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Gender identity, race/ethnicity and eating pathology in a treatment-seeking community sample

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Abstract

Despite the wide-reaching impact of eating disorders (EDs), less is known about eating pathology among individuals across racial/ethnic groups whose gender identity differs from the binary categorization. Examining ED pathology both across binary and minority-gender groups, and relative to racial/ethnic identification is necessary to inform screening and culturally-sensitive intervention efforts. This study investigated patterns of ED symptomology among youth and adults ($N = 13658$) who telephoned treatment centers in the United States when seeking clinical support for ED symptoms. Analyses examined data from participants who completed a semi-structured clinical interview. Results indicated that Anorexia nervosa was the most common diagnosis in

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[1]Abbreviations: ED = Eating disorder; TMS = transmasculine spectrum; TFS = transfeminine spectrum; NB = non-binary; AN = anorexia nervosa; OSFED = other specified feeding and eating disorder; BED = binge eating disorder; ARFID = avoidant restrictive food intake disorder; BN = bulimia nervosa

each gender category and for a majority of race/ethnic groups; Black individuals had elevated rates of binge eating disorder. Compared to females, males were less likely to endorse all ED symptoms ($ps < .001$); gender minority status was also associated with decreased report of a majority of ED symptoms. Asian and Black individuals were less likely than Whites to endorse most ED symptoms. When compared to Whites, Hispanic/Latinx and Bi/Multi-racial participants did not demonstrate significant differences in presentation across a majority of ED symptoms. Overall findings suggest individuals with female gender and White race may seek treatment from an ED treatment facility with greater frequency than other demographic groups. Noted exceptions include Hispanic/Latinx and Bi/Multi-racial individuals, for whom ED pathology may be represented comparably to Whites. While findings confirm traditional patterns in gender and racial/ethnic representation in EDs, current study findings also underscore that EDs are not culture bound.

Keywords

gender identity; eating disorder; transgender; race; ethnicity

Introduction

Eating disorders (EDs)[1] are serious mental illnesses that are distributed across age, race and ethnicity, and gender (Udo & Grilo, 2018). Despite their wide-reaching impact, EDs have historically been among the most gendered of psychiatric illnesses, with most research focused on heterosexual, cisgender females (Murray et al., 2017). Further, while a growing body of literature has focused on EDs among males (Mitchison & Mond, 2015; Gorrell & Murray, 2019), less is known about eating pathology among individuals across racial/ethnic groups and among those whose gender identity differs from binary categorization.

Binary Gender and Disordered Eating

Gender identity refers to a perception of self in dynamic relation to masculinity and femininity, and the culturally prescribed roles assigned to these categories (Ault & Brzuzy, 2009). For a western cultural majority, gender identity is considered binary; while less peer-reviewed research has addressed male EDs, (Murray et al., 2016), evidence supports unique differences in the male experience of body image, eating and exercise pathology (Gorrell & Murray, 2019; Lavender et al., 2017; Murray et al., 2017).

Findings from the study of binary gender differences in ED symptoms among adults are inconsistent. For example, while multiple investigations found lower drive for thinness and body dissatisfaction among males (Agüera et al., 2019; Araceli Núñez-Navarro et al., 2011), males may report higher (Nunez-Navarro et al., 2012) *or* lower (Aguera et al., 2019) bulimic symptoms than females. Study of youth is more consistent, demonstrating less dietary restriction and lower shape and eating concern (Darcy et al., 2012; Mond et al., 2014), greater drive for muscularity (Darcy et al., 2012) and similar rates of compulsive exercise (Allen et al., 2013; Goodwin et al., 2012; Mond et al., 2014) in adolescent males,

compared to females. While literature specific to male EDs is increasing (Gorrell & Murray, 2019), there remains a comparative paucity of investigation specific to the experience of EDs among individuals who are transgender, or feel their gender identity is not expressed within a binary categorization.

Minority Gender and Disordered Eating

Clinical research in transgender samples has largely consisted of case studies (Jones et al., 2016), or small samples (Hepp et al., 2005) with one systematic review of disordered eating and body image that included 26 studies (Jones et al., 2016). While this evidence base is small, especially among youth (Coelho et al., 2019), more recent research has examined disordered eating among gender minority and transgender adults and youth in college, community and population-based samples (Nagata et al., 2020; Simone et al., 2020; Witcomb et al., 2015).

Overall, findings indicate that transmasculine spectrum (TMS; assigned female at birth and identifying as men or on the masculine spectrum) individuals have higher levels of disordered eating and body dissatisfaction compared to cisgender men (Ålgars et al., 2012) and transfeminine spectrum (TFS; assigned male at birth and identifying as women or on the feminine spectrum) individuals (Witcomb et al., 2015). TFS individuals report elevated ED cognitive and behavioral symptoms compared to cisgender males, as well as elevated weight/shape concern, and body checking compared to cisgender females (Vocks et al., 2009). For TMS and TFS, dietary restraint is the most commonly reported ED behavior, followed by binge eating (Nagata et al., 2020).

Across gender identification, race/ethnic identity may considerably impact both symptom presentation and treatment-seeking for ED pathology (Burke et al., 2020). Specifically, among adults, males and ethnic/racial minorities (non-Hispanic Black individuals and Hispanics) may be less likely to seek treatment for binge eating disorder (BED) than women or non-Hispanic whites, and Hispanics may be less less likely to seek treatment for anorexia nervosa (AN) compared to Whites; in this study no differences were found across gender or race/ethnicity in treatment-seeking for BN (Coffino et al., 2019). Given these patterns, and further evidence that EDs are not exclusive to a specific demographic population, and present across gender, race/ethnicity, and age (Schaumberg et al., 2017), it is important that race/ethnic identity be considered when characterizing an ED treatment-seeking sample.

Current Study

To date, the study of eating pathology across gender identity has been considerably hindered by our sexually dimorphic approach (Murray, 2017), which has consequently limited our ability to consider potential critical nuances in ED presentation that may inform future screening and treatment approaches. The current study's sample size provided a unique opportunity to evaluate ED pathology across different gender-identified groups. As an additional aim, we investigated racial/ethnic diversity in relation to ED symptoms. Due to the lack of research evidence to date, our analyses were intended to be largely hypothesis-generating rather than confirmatory.

Methods

Participants

The study population was comprised of treatment-seeking individuals who called, or were the subject of a call, to a United States (US) national ED treatment program, October 2016-December 2019. The program consists of 27 sites across 13 states and offers four levels of care (i.e., intensive outpatient, partial hospitalization, residential, and inpatient treatment). These levels of care are considered elevated compared to standard outpatient care, and are particularly suitable for patients with greater ED severity, and/or those who may have responded less successfully to treatment in an outpatient setting. In the US, these levels of care typically require insurance coverage in order to pay for treatment. Callers included potential patients, family members, and professionals. This study was granted exemption from review by the Sterling Institutional Review Board.

Measures and Procedure

Master's level licensed clinicians trained in the assessment protocol received inquiry calls, and conducted semi-structured interviews that queried basic demographics, psychiatric and medical history, and ED symptoms. Specific ED symptoms were chosen based on the guidelines of various regulatory bodies, including the Joint Commission on Accreditation of Healthcare Organizations and the American Psychiatric Assocation (APA). When a symptom was endorsed, the clinician obtained further details to aid in an ED diagnosis, according to DSM-5 criteria (APA, 2013).

While some symptoms (e.g., "derogatory self-talk") are more self-explanatory, we provide detail here on symptoms that may require further explanation. Binge eating refers to objective binge episodes; when patients were queried, the assessor followed up with questioning to determine the objective (versus subjective) nature of the food amount, and the nature of loss-of-control during this episode. Categorizing food refers to whether an individual might endorse labeling a food as "healthy" or "good" versus alternative, negative-valenced adjectives. Food journaling was a term used to refer to individuals who engaged in logging the amount and type of foods they consumed. Compulsive overeating was described as snacking or grazing past the point of fullness, or when not hungry or bored. Night eating was used to describe consuming the majority of calories for the day after 7pm but before going to bed, whereas nocturnal-related eating was used to describe waking up from sleep, consciously or unconsciously, and eating. Finally, if an individual reported any purging behavior (i.e, self-induced vomiting, laxative use), this symptom was indicated as having been endorsed.

Analytic Plan

Multiple inquiries to the treatment center ($n = 7910$) were excluded, with the latest dated entry retained. The study sample was restricted to those for whom gender and racial/ethnic identity were reported. Cases where gender identity ($n = 26$) or race/ethnic identity ($n = 334$) were reported, but coded as 'unknown' or 'declined to answer' were listwise deleted. To reduce variability in the nature of symptom report, callers whose identity was qualified as 'friend' ($n = 12$) or 'unknown' ($n = 5077$) were excluded; the final sample for analyses (N

= 13658) included those for whom caller identity was patient (self), professional, or family member. Rates of symptom report per caller identity differed but did not appear to follow a systematic trend (no group appeared to comparatively over- or under-report) (Supplement A). As there was no systematic basis to either exclude or combine any of the groups, further analyeses included all three caller-identities.

A matrix was calculated for those uniquely representing each gender and racial/ethnic identity. Chi-square tests examined differences in the proportion of individuals diagnosed with each ED within (i) gender identity, and (ii) racial/ethnic category, irrespective of adult status. Effect sizes for $df = 4$ were determined using Cramer's V (.05 = small, .15 = medium, .25 = large) (Cohen, 2013). Given the number of pairwise column comparisons, a Bonferroni correction was calculated ($p < .05/10 = p$ .005) for Chi-square analyses.

For further analyses, gender was dummy coded into three categories (female, male, minority gender [combination of TFS, TMS, and non-binary [NB]); female was the reference category. Racial/ethnic identity was dummy coded into six categories (White, Hispanic/Latinx, Bi/Multi-racial, Asian, Black, Other [combination of Hawaiian/Other Pacific Islander and American Indian/Alaskan Native]); White was the reference category. Due to lack of representation across cells (Table 1), 'Other' was not entered into regression models. Also due to lack of representation across cells, and lack of clear *a priori* hypotheses, we prioritized the main effects of race/ethnicity, and gender, and did not test for interaction effects (i.e., race category by gender category). Twenty-four separate binary logistic regressions evaluated associations of gender (three categories) and race/ethnicity (five categories) with each ED symptom. Adult status (adult = 1, child = 0) was a covariate in each model, and for all variables of interest, presence = 1 and absence = 0. Analyses were conducted using SPSS (Version 27).

Results

Descriptive Characteristics

Of the total sample ($N = 13658$), $n = 10069$ (73.7%) were identified as adults. Those for whom age was recorded ($n = 8416$) ranged from age 8–76; $M(SD) = 25.65$ (11.69). A majority of callers ($n = 8079$; 59.2%) were patients, followed by family members ($n = 3593$; 26.3%), or professionals ($n = 1986$; 14.5%). Gender categories included female ($n = 10967$; 80.3%), male ($n = 2292$; 16.8%), TFS ($n = 72$; .5%), TMS ($n = 83$; .6%) and NB ($n = 244$; 1.8%) (Table 1). Racial categories included White ($n = 10556$; 77.3%), Hispanic/Latinx ($n = 978$; 7.2%), Bi/Multi-racial ($n = 823$; 6.0%), Black ($n = 640$; 4.7%), Asian ($n = 601$; 4.4%), Hawaiian/Other Pacific Islander ($n = 20$; .1%), and American Indian/Alaskan Native ($n = 40$; .3%). For purposes of the current study, Hawaiian/Other Pacific Islander and American Indian/Alaskan Native were considered 'Other' ($n = 60$; .4%).

Chi-square tests

There were significant differences among gender groups in the proportion of those with each ED diagnosis, with small-medium effects (all ps .001, Cramer's V range: .04 –.14; Table 2). In the full sample, females represented the largest participant count for all EDs.

Females and males were most likely to be diagnosed with AN. The most common diagnosis for TFS, TMS and NB was also AN; these proportions were not significantly different than that for females. Females had the greatest count with avoidant restrictive food intake disorder (ARFID), followed by males; however, TFS had the greatest proportion of those with this disorder. Females had the greatest proportion of those with bulimia nervosa (BN), but differences in these proportions compared to TFS, TMS and NB were not significant.

There were significant differences among racial/ethnic groups in the proportion of those with a diagnosis of BED, AN, or BN with small-medium effects (all ps < .001, Cramer's V range: .04– .11; Table 3). Whites, Hispanic/Latinx, Bi/Multi-racial and Asian participants were most likely to be diagnosed with AN. Black individuals were most likely to be diagnosed with BED, the proportion of which was significantly higher compared to all other race/ethnic categories. Hawaiian/Other Pacific Islander or American Indian/Alaskan Native participants were most often diagnosed with other specified feeding and eating disorder (OSFED). There were no statistically significant differences across racial/ethnic groups in the proportion of those diagnosed with ARFID or OSFED (all ps .005).

Regression Analyses

All full regression models explained significant variance in each outcome (all ps < .001, Table 4). Adult status was a significant covariate in all models with the exception of over-exercise; in this model, youth endorsed over-exercise more frequently, but the difference was not significant. Adults were significantly more likely to endorse all symptoms with the exception of four more often reported by youth: calorie counting, food avoidance, use of Pro Ana/Mia websites (i.e., websites promoting AN and BN, respectively), and restriction.

There were significant main effects for gender across all models. Compared to females (reference category), males were significantly less likely to report all symptoms (all ps < .001). Also compared to females, those identifying as gender minority (i.e., group comprised of TMS, TFS and NB) were significantly less likely to report binge eating, calorie counting, categorizing food, excessive guilt, food avoidance, laxative use, over-exercise, restricting, and strong food cravings.

Compared to Whites (reference category), there were significant main effects of race/ethnicity across all models. Black individuals were significantly less likely to report binge eating, calorie counting, categorizing food, chewing/spitting, derogatory self-talk, diet pills, diuretics, excessive guilt, food avoidance, food journaling, laxative use, medication misuse, over-exercise, pro Ana/Mia websites, purging, restricting, strong food cravings and water loading.

Asian individuals were significantly less likely than Whites to report all symptoms (all ps < .05). Hispanic/Latinx were significantly less likely than Whites to report calorie counting, categorizing food, derogatory self-talk, diuretics, emotional eating, excessive guilt, food avoidance, food journaling, night eating, nocturnal-related eating, over-exercise, restricting, and strong food cravings. Bi/Multi-racial participants were significantly less likely than Whites to report derogatory self-talk, food avoidance, night eating, over-exercise, and restricting.

Discussion

This study investigated patterns in eating pathology among individuals seeking treatment for transdiagnostic ED symptoms across gender and racial/ethnic categories. Overall trends in symptom report were consistent with the female-centered diagnostic framework prominent across ED literature, with a greater proportion of females comprising the sample, as well as endorsing a majority of ED symptoms compared to rates within other gender groups.

Within all gender groups, the greatest proportion of participants were diagnosed with AN. Of note, comparisons of proportions between females and males for BED, and among females, TFS, TMS and NB for AN were not significantly different, suggesting comparable prevalence rates within these sub-groups for these disorders. Reported ratios of AN and BN for females and males in the current sample (i.e., 11:1) largely followed published estimates (10:1 (American Psychiatric Association, 2013).

Within racial/ethnic groups, Whites, Hispanic/Latinx, Bi-Multi-racial and Asian participants were most likely to be diagnosed with AN. Comparing across all groups, Black individuals were significantly more likely to be diagnosed with BED, supporting prior work indicating Black adults report more frequent binge eating episodes than Whites (Lydecker & Grilo, 2016). In the current sample, Hispanic/Latinx had the highest proportion of those diagnosed with BN, in alignment with prior work among Hispanic/Latinx youth (Swanson, 2011). However, our findings differ from prior work suggesting that BED is the most commonly diagnosed ED among Hispanic/Latinx populations across the lifespan (Kolar et al., 2016; Perez et al., 2016). One possible explanation for findings in the current study may be related to rates of OSFED, which were fairly high across all race/ethnicities including among Blacks and Hispanic/Latinix. This pattern may reflect a tendency towards assigning a diagnosis of OSFED when it was unclear if the frequency of behaviors met criteria for another ED diagnosis such as BED.

Findings from regression analyses mirrored patterns seen in the literature, whereby males were significantly less likely than females to report all symptoms. This was somewhat surprising for over-exercise, given that this behavior has been reported more equitably across binary gender in both adolescent (Mond et al., 2014) and adult (Bentley et al., 2014) samples. Four other symptoms were reported significantly more often among youth: calorie counting, food avoidance, use of pro Ana/Mia websites, and restriction, symptoms that may be important targets of clinical prevention and intervention efforts among children and adolescents.

Gender minority status (i.e., TFS, TMS, NB) was a significant predictor in several models, indicating that these individuals were significantly less likely than females to report some ED symptoms (e.g., binge eating, over-exercise, restricting). Current study findings differ somewhat from recent work demonstrating higher risk among transgender youth for fasting, use of diet pills and laxatives compared to cisgender peers (Guss et al., 2016). While the current sample included youth, 71% of those with gender minority status were adult; future work might further explore ED pathology as it differs across age among those who identify as TMS, TFS, or NB.

Main effects of racial/ethnic group differed considerably, relative to specific symptoms. Black individuals were significantly less likely than Whites to report binge eating, which was surprising given evidence from prior work, mentioned above (Lydecker & Grilo, 2016). Of note, Black individuals were less likely to report compulsive overeating and emotional eating than Whites, but at a level that did not reach significance, suggesting that these symptoms may have been comparable within these two racial categories. The semantics of how to define binge-eating behavior has been contested across the ED field for some time, including in confirming the validity of the construct of loss-of-control which is required to qualify binge eating (e.g., Goldschmidt, 2017). Some overeating behavior may not meet the objective size or loss of control to be considered 'binge eating.' However, the experience of overeating (i.e., subthreshold binge eating) may be deeply distressing and negatively impact quality of life. Given that our findings support elevated rates of BED among Black individuals, and rates of compulsive overeating and emotional eating that did not differ significantly from Whites, future screening of, and the use of behavioral interventions to address both full and subthreshold binge eating, may be of particular importance within this racial subgroup.

Asians were significantly less likely to report all symptoms, compared to Whites. Findings for all regression models were reported without a Bonferroni correction to adjust the significance threshold. If a correction was generated based on $df = 7$ (i.e., $p = .05/7 = .007$), there are several symptoms where Asians would not differ significantly from Whites (e.g., ipecac, pro Ana/Mia websites, night eating), suggesting these may be symptoms to be attuned to in the context of screening and assessment.

Many symptoms that were reported less among Hispanic/Latinx than Whites (e.g., ipecac, laxatives, medication misuse, pro Ana/Mia websites, purging) were non-significant, but these symptoms are arguably relatively extreme and dangerous. Similarly, for Bi/Multi-racial participants, many behaviors did not reach a level of significance when compared with Whites, and of particular interest, Bi/Multi-racial participants were *more* likely than Whites to report binge eating, diet pills, diuretics, enema/suppository, ipecac, laxative use, nocturnal-related eating, pro Ana/Mia websites, and purging. These comparable rates suggest that as a sub-group, Bi/Multi-racial individuals may represent those with elevated rates of ED symptoms. While we typically rely upon statistical significance to determine the relative value of a finding in a research context, it is important that we do not underestimate the clinical meaning of elevated rates of a myriad of symptoms in an entire racial/ethnic subgroup, particularly symptoms that are ostensiby extreme weight-control behaviors (e.g., diet pills, laxative use). Our findings support thorough screening of even those symptoms that may have a low base rate (e.g., ipecac), particularly among Bi/Multiracial individuals.

Overall findings do not signify specific representation based on minority gender identification in the current study sample. However, it is difficult to determine whether findings reflect a greater proportion of females with AN who may (i) fit the traditional stereotype for this disorder, and therefore are more frequently screened for ED symptoms and/or (ii) be more likely to be encouraged to seek treatment due to medical acuity suggested by low weight (compared to those with EDs that may be more concealed within a higher body weight). Further, while race/ethnic diversity does not seem to highlight

increased representation of eating pathology, it is possible that individuals who identify as White may have less barriers to seeking treatment, and are therefore comparatively over-represented in the current sample. It is critical that continued efforts in screening and intervention in community settings be proliferated; while our findings represent evidence from a large number of individuals, the study sample may still reflect larger systemic bias in treatment-seeking for mental health issues, and ED-stigma in particular. Therefore, while findings underscore that EDs are not culture bound, the current study only provides a preliminary characterization of a treatment-seeking sample. Future potential research paradigms expanding upon the current study findings include investigating factors that may specifically impact representation (e.g., mental health and ED stigma; socioeconomic status).

Limitations

This study has several limitations, some already noted. Assessment of ED symptoms and diagnosis in this screening process was not made using a gold standard assessment, designed specifically for ED diagnosis. In addition, questions of gender and race/ethnicity preceded other ED symptom questions, allowing for potential bias in the way that an assessor may evaluate and record subsequent symptoms. The data also do not include delineation of atypical AN, as it is subsumed under OSFED. Despite these limitations, rates of ED diagnoses relative to binary gender largely followed DSM-5 estimates (APA, 2013) and generally align with evidence across non-White samples (Lydecker & Grilo, 2016; Perez et al., 2016).

The current study also did not include assessment of body image dissatisfaction or sexual orientation, critical domains that should be considered in future similar work, particularly given research showing increased ED pathology among those who identify as both gender and sexual minority (Calzo et al., 2017; Diemer et al., 2015). Further, we do not report on cross-sex hormone use, or transition status of TFS or TMS, clinical details that may be particularly important in future clinical and research contexts (Testa et al., 2017). Future research is also needed to consider socio-economic status, and nuances of race/ethnicity; for example, minimal research to date has examined within-group heterogeneity (e.g., Asian-Americans of different origins) or the impact of acculturation stress (Hun et al., 2021).

Due to a lack of representation across cells and due to a lack of clear *a priori* hypotheses, we did not test for interaction effects. For example, while some evidence indicates higher rates of binge eating among Black individuals compared to Whites (Lydecker & Grilo, 2016), there is limited research regarding eating pathology specifically among Black adults who also identify as gender minority. Only one individual identified as Black and TFS and one as Black and TMS in our sample; with this cell size, a test of interaction effect would not be statistically supported (Moineddin et al., 2007). Accordingly, the current study focused on generating future hypotheses via characterizing a treatment-seeking sample; important future work that expands upon our findings might specifically examine the intersectionality of race/ethnicity and gender in predicting eating pathology in a population that is over-sampled to provide adequate representation of each racial/ethnic and gender category, in order to appropriately support more complex statistical approaches. Relatedly, we acknowledge that

only a modest proportion of the current sample self-identified as minority gender, indicating a potential need for oversampling within this sub-group in future work.

Finally, most study participants telephoned the treatment center on behalf of themselves. While a majority of self-motivated callers was a study strength in securing homogeniety in self-report across the sample, we did not exclude family or professional reporters. While a provider may more effectively report on a patient's symptoms than a family member, this may depend on how well the provider knew the patient at the time of report. Further, while patients might be the most accurate reporters on themselves, family or providers may report more transparently should patients feel increased shame or hesitancy in disclosure. As well, in contrast to the other two categories, family members were more likely to call in on behalf of children than adults, which may have impacted the way in which symptoms were reported in this family member category. These are just a few examples of how we might expect differences in report across groups, but do not believe these trends would be systematic. As such, we chose to retain all reporters as one group for the current study, but acknowledge that there are limitations to this approach. As well, we did not divide analyses by age. Case studies suggest elevated suicidality and eating pathology among gender minority youth (Donaldson et al., 2018; Guss et al., 2016), and less is known about the clinical presentation of this high-risk subgroup, suggesting a need for future inquiry.

Conclusions

Overall current study findings suggest that individuals with female gender and White race may seek treatment from an ED treatment facility with greater frequency than other demographic groups, with comparatively greater report of symptoms. Noted exceptions include Hispanic/Latinx and Bi/Multi-racial individuals, for whom endorsement did not differ significantly from Whites for a majority of symptoms, suggesting that ED pathology is represented comparably across these race/ethnic groups. The current study provides an important characterization of a substantial treatment-seeking sample. While our findings do not delineate specific factors (i.e., barriers to seeking treatment) that may impact the composition of the current sample, they critically affirm the wide-reaching impact of ED pathology, and support robust screening for ED symptomology across varied gender identification, and racial/ethnic diversity.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Participant count stratified by gender and race/ethnic identification category (*n*, % of sample)

Category	Female *n* = 10967	Male *n* = 2292	TFS *n* = 72	TMS *n* = 83	NB *n* = 244
White, *n* = 10556	8525 (62.4)	1736 (12.7)	58 (.4)	62 (.5)	175 (1.3)
Hispanic/Latino, *n* = 978	771 (5.6)	186 (1.4)	5 (.04)	5 (.04)	11 (.08)
Bi/multi-racial, *n* = 823	632 (4.6)	146 (1.1)	7 (.05)	12 (.09)	26 (.2)
Black, *n* = 640	505 (3.7)	118 (.9)	1 (.03)	1 (.03)	15 (.1)
Asian, *n* = 601	486 (3.6)	94 (.7)	1 (.03)	3 (.02)	17 (.1)
Hawaiian/Other Pacific Islander, *n* = 20	16 (.1)	4 (.03)	0 (0)	0 (0)	0 (0)
American Indian/Alaskan Native, *n* = 40	32 (.2)	8 (.06)	0 (0)	0 (0)	0 (0)

Note: *N* = 13658; irrespective of adult status. TFS = transfeminine spectrum, those assigned male at birth and identifying as women or on the feminine spectrum; TMS = transmasculine spectrum, those assigned female at birth and identifying as men or on the masculine spectrum; NB = individuals identifying as gender non-binary.

Table 2.

Eating disorder diagnosis by gender identification category (n, % within gender)

Variable	Female $n = 10967$	Male $n = 2292$	TFS $n = 72$	TMS $n = 83$	NB $n = 244$	Full model χ^2 p-value	Cramer's V
BED	892_a (8.1)	180_a (7.9)	$3_{a,b}$ (4.2)	$1_{a,b}$ (1.2)	5_b (2.0)	.001	.04
AN	2926_a (26.7)	245_b (10.7)	18_a (25.0)	23_a (27.7)	47_a (19.3)	< .001	.14
Restricting	1907_a (17.4)	152_b (6.6)	$7_{a,b}$ (9.7)	17_a (20.5)	33_a (13.5)	< .001	.10
Binge/Purge	1002_a (9.1)	90_b (3.9)	10_a (13.9)	$6_{a,b}$ (7.2)	$14_{a,b}$ (5.7)	< .001	.10
ARFID	228_a (2.1)	130_b (5.7)	5_b (6.9)	$0_{a,b}$ (0)	$9_{a,b}$ (3.7)	< .001	.09
BN	919_a (8.4)	72_b (3.1)	$5_{a,b}$ (6.9)	$5_{a,b}$ (6.0)	$15_{a,b}$ (6.1)	< .001	.08
OSFED	1631_a (14.9)	139_b (6.1)	$8_{a,b}$ (11.1)	14_a (16.9)	42_a (17.2)	< .001	.10

Note: $N = 13658$. Given missing data, column totals do not equate to the full sample values for each gender category assessed; percent reflects the proportion of the entire category sample. Given a Bonferroni correction for 10 pairwise comparisons, each subscript letter denotes a subset of gender categories whose column proportions do NOT differ significantly from each other at the $p < .05/10 = .005$ level. TFS = transfeminine spectrum, those assigned male at birth and identifying as men or on the masculine spectrum; TMS = transmasculine spectrum, those assigned female at birth and identifying as men or on the feminine spectrum; NB = individuals identifying as gender non-binary; BED = binge eating disorder; AN = anorexia nervosa, italics represent AN subtypes and represent the subdivision within AN, when indicated. For some participants, a diagnosis of AN was given, without a subtype specifier. ARFID = avoidant-restrictive food intake disorder; BN = bulimia nervosa; OSFED = other specified feeding and eating disorder.

Table 3.

Eating disorder diagnosis by race/ethnic identification (n, % of race/ethnic category)

Variable	White $n = 10556$	Hispanic/Latino $n = 978$	Bi/multi-racial $n = 823$	Black $n = 640$	Asian $n = 601$	Other $n = 60$	Full model χ^2 p-value	Cramer's V
BED	852$_a$ (8.1)	78$_{a,c}$ (8.0)	50$_{a,b}$ (6.1)	77$_c$ (12.0)	21$_b$ (3.5)	3$_{a,b,c}$ (5.0)	< .001	.05
AN	2739$_a$ (25.9)	181$_b$ (18.5)	172$_b$ (20.9)	45$_c$ (7.0)	115$_b$ (19.1)	7$_{a,b,c}$ (11.7)	< .001	.11
Restricting	1780$_a$ (16.9)	113$_b$ (11.6)	111$_{a,b}$ (13.5)	28$_c$ (4.4)	80$_{a,b}$ (13.3)	4$_{a,b,c}$ (6.7)	< .001	.08
Binge/Purge	943$_a$ (8.9)	67$_a$ (6.9)	57$_a$ (6.9)	17$_b$ (2.7)	35$_{a,b}$ (5.8)	3$_{a,b}$ (5.0)	< .001	.08
ARFID	298$_a$ (2.8)	28$_a$ (2.9)	20$_a$ (2.4)	12$_a$ (1.9)	11$_a$ (1.8)	3$_a$ (5.0)	.36	.02
BN	755$_a$ (7.2)	112$_b$ (11.5)	63$_{a,b}$ (7.7)	40$_a$ (6.3)	41$_a$ (6.8)	5$_{a,b}$ (8.3)	< .001	.04
OSFED	1448$_a$ (13.7)	120$_a$ (12.3)	112$_a$ (13.6)	72$_a$ (11.3)	73$_a$ (12.1)	9$_a$ (15.0)	.36	.02

Note: N = 13658. Given missing data, column totals do not equate to the full sample values for each race/ethnicity category assessed; percent reflects the proportion of the entire category sample. Given a Bonferroni correction for 15 pairwise comparisons, each subscript letter denotes a subset of race/ethnic categories whose column proportions do NOT differ significantly from each other at the $p < .05/15 =$ .003 level. BED = binge eating disorder; AN = anorexia nervosa, italics represent AN subtypes and represent the subdivision within AN, when indicated. For some participants, a diagnosis of AN was given, without a subtype specifier. ARFID = avoidant-restrictive food intake disorder; BN = bulimia nervosa; OSFED = other specified feeding and eating disorder. Other group includes individuals identifying as Hawaiian/ Other Pacific Islander or American Indian/Alaskan Native.

Table 4.

Associations among gender, race/ethnic identity and disordered eating symptoms

DV	Model	Predictors	χ²	Nagelkerke R²	B	SE	Wald	p	Exp (B)	95% CI
Binge Eating	**1**		771.43	.07				<.001		
		Adult			0.91	0.04	434.68	<.001	2.48	[2.27, 2.70]
		Male			−0.83	0.05	251.38	<.001	0.44	[.39, .48]
		Minority Gender			−0.22	0.11	4.05	.04	0.81	[.65, .99]
		Hispanic/Latinx			0.10	0.07	2.09	.15	1.11	[.97, 1.27]
		Black			−0.31	0.09	12.45	<.001	0.74	[.62, .87]
		Bi/Multiracial			0.02	0.08	0.04	.83	1.02	[.88, 1.18]
		Asian			−0.32	0.09	12.42	<.001	0.73	[.61, .87]
Calorie Counting	**2**		759.53	.07				<.001		
		Adult			−0.09	0.04	5.17	.02	0.91	[.84, .99]
		Male			−1.29	0.06	502.10	<.001	0.27	[.25, .31]
		Minority Gender			−0.34	0.11	10.22	.001	0.71	[.58, .88]
		Hispanic/Latinx			−0.46	0.07	38.94	<.001	0.63	[.55, .73]
		Black			−0.97	0.10	95.70	<.001	0.38	[.31, .46]
		Bi/Multiracial			−0.13	0.08	2.71	.10	0.88	[.76, 1.02]
		Asian			−0.33	0.09	13.54	<.001	0.72	[.60, .86]
Categorizing Food	**3**		642.83	.06				<.001		
		Adult			0.18	0.04	18.09	<.001	1.20	[1.10, 1.30]
		Male			−1.15	0.06	381.27	<.001	0.32	[.28, .36]
		Minority Gender			−0.35	0.11	10.05	.002	0.71	[.57, .88]
		Hispanic/Latinx			−0.47	0.08	38.62	<.001	0.63	[.54, .73]
		Black			−1.07	0.11	100.87	<.001	0.34	[.28, .42]
		Bi/Multiracial			−0.05	0.08	0.42	.52	0.95	[.82, 1.11]
		Asian			−0.39	0.09	18.07	<.001	0.67	[.56, .81]
Chewing/Spitting	**4**		273.15	.04				<.001		
		Adult			0.27	0.06	22.08	<.001	1.31	[1.17, 1.47]
		Male			−1.17	0.09	158.20	<.001	0.31	[.26, .37]

DV	Model	Predictors	χ^2	Nagelkerke R^2	B	SE	Wald	p	Exp(B)	95% CI
		Minority Gender			0.11	0.13	0.73	.39	1.12	[.86, 1.45]
		Hispanic/Latinx			−0.05	0.10	0.31	.58	0.95	[.79, 1.14]
		Black			−0.71	0.15	23.62	<.001	0.49	[.37, .66]
		Bi/Multiracial			−0.14	0.11	1.76	.19	0.87	[.71, 1.07]
		Asian			−0.31	0.13	5.68	.02	0.74	[.57, .95]
Compulsive Overeating	5		260.35	.03				<.001		
		Adult			0.97	0.07	188.76	<.001	2.30	[2.30, 3.03]
		Male			−0.32	0.07	19.41	<.001	0.73	[.63, .84]
		Minority Gender			−0.29	0.16	3.26	.07	0.75	[.54, 1.03]
		Hispanic/Latinx			−0.09	0.10	0.78	.38	0.92	[.75, 1.11]
		Black			−0.17	0.12	2.00	.16	0.84	[.67, 1.07]
		Bi/Multiracial			−0.001	0.11	0.00	.99	1.00	[.81, 1.23]
		Asian			−0.27	0.13	4.32	.04	0.76	[.59, .99]
Derogatory Self-talk	6		614.56	.06				<.001		
		Adult			0.14	0.04	11.94	.001	1.16	[1.06, 1.25]
		Male			−1.16	0.06	402.12	<.001	0.31	[.28, .35]
		Minority Gender			−0.27	0.11	6.09	.01	0.77	[.62, .95]
		Hispanic/Latinx			−.046	0.08	38.37	<.001	0.63	[.55, .73]
		Black			−0.76	0.10	61.36	<.001	0.47	[.39, .57]
		Bi/Multiracial			−.018	0.08	5.14	.02	0.84	[.72, .98]
		Asian			−0.45	0.09	23.19	<.001	0.64	[.53, .77]
Diet Pills	7		687.56	.09				<.001		
		Adult			1.45	0.09	283.40	<.001	4.28	[3.62, 5.07]
		Male			−1.47	0.11	173.24	<.001	0.23	[.19, .29]
		Minority Gender			−0.25	0.16	2.35	.13	0.78	[.57, 1.07]
		Hispanic/Latinx			0.13	0.10	1.71	.19	1.14	[.94, 1.38]
		Black			−0.31	0.13	5.62	.02	0.73	[.57, .95]
		Bi/Multiracial			0.08	0.11	0.54	.46	1.09	[.87, 1.35]
		Asian			−0.75	0.16	21.45	<.001	0.47	[.34, .65]

DV	Model	χ^2	Nagelkerke R^2	Predictors	B	SE	Wald	p	Exp(B)	95% CI
Diuretics	**8**	371.88	.06					<.001		
				Adult	1.17	0.09	162.81	<.001	3.23	[2.70, 3.87]
				Male	−1.08	0.11	91.51	<.001	0.34	[.27, .42]
				Minority Gender	−0.17	0.18	0.88	.35	0.85	[.60, 1.20]
				Hispanic/Latinx	−0.44	0.13	10.62	.001	0.65	[.50, .84]
				Black	−0.45	0.16	8.12	.004	0.64	[.47, .87]
				Bi/Multiracial	0.007	0.13	0.003	.95	1.01	[.79, 1.29]
				Asian	−0.68	0.18	14.04	<.001	0.51	[.36, .72]
Emotional Eating	**9**	532.47	.06					<.001		
				Adult	0.98	0.06	315.76	<.001	2.68	[2.40, 2.98]
				Male	−0.72	0.06	126.10	<.001	0.49	[.43, .55]
				Minority Gender	−0.21	0.13	2.77	.10	0.81	[.64, 1.04]
				Hispanic/Latinx	−0.17	0.08	4.30	.04	0.84	[.71, .99]
				Black	−0.12	0.10	1.41	.23	0.89	[.74, 1.08]
				Bi/Multiracial	−0.01	0.09	0.02	.89	0.99	[.83, 1.18]
				Asian	−0.30	0.11	7.79	.005	0.74	[.60, .92]
Enema/Suppository	**10**	115.37	.03					<.001		
				Adult	0.81	0.13	39.12	<.001	2.24	[1.74, 2.88]
				Male	−1.13	0.18	37.77	<.001	0.32	[.22, .46]
				Minority Gender	−0.26	0.29	0.85	.36	0.77	[.45, 1.35]
				Hispanic/Latinx	−0.27	0.20	1.96	.16	0.76	[.52, 1.12]
				Black	−0.46	0.25	3.37	.07	0.63	[.39, 1.03]
				Bi/Multiracial	0.11	0.18	0.36	.55	1.12	[.78, 1.60]
				Asian	−0.82	0.31	7.12	.008	0.44	[.24, .80]
Excessive Guilt	**11**	840.63	.08					<.001		
				Adult	0.30	0.04	54.00	<.001	1.35	[1.24, 1.46]
				Male	−1.27	0.05	589.30	<.001	0.28	[.25, .31]
				Minority Gender	−0.46	0.10	19.50	<.001	0.63	[.52, .78]
				Hispanic/Latinx	−0.33	0.07	22.08	<.001	0.72	[.63, .83]

DV	Model	Predictors	χ²	Nagelkerke R²	B	SE	Wald	p	Exp (B)	95% CI
		Black			−0.71	0.09	66.78	<.001	0.49	[.41, .58]
		Bi/Multiracial			−0.10	0.08	1.88	.17	0.90	[.78, 1.05]
		Asian			−0.45	0.09	26.23	<.001	0.64	[.54, .76]
Food Avoidance	12		631.71	.06				<.001		
		Adult			−0.25	0.04	39.69	<.001	0.78	[.72, .84]
		Male			−1.02	0.05	380.92	<.001	0.36	[.33, .40]
		Minority Gender			−0.33	0.11	9.89	.002	0.72	[.59, .88]
		Hispanic/Latinx			−0.40	0.07	31.66	<.001	0.67	[.59, .77]
		Black			−1.01	0.10	110.03	<.001	0.37	[.30, .44]
		Bi/Multiracial			−0.17	0.08	4.92	.03	0.85	[.73, .98]
		Asian			−0.47	0.09	28.10	<.001	0.63	[.53, .74]
Food Journaling	13		514.81	.06				<.001		
		Adult			0.43	0.05	71.63	<.001	1.54	[1.40, 1.71]
		Male			−1.34	0.08	275.17	<.001	0.26	[.22, .31]
		Minority Gender			−0.18	0.12	2.03	.16	0.84	[.66, 1.07]
		Hispanic/Latinx			−0.44	0.09	23.00	<.001	0.65	[.54, .77]
		Black			−0.60	0.12	26.84	<.001	0.55	[.44, .69]
		Bi/Multiracial			0.00	0.09	0.00	1.00	1.00	[.84, 1.19]
		Asian			−0.38	0.11	11.51	.001	0.69	[.55, .85]
Ipecac	14		87.44	.03				<.001		
		Adult			0.78	0.15	25.59	<.001	2.18	[1.61, 2.95]
		Male			−1.21	0.23	27.38	<.001	0.30	[.19, .47]
		Minority Gender			−0.04	0.31	0.02	.90	0.96	[.52, 1.77]
		Hispanic/Latinx			−0.45	0.25	3.23	.07	0.64	[.39, 1.04]
		Black			−0.64	0.33	3.83	.050	0.53	[.28, 1.00]
		Bi/Multiracial			0.02	0.23	0.006	.94	1.02	[.66, 1.58]
		Asian			−1.07	0.42	6.70	.01	0.34	[.15, .77]
Laxative Use	15		731.69	.08				<.001		
		Adult			0.90	0.06	230.18	<.001	2.45	[2.18, 2.75]

DV	Model	χ^2	Nagelkerke R^2	Predictors	B	SE	Wald	p	Exp(B)	95% CI
				Male	−1.52	0.09	281.78	<.001	0.22	[.18, .26]
				Minority Gender	−0.38	0.14	7.49	.006	0.69	[.52, .90]
				Hispanic/Latinx	−0.04	0.09	0.18	.67	0.96	[.81, 1.14]
				Black	−0.48	0.12	16.72	<.001	0.62	[.50, .78]
				Bi/Multiracial	0.02	0.09	0.07	.79	1.03	[.85, 1.23]
				Asian	−0.73	0.13	30.91	<.001	0.48	[.37, .62]
Medication Misuse	16	260.98	.05					<.001		
				Adult	1.21	0.11	115.01	<.001	3.35	[2.68, 4.17]
				Male	−0.97	0.13	54.42	<.001	0.38	[.29, .49]
				Minority Gender	0.12	0.19	0.38	.54	1.13	[.77, 1.64]
				Hispanic/Latinx	−0.18	0.14	1.65	.20	0.83	[.63, 1.10]
				Black	−0.83	0.22	13.95	<.001	0.44	[.28, .68]
				Bi/Multiracial	−0.17	0.16	1.18	.28	0.84	[.62, 1.15]
				Asian	−0.83	0.23	12.86	<.001	0.44	[.28, .69]
Night Eating	17	344.97	.04					<.001		
				Adult	0.99	0.07	218.89	<.001	2.68	[2.35, 3.06]
				Male	−0.55	0.07	57.20	<.001	0.58	[.50, .67]
				Minority Gender	−0.12	0.14	0.74	.39	0.88	[.67, 1.17]
				Hispanic/Latinx	−0.27	0.10	7.04	.008	0.77	[.63, .93]
				Black	−0.07	0.11	0.37	.54	0.94	[.75, 1.16]
				Bi/Multiracial	0.01	0.10	0.02	.89	1.02	[.83, 1.24]
				Asian	−0.26	0.12	4.34	.04	0.77	[.61, .99]
Nocturnal-related Eating	18	180.50	.03					<.001		
				Adult	0.88	0.09	103.81	<.001	2.42	[2.04, 2.86]
				Male	−0.51	0.10	28.82	<.001	0.60	[.50, .72]
				Minority Gender	−0.14	0.19	0.54	.46	0.87	[.61, 1.26]
				Hispanic/Latinx	−0.37	0.14	7.39	.007	0.69	[.53, .90]
				Black	0.09	0.14	0.40	.53	1.09	[.84, 1.42]
				Bi/Multiracial	0.11	0.13	0.81	.37	1.12	[.88, 1.43]

DV	Model	Predictors	χ²	Nagelkerke R²	B	SE	Wald	p	Exp(B)	95% CI
		Asian			−0.54	0.18	9.05	.003	0.58	[.41, .83]
Over-exercise	19		757.75	.07				<.001		
		Adult			−0.07	0.04	3.21	.07	0.93	[.86, 1.01]
		Male			−1.21	0.06	462.07	<.001	0.30	[.27, .33]
		Minority Gender			−0.37	0.11	12.07	<.001	0.69	[.56, .85]
		Hispanic/Latinx			−0.46	0.07	39.69	<.001	0.63	[.55, .73]
		Black			−1.20	0.11	132.60	<.001	0.30	[.24, .37]
		Bi/Multiracial			−0.17	0.08	4.98	.03	0.84	[.73, .98]
		Asian			−0.46	0.09	25.37	<.001	0.63	[.53, .76]
Pro Ana/Mia Websites	20		342.22	.04				<.001		
		Adult			−0.12	0.05	5.15	.02	0.88	[.80, .98]
		Male			−1.49	0.10	204.25	<.001	0.23	[.18, .28]
		Minority Gender			0.18	0.13	1.97	.16	1.20	[.93, 1.54]
		Hispanic/Latinx			−0.14	0.10	1.97	.16	0.87	[.72, 1.06]
		Black			−0.60	0.14	18.23	<.001	0.55	[.42, .72]
		Bi/Multiracial			0.07	0.10	0.50	.48	1.07	[.88, 1.30]
		Asian			−0.29	0.13	5.22	.02	0.75	[.58, .96]
Purging	21		756.55	.07				<.001		
		Adult			0.35	0.04	69.98	<.001	1.42	[1.31, 1.54]
		Male			−1.28	0.06	484.81	<.001	0.28	[.25, .31]
		Minority Gender			−0.04	0.10	0.17	.68	0.96	[.78, 1.17]
		Hispanic/Latinx			−0.02	0.07	0.07	.80	0.98	[.86, 1.13]
		Black			−0.80	0.10	68.77	<.001	0.45	[.37, .55]
		Bi/Multiracial			0.05	0.08	0.37	.54	1.05	[.90, 1.22]
		Asian			−0.47	0.09	26.04	<.001	0.63	[.52, .75]
Restricting	22		1144.09	.11				<.001		
		Adult			−0.22	0.04	25.85	<.001	0.80	[.74, .87]
		Male			−1.41	0.05	834.94	<.001	0.25	[.22, .27]
		Minority Gender			−0.38	0.11	12.48	<.001	0.69	[.56, .85]

DV	Model	Predictors	χ^2	Nagelkerke R^2	B	SE	Wald	p	Exp(B)	95% CI
		Hispanic/Latinx			−0.41	0.07	33.88	<.001	0.66	[.58, .76]
		Black			−1.20	0.09	192.19	<.001	0.30	[.26, .36]
		Bi/Multiracial			−0.18	0.08	5.57	.02	0.83	[.72, .97]
		Asian			−0.57	0.09	42.92	<.001	0.57	[.48, .67]
Strong Food Cravings	23		444.14	.05				<.001		
		Adult			0.80	0.06	212.25	<.001	2.22	[1.99, 2.47]
		Male			−0.78	0.07	135.50	<.001	0.46	[.40, .52]
		Minority Gender			−0.36	0.13	7.30	.007	0.70	[.54, .91]
		Hispanic/Latinx			−0.38	0.09	17.90	<.001	0.69	[.58, .82]
		Black			−0.35	0.11	10.71	.001	0.71	[.58, .87]
		Bi/Multiracial			−0.09	0.09	0.92	.34	0.92	[.77, 1.10]
		Asian			−0.34	0.11	9.76	.002	0.71	[.57, .88]
Water Loading	24		369.71	.04				<.001		
		Adult			0.31	0.05	38.26	<.001	1.36	[1.23, 1.50]
		Male			−1.09	0.07	220.08	<.001	0.34	[.29, .39]
		Minority Gender			−0.01	0.12	0.002	.97	1.00	[.79, 1.26]
		Hispanic/Latinx			−0.12	0.08	1.93	.17	0.89	[.76, 1.05]
		Black			−0.76	0.12	38.91	<.001	0.47	[.37, .59]
		Bi/Multiracial			−0.06	0.09	0.49	.48	0.94	[.79, 1.12]
		Asian			−0.24	0.11	4.96	.03	0.79	[.64, .97]

Note: N = 13658, *df* = 7. Exp(*B*) = Odds ratio. Child status, White race, and female gender = unique reference categories. TFS = transfeminine spectrum, those assigned male at birth and identifying as women or on the feminine spectrum; TMS = transmasculine spectrum, those assigned female at birth and identifying as men or on the masculine spectrum; NB = individuals identifying as gender non-binary; Night eating = consuming the majority of calories for the day after 7pm but before going to bed; Nocturnal-related eating = waking up from sleep, consciously or unconsciously, and eating; Pro Ana/Mia refers to websites that promote anorexia nervosa and bulimia nervosa, respectively.