes are associated with greater ON symptomatology. These disordered eating attitudes are influenced by culture, social media, and psychopathological factors, such as obsessive-compulsive disorder [26] [27] [28], which may be more relevant to ON symptomatology than race or ethnicity.

4.2. Racial and Ethnic Differences for EAT-26

The second objective of our present study was to examine the racial and ethnic

differences in disordered eating behaviors. Regarding our first hypothesis, the results supported that Asian Americans did not significantly differ from other racial and ethnic groups on unhealthy dieting behaviors (e.g., restrictive eating, food avoidance, excessive exercise), although they were higher on binge eating and purging behaviors compared to Black Americans. Perhaps the general lack of differences between Asian Americans and the other racial and ethnic groups is due to Asian Americans also being influenced by the Western body image standards of thinness and muscularity [29] [30].

Consistent with our second hypothesis, Black Americans had significantly lower levels of unhealthy dieting behaviors compared to White Americans, as well as significantly lower binging and purging behaviors than White, Hispanic, and Asian Americans. Past research has shown that Black Americans engage in lower dietary restraint behaviors and have lower weight concern compared to White Americans [31]. Moreover, while Black Americans tend to have higher average BMIs compared to White and Asian Americans, their overall body satisfaction tends to be higher [30] [32]. One possible explanation for this is resiliency levels and social support among the Black community stemming from historical and social events (e.g., discrimination, racism, inequality). Some studies have suggested that higher resiliency moderates the relationship between stress and eating disorders [33]. Thus, higher resiliency among Black Americans may serve as a buffer and/or protective factor against unhealthy dieting behaviors. Future research would benefit from examining the relationship between resiliency and eating behaviors in racial and ethnic groups.

Contrary to our third hypothesis, White Americans reported significantly higher levels of binging and purging behaviors compared to Hispanic Americans. Many researchers have indicated that Hispanic Americans may be more likely to engage in binging and purging behaviors compared to other ethnic groups [5] [34], especially Black Americans [35]. However, a more recent study has shown that when compared to White women, Hispanic women reported significantly less binging and purging behaviors [36]. One possible explanation for this recent study and for our finding is that stigma may have prevented our Hispanic participants from reporting these behaviors. Typically, racial and ethnic minority groups tend to report unfavorable behaviors less. Therefore, future research should try to explore this phenomenon.

4.3. Limitations

This present study has some limitations. First, more than half of our sample was White participants. Although we reached our minimum sample size to detect group differences, the overrepresentation of one group can introduce biases that limit generalizability. This may be one possible explanation for why, contrary to past research, White participants reported higher binging and purging behaviors compared to Hispanic participants in our study. Moreover, it is important to consider that due to stigma, ethnic and racial minority groups tend to report less ad-

verse behaviors. Second, 74% of our sample overwhelmingly identified as women. Past studies have indicated gender differences among racial and ethnic groups in disordered eating behaviors and attitudes [34] [37]. Some studies have reported that compared to White men, Black men engage in higher binge eating and purging behaviors, while others have reported the inverse [38] [39]. There have also been studies suggesting that both groups engage in these behaviors at similar rates [5]. Future studies should further investigate the effects of intersectional identities on disordered eating behaviors and ON. Third, participants completed self-report measures that can introduce social desirability bias. In light of the sensitive nature of eating disorders, it is probable that some participants were reluctant to admit these behaviors. Lastly, while this study examined various racial and ethnic groups, it overlooked important intracultural differences within these communities (e.g., African Americans vs Ghanian Americans or Korean Americans vs Malaysian Americans).

5. Conclusions and Extensions

Despite these limitations, this present study is one of the first to explore racial and ethnic differences in ON symptomatology. Future studies would benefit from examining the role of intracultural differences and variations in ON symptomatology and disordered eating. Additionally, they should assess how the transmission of cultural health beliefs among community groups influences ON symptomatology and eating attitudes. Overall, this study aimed to evaluate potential racial and ethnic differences in ON symptomatology and general disordered eating behaviors. This study highlights the importance of understanding intersectionality and ethnic identity as protective factors against general disordered eating behaviors (e.g., unhealthy dieting, binge eating, purging).

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Cotter, E.W., Kelly, N.R., Mitchell, K.S. and Mazzeo, S.E. (2015) An Investigation of Body Appreciation, Ethnic Identity, and Eating Disorder Symptoms in Black Women. *Journal of Black Psychology*, **41**, 3-25. https://doi.org/10.1177/0095798413502671

[2] Claudat, K., White, E.K. and Warren, C.S. (2016) Acculturative Stress, Self-Esteem, and Eating Pathology in Latina and Asian American Female College Students. *Journal of Clinical Psychology*, **72**, 88-100. https://doi.org/10.1002/jclp.22234

[3] Goel, N.J., Jennings Mathis, K., Egbert, A.H., Petterway, F., Breithaupt, L., Eddy, K.T., Franko, D.L. and Graham, A.K. (2022) Accountability in Promoting Representation of Historically Marginalized Racial and Ethnic Populations in the Eating Disorders Field: A Call to Action. *International Journal of Eating Disorders*, **55**, 463-469. https://doi.org/10.1002/eat.23682

[4] Egbert, A.H., Hunt, R.A., Williams, K.L., Burke, N.L. and Mathis, K.J. (2022) Re-

porting Racial and Ethnic Diversity in Eating Disorder Research over the Past 20 Years. *International Journal of Eating Disorders*, **55**, 455-462. https://doi.org/10.1002/eat.23666

[5] Marques, L., Alegria, M., Becker, A.E., Chen, C.N., Fang, A., Chosak, A. and Diniz, J.B. (2011) Comparative Prevalence, Correlates of Impairment, and Service Utilization for Eating Disorders Across US Ethnic Groups: Implications for Reducing Ethnic Disparities in Health Care Access for Eating Disorders. *International Journal of Eating Disorders*, **44**, 412-420. https://doi.org/10.1002/eat.20787

[6] Swanson, S.A., Crow, S.J., Le Grange, D., Swendsen, J. and Merikangas, K.R. (2011) Prevalence and Correlates of Eating Disorders in Adolescents: Results from the National Comorbidity Survey Replication Adolescent Supplement. *Archives of General Psychiatry*, **68**, 714-723. https://doi.org/10.1001/archgenpsychiatry.2011.22

[7] Mason, T.B. and Lewis, R.J. (2017) Examining Social Support, Rumination, and Optimism in Relation to Binge Eating among Caucasian and African-American College Women. *Eating and Weight Disorders*, **22**, 693-698. https://doi.org/10.1007/s40519-016-0300-x

[8] Aviña, V. and Day, S.X. (2016) Eating Disorders: Explanatory Variables in Caucasian and Hispanic College Women. *Journal of College Counseling*, **19**, 31-44. https://doi.org/10.1002/jocc.12029

[9] Rodgers, R.F., Berry, R. and Franko, D.L. (2018) Eating Disorders in Ethnic Minorities: An Update. *Current Psychiatry Reports*, **20**, Article 90. https://doi.org/10.1007/s11920-018-0938-3

[10] Perez, M., Ohrt, T.K. and Hoek, H.W. (2016) Prevalence and Treatment of Eating Disorders among Hispanics/Latino Americans in the United States. *Current Opinion in Psychiatry*, **29**, 378-382. https://doi.org/10.1097/YCO.0000000000000277

[11] Jennings, K.M., Kelly-Weeder, S. and Wolfe, B.E. (2015) Binge Eating among Racial Minority Groups in the United States: An Integrative Review. *Journal of the American Psychiatric Nurses Association*, **21**, 117-125. https://doi.org/10.1177/1078390315581923

[12] Chao, A.M., Grilo, C.M. and Sinha, R. (2016) Food Cravings, Binge Eating, and Eating Disorder Psychopathology: Exploring the Moderating Roles of Gender and Race. *Eating Behaviors*, **21**, 41-47. https://doi.org/10.1016/j.eatbeh.2015.12.007

[13] Javier, S.J., Moore, M.P. and Belgrave, F.Z. (2016) Racial Comparisons in Perceptions of Maternal and Peer Attitudes, Body Dissatisfaction, and Eating Disorders among African American and White Women. *Women & Health*, **56**, 615-633. https://doi.org/10.1080/03630242.2015.1118721

[14] Bratman, S. (1997) Health Food Junkie: Obsession with Dietary Perfection Can Sometimes Do More Harm than Good, Says One Who Has Been There. *Yoga Journal*, **136**, 42-46.

[15] American Psychiatric Association (2013) Diagnostic and Statistical Manual of Mental Disorders, 5th Edition. https://doi.org/10.1176/appi.books.9780890425596

[16] Cena, H., Barthels, F., Cuzzolaro, M., Bratman, S., Brytek-Matera, A., Dunn, T., Varga, M., Missbach, B. and Donini, L.M. (2019) Definition and Diagnostic Criteria for Orthorexia Nervosa: A Narrative Review of the Literature. *Eating and Weight Disorders*, **24**, 209-246. https://doi.org/10.1007/s40519-018-0606-y

[17] Donini, L.M., Barrada, J.R., Barthels, F., Dunn, T.M., Babeau, C., Brytek-Matera, A., Cena, H., Cerolini, S., Cho, H.-H., Coimbra, M., Cuzzolaro, M., Ferreira, C., Galfano, V., Grammatikopoulou, M.G., Hallit, S., Håman, L., Hay, P., Jimbo, M., Lasson, C. and Lombardo, C. (2022) A Consensus Document on Definition and Diagnostic

Criteria for Orthorexia Nervosa. *Eating and Weight Disorders*, **27**, 3695-3711. https://doi.org/10.1007/s40519-022-01512-5

[18] Bundros, J., Clifford, D., Silliman, K. and Morris, M.N. (2016) Prevalence of Orthorexia Nervosa among College Students Based on Bratman's Test and Associated Tendencies. *Appetite*, **101**, 86-94. https://doi.org/10.1016/j.appet.2016.02.144

[19] Bratman, S. and Knight, D. (2000) Health Food Junkies: Overcoming the Obsession with Healthful Eating. Broadway Books, New York.

[20] Oberle, C.D. and Noebel, N.A. (2023) Assessment of Orthorexia Nervosa. In: Meule, A., Ed., *Assessment of Eating Behavior*, Hogrefe, Göttingen, 56-70.

[21] Oberle, C.D., De Nadai, A.S. and Madrid, A.L. (2020) Orthorexia Nervosa Inventory (ONI): Development and Validation of a New Measure of Orthorexic Symptomatology. *Eating and Weight Disorders*, **26**, 609-622. https://doi.org/10.1007/s40519-020-00896-6

[22] Garner, D.M., Olmsted, M.P., Bohr, Y. and Garfinkel, P.E. (1982) The Eating Attitudes Test: Psychometric Features and Clinical Correlates. *Psychological Medicine*, **12**, 871-878. https://doi.org/10.1017/S0033291700049163

[23] Fidan, T., Ertekin, V., Işikay, S. and Kırpınar, I. (2010) Prevalence of Orthorexia among Medical Students in Erzurum, Turkey. *Comprehensive Psychiatry*, **51**, 49-54. https://doi.org/10.1016/j.comppsych.2009.03.001

[24] Oberle, C.D., Samaghabadi, R. and Hughes, E. (2017) Orthorexia Nervosa: Assessment and Correlates with Gender, BMI, and Personality. *Appetite*, **108**, 303-310. https://doi.org/10.1016/j.appet.2016.10.021

[25] Ambwani, S., Shippe, M., Gao, Z. and Austin, S.B. (2019) Is #Cleaneating a Healthy or Harmful Dietary Strategy? Perceptions of Clean Eating and Associations with Disordered Eating among Young Adults. *Journal of Eating Disorders*, **7**, Article No. 17. https://doi.org/10.1186/s40337-019-0246-2

[26] Alfalahi, M., Mahadevan, S., Balushi, R.A., Chan, M.F., Saadon, M.A., Al-Adawi, S. and Qoronfleh, M.W. (2022) Prevalence of Eating Disorders and Disordered Eating in Western Asia: A Systematic Review and Meta-Analysis. *Eating Disorders*, **30**, 556-585. https://doi.org/10.1080/10640266.2021.1969495

[27] McComb, S.E. and Mills, J.S. (2019) Orthorexia Nervosa: A Review of Psychosocial Risk Factors. *Appetite*, **140**, 50-75. https://doi.org/10.1016/j.appet.2019.05.005

[28] Scheiber, R., Diehl, S. and Karmasin, M. (2023) Socio-Cultural Power of Social Media on Orthorexia Nervosa: An Empirical Investigation on the Mediating Role of Thin-Ideal and Muscular Internalization, Appearance Comparison, and Body Dissatisfaction. *Appetite*, **185**, Article ID: 106522. https://doi.org/10.1016/j.appet.2023.106522

[29] Cheng, Z.H., Perko, V.L., Fuller-Marashi, L., Gau, J.M. and Stice, E. (2019) Ethnic Differences in Eating Disorder Prevalence, Risk Factors, and Predictive Effects of Risk Factors among Young Women. *Eating Behaviors*, **32**, 23-30. https://doi.org/10.1016/j.eatbeh.2018.11.004

[30] Kelly, N.R., Cotter, E.W., Tanofsky-Kraff, M. and Mazzeo, S.E. (2015) Racial Variations in Binge Eating, Body Image Concerns, and Compulsive Exercise among Men. *Psychology of Men & Masculinity*, **16**, 326-336. https://doi.org/10.1037/a0037585

[31] Pike, K.M., Dohm, F.A., Striegel-Moore, R.H., Wilfley, D.E. and Fairburn, C.G. (2001) A Comparison of Black and White Women with Binge Eating Disorder. *American Journal of Psychiatry*, **158**, 1455-1460. https://doi.org/10.1176/appi.ajp.158.9.1455

[32] Rakhkovskaya, L.M. and Warren, C.S. (2016) Sociocultural and Identity Predictors of Body Dissatisfaction in Ethnically Diverse College Women. *Body Image*, **16**, 32-40. https://doi.org/10.1016/j.bodyim.2015.10.004

[33] Thurston, I.B., Hardin, R., Kamody, R.C., Herbozo, S. and Kaufman, C. (2018) The Moderating Role of Resilience on the Relationship between Perceived Stress and Binge Eating Symptoms among Young Adult Women. *Eating Behaviors*, **29**, 114-119. https://doi.org/10.1016/j.eatbeh.2018.03.009

[34] Lee-Winn, A.E., Reinblatt, S.P., Mojtabai, R. and Mendelson, T. (2016) Gender and Racial/Ethnic Differences in Binge Eating Symptoms in a Nationally Representative Sample of Adolescents in the United States. *Eating Behaviors*, **22**, 27-33. https://doi.org/10.1016/j.eatbeh.2016.03.021

[35] Gordon, K.H., Castro, Y., Sitnikov, L. and Holm-Denoma, J.M. (2010) Cultural Body Shape Ideals and Eating Disorder Symptoms among White, Latina, and Black College Women. *Cultural Diversity and Ethnic Minority Psychology*, **16**, 135-143. https://doi.org/10.1037/a0018671

[36] Smith, J.M., Smith, J.E., McLaughlin, E.A., Belon, K.E., Serier, K.N., Simmons, J.D., Kelton, K., Arroyo, C. and Delaney, H.D. (2020) Body Dissatisfaction and Disordered Eating in Native American, Hispanic, and White College Women. *Eating and Weight Disorders*, **25**, 347-355. https://doi.org/10.1007/s40519-018-0597-8

[37] Beccia, A.L., Baek, J., Jesdale, W.M., Austin, S.B., Forrester, S., Curtin, C. and Lapane, K.L. (2019) Risk of Disordered Eating at the Intersection of Gender and Racial/Ethnic Identity among US High School Students. *Eating Behaviors*, **34**, Article ID: 101299. https://doi.org/10.1016/j.eatbeh.2019.05.002

[38] Mitchell, K.S. and Mazzeo, S.E. (2004) Binge Eating and Psychological Distress in Ethnically Diverse Undergraduate Men and Women. *Eating Behaviors*, **5**, 157-169. https://doi.org/10.1016/j.eatbeh.2003.07.004

[39] Ricciardelli, L.A., McCabe, M.P., Williams, R.J. and Thompson, J.K. (2007) The Role of Ethnicity and Culture in Body Image and Disordered Eating among Males. *Clinical Psychology Review*, **27**, 582-606. https://doi.org/10.1016/j.cpr.2007.01.016