



Published in final edited form as:

Curr Psychiatry Rep. 2017 August ; 19(8): 49. doi:10.1007/s11920-017-0801-y.

Eating disorders and disordered weight and shape control behaviors in sexual minority populations

Jerel P. Calzo, PhD, MPH^{1,2}, Aaron J. Blashill, PhD^{3,4}, Tiffany A. Brown, PhD⁵, and Russell L. Argenal, BS¹

¹Graduate School of Public Health, San Diego State University

²Institute for Behavioral and Community Health, San Diego State University Research Foundation

³Department of Psychology, San Diego State University

⁴San Diego State University/University of California, San Diego Joint Doctoral Program in Clinical Psychology

⁵Eating Disorders Center for Treatment and Research, Department of Psychiatry, University of California, San Diego

Abstract

Purpose of review—This review summarized trends and key findings from empirical studies conducted between 2011–2017 regarding eating disorders and disordered weight and shape control behaviors among lesbian, gay, bisexual, and other sexual minority (i.e., non-heterosexual) populations.

Recent findings—Recent research has examined disparities through sociocultural and minority stress approaches. Sexual minorities continue to demonstrate higher rates of disordered eating; disparities are more pronounced among males. Emerging data indicates elevated risk for disordered eating pathology among sexual minorities who are transgender or ethnic minorities. Dissonance-based eating disorder prevention programs may hold promise for sexual minority males.

Summary—Continued research must examine the intersections of sexual orientation, gender, and ethnic identities, given emergent data that eating disorder risk may be most prominent among specific subgroups. More research is needed within sexual minorities across the lifespan. There are still a lack of eating disorder treatment and prevention studies for sexual minorities.

Keywords

Lesbian; gay; bisexual; mostly heterosexual; sexual orientation; disordered eating; body image; anabolic steroids; appearance and performance enhancing drugs

Corresponding Author: Jerel P. Calzo, Graduate School of Public Health, San Diego State University, 5500 Campanile Dr., San Diego, CA, 92182-4162. jcalzo@sdsu.edu.

HUMAN AND ANIMAL RIGHTS: This article does not contain any studies with human or animal subjects performed by any of the authors.

Introduction

Eating disorders (e.g., anorexia nervosa [AN], bulimia nervosa [BN], binge eating disorder [BED]) are life-threatening conditions that are notoriously difficult to treat.[1, 2] Engagement in disordered eating and weight and shape control behaviors, such as binge eating, purging, and restrictive dieting, are also debilitating and associated with significant morbidity.[3–5] Eating disorders and disordered weight and shape control behaviors affect individuals across all demographic strata, including sex, age, economic class, race, and ethnicity. However, risk for these behavioral health outcomes is disproportionately higher among some groups. One group that has received considerable focus is sexual minorities, which includes individuals who do not identify as heterosexual (e.g., gay, lesbian, bisexual), individuals who report attractions to people of the same or multiple genders, and individuals who report engaging in sexual contact with people of the same or multiple genders.[6]

Depending on the dimensions utilized for identifying sexual minority populations (identity, attractions, or behavior), data from the 2011–2013 United States National Survey of Family Growth indicate that 6.8%–19% of women and 3.9%–7.9% of men between the ages of 18–44 years old can be classified as sexual minorities.[7] As indicated in this review, sexual minorities overall are at manifold risk of presenting disordered eating behavior. Understanding the prevalence and underlying mechanisms of elevated eating disorder risk among sexual minority populations is critical to informing prevention efforts and tailoring treatment. Furthermore, conducting systematic research on the needs of sexual minority populations is a public health priority, as identified by the Institute of Medicine (IOM) in their 2011 report on research and practices to promote LGBT health equity [6].

The purpose of this review is to summarize the most recent research on eating disorders among sexual minority populations. We conducted a systematic search of the databases Medline (via PubMed), Web of Science, PsychINFO, and CINAHL with the assistance of a public health librarian in January 2017. The search consisted of articles that were peer reviewed and published within the last six years (01/2011 through 01/2017). To identify articles pertaining to sexual minority populations, sexual orientation key terms included: gay*, bisexual*, homosexual*, sexual minorit*, lesbian*, pansexual*, polysexual*, “mostly heterosexual”, queer, asexual*, “non-heterosexual”, nonheterosexual, and non-heterosexual*. The eating disorder key terms included: eating disorder, disordered eating, bulimia nervosa, anorexia nervosa, binge eating, diet pill*, purg*, polyphagia, fast*, fasting, vomit*, laxative, exercise, overeating, steroid*, supplement*, eating pathology, muscle, muscle building, muscle dysmorphia, bigorexia, reverse anorexia, APED, and appearance/performance enhancing drugs. Boolean terms were used to refine the search, yielding 3,611 articles in the initial search: Medline (via PubMed) 2,818, Web of Science 368, PsychINFO 343, and CINAHL 82. We retained articles that included at least one sexual minority population and one outcome variable related to disordered eating. Articles were excluded if they were not published between 01/2011–01/2017, if they were not new research papers (e.g., commentaries, literature reviews), and if they were duplicates from other database searches. After exclusions, we considered 52 articles for this scope review. In this review, we summarize findings regarding (1) theory and mechanisms underlying sexual orientation disparities, (2) epidemiologic surveillance, and (3) treatment and prevention among diverse

sexual orientation subgroups. As the focus of this review was on disparities by sexual orientation, we did not focus specifically on differential risk related to minority gender identity, such as identifying as transgender (i.e., an individual whose gender identity differs from their birth sex). However, we did not exclude research studies that included transgender and gender nonconforming participants, so long as these studies also reported information about their sexual orientation.

Theoretical Models for Sexual Orientation Disparities

Prevailing theoretical models accounting for sexual orientation disparities in eating disorder risk include sociocultural and minority stress approaches. Sociocultural approaches generally posit that sexual orientation disparities in disordered eating are rooted in gender and sexual minority-specific (e.g., community) norms concerning ideal appearance or the importance of appearance and physical attributes.[8–10] For example, Alvy (2013) examined the potential protective influence of lesbian community involvement on body dissatisfaction—a risk factor for eating disorders—given research indicating that lesbian community cultural norms are more accepting of diverse expressions of physical attractiveness and larger body sizes.[11] By contrast, Jankowski and colleagues (2014) focused on delineating the impact of appearance-based conversations as accounting for sexual orientation differences in body dissatisfaction among men based on prior studies indicating that sociocultural appearance pressures may be elevated among gay male communities.[12] Minority stress approaches frame differential risk for disordered eating behaviors as connected to stress-induced responses to victimization, discrimination and internalized sexual orientation-related stigma.[13, 14] Accordingly, researchers such as Bayer et al. (2017), Wang and Borders (2016), and Watson et al. (2016) examined how shame, concealing ones sexual orientation, and experiencing discrimination can elevate eating disorder risk among both sexual minority men and women.[15–17] An in-depth review of the findings of studies that formally applied and tested theories and mechanisms underlying sexual orientation disparities is beyond the scope of this review, but a summary of the papers culled during the review is provided in Table 1.

Summary and trends—The most common mechanisms examined were sociocultural, with a trend towards focusing on how sexual minority individuals differ from their heterosexual peers on a range of known risk factors for disordered eating (e.g., self-objectification, weight misperception, drive for thinness, drive for muscularity). Research examining minority stress processes generally found that minority stressors, such as discrimination and bullying, indirectly impact disordered eating via mental health pathways. Finally, integrative studies addressed the complex, lived realities of sexual minority individuals by synthesizing data on sociocultural, minority stress, and other mechanisms that may account for sexual orientation disparities. Research formally testing mechanisms is critical as it provides information on leverage points for preventive interventions. In curating research papers for this review, we found that all epidemiologic surveillance studies we reviewed were framed by sociocultural, minority stress, or integrative approaches; yet, the specific mechanisms theorized to account for sexual orientation disparities were seldom formally tested in analytic models.

Epidemiologic Surveillance

Disparities in Eating Disorder Diagnoses

Nearly all of the studies included in this review examined overall disordered eating behaviors; only four studies also examined the number of confirmed or probable eating disorder cases that were diagnosed by a health provider, or met clinical thresholds as defined by diagnostic criteria, such as the *Diagnostic and Statistical Manual of Mental Disorders 5*. Two focused on males only, and two utilized college student self-report data of eating disorder diagnosis.

Bankoff and colleagues (2016) conducted a novel analysis using data on military veterans, and created probable eating disorder diagnoses using the Eating Disorder Diagnostic Scale (EDDS).[18, 19] In a sample of 642 men (24 identified as gay, bisexual, or of a different sexual minority identity), 1 (0.1%) met the criteria for probable AN, 18 (2.4%) met the criteria for probable BN, and 12 (2.2%) met the criteria for probably BED.[19] Although the researchers detected that sexual minority males (as an overall group) had higher mean EDDS scores than heterosexual males, the researchers did not have sufficient power to test sexual orientation differences in probable eating disorder diagnoses. Using clinical data, Ming and colleagues (2014) conducted a database analysis of all male cases presenting at the Eating Disorders Clinic at Singapore General Hospital between 2003–2012 and found 72 eating disorder cases (36% AN, 33.3% BN, 30.5% eating disorders not otherwise specified).[20] Available sexual orientation data on these cases indicated that 63.9% self-identified as heterosexual and 15.3% as homosexual or bisexual.[20] The clinic data indicated that, proportionate to their numbers in the general population, sexual minority males were overrepresented in the clinic (a finding documented in earlier research [21]); however, the researchers noted that males overall were underrepresented at the clinic (male to female ratio 1:12.5), suggesting that gender may be a more salient health disparity factor than sexual orientation.[20] The researchers also noted that in comparison to heterosexual patients, sexual minority patients were more likely to present with psychiatric comorbidities (e.g., major depressive disorder, alcohol/substance abuse, self-harm/suicide),[20] indicating that treatment seeking for other health outcomes connected to minority stress may contribute to the greater representation of sexual minority males in the eating disorder treatment population.[10, 20]

Very little data exists examining eating disorders by sexual orientation among individuals of diverse gender identities. The American College Health Association National College Health Assessment (NCHA) dataset, examined by Matthews-Ewald and colleagues [22] and Diemer and colleagues [23] provided a unique opportunity to study the intersections of sexual and gender minority identities. However, whereas Matthews-Ewald and colleagues excluded transgender participants from analysis, Diemer and colleagues identified differences in past-year diagnosis and treatment for AN and BN by sexual orientation among cisgender (i.e., individuals whose gender identities align with their birth sexes) and transgender college students.[23] Among this large, US national sample of college students, 2% of cisgender sexual minority men, 3.52% of cisgender sexual minority women, and 3.66% and 2.97% of cisgender men and women who were unsure of their sexual orientation reported past year

eating disorder diagnosis or treatment (compared to 0.55% and 1.85% of cisgender heterosexual men and women, respectively).[23] Notably, transgender individuals of all sexual orientations had elevated prevalence of self-reported past year eating disorders (15.82%).[23]

Summary and Trends—The dearth of recent data on the prevalence of clinical eating disorders among sexual minorities of all gender identities may be due to a confluence of factors, most notably the lack of systematic data collection of sexual orientation in health records, and the omission of sexual orientation information in study sample descriptions.[6] Novel contributions of the four studies cited in this review are the presentation of data from heterosexual and sexual minority military veterans (an understudied group in eating disorders research overall), data on eating disorders among a more inclusive range of sexual orientation and gender identity subgroups, and data on sexual orientation disparities in a non-Western clinical sample. Limitations include the lack of data about other types of eating disorders, most notably BED, and limited data on the sexual orientation of women in clinical settings.

Disparities in Disordered Eating Behaviors

Most of the research published during the period of the review either focused on disparities in aggregate disordered eating symptoms (due to utilization of standardized assessments, such as the Eating Attitudes Test-26 [EAT-26][24], or due to low prevalence across individual behaviors), or disparities across specific disordered eating behaviors. In this subsection, we provide a brief summary of the latest research in sexual orientation disparities in (1) overall eating disorder symptoms; (2) overeating and binge eating; (3) purging; (4) fasting; (5) dieting behaviors; (6) compulsive exercise; (7) diet pills, drugs, and supplements to control weight; and (8) drugs and supplements to increase muscularity. There were limited recent data on binge eating and fasting, and very few studies examining dieting behaviors and compulsive exercise. An overall summary of trends in sexual orientation subgroup differences in disordered eating behaviors across the studies reviewed is provided in Table 2.

Overall symptoms—Research using instruments such as the EAT-26 to assess global eating disorder symptoms generally had the goal of testing theories and mechanisms of sexual orientation health disparities; thus, focusing on specific disordered eating behaviors was not the primary goal. Studies utilizing such instruments and aggregate measures of symptoms (e.g., aggregating vomiting, laxatives, diet pill use into a “unhealthy weight control” variable[25]) have found that sexual minority men and women report greater levels of overall symptoms than their same gender heterosexual peers, although disparities among men are more consistent across studies.[25–28] For example, Shearer and colleagues examined sexual orientation disparities in overall symptoms in a youth sample (ages 14–24) from Pennsylvania and found that males who reported same-gender attractions had higher symptoms than those who reported other-gender attractions; among females, those attracted to both genders had higher symptoms than those who reported other-gender or same-gender attractions, and those unsure of their attractions reported the highest symptoms of all.[28] However, in Yean et al.’s multi-site study of community and university participants, gay and

bisexual men had higher scores than heterosexual men on the EAT-26, whereas no difference was detected between lesbian and bisexual women and heterosexual women.[27]

One study focused on multiple symptoms and sexual orientation in the context of refining gender-sensitive eating disorder risk typologies.[29] Calzo and colleagues examined how sexual orientation may modify risk for different manifestations of body image concerns (concern with weight and shape; desire for muscularity) and disordered eating behaviors (dieting, binge eating, purging, muscle-building product use) among males across adolescence and young adulthood.[29] Using latent class and latent transition analysis, two high-risk subgroups were identified—“lean concerned” and “muscularity concerned,” characterized by disordered eating behaviors aligned with weight restriction and muscle-building, respectively. Although sexual minority males were more likely than heterosexual males to present symptoms consistent with weight restriction, sexual minority and heterosexual males were equally likely to display symptoms consistent with muscle-building (desire for toned and defined muscles; use of creatine and steroids).[29]

Binge eating—There were a dearth of studies reporting new data on overeating and binge eating among sexual minorities; the three studies cited in this review focused on women. Two online studies of lesbian and bisexual women assessed binge eating prevalence and severity using the Binge Eating Scale [30] and the EDDS.[31, 32] In one online sample of 164 lesbian and bisexual participants, 13.4% engaged in moderate binge eating and 4.9% engaged in severe binge eating.[32] Importantly, the investigators also found that overweight and obese lesbians were more likely than healthy weight lesbians to report binge eating.[31] The trends from these smaller scale online studies were replicated in Laska et al.’s pooled analysis of college student data from Minnesota, which found that bisexual women and women who had sex with women were most likely to engage in binge eating (30.2% and 29.1%, respectively, compared to 17.3% of heterosexual women).[25]

Purging (any vomiting or laxative use)—Updated surveillance on disparities in purging behavior, particularly among adolescent and young adult heterosexual and sexual minority populations in the United States, has been enhanced via national epidemiologic surveys such as the NCHA and Youth Risk Behavior Surveillance (YRBS) Survey. Consistent with findings from prior studies, Matthews-Ewald et al. examined data from the NCHA and found that, after adjusting for other risk factors (binge drinking, stress, smoking, depression, fraternity/sorority membership, college athletics participation, and race/ethnicity), gay, bisexual, and unsure men reported 3–4.5 times the odds of purging compared to heterosexual men.[22] This trend is consistent with that found in younger adolescent males from pooled data from the 1999–2013 Massachusetts YRBS, analyzed by Watson and colleagues [33]. In 1999 and 2001, gay adolescent males in the Massachusetts YRBS had nearly 16 times the odds of heterosexual men of purging.[33] However, between 2003–2013, odds ratios for purging were in the range of 5.00–5.78.[33]. Disparities in purging behavior have also been noted among sexual minority females in the Growing Up Today Study (GUTS), with repeated measures data from adolescence through young adulthood indicating that by age 25, 19.7% of sexual minority females report past year laxative use; sexual

minority females also have more than twice the odds of laxative use compared to heterosexual females.[34]

Two studies broke new ground by examining purging among understudied sexual minority subgroups. Diemer et al.'s research with NCHA examined the intersections of sexual minority and gender minority identities, finding that among transgender college students, 12.56% report purging (compared to 6.03% of heterosexual transgender college students). [23] In addition, Austin et al. pooled multiple waves of national YRBS data in order to examine sexual orientation and race/ethnicity intersections in eating disorder risk.[35] In addition to detecting that lesbian and bisexual females overall have 3.23–3.95 times the odds of purging compared to heterosexual females, and that gay and bisexual males have 5.21–6.16 times the odds of purging compared to heterosexual males, Austin et al. also detected elevated prevalence of purging among racial/ethnic minority sexual minority youth.[35]. For example, the prevalence of purging among Asian-American bisexual females was 13.9% compared to 3% among Asian-American heterosexual females; the prevalence of purging among Latina lesbians was 26.7% compared to 6.4% among Latina heterosexual females. [35]

Fasting—Limited research examined fasting, generally defined as not eating for at least 24 hours. Watson et al.'s research utilizing pooled YRBS data from Massachusetts found that from 2003–2013, gay males had 2.35–4.03 times the odds of heterosexual males of fasting, and bisexual males had 3.01–4.07 times the odds of fasting.[33] Disparities were more consistent among bisexual females, who from 1999–2013 were 2.11–3.19 times the odds of heterosexual females to report fasting.[33]

Restrictive dieting—No studies in the review focused specifically on dieting for weight loss. Matthews-Ewald and colleagues examined NCHA data and compared odds of dieting to lose weight by sexual orientation subgroup, adjusting for factors such as binge drinking, stress, smoking, depression, fraternity/sorority membership, college athletics participation, and race.[22] Results indicated that gay, bisexual, and unsure men reported approximately 30%–60% greater odds of dieting to lose weight, and that lesbian, bisexual, and unsure women reported approximately 20%–35% greater odds of dieting to lose weight. [22]

Compulsive exercise—No studies during the period examined sexual orientation disparities in compulsive exercise. Two studies examined disparities in engagement in sufficient moderate-vigorous physical activity (MVPA; a pathway toward obesity risk) [36, 37]. One study examined intensive anaerobic training in gym contexts as a lifestyle behavior associated with body dissatisfaction, dietary supplement use, use of anabolic steroids, and sexual risk behaviors among heterosexual men and men who have sex with men (MSM) in Israel.[38] Brewster et al. included compulsive exercise as an outcome in their path analysis testing objectification and minority stress processes underlying eating disorder risk among sexual minority men.[39]

Diet pills and supplements for weight loss—With regard to use of diet pills for weight loss, pooled YRBS data from Massachusetts indicate that from 2007 to 2013, gay males had 4.77–5.98 times the odds of heterosexual males of using diet pills, and from 2003

to 2013, bisexual females had 1.97 to 3.35 times of odds of heterosexual females of using diet pills.[33]. In a young adult, college sample, using data from NCHA, Matthews-Ewald and colleagues found that gay, bisexual, and unsure men had twice the odds of heterosexual men of using diet pills to lose weight.[22] As was the case with analyses of purging, Diemer and colleagues also used NCHA data to examine diet pill use disparities by sexual orientation and gender identity.[23] Cisgender sexual minority women and cisgender heterosexual men had lower odds of past month diet pill use compared to cisgender heterosexual women (college students); in the same model, transgender college students of all sexual orientations had twice the odds of past-month diet pill use.[23] New research also examined sexual orientation by race/ethnicity intersections, detecting elevated prevalence of diet pill use among certain racial/ethnic minority sexual minority subgroups. Overall, lesbian and bisexual females in YRBS datasets pooled across the US had 4.00 and 3.06 times the odds of diet pill use compared to heterosexual females, and gay and bisexual males had 4.33 and 6.77 times the odds of diet pill use compared to heterosexual males.[35] However, prevalence was elevated among racial/ethnic minority sexual minority youth. For example, the prevalence of diet pill use among African-American bisexual boys was 41.9% compared to 3.5% among African-American heterosexual boys; the prevalence of diet pill use among Latina lesbians was 44.7% compared to 4% among Latina heterosexual females.[35]

Supplements or drugs for muscle building—Recent studies concerning sexual orientation disparities in use of dietary supplements (e.g., creatine) or drugs (e.g., anabolic steroids) for muscle building are mixed in their findings. Research with the national cohort GUTS indicates that females overall, regardless of sexual orientation, report very little use of dietary supplements or drugs for muscle building,[34] whereas risk for use of dietary supplements or drugs for muscle-building among males does not differ by sexual orientation. [29, 34] Pooled data from the YRBS surveys indicate that sexual minority males have over 5 times the odds of reporting any lifetime use of AAS compared to their heterosexual peers. [40] After adjusting for confounders, such as number of sexual partners, depression, victimization, and race, boys who report AAS use were also at greater risk for condomless sex and use of alcohol/drugs during sex (OR 1.55, 1.48, respectively).[41] Furthermore, among sexual minority males, risk is further elevated among Black and Hispanic sexual minority males, who on the 2015 YRBS surveys reported 25% and 20% lifetime AAS use, respectively, compared to the 9% reported AAS use among White sexual minority males. [42]

Summary and trends—To summarize, sexual minorities overall fare worse than their heterosexual peers across all of the disordered eating behaviors reviewed. However, studies with sufficient power to disaggregate sexual orientation by identity, attraction, or behavioral subgroups indicate that not all sexual minority subgroups are at significantly greater risk for disordered eating behaviors compared to heterosexuals. Furthermore, sexual orientation disparities were generally more pronounced among men than among women. Risk may also be elevated among sexual minorities who are also transgender,[23] thus indicating the need to examine gender diversity as it intersects with sexual orientation. In addition research has also examined intersectionality by race/ethnicity, with studies noting elevated prevalence of

overall symptoms,[43] diet pills and purging,[35] and steroid use [42] among racial/ethnic sexual minorities.

More research is required to understand risk factors for eating disorders among sexual minority women, who do not always differ substantially from heterosexual women in risk for disordered eating behaviors. Additional insights may emerge through investigations of research on sexual orientation disparities in health *promoting* behavior, such as healthy eating. In one novel study utilizing dietary food frequency data to calculate a healthy eating index, VanKim and colleagues found that lesbian and bisexual women had better diet quality and diets lower in glycemic index compared to heterosexual women.[44] One possible explanation for this result is that sexual minority community norms concerning health and body image may enhance diet, whereas minority stress may contribute to risk for outcomes such as obesity and overeating.[45]

Much of the recent epidemiologic surveillance studies of disordered eating behaviors drew from large national surveys and cohorts, such as NCHA, YRBS, and GUTS. A benefit of utilizing regular surveillance methods, such as YRBS, is the possibility of evaluating potential secular trends that could coincide with sociocultural and minority stress pathways to eating disorder risk. Watson tested for secular trends with the pooled Massachusetts YRBS data, yet found few significant effects.[33] However, one limitation of the NCHA, YRBS, and GUTS is that these studies primarily focus on adolescents and young adults. Thus, less is known about sexual orientation disparities among older adults. Furthermore, as was the case with the YRBS in 2015, eating disorder variables may be dropped from survey cycles, thus preventing sources of regular surveillance on sexual orientation disparities in disordered eating.

Treatment and Prevention

Despite overwhelming evidence of sexual orientation disparities in disordered eating behaviors, the review yielded only two research papers focused on eating disorders treatment or prevention. Both of these papers were focused on sexual minority men,[46, 47] and both focused on adapting the Body Project,[48] a dissonance-based, peer-led eating disorders intervention previously developed for college women. Feldman et al. adapted aspects of the Body Project to improve body satisfaction and dietary habits among gay and bisexual men living with HIV/AIDS, focusing predominantly on the process of establishing an acceptable curriculum, and providing no data on efficacy.[47] Brown and Keel, however, were able to successfully adapt the Body Project into the PRIDE Body Project for use with 18–30 year old, sexual minority men, and demonstrate maintenance of intervention effects over 4 weeks of follow up.[46] Results indicated the impact of the treatment was primarily through reductions in body-ideal internalization, which supports prior studies emphasizing the role of sociocultural influences on eating disorder risk (Table 1). The results and commentary of these two studies are promising, but clearly more work is needed to generate evidence-based practices to treat and prevent eating disorders and disordered eating behaviors in sexual minority individuals of all genders.

Conclusion

In conclusion, research on eating disorders among sexual minority populations continues to focus predominantly on epidemiologic surveillance or examining potential mechanisms underlying health disparities. These studies are critical for discerning priority populations, and identifying mechanisms for treatment and interventions. However, given the persistent dearth of available prevention and treatment protocols, the exigent research priority is the development of evidence-based prevention and treatment approaches.[49] The PRIDE Body Project is one advance in prevention, but it has only been piloted with sexual minority men. [46] With regards to treatment, we are unaware of any published studies testing the efficacy of eating disorder treatment among sexual minority patients. In lieu of such data, clinicians should consult the literature on empirically supported treatments in the general population. Several psychosocial treatments may be applicable to clinical work with sexual minority patients, including enhanced cognitive behavioral therapy for eating disorders (CBT-E),[50] family-based treatment (FBT),[51] interpersonal therapy (IPT),[52] and dialectical behavior therapy (DBT).[53] As described in this review, public health practitioners and clinicians working with sexual minority populations must be particularly cognizant of the unique sociocultural factors, minority stressors, and co-occurring concerns that impact their risk for eating disorders.

Acknowledgments

Dr. Calzo was supported by K01DA034753. Dr. Blashill was supported by K23MH096647. We would like to thank Kathryn Houk and Hannah Saquilayan for their assistance in preparing this review.

References

Papers of particular interest, published recently, are as follows:

*Of importance

**Of major importance

1. Crow SJ, Swanson SA, Peterson CB, Crosby RD, Wonderlich SA, Mitchell JE. Latent class analysis of eating disorders: relationship to mortality. *J Abnorm Psychol.* 2012; 121:225–231. [PubMed: 21707126]
2. Micali N, Solmi F, Horton NJ, Crosby RD, Eddy KT, Calzo JP, Sonneville KR, Swanson SA, Field AE. Adolescent Eating Disorders Predict Psychiatric, High-Risk Behaviors and Weight Outcomes in Young Adulthood. *J Am Acad Child Adolesc Psychiatry.* 2015; 54:652–659. e1. [PubMed: 26210334]
3. Field AE, Sonneville KR, Crosby RD, 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; 168:34–39. [PubMed: 24190655]
4. Calzo JP, Horton NJ, Sonneville KR, Swanson SA, Crosby RD, Micali N, Eddy KT, Field AE. Male Eating Disorder Symptom Patterns and Health Correlates From 13 to 26 Years of Age. *J Am Acad Child Adolesc Psychiatry.* 2016; 55:693–700. e2. [PubMed: 27453083]
5. Solmi F, Hatch SL, Hotopf M, Treasure J, Micali N. Prevalence and correlates of disordered eating in a general population sample: the South East London Community Health (SELCoH) study. *Soc Psychiatry Psychiatr Epidemiol.* 2014; 49:1335–46. [PubMed: 24441522]
6. Institute of Medicine. *The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding.* The National Academies Press; Washington, DC: 2011.

7. Copen, CE., Chandra, A., Febo-Vazquez, I. Sexual Behavior, Sexual Attraction, and Sexual Orientation Among Adults Aged 18–44 in the United States: Data From the 2011–2013. National Survey of Family Growth; Hyattsville, MD: 2016.
8. Tylka TL, Andorka MJ. Support for an expanded tripartite influence model with gay men. *Body Image*. 2012; 9:57–67. [PubMed: 22036192]
9. McClain Z, Peebles R. Body Image and Eating Disorders Among Lesbian, Gay, Bisexual, and Transgender Youth. *Pediatr Clin North Am*. 2016; 63:1079–1090. [PubMed: 27865334]
10. Feldman MB, Meyer IH. Eating disorders in diverse lesbian, gay, and bisexual populations. *Int J Eat Disord*. 2007; 40:218–226. [PubMed: 17262818]
11. Alvy LM. Do lesbian women have a better body image? Comparisons with heterosexual women and model of lesbian-specific factors. *Body Image*. 2013; 10:524–534. [PubMed: 23927850]
12. Jankowski GS, Diedrichs PC, Halliwell E. Can appearance conversations explain differences between gay and heterosexual men’s body dissatisfaction? *Psychol Men Masc*. 2014; 15:68–77.
13. Katz-Wise SL, Scherer EA, Calzo JP, Sarda V, Jackson B, Haines J, Austin SB. Sexual Minority Stressors, Internalizing Symptoms, and Unhealthy Eating Behaviors in Sexual Minority Youth. *Ann Behav Med*. 2015; doi: 10.1007/s12160-015-9718-z
14. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychol Bull*. 2003; 129:674–697. [PubMed: 12956539]
15. Bayer V, Robert-McComb JJ, Clopton JR, Reich DA. Investigating the influence of shame, depression, and distress tolerance on the relationship between internalized homophobia and binge eating in lesbian and bisexual women. *Eat Behav*. 2017; 24:39–44. [PubMed: 27992763]
16. Wang SB, Borders A. Rumination mediates the associations between sexual minority stressors and disordered eating, particularly for men. *Eat Weight Disord - Stud Anorexia, Bulim Obes*. 2016:1–8.
17. Watson LB, Velez BL, Brownfield J, Flores MJ. Minority Stress and Bisexual Women’s Disordered Eating. *Couns Psychol*. 2016; 44:1158–1186.
18. Stice E, Telch C, Rizvi S. Development and validation of the eating disorder diagnostic scale: a brief self-report measure of anorexia, bulimia, and binge-eating disorder Psychological Assessment. *Psychol Assess*. 2000; 12:123–131. [PubMed: 10887758]
19. Bankoff SM, Richards LK, Bartlett B, Wolf EJ, Mitchell KS. Examining weight and eating behavior by sexual orientation in a sample of male veterans. *Compr Psychiatry*. 2016; 68:134–139. [PubMed: 27234194]
20. Ming TS, Lin P, Shan M, Kuek A, Cen S, Lian LE, Boon E, Kim S. Men do get it: eating disorders in males from an asian perspective. *ASEAN J Psychiatry*. 2014; 15:72–82.
21. Carlat DJ, Camargo CA, Herzog DB. Eating disorders in males: A report on 135 patients. *Am J Psychiatry*. 1997; 154:1127–1132. [PubMed: 9247400]
22. Matthews-Ewald MR, Zullig KJ, Ward RM. Sexual orientation and disordered eating behaviors among self-identified male and female college students. *Eat Behav*. 2014; 15:441–444. [PubMed: 25064296]
- **23. Diemer EW, Grant JD, Munn-Chernoff MA, Patterson DA, Duncan AE. Gender Identity, Sexual Orientation, and Eating-Related Pathology in a National Sample of College Students. *J Adolesc Health*. 2015; 57:144–9. Broke new ground by examining sexual orientation disparities in disordered eating among a large, national sample of cisgender and transgender college students. [PubMed: 25937471]
24. Garner D, Olmstead M, Bohr Y, Garfinkle P. The Eating Attitude Test: psychometric features and clinical correlates. *Psychol Med*. 1982; 12:871–878. [PubMed: 6961471]
25. Laska MN, Van Kim NA, Erickson DJ, Lust K, Eisenberg ME, Rosser BRS. Disparities in weight and weight behaviors by sexual orientation in college students. *Am J Public Health*. 2015; 105:111–121. [PubMed: 25393177]
26. Smith AR, Hawkeswood SE, Bodell LP, Joiner TE. Muscularity versus leanness: An examination of body ideals and predictors of disordered eating in heterosexual and gay college students. *Body Image*. 2011; 8:232–236. [PubMed: 21561818]

27. Yean C, Benau EM, Dakanalis A, Hormes JM, Perone J, Timko CA. The relationship of sex and sexual orientation to self-esteem, body shape satisfaction, and eating disorder symptomatology. *Front Psychol.* 2013; 4:1–11. [PubMed: 23382719]
28. Shearer A, Russon J, Herres J, Atte T, Kodish T, Diamond G. The relationship between disordered eating and sexuality amongst adolescents and young adults. *Eat Behav.* 2015; 19:115–9. [PubMed: 26332989]
- **29. Calzo JP, Masyn KE, Corliss HL, Scherer EA, Field AE, Austin SB. Patterns of body image concerns and disordered weight- and shape-related behaviors in heterosexual and sexual minority adolescent males. *Dev Psychol.* 2015; 51:1216–1225. First study of its kind to identify distinct patterns of body image concerns and disordered eating behaviors in heterosexual and sexual minority males across adolescence. [PubMed: 26098578]
30. Gormally J. The assessment of binge eating severity among obese persons. *Addict Behav.* 1982; 7:47–55. [PubMed: 7080884]
31. Mason TB. Binge Eating and Overweight and Obesity Among Young Adult Lesbians. *LGBT Heal.* 2016; 3:472–476.
32. Mason TB, Lewis RJ. Minority stress and binge eating among lesbian and bisexual women. *J Homosex.* 2015; 62:971–992. [PubMed: 25603175]
- *33. Watson RJ, Adjei J, Saewyc E, Homma Y, Goodenow C. Trends and disparities in disordered eating among heterosexual and sexual minority adolescents. *Int J Eat Disord.* 2017; 50:22–31. Examined secular trends in sexual orientation disparities in disordered eating using pooled 1999–2013 Youth Risk Behavior Surveillance Survey data from Massachusetts. [PubMed: 27425253]
34. Calzo JP, Sonnevile KR, Scherer EA, Jackson B, Austin SB. Gender Conformity and Use of Laxatives and Muscle-Building Products in Adolescents and Young Adults. *Pediatrics.* 2016; doi: 10.1542/peds.2015-4073
- **35. Austin SB, Nelson LA, Birkett MA, Calzo JP, Everett B. 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:e16–e22. Utilized pooled Youth Risk Behavior Surveillance Survey data to detect substantially elevated disordered eating risk among racial/ethnic sexual minority adolescent boys and girls.
36. Mereish EH, Poteat VP. Let's Get Physical: Sexual Orientation Disparities in Physical Activity, Sports Involvement, and Obesity Among a Population-Based Sample of Adolescents. *Am J Public Health.* 2015; 105:1842–1848. [PubMed: 26180946]
37. Calzo JP, Roberts AL, Corliss HL, Blood EA, Kroshus E, Austin SB. Physical activity disparities in heterosexual and sexual minority youth ages 12–22 years old: roles of childhood gender nonconformity and athletic self-esteem. *Ann Behav Med.* 2014; 47:17–27. [PubMed: 24347406]
38. Mor Z, Parfionov K, Davidovitch N, Grotto I. Gym exercising patterns, lifestyle and high-risk sexual behaviour in men who have sex with men and in heterosexual men. *BMJ Open.* 2014; 4:e005205.
39. Brewster ME, Sandil R, Deblaere C, Breslow A, Eklund A, Brewster ME, Sandil R, Breslow A, Eklund A. "Do You Even Lift, Bro?" Objectification, Minority Stress, and Body Image Concerns for Sexual Minority Men. 2016
40. Blashill AJ, Safren SA. Sexual Orientation and Anabolic-Androgenic Steroids in US Adolescent Boys. *Pediatrics.* 2014; 133:469–475. [PubMed: 24488735]
- **41. Blashill AJ, Safren SA, Jampel JD. Sexual risk behaviors and steroid use among sexual minority adolescent boys. *Drug Alcohol Depend.* 2016; 8:583–592. First study known to examine the prevalence of lifetime anabolic-androgenic steroid misuse as a function of sexual orientation among adolescent males.
42. Blashill AJ, Calzo JP, Griffiths S, Murray SB. Anabolic Steroid Misuse Among US Adolescent Boys: Disparities by Sexual Orientation and Race/Ethnicity. *Am J Public Heal.* 2017; 107:319–322.
43. De Santis JP, Layerla DM, Barroso S, Gattamorta KA, Sanchez M, Prado GJ. Predictors of Eating Attitudes and Behaviors Among Gay Hispanic Men. *Arch Psychiatr Nurs.* 2012; 26:111–126. [PubMed: 22449559]

44. VanKim NA, Bryn Austin S, Jun H-J, Hu FB, Corliss HL. Dietary Patterns during Adulthood among Lesbian, Bisexual, and Heterosexual Women in the Nurses' Health Study II. 2017; doi: 10.1016/j.jand.2016.09.028
45. Bowen DJ, Balsam KF, Diergaarde M, Russo M, Escamilla GM. Healthy eating, exercise, and weight: impressions of sexual minority women. *Women Health*. 2008; 44:79–93.
- **46. Brown TA, Keel PK. A randomized controlled trial of a peer co-led dissonance-based eating disorder prevention program for gay men. *Behav Res Ther*. 2015; 74:1–10. Developed and evaluated The PRIDE Body Project, a dissonance-based eating disorder prevention program for gay men that reduced eating disorder risk factors and maintained effects over 4-week follow-up. [PubMed: 26342904]
47. Feldman MB, Torino Ja, Swift M. A group intervention to improve body image satisfaction and dietary habits in gay and bisexual men living with HIV/AIDS. *Eat Disord*. 2011; 19:377–91. [PubMed: 21932969]
48. Becker CB, Smith LM, Ciao AC. Reducing Eating Disorder Risk Factors in Sorority Members: A Randomized Trial. *Behav Ther*. 2005; 36:245–253.
49. Austin SB. A public health approach to eating disorders prevention: it's time for public health professionals to take a seat at the table. *BMC Public Health*. 2012; doi: 10.1186/1471-2458-12-854
50. Fairburn, CG. *Cognitive Behavior Therapy and Eating Disorders*. Guildford Press; New York: 2008.
51. Courturier J, Kimber M, Szatmari P. Efficacy of family-based treatment for adolescents with eating disorders: a systematic review and meta-analysis. *Int J Eat Disord*. 2013; 46:3–11. [PubMed: 22821753]
52. Rieger E, Van Buren DJ, MB, Tanofsky-Kraff M, Welch R, Wilfley DE. An eating disorder-specific model of interpersonal psychotherapy (IPT-ED): causal pathways and treatment implications. *Clin Psychol Rev*. 2010; 30:400–410. [PubMed: 20227151]
53. Safer DL, Telch C, Agras WS. Dialectical behavior therapy for bulimia nervosa. *Am J Psychiatry*. 2001; 158:632–634. [PubMed: 11282700]
54. Brittain DR, Dinger MK, Hutchinson SR. Sociodemographic and Lesbian-Specific Factors Associated with Physical Activity Among Adult Lesbians. *Women's Heal Issues*. 2013; 23:e103–e108.
55. Blashill AJ. Gender roles, eating pathology, and body dissatisfaction in men: A meta-analysis. *Body Image*. 2011; 8:1–11. [PubMed: 20952263]
56. Cella S, Iannaccone M, Cotrufo P. Influence of gender role orientation (masculinity versus femininity) on body satisfaction and eating attitudes in homosexuals, heterosexuals and transsexuals. *Eat Weight Disord*. 2013; doi: 10.1007/s40519-013-0017-z
57. Brewster ME, Velez BL, Esposito J, Wong S, Geiger E, Keum TB. Moving beyond the binary with disordered eating research: a test and extension of objectification theory with bisexual women. *J Couns Psychol*. 2014; 61:50–62. [PubMed: 24188653]
58. Lanzieri N, Hildebrandt T. Using Objectification Theory to Examine the Effects of Media on Gay Male Body Image. *Clin Soc Work J*. 2016; 44:105–113.
59. Michaels MS, Parent MC, Moradi B. Does exposure to muscularity-idealizing images have self-objectification consequences for heterosexual and sexual minority men? *Psychol Men Masc*. 2013; 14:175–183.
60. Calzo JP, Corliss HL, Blood EA, Field AE, Austin SB. Development of muscularity and weight concerns in heterosexual and sexual minority males. *Heal Psychol*. 2013; 32:42–51.
61. Hunt CJ, Gonsalkorale K, Nosek Ba. Links Between Psychosocial Variables and Body Dissatisfaction in Homosexual Men: Differential Relations with the Drive for Muscularity and the Drive for Thinness. *Int J Mens Health*. 2012; 11:127–136.
62. Nerini A, Matera C, Baroni D, Stefanile C. Drive for muscularity and sexual orientation: Psychometric properties of the Italian version of the Drive for Muscularity Scale (DMS) in straight and gay men. *Psychol Men Masculinity*. 2016; 17:137–146.
63. Parent MC, Bradstreet TC. Integrating Self-Concept Into the Relationship Between Drive for Muscularity, and Disordered Eating and Depression, Among Men. *Psychol Men Masc*. 2016; 18 No Pagination Specified.

64. Smith AR, Hawkeswood SE, Bodell LP, Joiner TE. Muscularity versus leanness: An examination of body ideals and predictors of disordered eating in heterosexual and gay college students. *Body Image*. 2011; 8:232–236. [PubMed: 21561818]
65. Brennan DJ, Crath R, Hart TA, Gadalla T, Gillis L. Body dissatisfaction and disordered eating among men who have sex with men in Canada. *Int J Mens Health*. 2011; 10:253–268.
66. Frederick DA, Essayli JH. Male Body Image: The Roles of Sexual Orientation and Body Mass Index Across Five National U.S. Studies. *Psychol Men Masc*. 2016; 17:336–351.
67. Hadland SE, Austin SB, Goodenow CS, Calzo JP. Weight misperception and unhealthy weight control behaviors among sexual minorities in the general adolescent population. *J Adolesc Heal*. 2014; 54:296–303.
68. Brown TA, Keel PK. The impact of relationships on the association between sexual orientation and disordered eating in men. *Int J Eat Disord*. 2012; 45:792–799. [PubMed: 22407531]
69. Fussner LM, Smith AR. It's Not Me, It's You: Perceptions of Partner Body Image Preferences Associated With Eating Disorder Symptoms in Gay and Heterosexual Men. *J Homosex*. 2015; 8369:150617084805008.
70. Gigi I, Bachner-Melman R, Lev-Ari L. The association between sexual orientation, susceptibility to social messages and disordered eating in men. *Appetite*. 2016; 99:25–33. [PubMed: 26725149]
71. Katz-Wise SL, Scherer EA, Calzo JP, Sarda V, Jackson B, Haines J, Austin SB. Sexual Minority Stressors, Internalizing Symptoms, and Unhealthy Eating Behaviors in Sexual Minority Youth. *Ann Behav Med*. 2015; 49:839–852. [PubMed: 26156678]
- *72. Brennan DJ, Souleymanov R, George C, et al. Masculinity, Muscularity, and HIV Sexual Risk Among Gay and Bisexual Men of Color. *Psychol Men Masc*. 2015; 16:393–403. Examined drive for muscularity and masculinity norms in the context of sexual minority community norms as potential underlying factors of disordered eating behaviors among sexual minority males.
73. Greentree S, Lewis V. Male body image and its relationship to sexual preference and homophobia. *Pakistan J Psychol Res*. 2011; 26:105–126.
- *74. Watson LB, Grotewiel M, Farrell M, Marshik J, Schneider M. Experiences of Sexual Objectification, Minority Stress, and Disordered Eating Among Sexual Minority Women. *Psychol Women Q*. 2015; 39:458. Examined minority stress and objectification pathways to disordered eating among sexual minority women, and found that internalized standards of beauty and internalized heterosexism were both important predictors of sexual minority women's body image concerns.

Table 1

Brief Summary and List of Recent Articles Testing Theory and Mechanisms of Sexual Orientation Disparities in Eating Disorder Risk

	Sociocultural Mechanisms	Minority Stress Mechanisms	Integrative Approaches
Defining Features	Examines the contributions of gender socialization and expression; parent, peer, media socialization about beauty; objectification; internalization of appearance ideals; community norms	Focuses on sexual minority stigma and proximal and distal stressors that impact risk for disordered eating	Synthesizes or combines sociocultural, minority stress, or other mechanisms to account for differential risk for eating disorders between sexual orientation subgroups
Papers Describing, Testing, or Examining the Theory or Mechanism	<p><u>Lesbian Community-Specific Factors</u> Alvy [11], Brittain [54]</p> <p><u>Gender Roles, Gender Conformity</u> Blashill [55], Calzo et al. [37], Calzo et al. [34], Cella et al. [56]</p> <p><u>Objectification Theory</u> Brewster et al. [57], Lanzieri & Hildebrandt [58], Michaels et al. [59]</p> <p><u>Drive for Thinness/Drive for Muscularity</u> Calzo et al. [60], Hunt et al. [61], Nerini et al. [62], Parent & Bradstreet [63], Smith et al. [64]</p> <p><u>Body Dissatisfaction, Weight Misperception</u> Brennan et al. [65], Frederick & Essayli [66], Hadland et al. [67], Yean et al. [27]</p> <p><u>Social Messages, Relationship Status, Partner Effects, Appearance Conversations</u> Brown & Keel [68], Fussner & Smith [69], Gigi et al. [70], Jankowski et al. [12]</p>	<p>Bayer et al. [15]: <i>Shame significantly mediated the association between internalized homophobia and binge eating among lesbian and bisexual women.</i></p> <p>Blashill & Safren [40] <i>Examined victimization as a potential mediator of sexual orientation differences in anabolic-androgenic steroid use.</i></p> <p>Katz-Wise et al. [71]: <i>Earlier age of achievement of sexual minority developmental milestones was associated with more coping-motivated eating among bisexual females, but less coping-motivated eating among mostly heterosexual females, and more disinhibited eating among lesbians and gay males. Greater bullying was associated with more coping-motivated eating among bisexual females and gay males, and more disinhibited eating among bisexual and mostly heterosexual females. Depressive and anxious symptoms accounted for associations between sexual minority stressors and unhealthy eating behaviors for females more so than for males.</i></p> <p>Mason & Lewis [32]: <i>Among lesbian and bisexual women, minority stress is associated with binge eating via social isolation, emotion-focused coping, and negative affect.</i></p> <p>Wang & Borders [16]: <i>Experiencing discrimination and concealing sexual orientation may increase risk for disordered eating among sexual minority men.</i></p> <p>Watson et al [17]: <i>Among bisexual women, Higher levels of anti-bisexual discrimination increases risk for disordered eating behaviors among bisexual women, but this is mediated by internalization.</i></p>	<p>Brennan et al. [72]: <i>Examined drive for muscularity and conformity to masculinity in the context of sexual minority community sexual norms to understand the link between body image, gender norms, and diverse health behaviors.</i></p> <p>Brewster et al. [39]: <i>Examined objectification and minority stress processes as contributors to risk for anabolic steroid use and compulsive exercise among sexual minority men.</i></p> <p>Greentree & Lewis [73]: <i>Tested association between body image measures and internalized homophobia measures among heterosexual and gay men.</i></p> <p>Mor et al. [38]: <i>Studied intensive anaerobic training, dietary supplement use, and anabolic steroid use in the context of sexual risk behaviors among men who have sex with men who frequently go to gyms.</i></p> <p>Watson et al. [74]: <i>Integrated heterosexist discrimination and internalized heterosexism into the objectification theory framework and found that internalized standards of beauty and internalized heterosexism were both important predictors of sexual minority women's body image concerns.</i></p>

Table 2

Summary of Trends in Sexual Orientation Disparities in Disordered Eating Behaviors from Research Studies Published between 2011–2017

Construct	Results	References
Overall ED symptoms	SMM > HM	26, 27, 25, 28
	SMF > HF	25, 28
Overeating & binge eating	SMF > HF	25
Purging	SMM > HM	22, 33, 35
	SMF > HF	34, 35
	T-SM > T-H	23
Fasting	SMM > HM	33
	SMF > HF	33
Dieting behaviors	SMM > HM	22
	SMF > HF	22
Compulsive exercise	-	-
Diet Pills	SMM > HM	22, 33, 35
	SMF > HF	33, 35
	SMF < HF	23
	T-SM > HF	23
	T-H > HF	23
Drugs/supplements to increase muscle	SMM = HM	29, 34
	SMM > HM	41, 42

Note: HF- heterosexual females, HM- heterosexual males, SMF-sexual minority females, SMM-sexual minority males, T-H-transgender heterosexual individuals, T-SM- transgender sexual minority individuals