



Body dissatisfaction, muscle dysmorphia, eating disorder and self-esteem in Spanish men of different sexual orientations

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Abstract

In the 21st century there has been a considerable increase in research on body image, although men, and especially those who belong to sexual minority groups have been given little attention. The aim of this study was to investigate the risk of suffering clinical body image concerns in the form of eating disorders, muscle dysmorphia and low self-esteem for one's sexual orientation, using a cross-sectional design and an online survey. The convenience sample was made up of 182 men (43.4% gay, 33% heterosexual, 18.7% bisexual, and 4.9% asexual), with a mean age of 33.88 years old (SD=11.59). The results showed that body dissatisfaction was positively correlated to eating disorders and muscle dysmorphia and negatively correlated to self-esteem and age. The participants' sexual orientation was related to: (1) body image concerns and self-esteem (controlling by age); and (2) the risk of developing relevant body image concerns and eating disorders. Men in sexual minorities appear to have more body image concerns and eating disorders.

Keywords Body image · Body dissatisfaction · Eating disorder · Muscle dysmorphia · Sexual minority

Introduction

Body image is a multidimensional construct that includes how individuals “think, feel, and behave with regard to their own physical attributes” (Muth & Cash, 1997, p. 1438), i.e. it includes perceptual, cognitive-affective, and behavioral domains (Cash & Smolak, 2011). Body image can be manifested in either a positive or negative manner. A positive body image includes various facets such as body appreciation (satisfaction with or evaluation of one's appearance), functional body orientation (emphasizing the body's sensations and functioning over mere appearance), functional body satisfaction (satisfaction derived from the body's capabilities and experiences) and body image flexibility (Tylka & Wood-Barcalow, 2015). A positive body image encompasses feelings of gratitude, love, and respect for

the attributes and functionalities of one's own body (Tylka, 2018). Conversely, a negative body image or body image dissatisfaction pertains to an individual's negative assessment, negative thoughts, and a poor sense of identification with their own size and shape (Grogan, 2016; Quittkat et al., 2019).

Body image dissatisfaction

The experience of body image dissatisfaction arises from the perceived disparity between one's own body and the societal standards of appearance to which one associates (Heider et al., 2018); and it has been related to depressive disorders (e.g., Barnes et al., 2020; Flores-Cornejo et al., 2017), anxiety disorders (e.g., Barnes et al., 2020; Vannucci & Ohannessian, 2018) weight and eating disorders (e.g., Brownell & Walsh, 2017), muscle dysmorphia symptomatology (Skemp et al., 2019), low self-esteem (e.g., Lora & Valdés-Díaz, 2019) and a poor quality of life (e.g., Griffiths et al., 2016).

Several theories attempt to explain the development of body dissatisfaction, including the Tripartite Influence Model (Thompson et al., 1999), and the objectification theory (Fredrickson & Roberts, 1997). The Tripartite Influence

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Model posits that societal pressure emanating from family, friends, and the media to conform to prevailing sociocultural appearance standards contributes to body dissatisfaction and restrained eating via internalization of the gendered body ideal and social appearance comparisons. The objectification theory (Fredrickson & Roberts, 1997) explores how individuals internalize and adhere to culturally defined beauty standards (Fredrickson et al., 2011). According to this theory, individuals are treated and assessed on the basis of their physical appearance (i.e., as objects) rather than their human qualities. Repeated exposure to objectification experiences results in ‘self-objectification,’ wherein individuals internalize the observer’s viewpoint, which places the emphasis on appearance as the ideal standard for attractiveness. This leads individuals to evaluate themselves primarily based on their appearance, focusing on how they look rather than their capabilities and they frequently engage in monitoring their bodies and appearances against idealized standards (Fredrickson et al., 2011).

Body image dissatisfaction and sociodemographic characteristics

Gender Traditionally, the problems related to body image pathology have been considered a gender-specific issue, so that most research has been conducted on girls and women (Carrard et al., 2021; Di Gesto et al., 2022; Vall-Roqué et al., 2023). However, there is increasing recognition that people of all genders can experience body image dissatisfaction. Recent research has shown that men can also manifest feelings of body dissatisfaction when they consider they no longer conform to the prevalent masculine body model, i.e., to be thinner and have better musculature (Grogan, 2016).

The belief that men were generally satisfied with their bodies can be attributed to the narrow operationalization of body dissatisfaction, often linked solely to a desire for thinness. However, this approach does not capture the diverse body image ideals for men. In men, the aesthetic ideal is focused on weight loss accompanied by an increase in muscle mass (Sobrino-Bazaga & Rabito-Alcón, 2018). In other words, in men muscularity and low body fat are commonly identified as their primary body image concerns (Tylka, 2011). This is partly influenced by the culture of hegemonic masculinity based on aspects such as strength, invulnerability and rejection of the feminine, all intimately linked to the body, and by the emphasis on physical strength, sexual potency and emotional restraint (Beltrán, 2019). Body dissatisfaction in men is thus linked to lower self-esteem, a desire for increased muscularity, and problematic behaviors related to muscle development, including the use of supplements and substances, as well as dysfunctional exercise habits, particularly focused on muscle and strength training

(Ganson & Rodgers, 2022). This means that men have a higher risk of presenting body image disorders such as muscle dysmorphia than women (Lechner et al., 2019).

Age Some studies also approach the changes that affect the perception of self-body image in relation to age and different life stages (e.g., Hockey et al., 2021; Sobrino-Bazaga & Rabito-Alcón, 2018). For instance, Sobrino-Bazaga and Rabito-Alcón (2018) concluded that age influences maintaining body dissatisfaction, which seems to reduce over the years. In the same line, Hockey et al. (2021) found that body satisfaction decreased gradually with age for both men and women. Mellor et al. (2010) found that younger men had a higher degree of body dissatisfaction than older men, although Ålgars et al. (2009) found both an age-related reduction and an increase in body satisfaction as well as interactions between age and gender and concluded that body satisfaction can also fluctuate in the different phases in adult life, while this pattern can be different for women. Quittkat et al. (2019) found that body dissatisfaction in men remained relatively stable across all ages.

Social networks Social networks encompass online platforms such as Facebook, Instagram, and Twitter, providing users with the capability to generate and share visual and textual content with others. Prior research has related the use of social networks to body image pathology (e.g., Hinojo-Lucena et al., 2019; Imperatori et al., 2022; Padín et al., 2021; Saiphoo & Vahedi, 2019). For instance, a meta-analysis carried out by Hinojo-Lucena et al. (2019) associated problematic internet use, including social networks, with the development of eating disorders, such as, anorexia nervosa, bulimia nervosa, binge-eating, preoccupation with food, loss of control of one’s eating, and dieting. The meta-analysis by Saiphoo and Vahedi (2019) found that the use of social networks is associated with body image disturbance and was found to be more harmful in the younger population or in those who use social networks especially focused on their appearance. Holland and Tiggemann (2016) found that the use of social networks, especially for appearance, is related to increased body dissatisfaction and eating disorders.

In the same line, recent studies have found that social network use is also associated with body image concerns and the possible development or perpetuation of eating disorders (Padín et al., 2021), symptoms related to muscle dysmorphia in vulnerable subjects with dysfunctional use of the social media (Imperatori et al., 2022) and low self-esteem when using social networks to compare oneself to others (Krause et al., 2021).

Physical activity Prior studies have associated an addiction to exercise with body image dissatisfaction, body image concerns and eating disorders, such as bulimia (Gori et al., 2021), muscle dysmorphia (Olave et al., 2021) and low self-esteem (Corazza et al., 2019).

A scoping review by Sabiston et al. (2019) found that body image dissatisfaction, predominantly manifested as shape dissatisfaction or body weight, was related to little participation in physical activity and sport. This finding was included both men and women of all ages. A study by Fernández-Bustos et al. (2019) showed that physical activity can help to achieve a positive self-concept and promote psychological well-being by improving physical perception and body satisfaction.

Body image dissatisfaction and self-esteem

Self-esteem has been associated with body image pathology; the study by Soohinda et al. (2019) in India found a significant negative correlation between body image dissatisfaction and self-esteem, explained by the shame of failing to satisfy idealistic cultural standards. In the same line, a meta-analysis by Colmsee et al. (2021) found that low self-esteem is an important factor in the development of pathological eating and is a universal risk factor for different eating disorders.

Body image dissatisfaction and sexual orientation

Sexual minority men are considered vulnerable to developing a body image-related pathology. A greater prevalence has been found in sexual minority men compared to their heterosexual peers, and are often at greater risk of body dissatisfaction, eating disorder psychopathology, body dysmorphic disorder and muscle dysmorphia (e.g., Fabris et al., 2022b; Hazzard et al., 2020; He et al., 2020; Mahon et al., 2022). The research by Cervantes-Luna et al. (2019) in Mexico found that gay and bisexual men were more dissatisfied with their body image than heterosexual men, who are more motivated for weight loss, internalization of the thinness ideal, and concern about food, in comparison to heterosexual men. The research by Hazzard et al. (2020) conducted on a national sample of United States college students, found that bisexual men, and in particular gay men, were more than twice as likely to have a high risk of eating disorders than heterosexual men. Gay and bisexual men had a greater probability of a lifetime eating disorder diagnosis than heterosexual men. In a study carried out in Ireland, Mahon et al. (2022) found that, compared to heterosexual men, sexual minority men were more likely to report dissatisfaction with their bodies, while gay and bisexual

men were more likely to report restricting food intake to lose weight than heterosexual men. In a study conducted in Israel, Gewirtz-Meydan and Spivak-Lavi (2023) showed that non-heterosexual men present greater eating disorders symptomatology than heterosexual men. Swami et al. (2019) found a relationship between asexuality and body image concerns in a sample of British adults.

These differences can also be found in body image disorders such as body dysmorphic disorder, and muscle dysmorphia (a subtype of body dysmorphic disorder). The study carried out by Oshana et al. (2020) in the United States found that nearly 50% of sexual minority men (49.3%) tested positive for body dysmorphic disorder, a prevalence significantly higher than that observed in the general population. The validation study of Muscle Dysmorphic Disorder Inventory (MDDI) by Hildebrandt et al. (2004) in the United States found that sexual minority men reported significantly higher total scores in the MDDI than heterosexual men. In the research project conducted by Fabris et al. (2022a, b) in Italy, men who have sex with men (MSM) were found to be more at risk of developing body dysmorphia disorders, including muscle dysmorphia, than heterosexual men.

Self-esteem and sexual orientation

Self-esteem also appears to be a variable affected to a greater extent in certain sexual orientations. For instance, the longitudinal study by Jones et al. (2017) in the U. K., found that participants who were members of sexual minorities presented lower self-esteem than the heterosexual participants, while a recent meta-analysis by Bridge et al. (2019) found that sexual minority men had significantly lower self-esteem than heterosexual men. Self-esteem was also found to be significantly lower in all sexual minority orientation groups than in heterosexual men. The difference in self-esteem levels was slightly larger for bisexual men than gay and combined sexual minority men, although a direct comparison of gay men and bisexual and gay men did not find any difference in self-esteem.

Impact of minority stress on body image-related pathology and Self-esteem

The Minority stress theory (Meyer, 2003) has been employed to account for the difference in body dissatisfaction, eating disorder behaviors, body dysmorphic disorder, muscle dysmorphia and self-esteem between sexual minority men and heterosexual men. The Minority stress theory (Meyer, 2003) states that sexual minorities are subjected to increased levels of stigma-related stress associated with their minority status (e.g., fear of rejection, sexual orientation concealment, internalized homophobia, prejudice, discrimination,

stigma, and violence), which can lead to an increased risk of psychological distress and alterations in mental health, including body dissatisfaction, eating disorders and muscle dysmorphia symptomatology, and low self-esteem. For instance, the meta-analysis by Badenes-Ribera et al. (2018) found a relationship between internalized homonegativity and body image concerns in sexual minority men. In a study carried out in the United States, Convertino et al. (2021) found internalized homophobia, sexual orientation concealment, and heterosexist discrimination were positively associated with a higher of risk of disordered body image behaviors and concerns, including body dysmorphic disorder and eating disorders. Also in the United States, Wang and Borders (2017) found that minority stress factors like discrimination and sexual orientation concealment predicted eating disorders in sexual minority men. Oshana et al. (2020) found that gay-related rejection sensitivity and sexual orientation concealment are associated with body dysmorphia symptoms in sexual minority men.

Intra-minority stress theory highlights the importance of understanding the nuanced dynamics within minority communities and their impact on individuals' mental health, including body dissatisfaction (Pachankis et al., 2020). This theory suggests that interactions within the LGBTQ + community itself can be a potential source of body dissatisfaction. In this way, the LGBTQ + community may impose certain expectations related to appearance, adherence to stereotypical norms, and pressure to conform to idealized standards, which can influence body image concerns among sexual minority men. For instance, Convertino et al. (2021) found that community involvement (defined as behavioral participation: participating in political, social, or cultural events) was positively associated with a greater risk of disordered body image behaviors and concerns, including body dysmorphic disorder and eating disorders in sexual minority men.

Sexual minorities in the Spanish context

Spain is one of the countries that most support the LGBTQ + community. According to a recent survey (Nolsoe, 2021) and is the country in which most people would be supportive if a family member came out as lesbian, gay or bisexual, according to 91% of the respondents. Spain also has the highest proportion of people who identify as LGBTQ+, according to 10% of the respondents. Nevertheless, violence and hatred towards the LGBTQ + community continues to exist, as reflected by sexual orientation and gender identity as the third cause of hate crime in Spain (Ministerio del Interior, 2020). In areas such as the workplace, LGTBI people experience greater discrimination based on their

sexual orientation, causing them greater work-related stress, mental disorders and depression (Moya & Moya-Garófano, 2020).

Purpose of the study

To our knowledge, there are no prior studies that examine body image concerns in sexual minority men in the Spanish context, so that there is a lack of understanding and attention to body image concerns among sexual minority men in Spain. Given the cultural and social diversity across different contexts, it is crucial to explore these concerns in the Spanish setting to gain insights that are relevant and applicable to the experiences of sexual minorities in this country.

Our main aim was thus to investigate body dysmorphic concerns, eating disorder symptomatology, muscle dysmorphia symptomatology, self-esteem levels and their relationship to the participant's sexual orientation in Spanish men in an attempt to answer the following research questions:

- 1) Are there any differences in body dysmorphic concern symptomatology or in the risk of developing clinical body dysmorphic concerns by sexual orientation?
- 2) Are there differences in eating disorder symptomatology or in the risk of developing clinical eating disorder symptomatology by sexual orientation?
- 3) Are there differences in muscle dysmorphia symptomatology or in the risk of developing clinical muscle dysmorphia by sexual orientation?
- 4) Are there differences in self-esteem or in the risk of developing low self-esteem by sexual orientation?

A second aim was to examine the relationship among the study variables in a sample of these men.

Method

Research design

A cross-sectional research design was applied using an online survey by means of the Google Forms platform. To participate in the study, the participants had to meet the following inclusion criteria: (1) be over 18 years old (the legal age in Spain), (2) self-identified as a man, (3) Spanish speaking, (4) provide informed consent, and (5) fill in all the questions in the online survey.

Sampling method

The sample was recruited by a non-probabilistic sampling method that used various strategies to ensure a large and

diverse sample. Initially, e-mails were sent to LGBT associations to ask for their collaboration in sharing the survey link among their members. The survey link was also shared via the researcher's informal social networking (e.g., Twitter and Facebook) and messaging apps (e.g., WhatsApp), while the researchers shared the survey link with personal contacts and used the snowball sampling method by asking the participants to share the survey link with other men. These recruitment methods are widely used in studies with samples made up of LGBT individuals, given the difficulty of recruiting such a highly specific target.

Participants

The initial sample consisted of 199 participants. After checking the inclusion criteria, 17 participants were removed from the sample: 13 of them because they self-identified as women and 4 because they self-identified as the “other” sex variable, so that the final sample was composed of 182 Spanish men aged between 18 and 60 years old ($M = 33.88$, $SD = 11.59$). Of these, 43.4% self-identified as gay men ($n = 79$), 33% as heterosexual men ($n = 60$), 18.7% as bisexual men ($n = 34$) and only 4.9% self-identified as asexual men ($n = 9$). Table 1 presents the participants' sociodemographic information for the whole sample and by sexual orientation. No differences were found among different sexual orientation groups in the frequency of physical exercise practice (Fisher's Exact Test (9) = 13.95, $p = .124$, Cramer's $V = 0.16$), and the frequency of using the social network (Fisher's exact test (9) = 14.74, $p = .098$, Cramer's $V = 0.16$); however, there was a statistically significant difference in age (F. Welch (3, 178) = 5.90, $p < .001$, $\eta^2 = 0.090$). The heterosexual men were older than bisexual men ($p < .001$) and bisexual men were older than the gay men ($p < .001$). No differences were found between the rest of the pairwise comparisons.

Instruments

The participants responded to an online survey implemented on the Google platform. The online survey was made up of two sections, the initial section focused on gathering data related to sociodemographic variables, while the subsequent section was designed to obtain information on body image concerns, eating attitudes, muscle dysmorphia, and self-esteem.

Socio-demographic questionnaire

The participants were asked to give the following socio-demographic information: current age (years), sex (categorized as: men, women and other), sexual orientation (categorized as: heterosexual, homosexual, bisexual and asexual), frequency of physical exercise (categorized as: I don't usually do physical exercise, I do physical exercise once a week, I do physical exercise between two and three times a week, I do physical exercise more than four times a week) and frequency of using social networks (categorized as: I don't usually use social networks, I use social networks between 1 and 3 h/day, I use social networks between 3 and 5 h/day, I use social networks more than 6 h/day). No data was available on the educational qualifications and socio-economic status of the participants as these questions were not included the socio-demographic questionnaire.

Body Image Concern Inventory (BICI)

The BICI (Littleton et al., 2005) is a self-report measure for assessing body dysmorphic concerns consisting of 19 items with Likert-type responses on a 5-point scale ranging (from 1 = never to 5 = always). The total score was obtained as the sum of the scores of each item. Possible scores ranged from 19 to 95 and higher scores indicated greater body dysmorphic concerns. A cutoff of 72 points was proposed by Littleton et al. (2005) for distinguishing between individuals who

Table 1 Participants' sociodemographic characteristics

	Total ($N = 182$) n (%)	Sexual Orientation			
		Heterosexual ($n = 60$) n (%)	Bisexual ($n = 34$) n (%)	Gay ($n = 79$) n (%)	Asexual ($n = 9$) n (%)
Age, $M(SD)$	33.88(11.59)	35.83(13.08)	26.6(7.16)	35.43(10.79)	34.56(12.58)
Physical exercise					
Don't usually do it	60 (33%)	14 (23.3%)	17 (28.3%)	24 (40%)	5 (8.3%)
Once a week	27 (14.8%)	7 (25.9%)	6 (22.2%)	13 (48.1%)	1 (3.7%)
Between 2 or 3 times a week	61 (33.5%)	23 (37.7%)	6 (9.8%)	30 (49.2%)	2 (3.3%)
More than 4 times a week	34 (18.7%)	16 (47.1%)	5 (14.7%)	12 (35.3%)	1 (2.9%)
Use social networks					
Don't usually use it	23 (12.6%)	12 (52.2%)	1 (4.3%)	8 (34.8%)	2 (8.7%)
Between 1 and 3 h/day	87 (47.8%)	33 (37.9%)	15 (17.2%)	34 (39.1%)	5 (5.7%)
Between 3 and 5 h/day	57 (31.3%)	12 (21.1%)	15 (26.3%)	29 (50.9%)	1 (1.8%)
More than 6 h/day	15 (8.2%)	3 (20%)	3 (20%)	8 (53.3%)	1 (6.7%)

have a risk profile of developing body dysmorphic concern and those who did not. In the current study the scores scale showed excellent reliability (Cronbach's $\alpha = 0.94$, McDonald's $\omega = 0.94$).

Eating attitudes test–26 (EAT-26)

The EAT-26 (Garner et al., 1982) is a self-report measure for assessing the risk of eating disorders and contained 26 items with Likert-type responses on a 6-point scale ranging (from 0 = never to 5 = always). The total score was generated as the sum of the scores of each item. Possible scores ranged from 0 to 78 and higher scores indicated a greater risk of eating disorders (e.g., anorexia and bulimia). The scores scale showed adequate reliability (Cronbach's $\alpha = 0.86$, McDonald's $\omega = 0.87$).

Muscle Dysmorphic Disorder Inventory (MDDI)

The MDDI (Hildebrandt et al., 2004) is a self-report measure containing 13 items rated on a 5-point Likert-type scale (from 1 = never to 5 = always). The total score was obtained as the sum of the scores of each item. Possible scores ranged from 13 to 65 and higher scores indicated greater muscle dysmorphia symptomatology. A cutoff of 39 points was suggested by Hildebrandt et al. (2004) for differentiating between individuals who have a risk profile of developing muscle dysmorphia and those who do not. The scores scale showed acceptable reliability (Cronbach's $\alpha = 0.76$, McDonald's $\omega = 0.77$).

Rosenberg Self-Esteem Scale (RSES)

This RSES (Rosenberg, 1965) scale is a self-report instrument consisting of 10 items rated on a 4-point Likert scale (from 1 = Completely disagree to 4 = Completely agree). The total score was generated by adding the scores of the items that make up the scale. Possible scores ranged from 10 to 40 and higher total scores and higher scores indicated higher self-esteem. The scores were divided into total self-esteem scores in three categories: high (30 to 40 points), medium (26 to 29 points) and low (25 or less) (Rosenberg, 1965). The reliability of this study was robust (Cronbach's $\alpha = 0.89$, McDonald's $\omega = 0.90$).

Procedure

The study was carried out in accordance with the principles outlined in the Declaration of Helsinki for research involving human subjects, including research on identifiable human material and data or other comparable and equivalent ethical standards (World Medical Association, 2013)

and implemented on the Google Forms platform. The forms contained information on the purpose of the study, stated that data confidentiality would be ensured that participation in the study was voluntary and unremunerated and that the participants could drop out at any time. Informed consent was obtained online from all the participants as the forms included on the subject. Data were collected between 17 th February 2022 and 14 th April 2022. All the respondents completed the same questionnaire pack. The whole procedure took approximately 15–20 min.

Data analyses

Firstly, the variables under study were examined to explore the normality data skewness and the kurtosis of the variables under study. Data can be considered as normally distributed if skewness and kurtosis values are between ± 2 $y \pm 7$, respectively (Finney & DiStefano, 2006). None of the variables showed marked skewness and/or kurtosis, so that it could be considered as following a normal distribution (Finch et al., 1997).

Secondly, to describe the participants' sociodemographic characteristics and variables (BICI, EAT-26, MDDI, RSES), the mean (and standard deviation) of the continuous variables, frequencies (and percentages) of the categorical variables (physical exercise and use of social networks) were used. To determine any differences in the participants' sociodemographic characteristics by sexual orientation, Fisher's Exact Test for categorical variables and the one-way ANOVA test for age were then performed. If these analyses showed statistically significant differences, a post hoc pairwise comparison adjusted by Bonferroni's method for categorical variables and adjusted by Tukey's method were performed to distinguish the groups that were statistically different from others. Prior to the ANOVA analyses, the assumptions of homoscedasticity were tested and met in all cases using Levene's Test. Cramer's V and eta squared value (η^2) were used as the effect size measure for categorical and continuous variables, respectively (Cohen, 1988).

Thirdly, to evaluate the relationship between variables, bivariate correlations tests (Pearson or Spearman Coefficient) were performed.

Fourthly, to determine whether the participants' sexual orientation affected the main variables under study (BICI, EAT, MDDI and RSES), several one-way analyses of covariance (ANCOVA) with the participant's age as covariate were performed and the partial eta squared (η^2) was estimated as the effect size measure. Subsequently, if the overall F test showed mean differences, a post hoc comparison by Tukey's method was used to determine the means that were statistically different from others. Prior to analyses, the

assumptions of homoscedasticity were tested by Levene's test and met in all cases.

Finally, to evaluate the frequency and percentage of participants who met the criteria of the risk of developing body dysmorphic concerns, eating disorders, muscle dysmorphia and low self-esteem (BICI, EAT-26, MDDI, and RSES), a contingency table was drawn up for the total sample by the participants' sexual orientation, after which Fisher's exact test was performed to examine potential differences in the participants' risk profile by sexual orientation and Cramer's V was used as the effect measure (Cohen, 1988).

Cohen (1988) established a conventional interpretation of effect size, in which a correlation coefficient value equal to 0.10 indicates a small effect, 0.30 a moderate effect and 0.50 a large effect. An eta squared value (η^2) equal to 0.01 indicates a small effect, 0.06 a moderate effect and 0.14 a large effect.

All the analyses were performed by the Jamovi 2.3.6.0 Version for Windows and the statistical tests were interpreted assuming a significance level of 5% ($\alpha = 0.05$) using two-tailed tests.

Results

Descriptive statistics and correlations

Table 2 presents the descriptive statistics and correlation coefficients of the study variables for the whole sample. Overall, the participants did not indicate a risk of body image concerns (BICI's mean scores <72), eating disorders (EAT's mean scores <20), or muscle dysmorphia (MDDI's mean scores <39) and had a medium level of self-esteem (RSES' mean scores between 26 and 29 points).

As expected, body dysmorphic concerns were found to have a large, positive and statistically significant relationship with eating disorders ($r = .52, p < .001$) and muscle dysmorphia symptomatology ($r = .67, p < .001$), and a large, negative and statistically significant association with self-esteem ($r = -.59, p < .001$). Body dysmorphic concerns had a small, negative and statistically significant link with the

participants' age ($r = -.25, p < .001$), and a small, positive and statistically significant association with the frequency of using social networks ($\rho = 0.26, p < .001$). This indicates that the higher the level of body dysmorphic concerns, the greater the eating disorder symptomatology, muscle dysmorphia symptomatology and the lower the level of self-esteem, age and the greater the use of social networks, although body dysmorphic concerns did not correlate to physical exercise.

Eating disorders showed a large, positive and statistically significant relationship with muscle dysmorphia symptomatology ($r = .51, p < .001$), small, negative and statistically significant association with self-esteem ($r = -.25, p < .001$) and a small, positive and statistically significant relationship with frequency of physical exercise ($\rho = 0.16, p = .031$). Muscle dysmorphia symptomatology showed a medium, negative, and statistically significant relationship with self-esteem ($r = -.41, p < .001$) and a small, negative and statistically significant link with the participant's age ($r = -.20, p = .006$). Finally, self-esteem showed a small, positive and statistically significant association with the participant's age ($r = .28, p < .001$) and a small, negative and statistically significant relationship with the frequency of using social networks ($\rho = -0.16, p = .029$).

Differences in body image concerns, eating disorders, muscle dysmorphia and self-esteem by sexual orientation

Table 3 presents the results of the ANCOVA performed on the BICI, EAT, MDDI and RSES total scores by sexual orientation and the participant's age as covariable. No difference was found among the different sexual orientation groups on the eating disorder ($p = .123$) and muscle dysmorphia scores ($p = .104$) but was found for level of body image concerns ($p < .001$) and self-esteem ($p = .038$).

As regards body image concern, post hoc comparisons revealed a statistically significant difference between heterosexual and gay men on the level of body image concerns, gay men showing higher levels than heterosexual men ($p = .001$). Post hoc comparisons also found a marginally

Table 2 Descriptive statistics and correlations for variables under study

	M/Median	SD/IQR	Skew	Kur	1	2	3	4	5	6
1.BICI	47.44	15.98	0.59	-0.25	-					
2.EAT-26	9.17	7.94	1.09	0.57	0.53***	-				
3.MDDI	25.66	7.80	0.62	-0.09	0.67***	0.51***	-			
4.RSES	29.84	6.85	-0.49	-0.50	-0.59***	-0.25***	-0.41***	-		
5.Age	33.88	11.59	0.64	-0.84	-0.25***	0.01	-0.20**	0.28***	-	
6.Physical exercise	3	2	-	-	-0.07	0.16*	0.14	0.09	0.22**	-
7.Social networks	2	1	-	-	0.26***	0.11	0.09	-0.16*	-0.18*	-0.21**

M/Median Mean or median, SD/IQR Standard Deviation or Range Interquartile, Skew Skewness, Kur Kurtosis, EAT-26 Eating Attitudes Test, BICI Body Image Concern Inventory, MDDI Muscle Dysmorphic Disorder Inventory, RSES Rosenberg Self-Esteem Scale. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3 Difference in body image concerns, eating disorder, muscle dysmorphia and self-esteem scores by sexual orientation

Outcomes	Sexual Orientation				F	p	η^2
	Heterosexual (n = 60)	Bisexual (n = 34)	Gay (n = 79)	Asexual (n = 9)			
	$M_{adj}(SE)$	$M_{adj}(SE)$	$M_{adj}(SE)$	$M_{adj}(SE)$			
BICI	41.21(1.94)	48.22(2.66)	50.97(1.69)	55(4.97)	5.75	< 0.001	0.09
EAT-26	8.25(1.03)	8.01(1.41)	9.78(0.89)	14.34(2.63)	1.94	0.125	0.03
MDDI	23.66(0.98)	26.48(1.35)	26.78(0.86)	26.20(2.53)	2.09	0.104	0.03
RSES	31.47(0.84)	28.22(1.15)	29.71(0.73)	26.12(2.16)	2.86	0.038	0.05

M_{adj} , mean adjusted by participants age, SE Standard Error, *BICI* Body Image Concern Inventory, *EAT-26* Eating Attitudes Test, *MDDI* Muscle Dysmorphic Disorder Inventory, *RSES* Rosenberg Self-Esteem Scale, *SO* Sexual Orientation, *F* Anova test for sexual orientation controlling by participants' age, *p* *p*-value for ANOVA test. η^2 partial squared eta

Table 4 Risk profile for body image concerns, eating disorders, muscle dysmorphia and low self-esteem in whole sample and by sexual orientation

	Total (N = 182)	Sexual Orientation				χ^2	p	V
		Heterosexual (n = 60)	Bisexual (n = 34)	Gay (n = 79)	Asexual (n = 9)			
BICI, n	16	0	3	10	3	14	0.001	0.278
%	(8.8)	(0)	(8.8)	(12.7)	(33)			
EAT-26, n	22	4	2	13	3	8.13	0.048	0.211
%	(12.1)	(6.7)	(5.9)	(16.5)	(33.3)			
MDDI, n	12	1	5	5	1	6.31	0.058	0.186
%	(6.6)	(1.7)	(14.7)	(6.3)	(11.1)			
Low Self-Esteem, n	50	13	13	20	4	6.59	0.298	0.135
%	(27.5)	(21.7)	(38.2)	(25.3)	(44.4%)			

n frequency, % percentage. *BICI* Body Image Concern Inventory, *EAT-26* Eating Attitudes Test, *MDDI* Muscle Dysmorphic Disorder Inventory, *RSES* Rosenberg Self-Esteem Scale, *SO* Sexual Orientation, χ^2 Fisher's exact test, *p* *p*-value for Fisher's exact test, *V* Cramer's V coefficient

significant difference between heterosexual and asexual men ($p=.051$), with asexual men showing higher level of body image concerns than heterosexual men. No difference was found in the remaining comparisons.

The self-esteem post hoc comparisons did not find a statistically significant difference among the different sexual orientation groups on the level of this factor.

Risk of body image concerns, eating disorders, muscle dysmorphia and low self-esteem by sexual orientation

Table 4 presents the prevalence of the risk of dysmorphic body concerns, eating disorders, muscle dysmorphia and self-esteem in the whole sample, and by sexual orientation. For the total sample, the risk of low self-esteem (27.5%) was the most prevalent risk profile, followed by the risk of eating disorders (12.1%), dysmorphic concern (8.8%) and muscle dysmorphia (6.6%). By sexual orientation, Fisher's Exact Test found a small and statistically significant difference in the risk of body dysmorphic concern symptomatology ($p=.048$, Cramer's $V=0.278$) and eating disorders ($p=.001$, Cramer's $V=0.211$) among the different sexual orientation groups. A marginal significant difference was also noted in the risk profile of muscle dysmorphia symptomatology ($p=.058$, Cramer's $V=0.186$). No statistically significant difference was found for a risk of low self-esteem among the different sexual orientation groups ($p=.298$).

Concerning the risk of body dysmorphic concerns, post hoc comparisons adjusted by the Bonferroni method found statistically significant differences between heterosexual men and both gay ($p=.011$) and asexual men ($p<.001$). In all cases, heterosexual men showed a lower risk of developing clinical body image concerns, nor were significant differences in the risk of body image concerns found among the remaining sexual orientation groups.

Regarding the risk of eating disorders, post hoc comparisons adjusted by the Bonferroni method showed a marginally significant difference between heterosexual men and asexual men ($p=.060$), asexual men showing a higher risk of developing eating disorders than heterosexual men. No significant differences in the risk of eating disorder were found among the rest of the sexual orientation groups.

Concerning the risk of muscle dysmorphia, post hoc comparisons adjusted by the Bonferroni method revealed statistically significant differences between heterosexual men and bisexual men ($p=.041$), bisexual men showing a higher risk of muscle dysmorphia than heterosexual men. No significant differences were found in the risk of muscle dysmorphia among the rest of the sexual orientation groups.

Discussion

The aim of this study was to examine body dissatisfaction, including eating disorder psychopathology and muscle dysmorphia symptomatology, and self-esteem in Spanish men of different sexual orientations.

In relation to the correlation analyses, we found that body image dysmorphic concern correlated with all the variables analyzed, being in agreement with the previously cited literature, i.e., eating disorder symptomatology (Martínez et al., 2021), muscle dysmorphia symptomatology (Skemp et al., 2019), level of self-esteem (Lora & Valdés-Díaz, 2019), age (Sobrinho-Bazaga & Rabito-Alcón, 2018), and frequency of social network use (Hinojo-Lucena et al., 2019; Imperatori et al., 2022; Padín et al., 2021; Saiphoo & Vahedi, 2019). This indicates that the higher the body dysmorphic concern level, the greater the eating disorder symptomatology, muscle dysmorphia symptomatology, and frequency of social network use, lower self-esteem and age. The close correlation between body image concerns and eating disorders symptomatology (i.e., anorexia nervosa and bulimia nervosa), and between muscle dysmorphia and eating disorder symptomatology suggest a potential overlap between these constructs (Phillipou et al., 2018). A recent systematic review by Phillipou et al. (2019) found that individuals with body dysmorphic disorders and anorexia nervosa share a number of similarities in terms of phenomenology, including their degree of body dissatisfaction and preoccupation, severity of body image concerns, deficits in body size estimation, altered experience of emotion, degree of perfectionism, degree of obsessive-compulsive disorder comorbidity, and similarities in sociodemographic characteristics, although when considering the predominant physical concerns in body dysmorphic disorder and anorexia nervosa some differences between both disorders were found. In individuals with body dysmorphic disorder, the patients report more diverse body regions of concern, whereas in anorexia nervosa their main locus is body weight and shape. They also found similarities between individuals with muscle dysmorphia and anorexia nervosa in body image disturbance, eating and compulsive exercise behaviors, although men with muscle dysmorphia showed higher adherence to masculine norms, whereas men with anorexia nervosa presented higher adherence to feminine norms.

These findings highlight the intricate relationships between body dysmorphic concerns, muscle dysmorphia and eating disorders, indicating shared elements and potential common factors in the underlying psychopathology. This suggests that the manifestations of body image dysmorphic concerns (including muscle dysmorphia) and eating disorders extend beyond being mere co-occurring symptoms, suggesting that these conditions might represent

similar body image disorders (Phillipou et al., 2019). In this area, some researchers have suggested that eating disorders (anorexia nervosa and bulimia nervosa) be grouped with body dysmorphic disorder and muscle dysmorphia as body image disorders (Beilharz et al., 2019; Phillipou et al., 2016, 2018, 2019). Due to body dysmorphic concerns, muscle dysmorphia symptomatology tends to co-occur with eating disorder symptomatology in men. It is therefore recommended that when evaluating individuals with body dysmorphic disorder and muscle dysmorphia, practitioners should explore the possibility of the presence of ED, and vice versa (Rubio-Aparicio et al., 2020).

The close correlation noted between body dysmorphic concerns and self-esteem could emphasize the role of body satisfaction as a source of global self-esteem. According to Wichstrøm and von Soest (2016), this correlation, to some extent, could be interpreted as a causal relationship in which body satisfaction affects self-esteem, and conversely.

The negative association between age and body dysmorphic concerns and muscle dysmorphia found in the sociodemographic variables suggests that individuals generally tend to experience an increased sense of acceptance and appreciation of their bodies as they age, which could indicate that older men may prioritize body functionality over body appearance. However, as Hockey et al. (2021) have pointed out, considering the usual decline in physical abilities associated with age, there is a possibility that emphasizing physical functionality could contribute to body dissatisfaction in older men. These findings underscore the importance of understanding the development of body image throughout the lifespan, indicating how perceptions evolve in the different stages of life (Lacroix et al., 2023). Interventions targeted on body dissatisfaction should thus be tailored to address age-specific concerns. The programs promoting health and a positive body image could benefit from personalization to address specific concerns in the different life stages, recognizing the diversity in experiences and the challenges related to body image. For instance, for younger age groups, interventions could focus on fostering a positive body image through education and self-acceptance.

The positive association found between network use and body dysmorphic concerns suggests that higher levels of network use are linked to increased body dissatisfaction. This link could be explained by the objectification theory; recent studies found that higher levels of objectification are related to spending more time on image-focused social networks and higher levels of social network activity (Meechem, 2023), and in turn is associated with body image concerns (Saiphoo & Vahedi, 2019). For instance, Salomon and Brown (2019) examined how social network photo-related behaviors (considered as “self-objectifying behaviors”) were associated with body image concerns.

They also found a link between photo-related behaviors and body image concerns fully mediated by (i.e. fully explained by) self-objectification.

Although most of the participants did not show a risk of developing body image concerns, the findings showed that 8.8% presented a relevant dysmorphic concern about their body image. Additionally, body dissatisfaction was related to the participants' sexual orientation in two ways: firstly, body image concern levels differed between heterosexual men and both gay and asexual men. The former showed lower levels of body dissatisfaction than both gay and asexual men but did not as regards bisexual men. No significant difference was noted among men belonging to the different sexual minority groups. Secondly, the risk of developing a clinical body image concern differed between heterosexual men and the men in the sexual minority groups. Heterosexual men presented a lower risk of developing clinical body image concerns than gay men (and, marginally, asexual men). In other words, gay men showed a greater risk of developing clinical body image concerns than heterosexual men. Men who belonged to sexual minorities did not differ significantly in the risk of developing body dissatisfaction. These findings are in line with few previous studies on differences in body image concern between individuals with different sexual orientations (e.g., Cervantes-Luna et al., 2019; Levitan et al., 2019; Mahon et al., 2022; Swami et al., 2019; He et al., 2020; Schmidt et al., 2022), who found that sexual minority men may present greater body image concern than heterosexual men and were at a higher risk of developing body dysmorphic disorder.

The findings also show that 12.1% of the participants presented a risk profile for developing clinical eating disorders, such as anorexia and/or bulimia nervosa. When controlling by the participants' age, there was no significant difference in the levels of eating disorder symptomatology among participants, suggesting that sexual minority men do not differ from heterosexual men in terms of pathological eating disorders, in agreement with previous studies (e.g., Schmidt et al., 2022). Nevertheless, we found that the risk of developing a clinical eating disorder did differ by the participants' sexual orientation, with a small effect size noted ($r=.21$). Although only a marginal difference was found between heterosexual men and asexual men ($p=.060$). Asexual men exhibited a higher risk of eating disorders compared to heterosexual men, while men who belonged to sexual minorities did not have a significantly different risk of developing these disorders than heterosexual men. These findings are in contrast with previous studies (Carlat et al., 1997; Hazzard et al., 2020), except perhaps for asexual people, although these results are inconsistent and not conclusive, further research is required. The observed marginally significant difference between heterosexual men and asexual men in

the risk of developing clinical eating disorders, despite a small effect size, could suggest a potential lack of statistical power, which could have affected the ability to detect a significant difference, so that a larger sample size might be needed to increase the sensitivity to detect more subtle but potentially meaningful effects and provide more conclusive insights into the relationship between sexual orientation and the risk of eating disorders.

In relation to the presence of a risk of muscle dysmorphia symptomatology, we found that 6.6% of the sample presented a risk profile for developing clinical muscle dysmorphia. Controlling by participants' age, no significant difference was found among the participants with different sexual orientation on the levels of muscle dysmorphia symptomatology. Nevertheless, the risk of developing clinical muscle dysmorphia was marginally associated with the participants' sexual orientation. Bisexual men had a higher risk of developing this dysmorphia than heterosexual men. This marginal association suggests that sexual orientation could play a subtle role in influencing the risk of clinical muscle dysmorphia, even when the overall symptomatology levels are comparable. No significant differences in the risk of muscle dysmorphia were found among the rest of the sexual orientation groups, i.e., gay men, asexual men and heterosexual men showed a similar risk of developing clinical muscle dysmorphia. These findings are partially in line with previous studies that did not find a significant difference between bisexual and gay men on developing drive for muscularity symptomatology (Fabris et al., 2022b; Levitan et al., 2019).

Concerning self-esteem, we found that the participants presented a mean score of 29.84 on the RSES, so that we placed the sample in the medium self-esteem category. Significant differences were found by participants' age according to sexual orientation (with a small effect size). However, the Tukey Test did not yield significant differences between any pair of group means. These findings are not in line with previous studies (e.g., Bridge et al., 2019), which indicates that those who belong to sexual minorities have lower self-esteem than the heterosexual population, although this could be explained by the small sample size (i.e., lack of statistical potential to detect difference). Future research should thus examine the differences in self-esteem between sexual minority men and heterosexual men, and also the difference in self-esteem between gay men and other sexual minority men via direct comparison.

The differences found between sexual minority men and heterosexual men on body image concerns, eating disorders and self-esteem might be explained by minority stress factors such as internalized homonegativity (Badenes-Ribera et al., 2018) and discrimination, such as, homophobic bullying (Fabris et al., 2022b) in relation to the minority stress model

(Meyer, 2003). As aforementioned, individuals within sexual minority groups frequently face persistent stress stemming from discrimination, stigmatization, violence, and prejudice related to their minority status. In an effort to cope with the experiences of discrimination and sexual prejudice, sexual minority men should prioritize their external appearance (self-objectification) to counterbalance their devalued social identity, increasing their vulnerability to body dissatisfaction (including dysmorphic concerns such as muscle dysmorphia) and behaviors associated with eating disorders as well as lower self-esteem (Brewster et al., 2017; Convertino et al., 2021; Oshana et al., 2020; Frederick & Essayli, 2016; Velez et al., 2016). Sexual minority stress thus emerges as a risk factor for body image concerns and other related disorders (Huang, 2023).

The intra-minority stress theory suggests a possible source of body-image concerns in interactions among sexual minority men within the gay community itself (Pachankis et al., 2020). Within the LGBTQ + community, the specific expectations and norms related to appearance can also contribute to objectification. For instance, gays and bisexual men may encounter pressure from the LGBT + community to conform to the physical appearance standards prevalent within the community (e.g., masculine body ideal, which highlights being thin and muscular). These pressures to conform to specific appearance norms can lead to negative evaluations of one's own body, fostering discontent and dissatisfaction. Soulliard et al. (2023) recently examined the associations between intra-minority stress theory and body dissatisfaction in sexual minority men and found that gay-community stress was significantly related to sexual-minority men's greater body dissatisfaction, while Tylka and Andorka (2012) found that involvement in the gay community was directly linked to muscularity enhancement behaviors and indirectly with disordered eating behaviors.

Conclusions

In conclusion, the results obtained from the study are relevant for several reasons: firstly, this study is the first to examine body image concerns, eating disorders, muscle dysmorphia and self-esteem in Spanish men LGTB population, especially in gay, bisexual and asexual men, who thus face a double lack of visibility in this problem in being a man and belonging to a sexual minority. The problems traditionally related to body image pathology have been considered exclusive to women, although our results provide evidence of the presence of this pathology in the male population; the fact that 12.1% of the sample has a risk profile for developing eating disorders indicates a great need for intervention and/or prevention of body dissatisfaction in men. When

considering the vulnerable situation of men who belong to the LGBT population, it is also necessary to raise awareness of the problems associated with body image, which require more research, to provide further information and therefore a better understanding in future interventions.

Limitations

Several limitations should be taken into consideration. The convenience sample (i.e., recruitment method used) and the self-selection bias in participation could compromise the representativeness of our sample and the generalization of the results. Future research should thus try to overcome this limitation by using samples recruited through a different sampling approach (e.g., specific online paid software such as Prolific or MTurk). As the sample size of asexual men ($n = 9$) is somewhat limited, any results should be replicated in studies on larger sample sizes of this subgroup. For instance, having the same large number of asexual participants as bisexual, gay and heterosexual men in the sample would help to verify any differences noted among males of different sexual orientations. The cross-sectional design does not allow to obtain a causal explanation of the relationships noted. A question on educational qualifications was not included in relation to the sociodemographic characteristics, because the sample was expanded to settings that are not exclusively university environments. This variable should be controlled for any possible effects. Some questions should also take into consideration the effects of the COVID-19 pandemic on people's activities, such as for example going to gyms or changes in exercise, dietary or social routines due to the restrictions imposed on movements.

Future research directions

Further research on body image concerns (e.g., body dissatisfaction, eating disorders and muscle dysmorphia) in men is required to determine whether LGBT people are more vulnerable to eating disorders or muscular dysmorphia, as indicated in previous research studies. It would also be interesting to study subgroups in the collective that are less frequently considered and even the trans community. Finally, it would be interesting to study in more detail the role of the social networks as transmission channels for theoretical body ideals in the processes of the development of dissatisfaction with body image and the possible consequences.

Practical implications

The results obtained in this study contribute to enhancing sensitivity to and awareness of body image disorders among

men, challenging the historical perception that these issues are exclusive to women. They also help to attend to possible vulnerabilities in the LGTB population for belonging to this group. This allow us to focus on two social subgroups that are given little consideration in this field of study: men and sexual minorities. Understanding the nuanced experiences of different groups can inform the development of targeted programs and support networks. In this way, the identification of distinct body image concerns and self-esteem levels among individuals of different sexual orientations emphasizes the need for tailored mental health interventions. Interventions aimed at addressing body dissatisfaction should thus be adapted to meet the specific needs associated with diverse sexual orientations. It is therefore important, in the therapeutic context, to raise awareness of the minority stressors experienced by LGTBQ + people, and especially how these affect men's body image concerns. Framing this process within affirmative therapies (Malyon, 1982) would thus be a good option aimed at cultivating a supportive and inclusive therapeutic environment to empower sexual minority men by acknowledging and validating their identities, experiences and unique strengths. Given the importance of appearance-based social network use on body image concerns (Padín et al., 2021; Saiphoo & Vahedi, 2019), it would be important to intervene in this area, as the dating apps frequently used by sexual minority men, such as Grindr, have been shown to affect body image through the weight stigma, objectification, and social comparisons (Filice et al., 2019). Interventions based on self-compassion and self-esteem writing tasks could be effective for body image dissatisfaction in sexual minority men (Grey et al., 2022).

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Data availability Supporting data for the findings of this study are available from the corresponding author on reasonable request.

Declarations

Ethical approval All the procedures performed in the studies involving human participants were conducted in accordance with the ethical standards of the institutional and national research committees and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. This article does not refer to any studies on animals performed by any of the authors.

Conflict of interest No potential conflict of interest is reported by the author(s).

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