Title

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Associations among romantic and sexual partner history and muscle dysmorphia symptoms, disordered eating, and appearance- and performance-enhancing drugs and supplement use among cisgender gay men

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Abstract

This study examined relationship status (e.g., single versus not single) and number of sexual partners in relation to muscularity- and disordered eating-related attitudes and behaviors among 1090 cisgender gay men enrolled in The PRIDE Study in 2018. Participants completed measures assessing muscle dysmorphia (MD) symptoms, disordered eating attitudes and behaviors, and appearance- and performance-enhancing drug or supplement (APEDS) use. In linear regression models adjusting for theoretically relevant covariates, neither relationship status nor number of past-month sexual partners was associated with disordered eating attitudes. In terms of MD symptoms, single (versus not single) relationship status was associated with greater appearance intolerance, and a greater number of sexual partners was associated with greater drive for size and functional impairment. In adjusted logistic regression models, a greater number of past-month sexual partners was associated with use of anabolic-androgenic steroids, synthetic performance-enhancing substances, protein supplements, and creatine supplements, as well as greater likelihood of engaging in compelled/driven exercise. Across all associations, effect sizes were generally small. Overall, results support that inquiring about sexual partners may have utility in evaluating risk for muscularity-oriented attitudes and behaviors among cisgender gay men. Future work will need to replicate these findings, particularly in more diverse samples.

Keywords

eating disorder; muscularity; steroid; gay; homosexuality; sexual minority; body image; disordered eating; sexual partners; relationships

1. Introduction

Evidence from studies of gay (presumably cisgender) men suggests elevated body image concerns and eating pathology relative to heterosexual men (Calzo et al., 2017; Feldman & Meyer, 2007; Frederick & Essayli, 2016; Nagata, Compte, et al., 2021a), and the prototypical body ideal among gay men is characterized by lean muscularity (Brewster et al., 2017; Calzo et al., 2013; Halkitis et al., 2004; Marmara et al., 2018). Specifically, community-based studies indicate that gay men report an elevated drive for thinness (Brown & Keel, 2012; Martins et al., 2007) and drive for muscularity (Tiggemann et al., 2007), as well as elevated rates of muscle-enhancing behaviors (Brewster et al., 2017), anabolic steroid use (Blashill & Safren, 2014), disordered eating behaviors (Calzo et al., 2015), and muscle dysmorphia (MD) symptoms (i.e., preoccupation with perceived deficits in muscularity, Calzo et al., 2015, 2017) compared to heterosexual men.

Several theories address why cisgender gay men may be at an increased risk for concerns related to body image, muscularity, and disordered eating, including the expanded tripartite influence model (Tylka & Andorka, 2012), minority stress theory (Meyer, 2003), and intraminority stress theory (Pachankis et al., 2020), which have recently been integrated into a single model for sexual minority men (Convertino, Helm, et al., 2021). This

integrated model suggests that pressures to pursue the ideal body for sexual minority men, including from peers and potential significant others, promote greater thin- and muscular-ideal internalization, which in turn promotes dual pathways of thinness and muscularity dissatisfaction, and restraint and muscle-building behaviors, respectively (Convertino, Brady, et al., 2021). Empirical results supporting this model were consistent with other findings in sexual minority men that dating partner pressures were directly associated with muscularity-enhancing behaviors and indirectly associated with disordered eating and muscularity-enhancing behaviors (Tylka & Andorka, 2012).

Convertino and colleagues (2021) also found that sexual minority community involvement was directly related to greater dietary restraint and muscle-building behavior for sexual minority men. These results are consistent with intraminority stress theory, which suggests that, in addition to pressure as part of being a minoritized group, sexual minority men may experience stress driven by status-based competitive pressures including appearance-based pressures *within* the sexual minority male community (Pachankis et al., 2020). This may be because gay men engage in social and sexual relationships with other men, and men are known to compete for social and sexual opportunities (Pachankis et al., 2020). One study found that gay men were more concerned with body shape and weight and advertised their own weight to potential partners in personal ads more often than heterosexual men (Epel et al., 1996), and body weight and shape-based discrimination is commonly experienced on dating apps for sexual minority men (Tran et al., 2020). Thus, heightened emphasis on physical appearance may lead gay men to overvalue a lean, muscular appearance when trying to attract a partner, which may increase risk for disordered eating and muscularity-enhancing behaviors.

Based on these theories, single gay men seeking a romantic partner may experience these pressures to a greater degree than partnered men, and thus may also be at greater risk for disordered eating and muscle-enhancing behaviors. However, studies examining relationship status as a predictor of body image and disordered eating in gay men have produced mixed results. In a series of studies within the same small sample of gay and bisexual men, being in a relationship (i.e., endorsing “yes” to being currently involved in a steady relationship) served as a protective factor against restrictive eating disorder symptoms, both cross-sectionally (Brown & Keel, 2012, 2013) and longitudinally (Brown & Keel, 2015). However, a larger cross-sectional study of gay men did not find a significant association between relationship status (i.e., single versus in a relationship) and body image, although disordered eating was not examined as an outcome (Marmara et al., 2018). Number of sexual partners, regardless of relationship status, may represent another important variable; few studies have examined associations between number of sexual partners and disordered eating. Gay men with low body satisfaction are more likely to report avoiding sex (Frederick & Essayli, 2016). Among men who have sex with men, self-perception of a higher weight is associated with lower sexual sensation seeking (Goedel et al., 2017). In contrast, other research has reported no significant association between number of sexual partners and body satisfaction (e.g., Wilton, 2009). Further, higher body image disturbance was associated with lower condom use self-efficacy (Blashill, Goshe, et al., 2014) and greater appearance investment (e.g., excessive grooming, mirror checking, and time thinking about one’s appearance) was associated with higher number of condomless anal sex partners

(Brady et al., 2019). Recent research supports that among sexual minority men living with (Gholizadeh et al., 2018) and without HIV (Brady et al., 2019), higher body dissatisfaction was associated with greater frequency of condomless anal sex, only when appearance investment was also high. Conversely, when appearance investment was low, higher body dissatisfaction was associated with lower frequency of condomless anal sex, consistent with potential avoidance of sexual activity (Gholizadeh et al., 2018). Thus, research supports an association between body image concerns and sexual activity; however, more research on the relationships between sexual activity and disordered eating is needed.

Relationship status and number of sexual partners may be associated with appearance and performance-enhancing drug (APEDS) use, which are used by men to enhance physical appearance and level of muscularity (Ip et al., 2011), possibly to increase attractiveness to potential romantic and/or sexual partners. Associations between APEDS use and higher number of sexual partners and condomless sex have been documented among presumed heterosexual (Blashill, Gordon, et al., 2014; Desai et al., 2021) and sexual minority boys and men (Blashill et al., 2015; Ip et al., 2019). In a review of sexual behavior among APEDS users by Ip, Yadao, Shah, & Lau (2016), 36.4% were found to report having multiple sexual partners in the last year. In a sample of presumably cisgender men who endorsed APEDS use, 20% reported ≥ 5 female sexual partners in the last year, and 3.3% reported ≥ 1 male sexual partner during the preceding year (Hope et al., 2013). Therefore, compared to male general population rates of multiple sexual partners in the past year reported by the Centers for Disease Control and Prevention (3.9%; Chandra et al., 2012), male APEDS users reporting female sexual partners were five times more likely to have had multiple sexual partners, while those reporting male sexual partners were about as likely to endorse having multiple sexual partners (Hope et al., 2013; Ip et al., 2016). Further, anabolic-androgenic steroid use has been associated with higher rates of condomless anal sex in sexual minority adult men (Ip et al., 2019) and, and higher rates of condomless anal sex and/or use of alcohol or drugs during sex for adolescent boys (Blashill et al., 2015).

Taken together, evidence suggests variables related to sexual and romantic partnering may be associated with certain muscularity- and disordered eating-related attitudes and behaviors among cisgender gay men. However, findings have been mixed, and prior studies have been limited in conceptual scope (i.e., constructs examined) and the nature of the samples (i.e., smaller sample size, convenience samples). The aim of the present study was to examine the associations among two sexual partner/relationship-related variables (i.e., relationship status and number of sexual partners) and attitudinal and behavioral symptoms of both MD and disordered eating among cisgender gay men. We focused this study on cisgender gay men specifically given differential experiences of relationships, as well as physical and mental health outcomes, in gay men compared to other sexual minority populations (Kuyper & Vanwesenbeeck, 2010; Nagata, Ganson, et al., 2021). We hypothesized that being single (versus not single) and having a higher number of sexual partners would be associated with greater MD symptoms, disordered eating attitudes and behaviors, and APEDS use.

2. Methods

2.1. Study population

The Population Research in Identity and Disparities for Equality (PRIDE) Study is a large-scale national longitudinal cohort study of sexual and gender minority (SGM) adults which include, but are not limited to, people who identify as lesbian, gay, bisexual, transgender, and/or queer (LGBTQ) in the U.S. Specific inclusion criteria included age ≥ 18 years, living in the U.S. or its territories, and the ability to read and respond to questionnaires written in English. Data were collected on a secure, cloud-based, web-responsive platform. PRIDEnet, a national network of organizations and individuals, actively engages SGM communities in all stages of research for The PRIDE Study. Participants in The PRIDE Study were recruited through PRIDEnet constituents, digital communications (blog posts, newsletters), distribution of The PRIDE Study-branded promotional items, in-person outreach at conferences and events, social media advertising, and word-of-mouth. Additional details about The PRIDE Study research platform, recruitment, and design have been previously described (Lunn, Capriotti, et al., 2019; Lunn, Lubensky, et al., 2019). All participants in The PRIDE Study were invited to complete the ‘Eating and Body Image’ survey between April 2018 and August 2018.

For this analysis, we included only participants who reported a male sex assigned to them at birth, exclusively indicated ‘man’ as their gender identity, and exclusively indicated ‘gay’ as their sexual orientation. Of the 10,665 participants in The PRIDE Study at that time, 4285 completed the ‘Eating and Body Image’ survey, and 1090 identified as a cisgender gay man. No compensation was given for survey completion. This study was approved by the University of California, San Francisco and Stanford University Institutional Review Boards, as well as The PRIDE Study’s Research Advisory Committee and Participant Advisory Committee.

2.2. Measures.

See Table 1 for a description of all study measures.

2.3. Data analysis

Stata 15.1 (StataCorp, College Station, TX) was used to conduct analyses. Multiple linear regression analyses were used to examine associations between the romantic/sexual partnering variables (i.e., relationship status and number of sexual partners, both in same model) and MDDI and EDE-Q scales (disordered eating attitudes), adjusting for body mass index (BMI), race/ethnicity, age, and educational attainment. Multiple logistic regression analyses were used to examine associations between the romantic/sexual partnering variables (both in same model) and presence/absence of EDE-Q disordered eating behaviors and lifetime APEDS use, adjusting for BMI, race/ethnicity, age, and educational attainment. Statistical assumptions of linear (e.g., linearity, homoscedasticity, normality, absence of multicollinearity) and logistic regression (e.g., binary outcome, independent observations, no extreme outliers, absence of multicollinearity) were evaluated in Stata and were supported; in logistic regression models, BMI was log transformed to meet the linearity assumption. A two-sided alpha of 0.05 was considered statistically significant. No correction for multiple

testing was applied for the primary analyes; however, results applying the Benjamini-Hochberg procedure to adjust for false discovery rate are presented in the Supplemental Appendix.

3. Results

Table 2 reports descriptive data for the 1090 cisgender gay men included in the sample. Nearly half (42.4%) reported their current relationship status as single, and the median number of sexual partners in the past month was 1 (interquartile range 0–2).

Table 3 reports results of the linear regression and logistic regression analyses. Neither relationship status nor number of sexual partners was associated with disordered eating attitudes (EDE-Q scales). In contrast, having a greater number of sexual partners was associated with higher scores on MDDI Drive for Size and MDDI Functional Impairment. Being single (versus not single) was associated with higher scores on MDDI Appearance Intolerance. In logistic regression models, having a greater number of sexual partners was associated with greater likelihood of compelled/driven exercise and use of all four types of APEDS: anabolic-androgenic steroids, synthetic performance-enhancing substances, creatine supplements, and protein supplements. Relationship status was not associated with any disordered eating behaviors or use of any APEDS. When applying the Benjamini-Hochberg adjustment procedure, associations were found only between number of sexual partners and use of anabolic-androgenic steroids and synthetic performance-enhancing substances (see Supplemental Appendix).

4. Discussion

The present study examined relationship status (being single versus not single) and number of sexual partners in relation to MD symptoms, disordered eating attitudes and behaviors, and APEDS use among cisgender gay men. Findings for MD symptoms were partially consistent with hypotheses. Specifically, adjusted models demonstrated that a greater number of past-month sexual partners was associated with greater MD symptoms including drive for size and functional impairment. Being single (versus no single) was associated with higher scores for only one MD symptom (i.e., appearance intolerance). Hypotheses were generally not supported for disordered eating symptoms. Specifically, adjusted models showed that a greater number of sexual partners was positively associated with the likelihood of compelled/driven exercise; there were no other associations with disordered eating attitudes or behaviors. Relationship status also was not associated with any disordered eating attitudes or behaviors. Finally, hypotheses regarding associations with APEDS use were partially supported. A greater number of sexual partners was associated with greater likelihood of use for all four types of APEDS assessed in this study. However, there were no associations found between relationship status and APEDS use. Importantly, most of the effect sizes for the associations found here were small or very small.

There are several potential explanations for the associations found between number of sexual partners and muscularity-oriented attitudes and behaviors. Consistent with minority stress theory, internalized heterosexism, which refers to the adoption of societal heterosexist

attitudes and beliefs (Meyer, 2003; Szymanski et al., 2008), may manifest in cisgender gay men as a preference for a larger and more muscular body (Halkitis et al., 2004) or engagement in behaviors often seen as masculine, such as muscle building (Brewster et al., 2017; Convertino, Helm, et al., 2021; Kazi et al., 2017; Kimmel & Mahalik, 2005), to challenge the cultural stereotype that gay men are effeminate (Kurtz, 2008). While these cross-sectional results do not address causality, APEDS may promote a physical appearance consistent with predominant cultural ideals for cisgender gay men (i.e., lean and muscular body), which, in turn, may increase confidence in the ability to attract and engage with sexual partners.

The positive results for sexual partner history and APEDS use specifically are consistent with findings in predominately cisgender heterosexual men (Blashill, Gordon, et al., 2014; Desai et al., 2021; Hope et al., 2013; Ip et al., 2016) and sexual minority boys and men (Blashill et al., 2015; Ip et al., 2019). Other explanations for the positive associations between APEDS use and sexual partner history involve potentially shared underlying psychological or physiologic mechanisms. For example, a tendency for greater impulsivity, novelty-seeking, or reward responsivity may contribute to APEDS use and engaging with more sexual partners (Garcia-Argibay, 2019). Further, some types of APEDS, such as anabolic androgenic steroids, lead to increased testosterone levels and heightened sexual arousal and libido (Boloña et al., 2007; Traish et al., 2007).

The absence of associations between relationship status and number of sexual partners and most of the disordered eating variables in this study are consistent with some, but not all, previous findings. Although investigating a slightly different construct, Marmara et al. (2018) found that neither relationship status nor sexual agreement type (monogamous versus non-monogamous) moderated the detrimental impacts of body image disturbance on mental health in gay men. In contrast, our findings differ from those reported by Brown and Keel (2012, 2013, 2015), who found that single bisexual and gay men had greater eating pathology (e.g., drive for thinness, restrictive eating). However, these studies were based on a relatively small sample of gay and bisexual male students from a single university in the U.S.; the findings may not be consistent with the large U.S. national sample used in this investigation, which also has a wider age range. While a number of previous studies have found associations between body image concerns and risky sexual behavior in sexual minority men (Blashill, Goshe, et al., 2014; Brady et al., 2019; Gholizadeh et al., 2018) variables in the present study assessed broader disordered eating symptoms and number of sexual partners across a wider age range of gay men, which may account for observed differences. Taken together, the mixed consistency of findings from the present and prior studies may be due to the somewhat different nature of the constructs under investigation and the corresponding measures used. More research is needed to better understand the relationship between romantic and sexual partner history with disordered eating symptoms, drive for muscularity, and body image in gay men.

4.1. Strengths and limitations

Strengths of this study include the large, national, community-based sample reflecting a broad age range, the use of MD and disordered eating symptom measures that were

validated for use with gay men, and an analytic approach that adjusted for numerous conceptually relevant covariates. However, limitations should be noted. First, the cross-sectional, survey-based design precludes prospective and causal determinations. Second, there may have been other confounding variables that were not accounted for in the analyses. Third, our U.S.-based sample was recruited via an online platform and was predominantly White and highly educated; thus, findings may not be generalizable to cisgender gay men from more diverse sociodemographic backgrounds. Fourth, we combined non-single relationship statuses into one group to facilitate interpretation and maintain adequate sample sizes for comparisons, but this may be an oversimplification. The "single" category may be also heterogeneous as "single" can be defined differently for different people. Fifth, APEDS items assessed lifetime use, and data on current use were not available. Data on APEDS dosage, frequency, or duration of use were not collected. Finally, primary results were reported as uncorrected for multiple testing; corrected results are presented in the supplement for transparency.

5. Conclusions

The current findings indicate that number of past-month sexual partners is associated with APEDS use, certain core MD symptoms, and compelled/driven exercise among cisgender gay men. In contrast, relationship status was significantly associated only with the MD symptom of appearance intolerance, but not with any disordered eating symptoms or APEDS use. These findings have potential clinical implications. Inquiring about sexual partners is already recommended in assessments of risk for sexually-transmitted infections (Workowski & Bolan, 2015), but it also may be important for evaluating risk for certain MD and disordered eating symptoms as well as APEDS use. Further research is needed to examine theoretically relevant moderators and mediators of the associations investigated in this study. For instance, appearance investment has been found to moderate associations between body dissatisfaction and risky sexual behavior among sexual minority men living with (Gholizadeh et al., 2018) and without HIV (Brady et al., 2019). Additional research will also be needed to explore these relationships in other sexual minority groups. Finally, future studies would benefit from examining how different types and characteristics of romantic and sexual relationships (e.g., relationship length, security and satisfaction; monogamy versus polyamory) impact body image, disordered eating, and MD symptomatology in gay men.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- We analyzed data from cisgender gay men from The PRIDE Study
- Sexual/romantic partner history was generally not associated with disordered eating
- Sexual partner history was associated with certain muscle dysmorphia symptoms
- Relationship status was associated with only one muscle dysmorphia symptom
- Sexual partner history, but not relationship status, was associated with APEDS use

Table 1.

Description of measures

Measure	Description
Number of sexual partners	Participants were asked, “How many sexual partners (including oral, anal, vaginal sex) have you had in the past month?” Participants could select a numerical response ranging from “0” to “29” in single integer values (e.g., “0”, “1”, “2”) or the option “30 or more.”
Relationship status	Participants were asked “How would you describe your current relationship status?” Response options included “single,” “dating (not living together),” “cohabitation (living together),” “civil union/domestic partnership,” “married,” or “other (please specify).” For the purposes of these analyses, responses were dichotomized to “single” or “not single” (i.e., all other response choices).
Muscle Dysmorphic Disorder Inventory (MDDI)	The MDDI is a 13-item self-report measure of muscle dysmorphia symptoms (Hildebrandt et al., 2004) and has been validated in cisgender gay men (Compte et al., 2021). Participants rate items on a 5-point Likert-type scale from 1 (*never*) to 5 (*always*) scale. The MDDI includes a total score and three subscales: Drive for Size, Appearance Intolerance, and Functional Impairment. Items are summed, and higher scores reflect greater muscle dysmorphia symptomatology. Internal consistency was acceptable for the total scale and subscales in this study (Cronbach αs: 0.74–0.87).
Eating Disorder Examination-Questionnaire (EDE-Q)	The EDE-Q is a self-report questionnaire that assesses disordered eating attitudes and behaviors over the previous 28 days (Fairburn & Beglin, 2008). The measure has been validated in sexual minority men (Klimek et al., 2021), revealing an alternate factor structure from the original validation study (Friborg et al., 2013) that is comprised of four subscales: Weight and Shape Concern, Preoccupation and Restriction, Dietary Restraint, and Eating Shame. Participants respond to items on a 7-point scale, and items are averaged such that higher scores reflect greater disordered eating severity. Internal consistency was acceptable for the four subscales in this study (Cronbach αs: 0.78–0.93). The EDE-Q also assesses frequency of disordered eating behaviors in the previous 28 days, including binge eating, vomiting, laxative use, and compelled/driven exercise. In this study, consistent with previous research on non-clinical samples (Lavender et al., 2010; Luce et al., 2008; Nagata et al., 2020), frequencies were dichotomized to reflect presence/absence of each behavior, with presence defined as ≥1 episode of a given behavior in the past 28 days. The majority of participants had 0 for each of the behaviors as expected given the non-clinical sample; therefore, disordered eating behavior data were not normally distributed. Further, our research focused on understanding the association of relationship status and sexual partners with presence or absence of any disordered eating behavior, as opposed to behavior severity or frequency.
Appearance- and Performance-Enhancing Drugs and Supplement (APEDS) Use	Participants were asked if they had ever used the following drugs/supplements for the purpose of enhancing appearance or performance: anabolic androgenic steroids, creatine supplements (such as creatine monohydrate, creatine ethyl ester, or others), synthetic muscle enhancers (such as clenbuterol or human growth hormones), or protein supplements (such as whey protein, protein shakes, or protein bars). This question was adapted from the EAT 2010 survey (Eisenberg et al., 2012).
Covariates	Sociodemographic information (age, race/ethnicity, education), weight, and height were based on self-report. Body mass index was calculated using the standard formula (weight(kg)/height(m)^2). These covariates were selected because they could be possible confounders in the associations examined in this study (Nagata et al., 2020; Nagata, Compte, et al., 2021b; Nagata, Peebles, et al., 2021; Udo & Grilo, 2018).

Table 2.

Sociodemographic characteristics of cisgender gay men (N= 1090) from The PRIDE Study.

Age, years (median, IQR)	39 (29, 54)
Race/ethnicity (%)	
White	83.7%
Hispanic/Latino	6.4%
Multiracial/Other	4.3%
Asian/Pacific Islander	3.2%
Black/African American	1.9%
Native American	0.6%
Educational attainment (%)	
College degree or higher	78.6%
Body mass index (BMI), kg/m^2 (mean ± SD)	27.2 ± 6.3
Relationship status	
Single	42.4%
Not single[a]	57.6%
Number of sexual partners (median, IQR)	1 (0, 2)
Muscle Dysmorphic Disorder Inventory (mean ± SD)	
Total Score	27.4 ± 7.7
Drive for Size	9.9 ± 4.7
Appearance Intolerance	11.5 ± 4.3
Functional Impairment	6.1 ± 3.0
Eating Disorder Examination-Questionnaire attitudes[b] (mean ± SD)	
Weight & Shape Concern	2.5 ± 1.7
Preoccupation & Restriction	.6 ± 1.0
Dietary Restraint	2.2 ± 2.0
Eating Shame	.6 ± 1.0
Eating Disorder Examination-Questionnaire behaviors (%)	
Binge eating	10.7%
Compelled/driven exercise	9.4%
Laxative use	1.1%
Vomiting	0.6%
Appearance- and performance-enhancing drugs and supplements use (%)	
Protein supplements	42.5%
Creatine supplements	16.2%
Anabolic androgenic steroids	2.9%
Synthetic performance enhancing substances	2.0%

IQR = interquartile range

[a]"Not single" includes dating, cohabitation, civil union/domestic partnership, married, and other

[b]Friborg et al.'s (2013) four-factor structure, validated in sexual minority men, was used

Table 3.

Associations of number of relationship status (single versus not single) and sexual partners with Muscle dysmorphia symptoms, eating disorder attitudes and behaviors, and appearance- and performance-enhancing drugs and supplements use among cisgender gay men in The PRIDE Study (N=1,090).

	Single versus not single[a]		Number of sexual partners	
Muscle Dysmorphia symptoms				
Muscle Dysmorphic Disorder Inventory	B (95% CI)	p	B (95% CI)	p
Total Score	0.68 (−0.30 – 1.65)	0.175	0.17 (−0.03 – 0.36)	0.090
Drive for Size	0.10 (−0.43 – 0.63)	0.714	0.14 (0.04 – 0.25)	0.009
Appearance Intolerance	0.49 (0.01 – 0.97)	0.046	−0.05 (−0.15 – 0.05)	0.306
Functional Impairment	−0.01 (−0.39 – 0.37)	0.972	0.08 (0.01 – 0.16)	0.030
Disordered eating attitudes and behaviors				
Eating Disorder Examination-Questionnaire				
Attitudes[b]	B (95% CI)	p	B (95% CI)	p
EDE-Q Weight & Shape Concern	0.18 (−0.01 – 0.38)	0.068	0.01 (−0.03 – 0.05)	0.545
EDE-Q Preoccupation & Restriction	0.05 (−0.07 – 0.16)	0.458	0.00 (−0.02 – 0.02)	0.829
EDE-Q Dietary Restraint	−0.16 (−0.41 – 0.10)	0.237	0.03 (−0.02 – 0.08)	0.293
EDE-Q Eating Shame	−0.01 (−0.13 – 0.11)	0.860	0.01 (−0.01 – 0.04)	0.298
Behaviors	aOR (95% CI)	p	aOR (95% CI)	p
Binge eating	1.10 (0.72 – 1.67)	0.660	1.03 (0.96 – 1.12)	0.398
Compelled/driven exercise	1.00 (0.64 – 1.53)	0.970	1.08 (1.01 – 1.16)	0.024
Laxative use	2.07 (0.58 – 7.36)	0.259	1.05 (0.84 – 1.30)	0.674
Vomiting	0.25 (0.03 – 2.20)	0.211	1.08 (0.88 – 1.35)	0.439
Appearance- and performance-enhancing drugs and supplements (APEDS) use	aOR (95% CI)		aOR (95% CI)	p
Protein supplements	1.10 (0.85 – 1.43)	0.469	1.06 (1.01 – 1.12)	0.020
Creatine supplements	1.20 (0.85 – 1.68)	0.300	1.07 (1.01 – 1.14)	0.021
Anabolic androgenic steroids	1.68 (0.79 – 3.60)	0.180	1.22 (1.11 – 1.34)	<0.001
Synthetic performance enhancing substances	1.39 (0.55 – 3.51)	0.491	1.18 (1.07 – 1.31)	0.002

Analyses are adjusted for BMI (log transformed in logistic regression analyses to meet linearity assumption), race/ethnicity, age, and education. Both number of sexual partners and relationship status were included in the same model.

[a] "Not single" includes dating, cohabitation, civil union/domestic partnership, married, and other. In sensitivity analyses, there were no significant differences using the dichotomous versus categorical relationship status variable.

[b] Friborg et al.'s (2013) four-factor structure, validated in sexual minority men, was used.

B = Estimated coefficient from linear regression; aOR = adjusted odds ratio from logistic regression; CI = confidence interval