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Eating Disorders in Males

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INTRODUCTION AND HISTORICAL CONTEXT

Eating disorders (EDs) are pernicious psychiatric illnesses associated with significant psychiatric and medical morbidity and mortality, and at significant personal, familial, and societal costs.[1] Historically, EDs are among the most gendered of psychiatric illnesses, and it was not until nearly a century after anorexia nervosa (AN) was first clinically described[2] that the notion of male ED presentation was broached in the extant literature.[3] Particularly as amenorrhea, historically a hallmark feature of AN, does not have a direct endocrine equivalent in male patients, most twentieth century literature does not recognize the disorder if not among females. This notion eventually gave way to the realization that males account for a substantial number of cases, with more recent evidence suggesting that males comprise approximately 1 in 4 presentations of bulimia nervosa (BN) and AN.[4] Thus, it is no longer tenable to suggest that EDs are relatively uncommon among males, or to assume that males account for a negligible proportion of the public health burden associated with EDs. However, as an unfortunate consequence of historical inattention, the way in which EDs are assessed and treated is largely reflective of a female-oriented diagnostic framework. Further, less than 1% of current peer-reviewed, published articles relate specifically to male presentation of AN,[5] resulting in a conceptualization of the clinical profile of ED among males as largely an extrapolation of findings from female samples. This approach is predicated on the notion that the presentation of ED is similar across the sexes, although mounting evidence now suggests noteworthy differences. In the following discussion of this broad subject domain, current relevant evidence on EDs among males is synthesized, and clinical and theoretic implications are discussed along with critical directions for future research.

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EPIDEMIOLOGY AND PREVALENCE RATES

It is likely that prevalence rates for male ED cited in much of the recent history of research is a gross underestimate. Emerging evidence in community settings now indicates that rates of ED in males are increasing at a faster rate than for females, and with no degree of difference in clinical severity of symptoms across the sexes.[6,7] Some population-based data suggest that there are no sex differences in the age of presentation of EDs,[8] including for early-onset (<14 years old) cases.[9] Specifically, preadolescent presentation of ED in males comprises more than 1 in 4 cases in specialty clinics in Australia[9] and as many as one-third of cases in the United Kingdom.[10] Further, ED diagnosis in non-ED settings (ie, gastroenterology) demonstrate increased rates in males, with nearly two-thirds of avoidant/restrictive food intake disorder (ARFID) diagnoses presenting among preadolescent males.[11] Recent study of male adolescents that amalgamated both full and partial EDs indicated prevalence rates of full or partial BN (0.2%), and full or partial binge eating disorder (BED) (0.4%) to be lower than in females.[12] These rates cited in adolescents are lower than in adult males, which might be reflective of some data that indicate later onset of EDs in males compared with females.[4] Some evidence suggests that later onset in males may be more specific to AN than for other EDs.[13] However, given the conflicting evidence for age of onset for ED among males, further study on prevalence is critical, particularly in population-based, primary care, and community settings.[7,14]

SIMILARITIES AND DIFFERENCES IN PRESENTATION OF EATING DISORDERS ACROSS THE SEXES

Along with the paucity of empirical research devoted solely to male populations, many full-scale clinical trials continue to exclude male patients on the premise of their assumed atypicality.[14] Although many symptoms of ED among males may indeed be qualitatively different than for females, gold standard assessments for EDs demonstrate a lack of sensitivity in detecting and qualifying ED symptoms in males.[15,16] Many EDs in males may be undetected, or at least indexed with symptoms that appear less in number or in severity. One of the hallmark features of ED, overvaluation of weight and shape, is specifically predicated on internalization of a thin ideal. The widespread screening efforts for thinness-oriented ED behaviors that support this cardinal feature (eg, caloric restriction) are largely due to researchers who must extrapolate ED symptoms from female samples. However, this assessment strategy does not take into account differences in body image among males. Specifically, the ideal body type that is typically presented among males, and henceforth potentially idealized and internalized, centers on muscularity. Subsequently, with this priority on screening for symptoms that may not directly apply to many males, lower scores are consistently reported among males in standard ED assessments.[16,17] In 1 study of adolescent high school students, only 4.9% of boys reported overvaluation of body weight or shape compared with 24.2% of girls.[18] Future studies might aid in confirming whether these findings support the notion that body image distortion in males has later onset, or if these results are instead a reflection of insufficient illness detection by focusing on the thin ideal more typical in women. In the following sections, prevalence estimates, as well as factors

that are both similar and divergent across the sexes in presentation of transdiagnostic EDs, are presented.

Anorexia Nervosa

According to the latest *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), diagnostic criteria for AN consists of

1. Persistent restriction of energy intake
2. Intense fear of weight gain or becoming fat
3. Disturbance in how the body is experienced or undue influence of shape and weight on self-evaluation[19]

Criteria from DSM-IV that have since been abandoned include amenorrhea and endocrine dysfunction, which has no direct equivalent for men but might manifest in loss of sexual potency or decreased testosterone. In community-based samples, the lifetime prevalence of AN for males is estimated at 0.1% to 0.3%.[4,8,20–22] In contrast, in clinical settings, rates of AN are considerably increased, with males constituting 5% to 11% of individuals with EDs (including, but not limited to, AN) receiving specialist treatment. The discrepancy in these estimates is likely because of differences across the sexes in treatment seeking and mental health stigma that may disproportionately affect males with EDs.[7] Beyond inconsistencies in presentation for treatment, symptoms associated with AN may appear subtly different across the sexes. For example, instead of a goal of emaciation as might be commonly expressed among females with AN, dietary restriction and restraint among males with AN may be more oriented toward leanness, in the interest of enhancing muscle definition.[23] Consistent with this premise, adolescent males with AN are more likely to report a desire to have "6-pack" abdominal muscles than to have a flat stomach.[15]

Possibly a result of a lack of nuance in screening for such subtleties in symptom presentation, in a population of high school students, adolescent males reported episodes of extreme dietary restriction at least 3 times per week at a rate of 2.3%, a prevalence estimate that was considerably lower than for females (11.5%).[18] In this same sample, regular compulsive exercise (specifically motivated by a reported drive for thinness) was reported by 5.3 % of males (vs 5.4% of females), with no sex differences evident in the proportion of participants who reported this symptom. The presence of compulsive exercise, a symptom commonly expressed across EDs but particularly characteristic of AN, has been found to be similar in male and female adolescents.[20,24]

Bulimia Nervosa

Bulimia nervosa is characterized by recurrent episodes of binge eating, the use of 1 or more compensatory strategies intended to offset the impact of binge episodes, and overvaluation of weight and shape.[19] Lifetime prevalence estimates for BN among males range between 0.1% and 1.6%[4,8,20,21] with males comprising approximately one-third of all BN cases in the general population.[4,25] Compared with adult samples with BN, there is little empirical evidence of the adolescent experience of BN, and even less so among males. That said, there

are some indications that male BN, similar to male AN, presents with nuanced differences in symptom presentation.

Some of these differences include that within bulimic syndrome symptoms, boys report less eating concerns and might not experience as much loss of control as females of the same age group.[18] These specific findings are reflected in lower scores for BN behaviors on standard assessment measures. However, in a large sample of adolescent boys, 6.0% of boys reported regular episodes of objective binge eating, and 8.3% reported regular episodes of loss of control eating.[18] Another behavior that is likely more common among boys specifically endorsing body image concerns related to muscularity (described in more detail later) is a phenomenon referred to as a "cheat meal." This term refers to the consumption of a large number of calories as a periodic deviation from what is customarily a muscularity-oriented dietary regimen, in a manner that specifically includes foods that are ordinarily prohibited or restricted.[5,26,27] Notably, even though these meals typically represent the number of calories that might be consumed in an objective binge episode (eg, 1000–9000 calories), they are believed to augment metabolic function to continue to achieve muscular bulk.[5,26] These cheat meals can also be accompanied by subjective loss of control, as well as compensation (eg, increased workout activity), but it remains unclear if this behavior is also associated qualitatively with distress.[26]

Binge Eating Disorder

Review of the extant adult literature indicates that binge eating seems to be the most common ED behavior in males, with a prevalence nearly equivalent to that of females among adult samples based on DSM-IV criteria.[4,7] Current DSM-5 diagnostic criteria for BED requires that objective binge eating episodes must occur with a minimum frequency of once per week for 3 months.[19] These current criteria are a reduction in frequency from DSM-IV, which required twice weekly episodes, and thus it is reasonable to conclude that the number of men with BED is systematically increased with the advent of DSM-5. Notably, a study excluding those adults who met DSM-IV criteria (ie, therefore assessing only those with a subthreshold BED presentation) found that males were 3 times as likely as females to report this frequency of binge eating.[4] Among high school adolescents, 6.0% of male students (vs 16.6% of female students) engaged in at least weekly objective binge eating over the past month.[18] Also evident in this sample, 3.4% of boys (vs 12.3% of girls) in a population-level high school survey reported at least weekly episodes of subjective binge eating.[18] Taken together, it is possible that males endorse less binge eating behavior, but future research is indicated to determine whether this report is a function of objective behavioral indices or due to nonresponse bias in reporting loss of control over eating.

Avoidant Restrictive Food Intake Disorder

ARFID, included in DSM-5 to replace the DSM-IV diagnosis of feeding disorder of infancy and early childhood, is characterized by avoidant or restrictive eating behavior resulting in 1 or more of the following:

1. Significant weight loss (or failure to achieve expected growth)
2. Nutritional deficiency

3. Dependence on oral nutritional supplements or enteral feeding, or
4. Significant interference with psychosocial functioning[19]

As restrictive eating is not associated with weight or shape concerns, screening and diagnosis of ARFID may be more equal across the sexes. Among youth and adolescents seeking treatment of an ED, approximately 14% are diagnosed with ARFID and, compared with other EDs, a larger proportion of these cases, up to 35%, are boys.[28–31] As ARFID is comparatively recent in its characterization as a pediatric ED, future research is needed to illuminate sex differences in symptom presentation, as well as treatment response.

THE MUSCULAR IDEAL

As briefly mentioned earlier, the male body ideal typically features a dual focus on a drive for both muscularity and leanness (ie, low body fat).[23] This distinct male ideal offers unique consequences for patterns in ED behaviors and attitudes. For instance, males may be motivated to pursue rigid eating or exercise routines, as well as the use of appearance-enhancing or performance-enhancing drugs (eg, anabolic steroids) to achieve a muscular body idea. Males also endorse a drive for thinness (as females might also report a desire for muscularity) but among males, muscular-oriented disordered eating is considerably more common.[26] A specific pattern of behaviors within muscularity-oriented disordered eating involves what is referred to as “bulking and cutting,” and describes an oscillation between pursuit of muscularity and leanness, respectively.[32] During bulking, targeted consumption of protein is typical and often includes somewhat rigid and arbitrary guidelines for the amount, timing, and type of protein consumed.[33,34] Deviation from these rules may cause distress, but it is also during this phase that body image distress related to a desire for leanness may emerge.[26] Henceforth follows the cutting phase, whereby dietary restriction can be extreme, and is typically intended to decrease body fat (ie, improving muscular definition). Cutting may limit muscular development and trigger further body image distress, thereby setting into motion a maladaptive cycle of muscle building and alternating dietary restriction. Although much of the empirical evidence for these practices is nascent, up to 60% of all boys in the United States report purposefully manipulating their diet in striving for greater muscularity, [35] suggesting salient links between muscularity orientation and ED pathology.

Muscle Dysmorphia

Muscle dysmorphia, originally conceptualized as opposite to AN and referred to as “reverse anorexia,” was initially identified in a study of male body builders.[36] In a seminal study, some participants displayed similarities to patients with AN, especially related to body image distortion. As would be considered opposite to traditionally internalized body image in AN, core body image distortion in these men manifested as the belief that they were skinny and small, despite being large and muscular. Although preference for a more muscular build may begin at a young age for boys, current average age of onset of muscle dysmorphia occurs in later adolescence.[37] Cognitively, men who experience muscle dysmorphia may have obsessive thoughts about their lack of muscularity, which behaviorally may lead to excessive weight lifting or exercise[23] and rigidity in adhering to a dietary regimen that enhances muscle development.[33,38] Associated with muscle dysmorphia,

anabolic steroids are used predominantly by male-identified individuals with muscularity-focused body dissatisfaction,[39] and their use is considerably more common among homosexual male adolescents than those who identify as heterosexual.[40] In DSM-5, muscle dysmorphia is currently classified as a unique body dysmorphic disorder associated with muscularity concerns,[19] although some researchers propose that this pattern of symptoms may more aptly be classified as part of the ED spectrum.[38]

Proposed factors that negatively affect body image among youth and adolescents include media, family, and friends.[41] A recent study of social media use among sexual minority male adults found that higher frequency of use of social media platforms, and particularly those that were body centric in focus (eg, Facebook, Instagram), was associated with greater muscularity-oriented body image concerns and eating pathology.[42] Although this study was conducted among adult participants, its findings are relevant to youth and adolescents who are frequent consumers of social media. Other risks for eating pathology that are evident among sexual minority males are detailed in the next section.

RISK ASSOCIATED WITH SEXUAL ORIENTATION

Over several decades, evidence has accumulated in support of an association between sexual orientation and ED symptoms in adults, particularly in men,[43–47] and in adolescent males.[48–50] In examination of trends over time in eating pathology among adolescent sexual minority subgroups, although notably improved compared with sexual minority females, males continue to report higher prevalence of purging, using diet pills, and fasting to lose weight compared with their heterosexual counterparts.[50] It seems that increased prevalence exists across a variety of ED symptoms; in a recent cohort study in the United Kingdom, at age 14 years, homosexual and bisexual boys reported significantly greater body dissatisfaction than their same-sex heterosexual peers.[49] At this age, sexual minority boys also reported greater dysfunctional eating behaviors compared with their heterosexual peers. At age 16 years, homosexual and bisexual boys had 12.5 times the likelihood of engaging in binge eating as heterosexual boys.[49] In other large community-based studies in the United States, homosexual males[51] and males with same-sex sexual partners[52] reported increased ED symptoms compared with heterosexual males and males with other-sex partners. In a nationally representative cohort of high school students in Norway, male adolescents with same-sex sexual experience were more likely to report bulimic symptoms than those without same-sex sexual experience (estimated 7 times the risk in males with same-sex sexual experience).[53] Taken together, the extant research on models of ED and their intersection with sexual orientation suggest that sexual minority status may be a contributing risk factor for ED among young males.

CLINICAL IMPACT OF A FEMALE-CENTRIC FRAMEWORK OF ASSESSMENT AND TREATMENT

Moving both within and beyond a long history whereby men are consistently marginalized in screening, treatment, and research of EDs, there are several areas that receive the greatest impact from the traditionally held female-centric ED framework. One of these domains is treatment seeking, or what some have referred to as “help seeking.”[7] Lack of insight, denial,

shame, and secrecy are all factors that have an impact on willingness to seek treatment of EDs across the sexes. However, this influence may be greater among males, given perceived stigma associated with disclosure of mental health issues.[7,54] Further, despite widespread efforts to convey an opposite missive, cultural stereotypes still perpetuate the perception that EDs are typically a female disorder. Stigmatizing beliefs about the presentation of AN among men may contribute to the latency for males to present to treatment. Perhaps as a result of this delay, 50% of male adolescent ED presentations for treatment results in the need for immediate hospitalization.[54] One recent study of adolescent males presenting for treatment found that nearly half had a history of being overweight or obese. Subsequently, the mean percentage of median body mass index in this sample was 88.8%, a value that is in line with other work indicating higher premorbid weights among males compared with females, which likely contributes to a delay in receiving treatment.[55] However, in this study, patients had lost an average of 21.5% of premorbid body weight, consistent with severe malnutrition and presented with significantly dysregulated vital signs.[56] Reducing stigma and improving screening and detection of symptoms consistent with EDs among young males is clearly an important endeavor in future directions of clinician education, particularly within standard pediatric clinical care.

FUTURE DIRECTIONS

Although there is increasing momentum within the field to focus specifically on the screening, assessment, and study of ED presentation among adolescent males, considerable efforts are required to attenuate to the knowledge base within the field, established for EDs among female peers. Toward that end, some specific domains are highlighted whereby targeted research would be optimized. Perhaps the most important of these domains is in the area of improving the tools with which male ED symptom pathology is screened, assessed, and diagnosed. The removal of amenorrhea as a diagnostic criterion for AN within DSM-5 was an important step in improving accuracy in prevalence estimates among boys. However, there is no current diagnostic category that can accommodate inclusion of a muscularity-oriented body image as opposed to a thinness ideal. Given consistent presentation of muscular-oriented body image concerns and related behaviors, this lack of conceptual framework is concerning.[57] Further, evidence suggests that males report less severe overall ED psychopathology compared with females.[17] However, it is likely that much of the gold standard assessments reveal lower scores among boys given a lack of validity and sensitivity within specific items.[15] Given a limited number of studies specific to boys, low sample size in samples of men in mixed-sex trials and assessment methods that retain bias and cull symptoms more specific to females (eg, internalization of a thin ideal),[32,57] developing and testing assessment tools specifically among males is unequivocally essential to future assessment, diagnostic, and treatment endeavors.

Related to current issues with assessment among males is consideration of the age of ED onset among males, because research to date has been conflicting. On the one hand, evaluation of ED symptoms in a large cohort sample suggested that loss of control eating may be nearly twice as common in older boys as in younger boys; concerns about weight and shape also seem to increase substantially from early to late adolescence.[18] However, other work has found that in certain populations, such as sexual minority males, binge eating

and purging behaviors were consistently greater than heterosexual peers (aged 12–23 years), across all ages.[58] Early identification of EDs is important across the sexes, but in light of the aforementioned barriers to treatment seeking, earlier efforts to screen and assess boys for ED symptoms should be prioritized. Overall, in most cases, it seems that as male adolescents age, reported cognitive and behavioral ED symptoms seem to worsen, indicating that early intervention is of critical importance.[18]

Most investigations of EDs among adolescent males has been conducted within a western cultural milieu, and overwhelmingly comprised of individuals who identify as white. Thus, future research should include attention to potential differences in risk and ED presentation in males, intersected with cultural and ethnic identification. Some existing literature indicates that non-white boys, and in particular those of Latino and African American identification, demonstrate higher rates of disordered weight control behaviors compared with white or Asian boys.[48,59–61] However, other work found that weight control behavior and concerns were equally or more prevalent among all non-whites, including higher risk among Asian American boys.[58] Overall, there are largely mixed findings in the relationship between ED symptoms and cultural and ethnicity-related factors. Compounding the dearth of methodologically valid assessment tools to index ED symptoms among men, an even greater gap exists surrounding psychometric evaluation of symptoms with cultural sensitivity. Future endeavors should include testing of both existing and to-be-developed indices of ED symptoms across diverse male samples.

Moving beyond screening and assessment efforts, no treatments to date have been tailored to the clinical presentation of boys and tested accordingly. Precision ED treatment of boys should directly address muscularity-oriented body image concerns, potentially minimizing exercise behavior that exacerbates and maintains these symptoms. Further, given the consistent evidence indicating increased risk and severity of ED pathology among sexual minority boys, treatment that specifically addresses a broad spectrum of gender and sexual presentations, including among those who identify as transgender or gender fluid, is necessary. Many current treatment centers with specialty in a higher level of care are unable to admit boys to their service, given logistical issues with housing boys and girls separately, leading to further marginalization and internalized stigma among young men and their families who seek treatment.

SUMMARY

Estimates of prevalence for EDs among youth and adolescent males are likely considerably underestimated. Perpetuation of the perception that EDs are largely a female phenomenon over nearly 5 decades has led to the consistent exclusion of young men from research efforts, and subsequent paucity of understanding and accuracy in classification and assessment. Although increased appreciation of eating and body image concerns among males has been demonstrated, methods of identification, assessment, classification, and treatment specific to male concerns are critically in need of advancement. Particularly as epidemiologic studies indicate that EDs among males are advancing equally or perhaps even more quickly than among females, it is essential that the thinness-oriented body image characteristic of a traditional ED framework be re-evaluated and adjusted. Further, males present with

symptoms that are as severe as their female counterparts, indicating that increased awareness and early identification of these disorders among young men is crucial. As screening efforts are honed and stigma is reduced, presentation of males to treatment will also increase. It will be important for clinicians to familiarize themselves with the clinical presentation of EDs among males, as well as to increase education efforts surrounding optimal treatment approaches.

REFERENCES

1. Schaumberg K, Welch E, Breithaupt L, et al. The science behind the academy for eating disorders' nine truths about eating disorders. Eur Eat Disord Rev 2017;25(6):432–50. [PubMed: 28967161]
2. Gull W. Anorexia nervosa (apepsia hysterica, anorexia hysterica). Trans Clin Soc London 1874;7:22.
3. Bruch H. Anorexia nervosa in the male. Psychosom Med 1971;33:31–47. [PubMed: 5100732]
4. Hudson JI, Hiripi E, Pope HG, et al. The prevalence and correlates of eating disorders in the National Comorbidity Survey replication. Biol Psychiatry 2007;61:349–58.
5. Murray SB, Griffiths S, Mond JM. Evolving eating disorder psycho- pathology: conceptualizing muscularity-oriented disordered eating. Br J Psychiatry 2016;208:414–5. [PubMed: 27143005]
6. Mitchison D, Hay P, Slewa-Younan A, et al. The changing demographic profile of eating disorder behaviors in the community. BMC Public Health 2014;14:943. [PubMed: 25213544]
7. Mitchison D, Mond JM. Epidemiology of eating disorders, eating disordered behaviour, and body image disturbance in males: a narrative review. J Eat Disord 2015;3:20. [PubMed: 27408719]
8. Woodside DB, Garfinkel PE, Lin E, et al. Comparisons of men with full or partial eating disorders, men without eating disorders, and women with eating disorders in the community. Am J Psychiatry 2001;158(4):570–4. [PubMed: 11282690]
9. Madden S, Morris A, Zurynski YA, et al. The burden of eating disorders in 5–13-year-old children in Australia. Med J Aust 2009;190:410–4. [PubMed: 19374611]
10. Nicholls DE, Lynn R, Viner RM. Childhood eating disorders: British national surveillance study. Br J Psychiatry 2011;198:295–301. [PubMed: 21972279]
11. Eddy KT, Thomas JT, Hastings E, et al. Prevalence of DSM-5 avoidant/restrictive food intake disorder in a pediatric gastroenterology healthcare network. Int J Eat Disord 2014;48:464–70. [PubMed: 25142784]
12. Field A, Sonneville K, Crosby R, et al. Prospective associations of concerns about physique and the development of obesity, binge drinking, and drug use among adolescent boys and young adult men. JAMA Pediatr 2014;168(1):34–9. [PubMed: 24190655]
13. Gueguen J, Godart N, Chambry J, et al. Severe anorexia nervosa in men: comparison with severe AN in women and analysis of mortality. Int J Eat Disord 2012;45(4):537–45. [PubMed: 22271620]
14. Murray SB, Griffiths S, Nagata JM. Community-based eating disorder research in males: a call to action. J Adolesc Health 2018;62(6):649–50. [PubMed: 29784111]
15. Darcy AM, Doyle AC, Lock J, et al. The eating disorders examination in adolescent males with anorexia nervosa: how does it compare to adolescent females? Int J Eat Disord 2012;45:110–4. [PubMed: 22170022]
16. Murray SB, Nagata JM, Griffiths S, et al. The enigma of male eating disorders: a critical review and synthesis. Clin Psychol Rev 2017;57:1–11. [PubMed: 28800416]
17. Smith KE, Mason TB, Murray SB, et al. Clinical norms and sex differences on the Eating Disorder Inventory (EDI) and the Eating Disorder Examination Questionnaire (EDE-Q). Int J Eat Disord 2017;50:769–75. [PubMed: 28436086]
18. Mond J, Hall A, Bentley C, et al. Eating-disordered behavior in adolescent boys: eating disorder examination questionnaire norms. Int J Eat Disord 2014;47(4):335–41. [PubMed: 24338639]
19. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Washington, DC: APA; 2013.

20. Allen KL, Byrne SM, Oddy WH, et al. Early onset binge eating and purging eating disorders: course and outcome in a population-based study of adolescents. J Abnorm Child Psychol 2013;41(7):1083–96. [PubMed: 23605960]
21. Kjelsås E, Bjørnstrøm C, Götestam KG. Prevalence of eating disorders in female and male adolescents (14–15 years). Eat Behav 2004;5(1):13–25. [PubMed: 15000950]
22. Smink FR, van Hoeken D, Oldehinkel AJ, et al. Prevalence and severity of DSM-5 eating disorders in a community cohort of adolescents. Int J Eat Disord 2014;47(6):610–9. [PubMed: 24903034]
23. Pope HG, Phillips KA, Olivardia R. The Adonis complex: the secret crisis of male body obsession. New York: The Free Press; 2000.
24. Goodwin H, Haycraft E, Meyer C. The relationship between compulsive exercise and emotion regulation in adolescents. Br J Health Psychol 2012;17:699–710. [PubMed: 22385050]
25. Hay P, Girosi F, Mond J. Prevalence and sociodemographic correlates of DSM-5 eating disorders in the Australian population. J Eat Disord 2015;3(1):19. [PubMed: 25914826]
26. Lavender JM, Brown TA, Murray SB. Men, muscles, and eating disorders: an overview of traditional and muscularity-oriented disordered eating. Cur Psychiatry Rep 2017;19(6):32.
27. Pila E, Mond JM, Griffiths S, et al. A thematic content analysis of #cheatmeal images on social media: characterizing an emerging trend. Int J Eat Disord 2017;50(6):698–706. [PubMed: 28075492]
28. Cooney M, Lieberman M, Guimond T, et al. Clinical and psychological features of children and adolescents diagnosed with avoidant/restrictive food intake disorder in a tertiary care eating disorder program. J Adolesc Health 2017;60(2):S46.
29. Fishe MM, Rosen DS, Ornstein RM, et al. Characteristics of avoidant/restrictive food intake disorder in children and adolescents: a “new disorder” in DSM-5. J Adolesc Health 2014;55(1): 49–52. [PubMed: 24506978]
30. Nicely TA, Lane-Loney S, Masciulli E, et al. Prevalence and characteristics of avoidant/restrictive food intake disorder in a cohort of young patients in day treatment for eating disorders. J Eat Disord 2014;2:21. [PubMed: 25165558]
31. Norris M, Norris L, Katzman DK. Change is never easy, but is it possible: reflections on avoidant/ restrictive food intake disorder two years after its introduction in the DSM-5. J Adolesc Health 2015;57:8–9. [PubMed: 26095404]
32. Griffiths S, Murray SB, Touyz SW. Disordered eating and the muscular ideal. J Eat Disord 2013;1:15. [PubMed: 24999396]
33. Mosley PE. Bigorexia: bodybuilding and muscle dysmorphia. Eur Eat Disord Rev 2009;17(3):191–8. [PubMed: 18759381]
34. Murray SB, Rieger E, Touyz SW. Muscle dysmorphia symptomatology during a period of religious fasting: a case report. Eur Eat Disord Rev 2011;19:162–8. [PubMed: 20928927]
35. Eisenberg MA, Wall M, Nuemark-Sztainer D. Muscle-enhancing behaviors among adolescent girls and boys. Pediatrics 2012;130:1019–26. [PubMed: 23166333]
36. Pope HG Jr, Katz DL, Hudson JI. Anorexia nervosa and “reverse anorexia” among 108 male bodybuilders. Compr Psychiatry 1993;34(6):406–9. [PubMed: 8131385]
37. Olivardia R. Mirror, mirror on the wall, who’s the largest of them all? The features and phenomenology of muscle dysmorphia. Harv Rev Psychiatry 2001;9:245–59.
38. Murray SB, Rieger E, Touyz SW, et al. Muscle dysmorphia and the DSM-V conundrum: where does it belong? A review paper. Int J Eat Disord 2010;43:483–91. [PubMed: 20862769]
39. Pope HG, Kanayama G, Hudson JI. Risk factors for illicit anabolic-androgenic steroid use in male weightlifters: a cross-sectional cohort study. Biol Psychiatry 2012;71:254–61. [PubMed: 21839424]
40. Blashill AJ, Calzo JP, Griffiths S, et al. Anabolic steroid misuse among US adolescent boys: disparities by sexual orientation and race/ethnicity. Am J Public Health 2017;107:319–21. [PubMed: 27997246]
41. Ricciardelli LA, McCabe MP, Banfield S. Body image and body change methods in adolescent boys: role of parents, friends, and the media. J Psychosom Res 2000;49:189–97. [PubMed: 11110990]

42. Griffiths S, Murray SB, Krug I, et al. The contribution of social media to body dissatisfaction, eating disorder symptoms, and anabolic steroid use among sexual minority men. Cyberpsychol Behav Soc Netw 2018;21(3):149–56. [PubMed: 29363993]
43. Beren SE, Hayden HA, Wilfley DE, et al. The influence of sexual orientation on body dissatisfaction in adult men and women. Int J Eat Disord 1996;20(2):135–41. [PubMed: 8863065]
44. Carlat DJ, Camargo CA Jr. Review of bulimia nervosa in males. Am J Psychiatry 1991;148(7): 831–43. [PubMed: 2053621]
45. Feldman MB, Meyer IH. Eating disorders in diverse lesbian, gay, and bisexual populations. Int J Eat Disord 2007;40(3):218–26. [PubMed: 17262818]
46. Frederick DA, Essayli JH. Male body image: the roles of sexual orientation and body mass index across five national US Studies. Psychol Men Masc 2016;17(4):336.
47. Russell CJ, Keel PK. Homosexuality as a specific risk factor for eating disorders in men. Int J Eat Disord 2002;31:300–6. [PubMed: 11920991]
48. Austin SB, Nelson LA, Birkett MA, et al. Eating disorder symptoms and obesity at the intersections of gender, ethnicity, and sexual orientation in US high school students. Am J Public Health 2013;103(2):e16–22.
49. Calzo JP, Austin SB, Micali N. Sexual orientation disparities in eating disorder symptoms among adolescent boys and girls in the UK. Eur Child Adolesc Psychiatry 2018;27(11):1483–90. [PubMed: 29550905]
50. Watson RJ, Adjei J, Saewyc E, et al. Trends and disparities in disordered eating among heterosexual and sexual minority adolescents. Int J Eat Disord 2017;50(1):22–31. [PubMed: 27425253]
51. French SA, Story M, Remafedi G, et al. Sexual orientation and prevalence of body dissatisfaction and eating disordered behaviors: A. Int J Eat Disord 1996;19(2):119–26. [PubMed: 8932550]
52. Ackard DM, Fedio G, Neumark-Sztainer D, et al. Factors associated with disordered eating among sexually active adolescent males: gender and number of sexual partners. Psychosom Med 2008;70:232–8. [PubMed: 18256348]
53. Wichstrøm L. Sexual orientation as a risk factor for bulimic symptoms. Int J Eat Disord 2006;39(6):448–53. [PubMed: 16634052]
54. Griffiths S, Mond JM, Murray SB, et al. Young peoples' stigmatizing attitudes and beliefs about anorexia nervosa and muscle dysmorphia. Int J Eat Disord 2014;47(2):189–95. [PubMed: 24222584]
55. Raevuori A, Keski-Rahkonen A, Hoek H. A review of eating disorders in males. Curr Opin Psychiatry 2014;27:426e30. [PubMed: 25226158]
56. Vo M, Lau J, Rubinstein M. Eating disorders in adolescent and young adult males: presenting characteristics. J Adolesc Health 2016;59:397–400. [PubMed: 27287963]
57. Murray SB, Griffiths S, Hazery L, et al. Go big or go home: a thematic content analysis of pro-muscularity websites. Body Image 2016;16:17–20. [PubMed: 26523689]
58. Neumark-Sztainer D, Croll J, Story M, et al. Ethnic/racial differences in weight-related concerns and behaviors among adolescent girls and boys: findings from Project EAT. J Psychosom Res 2002;53(5):963–74. [PubMed: 12445586]
59. Field AE, Colditz GA, Peterson KE. Racial/ethnic and gender differences in concern with weight and in bulimic behaviors among adolescents. Obes Res 1997;5(5):447–54. [PubMed: 9385620]
60. Johnson WG, Rohan KJ, Kirk AA. Prevalence and correlates of binge eating in white and African American adolescents. Eat Behav 2002;3(2):179–89. [PubMed: 15001015]
61. Nicdao EG, Hong S, Takeuchi DT. Prevalence and correlates of eating disorders among Asian Americans: results from the National Latino and Asian American Study. Int J Eat Disord 2007;40(suppl):S22–6. [PubMed: 17879986]

KEY POINTS

- Eating disorders occur among a significant minority of youth and adolescent males.
- Eating disorder symptom presentation and risk factors are specific to males, particularly related to body image concerns.
- Future study of adolescent males must test screening and assessment measures for use among male populations.
- Precision screening and treatment efforts are critical in appropriately addressing eating disorders among youth and adolescent males.