Instagram use and negative and positive body image: the relationship with following accounts and content and filter use among female students

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Abstract

Exposure to Instagram content and photo manipulation behaviors may negatively impact women's body image. However, some studies did not find support for this assumption. The current study aimed to explore this issue further. The first objective was to investigate associations between self-reported frequency of following Instagram beauty-related and body positive-related accounts and content and body image dimensions (i.e., Body Dysmorphic Disorder [BDD] symptoms, body appreciation, and body functionality appreciation). To achieve this, we controlled for the role of Instagram appearance comparison and internalization of general attractiveness ideal. As for the second objective, the influence of Instagram filter use was assessed: two groups of Instagram filter users (high-frequency and low-frequency users) and non-users were compared on dimensions of Instagram use and body image. Findings from a sample of 149 female undergraduates demonstrated that self-reported frequency of following body positive Instagram content was associated with higher levels of BDD symptoms even after controlling for appearance comparison and internalization of general attractiveness ideal. Conversely, the self-reported frequency of following beauty content was not. Moreover, positive body image dimensions were not associated with self-reported frequency of following any Instagram content. High-frequency Instagram filter users reported a higher frequency of following beauty content and higher levels of appearance comparison and internalization of general attractiveness ideal compared to non-users. However, these two groups did not differ on negative and positive body image dimensions. Finally, low-frequency Instagram filter users did not differ on any investigated dimensions from the other two groups.

Keywords Body image · Body dysmorphic disorder symptoms · Positive body image · Instagram contents · Instagram filter use

Introduction

Instagram, a widely utilized social media, enables users to create a private (i.e., accessible to selected users) or public (i.e., accessible to every Instagram user) account and to share content, including photos and videos (Fardouly et al., 2018). Women are more likely to report Instagram use, share, post, and manipulate selfies than men (Verrastro et al., 2020). Accordingly, available studies focused predominantly on women. While browsing Instagram, users could find several types of content, such as thinspiration images (which depict and praise thinness; Ghaznavi & Taylor, 2015), fitspiration images (meant to motivate people to exercise and achieve a healthy lifestyle; Tiggemann & Zaccardo, 2018), beauty content (showcasing make-up or fashion; Seekis & Barker, 2022), and body positive content (aimed to reject unrealistic body ideals and to encourage people to accept and love their bodies at any shape and size; Cohen et al., 2019). Furthermore, Instagram provides filters, i.e., technological tools that airbrush, highlight, and smooth images. Instagram

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users usually employ these filters to improve photos' overall appeal and conceal perceived physical flaws.

Due to the highly visual nature of Instagram features, scholars have investigated their effect on body image, yielding mixed findings. Most of the available studies highlighted a negative effect (for a review, Ryding & Kuss, 2020), while others did not find an association (Walker et al., 2021) or highlighted some inconsistencies (Hao, 2023; McGovern et al., 2022; Stevens & Griffiths, 2020). Extant literature mostly focused on body dissatisfaction (e.g., Fardouly et al., 2018; Lee & Lee, 2021) but did not thoroughly address the relationship between Instagram use (both frequency of following content and photo manipulation) and negative body image dimensions - such as Body Dysmorphic Disorder (BDD) symptoms - or positive body image dimensions - such as body and body functionality appreciation.

Negative and positive body image

Negative body image is a multidimensional construct prominently characterized by body dissatisfaction (Hosseini & Padhy, 2023). Conceptually, body dissatisfaction involves a negative evaluation of one's physical appearance arising from a perceived discrepancy between the real physical appearance and the ideal one (Cash & Szymanski, 1995; Grogan, 2008). Negative body image is a core feature of several psychological disorders, such as BDD (Hrabosky et al., 2009), whose symptoms are more frequently described among women compared to men (Cerea et al., 2018). In addition to body dissatisfaction, BDD is characterized by compulsive behaviors (e.g., excessive mirror checking), mental acts (e.g., appearance comparison), suicidal thoughts, and seek for cosmetic procedures (American Psychiatric Association, 2013). Thus, BDD is a complex and multifaceted condition, and body dissatisfaction is only one of its features.

Several factors may influence body image and, more specifically, BDD. One of them is appearance comparison, which refers to the innate tendency to compare one's appearance with that of others (Festinger, 1954) and is included in the phenomenology of BDD itself (American Psychiatric Association, 2013). Another relevant psychological dimension is the internalization of beauty ideals, referring to the endorsement of unrealistic sociocultural beauty standards (Thompson & Stice, 2001). Both these dimensions contribute to the development of body dissatisfaction and dysfunctional body-related behaviors (e.g., dysfunctional eating behaviors), as delineated by the Tripartite Influence Model (Thompson et al., 1999), and several psychological disorders, including BDD.

On the other hand, positive body image represents a multidimensional construct that broadly refers to love and respect for one's body (Tylka & Wood-Barcalow, 2015a). It is composed of several factors, such as body appreciation and body functionality appreciation. The former involves appreciation and love for one's body, extending beyond mere satisfaction with physical appearance (Tylka & Wood-Barcalow, 2015b). The latter entails appreciating the body for its functionality and capability, such as walking, dancing, engaging with other people, and experiencing the external world through the senses (Alleva et al., 2017). Negative and positive body image are conceptually defined as not mere opposites (Tylka & Wood-Barcalow, 2015a); therefore, results reported by literature so far cannot be entirely generalized to each other, and both constructs should be investigated separately. Consequently, shedding light on the relationship between negative body image, positive body image, and Instagram use is important. Indeed, Instagram use might lead people to focus on their perceived flaws excessively, to compare these flaws with those of other users, to monitor their physical appearance, and to engage in dysfunctional coping mechanisms to deal with excessive preoccupations with physical appearance, fostering the development of BDD symptoms (Ryding & Kuss, 2020). Instagram use may also negatively influence positive attitudes toward body image, enhancing attention toward physical appearance (Rousseau, 2021) and distancing the user from appreciating the body and its functionality.

Instagram use: content and filter use

Instagram use may exert a negative impact on body image; however, studies have yielded mixed results in this regard. Concerning Instagram content, Authors mainly focused on thinspiration and fitspiration images and found that following or being exposed to them was often associated with high levels of body dissatisfaction (Cataldo et al., 2022; Fardouly et al., 2018; Stevens & Griffiths, 2020) and low levels of body appreciation (Barron et al., 2021) in women. However, inconsistencies were reported, such as a non-significant effect of fitspiration content on body satisfaction (Stevens & Griffiths, 2020). Furthermore, appearance comparison and internalization of general attractiveness were identified as mediators between following social media content and body dissatisfaction (Fardouly et al., 2018).

Only one study devoted its attention to beauty accounts and content on social media in general (including Instagram), outlining that exposure to this content was related to high levels of BDD symptoms and that this association was mediated by appearance comparison and internalization of beauty ideals (Seekis & Barker, 2022). Nonetheless, these findings may not be representative when focusing on Instagram use. Moreover, to our knowledge, no data on

the association between beauty content and positive body image dimensions is available.

Studies examining the effect of body positive images are still required. Exposure to body positive images was related to higher levels of body satisfaction (Stevens & Griffiths, 2020) and body appreciation (Nelson et al., 2022). Nevertheless, scholars also highlighted a putative adverse effect on body image dimensions (Vendemia et al., 2021). Indeed, body positive images on Instagram have been shown to portray women in sexually provocative positions (Cohen et al., 2019; Lazuka et al., 2020) or messages closer to thinspiration and fitspiration themes (e.g., thin praise, weight loss, and exercising; Lazuka et al., 2020). Moreover, such a putative negative effect could become non-significant after taking into account appearance comparison and internalization of beauty ideals; however, research on this topic is lacking.

Concerning photo manipulation, positive and non-significant associations with negative body-related outcomes were described (McGovern et al., 2022). Interestingly, a study showed that it might negatively affect body image even when the user modifies the background of a self-photo due to increased attention toward one's appearance and its perceived imperfections, leading to self-objectification (Vendemia & DeAndrea, 2021). Photo manipulation moderated the relationship between appearance-focused use of social media and internalization of general attractiveness and between such internalization and appearance comparison in women: greater associations were found among women engaging in high-frequency photo editing compared to low-frequency (Lee & Lee, 2021). Similarly, a higher frequency of internalization of beauty ideal and higher levels of body image issues were described in adolescents who reported engaging in photo editing with apps (such as Photoshop) compared to adolescents who did not (Verrastro et al., 2020). However, to our knowledge, no studies considered specifically Instagram filter use and ascertained whether filter use per se or its frequency is relevant for body image. Additionally, individuals engaging in photo editing were compared only based on high and low frequency (including non-users in the low-frequency group; Lee & Lee, 2021) or use and non-use (Verrastro et al., 2020). Studies directly comparing non-users, low-frequency users, and high-frequency users are warranted since they would enable detecting possible nuances related to photo editing engagement. Moreover, they would help clarify whether engaging in filter use or engagement frequency can put users at high risk for developing or displaying body image disorder symptoms, such as BDD.

Finally, only one study examined positive body image and found a non-significant association between trait body appreciation and photo editing (Veldhuis et al., 2020).

The present study

The present study aimed to further examine the relationship between Instagram use and body image in a sample of female undergraduate students. First, we investigated associations between self-reported frequency of following Instagram beauty and body positive accounts and content on body image disturbances (i.e., BDD symptoms) and positive body image dimensions (i.e., body and body functionality appreciation). These associations were tested, controlling for the effect of appearance comparison and internalization of general attractiveness ideal. We hypothesized that:

H1a Self-reported frequency of following beauty-related accounts and content on Instagram could be associated with high levels of BDD symptoms, alongside appearance comparison with idealized images published on Instagram and internalization of general attractiveness.

Moreover, as described in a similar study (Barron et al., 2021), we hypothesized that:

H1b Self-reported frequency of following beauty-related accounts and content could be negatively associated with positive body image dimensions.

Conversely, given mixed findings (Nelson et al., 2022; Stevens & Griffiths, 2020; Vendemia et al., 2021), no clear hypotheses were made for body positive content:

H1c Self-reported frequency of following body positive accounts and content could be either positively or negatively associated with BDD symptoms and positive body image dimensions.

As a main second aim, we compared high-frequency, low-frequency, and non-users of Instagram filters on BDD symptoms, positive body image (i.e., body and body functionality appreciation), internalization of general attractiveness ideal, and Instagram use (i.e., time of utilization, appearance comparison, and accounts and content followed). According to previous findings (Lee & Lee, 2021; Verrastro et al., 2020), we hypothesized that:

H2a Individuals using Instagram filters would be more prone to engage in social comparisons on Instagram and internalize an ideal of attractiveness.

Moreover, given inconsistent previous findings (McGovern et al., 2022), no clear hypothesis for BDD symptoms was formulated:

H2b The two filter users' groups could be characterized by either higher or similar levels of BDD symptoms than non-users.

As for positive body image, since no association has previously emerged (Veldhuis et al., 2020), we hypothesized that:

H2c No differences among groups would emerge on body appreciation and body functionality appreciation.

Finally, since photo manipulation behaviors are associated with Instagram use and activities (Lee & Lee, 2021):

RQ1 We explored differences in following Instagram accounts and content among Instagram filter users and non-users.

Method

Participants & procedure

A hundred and eighty-five female students entered the study. Fifteen were excluded since they reported not having an Instagram account, while 4 were excluded because they reported not using their Instagram account. Moreover, 17 participants were excluded because of inconsistent answers in self-reported measures: specifically, they reported a frequency of filter use > 1 on the Likert scale (more than "never") even though they reported not to utilize filters (see Measures section). Thus, the final sample included 149 female students. The mean age of the sample was 21.58 (SD = 1.44; range 19–27 years), and the mean years of education were 15.01 (SD = 1.52; range 13–18 years). Pertaining to relationship status, 79 participants (53%) were single, while 70 (47%) had a fiancé/were in a non-domestic relationship. The overall sample's average Body Mass Index (BMI) was 20.89 (SD = 2.57, range 15.92–28.65). Usually, a BMI < 18 has been considered an index of underweight, while a BMI ≥ 25 has been considered an index of pre-obesity (World Health Organization, 2000).

To distinguish Instagram filter users from non-users, participants were asked if they used to manipulate photos with Instagram filters before posting them. Participants were not specifically asked about appearance-related filters since the mere use of filters emerged as influential for body dissatisfaction (Vendemia & DeAndrea, 2021). Subsequently, the main sample was split into a subgroup of Instagram filter users ($n = 94$) and non-users ($n = 55$). Then, Instagram filter users were divided according to frequency of filter use: females in the low-frequency group ($n = 39$) reported a

frequency < 6 (observed median) in the Likert scale, while females in the high-frequency group ($n = 55$) reported a frequency ≥ 6 of filter use (see Measures section). These three final groups did not differ in terms of age ($F_{(2,146)} = 0.11$, $p = .90$), relationship status ($\chi^2_{(2)} = 0.39$; $p = .82$), and BMI ($F_{(2,146)} = 0.64$, $p = .53$).

Participants were recruited at University of Padova. To be eligible for the study, they had to be women and at least 18 years old. Participants were instructed to fill in an online link composed of an informed consent, a socio-demographic information schedule, and a battery of self-report questionnaires. This link was presented during classes as an extra-curricular activity (not related to the undertaken classes), and students were invited to participate in a study to investigate the relationship between body image and social media usage. Students were not asked to complete the link during classes, but they were able to complete it on their own during their free time. No compensation was provided for their participation. Before entering the study, participants were informed about the purposes of the study; moreover, they were aware of the voluntary nature of their participation, and they were assured about the possibility of withdrawing from the study without any form of penalty.

The study was conducted in accordance with the Declaration of Helsinki and approved by the relevant departmental ethics committee at the School of Psychology, University of Padova.

Measures

Demographics

All participants completed a socio-demographic schedule including information about sex, age, height and weight, education, relationship and occupational status, as well as about the presence of any current or past medical or psychological disorder.

Instagram use

Several questions related to Instagram use were presented. First, participants were asked if they had an Instagram account and their daily time spent (i.e., hours and minutes). The latter variable was later converted into minutes as a measurement unit. Then, participants reported how frequently they followed accounts and content related to beauty (examples of beauty content provided were "fashion and make-up") and body positive (a definition of this content was provided, and it was presented as "accounts focused on acceptance of one's own body") using a Likert scale ranging from 0 ("never") to 10 ("always"). Moreover, participants were asked if they used Instagram filters before

posting pictures on Instagram (dichotomous item) and how frequently they used filters before posting (Likert scale ranging from 0 = "never" to 10 = "always"). Then, participants completed the following self-report questionnaires:

Instagram appearance comparison

The Instagram Appearance Comparison Scale (IACS; Di Gesto et al., 2020) is a self-report questionnaire made up of 15 items on a 5-point Likert scale, ranging from 1 ("never") to 5 ("very often"). The IACS assesses frequency (example of item: "When I use Instagram, I compare my physical appearance with the one of others") and direction (example of item: "When I compare my body with the one of other people that I follow on Instagram, I feel worst") of social comparison performed on Instagram and showed a two-factor structure with excellent internal consistency: Cronbach's α was 0.94 for the Frequency subscale and 0.79 for the Direction subscale. According to previous papers (Di Gesto et al., 2020; Gesto et al., 2022), a total score for the IACS was computed to assess the general tendency of engaging in appearance comparison on Instagram, including frequency and negative effects of appearance comparison. In this sample, the overall scale score demonstrated a McDonald's ω of 0.95 (95% CI = 0.94, 0.96).

BDD symptoms

The Questionario sul Dismorfismo Corporeo (QDC; English translation: "Body Dysmorphic Disorder Questionnaire"; Cerea et al., 2017) is a self-report questionnaire made up of 40 items on a 7-point Likert scale, ranging from 1 ("strongly disagree") to 7 ("strongly agree"). The QDC evaluates the presence of BDD symptoms and psychological components, such as appearance concerns (example of item: "I am really worried about the presence of flaws in my physical appearance"), repetitive behaviors (i.e., mirror checking, excessive grooming, reassurance seeking; example of item: "I spend much time in front of the mirror to check my physical appearance"), mental acts (i.e., comparing the "defective" body areas with the same body areas of other people; example of item: "I compare my physical appearance with that of people around me or with people on television"), and avoidant behaviors related to appearance concerns (i.e., avoidance of social situations; example of item: "I often avoid social interactions (for example, going out with my friends) due to the dissatisfaction for my physical appearance"). Finally, the QDC investigates the request for cosmetic and surgical procedures (example of item: "I would like to undergo plastic surgery in order to fix my flaws/imperfections"), as well as suicidal thoughts due to appearance concerns (example of item: "I thought about

committing suicide due to the presence of flaws/imperfections in my physical appearance"). Higher scores indicate higher levels of BDD symptoms. An excellent internal consistency was described (α = 0.95), as well as a high 1-month test-retest reliability (r = 0.91). In the current sample, an excellent internal consistency has been found (McDonald's ω = 0.94, 95% CI = 0.93, 0.95).

Body functionality appreciation

The Functionality Appreciation Scale (FAS; Alleva et al., 2017; Italian version by Cerea et al., 2021) is a self-report questionnaire made up of 7 items (example of item: "I appreciate my body for what it is capable of doing") on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Higher scores indicate appreciation of body functionality and capability (e.g., bodily senses and abilities). The Italian version of the FAS showed adequate internal consistency in women (McDonald's ω = 0.89, 95% CI = 0.87, 0.91), demonstrated invariance across genders, and achieved test-retest reliability (Cerea et al., 2021). In the current sample, the FAS had an adequate internal consistency (McDonald's ω = 0.88, 95% CI = 0.85, 0.91).

Body appreciation

The Body Appreciation Scale − 2 (BAS-2; Tylka & Wood-Barcalow, 2015b; Italian version by Casale et al., 2021) is a 10-item self-report questionnaire that assesses appreciation, respect, and love toward one's own body (example of item: "I take a positive attitude towards my body"). Participants rate the extent to which they agree with each item using a 5-point Likert scale, from 1 ("never") to 5 ("always"). Higher scores indicate appreciation and love toward one's own body. The Italian version of the BAS-2 showed excellent internal consistency (Cronbach's α was 0.93 and McDonald's ω was 0.93 among females) and gender invariance (Casale et al., 2021). In the current sample, the BAS-2 showed an excellent internal consistency (McDonald's ω = 0.94, 95% CI = 0.92, 0.95).

Internalization of the general attractiveness ideal

The Sociocultural Attitudes Towards Appearance Questionnaire − 4 Revised (SATAQ-4R; Schaefer et al., 2017; Italian version by Stefanile et al., 2019) is a self-report questionnaire that assesses the internalization of beauty ideals and appearance-related sociocultural influences. Thus, the SATAQ-4R is composed of seven subscales, three related to internalization (thinness/low body fat, muscular, general attractiveness) and four related to social pressures (family, peers, significant others, media). Participants rate the extent

to which they agree with each item using a 5-point Likert scale, with response options ranging from 1 ("definitely disagree") to 5 ("definitely agree"). The SATAQ-4R is available in two gender-oriented forms: one for females (31 items) and one for males (28 items). Each version showed excellent to adequate internal consistency values for each subscale (Cronbach's αs ranging from 0.82 to 0.95 in the female version), reliability (Pearson's r values ranging from 0.68 to 0.88 in the female version), and construct validity (Stefanile et al., 2019). For the purposes of the study, only the subscale related to the internalization of the general attractiveness ideal was utilized in the analyses (example of item: "I think a lot about my appearance"). The McDonald's ω was 0.82 (95% CI = 0.77, 0.86), indicating adequate internal consistency.

Analytic plan

First, descriptive analyses were performed. Then, multiple regression analyses were computed. Before conducting the analysis, we planned to compute 6 different regression models: self-reported frequency of following beauty- and body positive-related accounts and content were separately considered independent variables, whereas the QDC total score, the BAS-2 total score, and the FAS total score were considered as dependent variables. In each model, the IACS total score and the General Attractiveness ideal subscale of the SATAQ-4R were included as control variables. Pearson's correlations were performed before regression analyses to select the variables to be included in the models: multiple regression models were computed only when the dependent variables were associated with the self-reported frequency of following beauty- or body positive-related accounts and content. Accordingly, as later discussed in the Results section, we computed only 2 multiple regression models.

To compare groups of Instagram filter users, Analysis of Variances (ANOVAs) were performed on dimensions related to Instagram use (i.e., time of utilization, frequency of following beauty- and body positive-related accounts and content) and on scores obtained at IACS, QDC, FAS, BAS-2, and SATAQ-4R (i.e., General Attractiveness subscale) among filter users, divided into a high-frequency group ($n = 55$) and a low-frequency group ($n = 39$), and non-users ($n = 55$). A Bonferroni's post-hoc was calculated to further assess differences among groups, and a partial eta square (η_p^2) was computed to assess the effect size; according to Cohen's classification (1988), $\eta_p^2 = 0.01$ corresponds to a small effect size, $\eta_p^2 = 0.06$ to a medium effect size, and $\eta_p^2 = 0.14$ to a large effect size. To provide a more in-depth analysis of the differences found, we compared Instagram filter users, regardless of their self-reported frequency of filter use, to non-users, conducting a t-test (Table S1 in Supplementary Information).

All data analyses were conducted using RStudio, version 1.4.1717 (Rstudio Team, 2021), based on R, version 4.1.1 (R Core Team, 2021), and the *Hmisc* (Harrell, 2021), *reghelper* (Hughes, 2021), and *sjstats* (Lüdecke, 2021) packages.

Results

Associations between beauty- and body positive-related accounts and content and BDD symptoms

According to correlations presented in Table 1, the frequency of following beauty accounts and content, Instagram appearance comparison (IACS total score), and the internalization of general attractiveness ideal (SATAQ-4R: General Attractiveness subscale) were positively correlated with BDD symptoms (QDC total score).

Thus, a multiple regression model was computed, including the QDC total score as a dependent variable. As shown in Table 2, the overall model was significant. The frequency of following beauty accounts and content did not emerge as significantly associated with BDD symptoms, while the IACS total score and the General Attractiveness subscale

Table 1 Correlation Matrix including dimensions related to Body Image and Instagram use

	1	2	3	4	5	6	7	8
1. QDC total score	1							
2. FAS	− 0.49***	1						
3. BAS-2 total score	− 0.70***	0.65***	1					
4. Instagram frequency	0.14	− 0.05	− 0.05	1				
5. Beauty accounts and content	0.32***	− 0.05	− 0.09	0.19*	1			
6. BP accounts and content	0.22**	0.04	− 0.09	0.22**	0.28***	1		
7. IACS total score	0.61***	− 0.38***	− 0.65***	0.11	0.35***	0.09	1	
8. SATAQ-4R: General Attractiveness	0.48***	− 0.12	− 0.30***	0.03	0.34***	0.16	0.51***	1

Note. *p < .05, **p < .01, ***p < .001; QDC = Questionario sul Dismorfismo Corporeo (English translation: "Body Dysmorphic Disorder Questionnaire"); FAS = Functionality Appreciation Scale; BAS-2 = Body Appreciation Scale − 2; Beauty accounts and content = frequency of following beauty accounts and content; BP accounts and content: frequency of following body positive accounts and content; IACS = Instagram Appearance Comparison Scale; SATAQ-4R: General Attractiveness: Sociocultural Attitudes Towards Appearance Questionnaire − 4 Revised – General Attractiveness subscale

Table 2 Results of the Multiple Regression Analysis for the associations of BDD symptoms among Instagram users with the inclusion of self-reported frequency of following beauty-related accounts and content

	Variables	B	ES	β	t	p	F	df
Model							36.78***	3,145
	Constant	7.36	14.71		0.50	0.62		
	Beauty accounts/content	0.96	0.88	0.08	1.09	0.28		
	IACS total score	18.97	3.01	0.48	6.30	< 0.001		
	SATAQ-4R: General Attractiveness	11.74	4.18	0.21	2.81	0.006		

Note. DV: BDD symptoms = Body Dysmorphic Disorder symptoms; $R^2 = 0.433$; *p < .05, **p < .01, ***p < .001; Beauty accounts and content = frequency of following beauty accounts and content; IACS = Instagram Appearance Comparison Scale; SATAQ-4R: General Attractiveness: Sociocultural Attitudes Towards Appearance Questionnaire − 4 Revised – General Attractiveness subscale

Table 3 Results of the Multiple Regression Analysis for the Associations of BDD symptoms among Instagram users with the inclusion of self-reported frequency of following body positivity-related accounts and content

	Variables	B	ES	β	t	p	F	df
Model							36.91***	3,145
	Constant	3.39	14.54		0.23	0.82		
	BP accounts/content	1.72	0.78	0.14	2.22	0.03		
	IACS total score	19.61	2.90	0.49	6.77	< 0.001		
	SATAQ-4R: General Attractiveness	11.48	4.08	0.21	2.81	0.006		

Note. DV: BDD symptoms = Body Dysmorphic Disorder symptoms; $R^2 = 0.433$; *p < .05, **p < .01, ***p < .001; BP accounts and content = frequency of following body positive accounts and content; IACS = Instagram Appearance Comparison Scale; SATAQ-4R: General Attractiveness: Sociocultural Attitudes Towards Appearance Questionnaire − 4 Revised – General Attractiveness subscale

of the SATAQ-4R did. The overall model explained 41.9% of the variance in the dependent variable. Self-reported frequency of following beauty accounts and content was not associated with levels of BDD symptoms after controlling for appearance comparison on Instagram and internalization of general attractiveness ideal.

Then, since the self-reported frequency of following body positive accounts and content was positively associated with BDD symptoms (QDC total score), a multiple regression was performed, entering self-reported frequency of following body positive accounts and content, Instagram appearance comparison (IACS total score), and internalization of general attractiveness ideal (SATAQ-4R: General Attractiveness subscale) as independent variables, and BDD symptoms (QDC total score) as a dependent variable. As shown in Table 3, the overall model was significant. Frequency of following body positive accounts and content emerged as significantly associated with BDD symptoms, alongside the IACS total score and the General Attractiveness subscale of the SATAQ-4R. The overall model explained 43.3% of the variance in the dependent variable. Thus, self-reported frequency of following body positive accounts and content, appearance comparison on Instagram, and internalization of general attractiveness ideal were associated with high levels of BDD symptoms.

Associations between beauty- and body positive-related accounts and content and positive body image dimensions (body and body functionality appreciation)

As shown in Table 1, body appreciation (BAS-2 total score) and body functionality appreciation (FAS total score) did not significantly correlate with self-reported frequency of following either beauty- or body positive-related accounts and content. Accordingly, no multiple regression model was computed, and only correlations were examined. Positive body image dimensions did not seem to be associated with these dimensions related to Instagram use. However, body appreciation (BAS-2 total score) demonstrated significant, moderate-to-strong, negative correlations with Instagram appearance comparison (IACS total score) and with the internalization of general attractiveness ideal (SATAQ-4R: General Attractiveness subscale), while body functionality appreciation (FAS total score) demonstrated a significant, moderate, negative correlation with Instagram appearance comparison (IACS total score).

Differences between Instagram filter users and non-users on dimensions related to body image and Instagram use

High-frequency Instagram filter users showed higher frequency of following beauty-related accounts and content

($p < .001$) and higher scores on Instagram appearance comparison (IACS total score: $p = .03$) and the internalization of general attractiveness ideal (SATAQ-4R: General Attractiveness subscale: $p = .005$) compared to non-users, while they did not differ from low-frequency users (beauty-related accounts and content: $p = .15$; IACS total score: $p = .19$; SATAQ-4R: General Attractiveness subscale: $p = .13$) (Table 4). Furthermore, the low-frequency group and the non-user group did not differ on these variables (beauty-related accounts and content: $p = .09$; IACS total score: $p = .99$; SATAQ-4R: General Attractiveness subscale: $p = .99$). Differences on Instagram appearance comparison (IACS total score) demonstrated a small-to-medium effect size, while differences on the internalization of general attractiveness ideal (SATAQ-4R General Attractiveness subscale) and on self-reported frequency of following beauty-related accounts and content demonstrated a medium-to-large effect size. No other statistically significant differences emerged.

Discussion

The current study aimed to fill some gaps in extant literature. Specifically, we explored the associations between self-reported frequency of following Instagram beauty and body positive accounts and content and negative and positive body image dimensions. As a second objective, we addressed the putative differences between filter users, divided into high-frequency and low-frequency users, and

non-users on dimensions of Instagram use, body image dimensions, and associated constructs. According to our findings, H1a was partially supported: self-reported frequency of following Instagram beauty-related content was not related to BDD symptoms after controlling for appearance comparison and internalization processes. However, both these control variables were significantly associated with BDD symptoms. Moreover, H1b was not supported since the self-reported frequency of following beauty accounts and content was not correlated with positive body image dimensions. Conversely, H1c received partial support: self-reported frequency of following Instagram body positive content was associated with BDD symptoms, alongside control variables, while not correlated with positive body image dimensions. Concerning the second objective, H2a was partially supported: high-frequency Instagram filter users demonstrated higher levels of appearance comparison and internalization of general attractiveness ideal compared to non-users. However, low-frequency users did not differ from the other two groups. As for H2b, we achieved support since the two filter user groups did not differ in BDD symptoms compared to non-users. Similarly, H2c received support: the three groups did not differ on positive body image dimensions. Concerning RQ1, we found that high-frequency Instagram filter users demonstrated a higher frequency of following beauty-related accounts than non-users, while low-frequency users did not differ from the two groups. Finally, the three groups did not differ in self-reported frequency of Instagram use and self-reported frequency of following body positive accounts and content.

Table 4 Comparisons between Instagram filter users and non-users on body image dimensions and aspects of Instagram use

	HF group (N=55) M (SD)	LF group (N=39) M (SD)	NU group (N=55) M (SD)	$F_{(2, 146)}$	p	η_p^2	Post-hoc
QDC	117.24 (35.63)	110.43 (39.01)	109.18 (32.71)	0.80	0.45	0.011	
FAS	4.12 (0.63)	4.03 (0.83)	4.12 (0.55)	0.28	0.76	0.004	
BAS-2	3.50 (0.83)	3.45 (0.82)	3.44 (0.72)	0.08	0.92	0.001	
IACS total score	2.99 (0.88)	2.65 (0.98)	2.56 (0.79)	3.61	0.03	0.047	HF > NU; HF = LF; NU = LF
SATAQ-4R: General Attractiveness	4.33 (0.60)	4.07 (0.65)	3.96 (0.62)	5.32	0.006	0.068	HF > NU; HF = LF; NU = LF
Frequency of Instagram use	102.07 (67.94)	106.51 (65.66)	75.84 (45.08)	3.88	0.02	0.050	HF = LF = NU
Frequency of following beauty accounts and content	5.96 (2.62)	4.87 (2.44)	3.67 (2.74)	10.50	< 0.001	0.126	HF > NU; HF = LF; NU = LF
Frequency of following body positive accounts and content	5.24 (2.94)	4.41 (2.40)	4.09 (3.09)	2.30	0.10	0.031	

Note. HF group = high frequency of Instagram filter use group; LF group = low frequency of Instagram filter use group; NU = non-users group; QDC = Questionario sul Dismorfismo Corporeo (English translation: "Body Dysmorphic Disorder Questionnaire"); FAS = Functionality Appreciation Scale; BAS-2 = Body Appreciation Scale − 2; IACS = Instagram Appearance Comparison Scale; SATAQ-4R: General Attractiveness: Sociocultural Attitudes Towards Appearance Questionnaire − 4 Revised − General Attractiveness subscale

Self-reported frequency of following beauty and body positive accounts and content and negative and positive body image dimensions

Results of the first objective showed that the frequency of following beauty-related accounts and content was positively associated with BDD symptoms among female university students. However, after controlling for Instagram appearance comparison performed on Instagram and internalization of general attractiveness, this association became non-significant. Among females, following accounts and content that advertise fashion and make-up brands on Instagram did not appear to be associated with BDD symptoms, which comprise concerns related to perceived physical flaws, body checking behaviors (e.g., mirror checking), avoidance behaviors (e.g., avoidance of social situations), and need for reassurance for one's physical appearance. Given the cross-sectional design, the interpretation of this finding could be mostly speculative. A first possible explanation could be that the relationship between Instagram beauty content and BDD symptoms could be mediated by appearance comparison and internalization of beauty ideals, as suggested by previous findings and our results as well (Seekis & Barker, 2022; Thompson et al., 1999). A different design (e.g., a longitudinal study) could further address this hypothesis. Another possible explanation could be that other psychological factors (such as comparing oneself with other individuals on Instagram and internalizing the importance of appearing physically attractive) are indeed more relevant for BDD symptoms, and the relationship with beauty content is too weak. Thus, self-reported frequency of following beauty content on Instagram might not be per se indicative of a certain attitude toward body image. To note, this finding emerged utilizing the Tripartite Influence Model (Thompson et al., 1999) as a theoretical background; thus, Instagram content was considered influential for BDD symptoms. However, given the cross-sectional design of this study, this finding could be interpreted as female users with BDD symptoms were not affected by or did not frequently engage in viewing Instagram beauty content. They may avoid being exposed to Instagram content that may reinforce a reliance on physical attractiveness or feature physically attractive individuals that would ultimately be means of appearance comparisons. Indeed, users' attitudes toward body image could also influence social media use (Marques et al., 2022).

Moreover, self-reported frequency of following Instagram body positive accounts and content was associated with higher levels of BDD symptoms, alongside appearance comparison on Instagram and internalization of general attractiveness ideal. In fact, even though a positive association between exposure to body positive images and body satisfaction was previously found (Stevens & Griffiths, 2020), body positive content could lead to a negative effect due to the presence of thin and fit praise or sexualization (Cohen et al., 2019; Lazuka et al., 2020; Vendemia et al., 2021). An alternative hypothesis could be that exposure to "flawed" or "undesirable" physical attributes, typically featured in these images (Cohen et al., 2019), may be related with more attention toward physical appearance. Therefore, such content could be associated with greater BDD symptoms instead of being beneficial. A third putative explanation is that body positive content could enhance emphasis on being satisfied with physical appearance: viewing people praising their body could be related with more attention toward perceived physical flaws in individuals who cannot access such positive emotions. Also in this case, the present finding is discussed in accordance with the Tripartite Influence Model (Thompson et al., 1999). However, the cross-sectional design of this study also enabled to hypothesize that female users with BDD symptoms would seek specific forms of content on Instagram (Rodgers et al., 2016). Accordingly, the more pronounced their BDD symptoms, the more likely they might be to search for body positive content as a coping mechanism to deal with their dysfunctional body-related concerns and behaviors.

Both regression models highlighted that Instagram appearance comparison and internalization of general attractiveness ideal showed a positive association with BDD symptoms. These associations are in line with the Tripartite Influence Model (Thompson et al., 1999), with the phenomenology of BDD (American Psychiatric Association, 2013), and with previous findings (e.g., Seekis & Barker, 2022). Instagram users could be exposed to carefully produced and idealized content generated by other creators (e.g., friends and family members), increasing their need to improve their self-presentation to appear more physically appealing (Rousseau, 2021). Moreover, users could perceive this content as an adequate term for comparison due to the perceived similarity and attractiveness of the portrayed individual (Chae, 2018). The combination of these two characteristics (high perceived attractiveness of the content and perceived similarity) may easily lead Instagram users to internalize the importance of being physically attractive, to perform appearance comparisons (Festinger, 1954) and, ultimately, to body image disturbances. On the other hand, individuals with BDD symptoms could be more prone to engage in comparisons on Instagram and to internalize the importance of appearing physically attractive due to the salience of physical appearance and involvement in appearance comparisons typical of this psychological disorder (American Psychiatric Association, 2013). Thus, given the cross-sectional design of this study, the other direction of the relationship is equally plausible.

The frequency of following both types of Instagram accounts and content was not related to positive body image dimensions among female university students. These findings corroborate the independence between negative and positive body image (Tylka & Wood-Barcalow, 2015a). Instagram content, including themes centered around beauty and body positivity, could induce appearance evaluation, a dimension not included within body appreciation and body functionality appreciation. Thus, we could reasonably assume that positive body image may not be associated with self-reported frequency of following Instagram content. This study is in contrast with a previous experimental study (Barron et al., 2021) that found a decrease in state body appreciation after being exposed to fitspiration images. Besides differences in the content examined, this discrepancy might be explained by the dynamicity of positive body image: after a brief exposure, female students could be affected by Instagram content threatening their body image. However, in the long term, they may be able to cope with these negative stimuli and maintain their acceptance and love toward the body and its functionality, relying on a "protecting filter" that shields them from negative external influences (Tylka & Wood-Barcalow, 2015a). The results of this study are also in contrast with another finding that highlighted increased body appreciation after being exposed to body positive images (Nelson et al., 2022). A possible explanation might be that our cross-sectional study highlighted the heterogeneity of Instagram content presented as "body positive" (Cohen et al., 2019; Lazuka et al., 2020), which could be lost during the process of selecting stimuli in an experimental study. Given the cross-sectional design of the study, another possible explanation for these findings could be that women referring a positive attitude toward their body do not actively search for appearance-focused content on Instagram, such as beauty and body positive content. Accordingly, they might be more interested in "appearance-neutral" Instagram content, such as content not portraying individuals (e.g., animals, nature, interior design, travel images).

Interestingly, Instagram appearance comparison and internalization of general attractiveness ideal were negatively associated with positive body image dimensions, as previously found (Linardon et al., 2022).

Lastly, moving behind the main purposes of the study, non-significant associations emerged between self-reported frequency of Instagram use and negative and positive body image dimensions. As suggested by previous similar studies (Swirsky et al., 2021; Walker et al., 2021), the frequency of social media use should not be entirely considered dysfunctional for individuals' well-being.

Differences among Instagram filter users and non-users on dimensions of Instagram use, negative, and positive body image

As for the second aim, high-frequency users of Instagram filters reported a higher frequency of following beauty-themed accounts and content than non-users. Moreover, they reported a greater tendency to compare their physical appearance on Instagram and to internalize the importance of appearing attractive compared to non-users. Interestingly, individuals who reported using Instagram filters with a low frequency did not differ from the other groups. Overall, medium effect sizes were detected. These findings are in line with previous ones (Lee & Lee, 2021; Verrastro et al., 2020) and outline that female students engaging in Instagram filter use with high frequency could be more oriented toward physical appearance than non-users. Moreover, individuals reporting low frequency of Instagram filter use demonstrated the same pattern as high-frequency users and non-users. A possible explanation might be that individuals self-reporting low frequency of Instagram filter use could display both high and low investment toward appearance. Therefore, low engagement on Instagram filters might be less representative of a certain attitude toward body image compared to high or no engagement.

Finally, no differences in BDD symptoms and positive body image dimensions emerged between groups. Thus, the use of Instagram filters per se did not characterize female students with high levels of body image issues or low levels of positive body image. As for BDD symptoms, this finding was not supported by studies highlighting a significant positive relationship between body dissatisfaction and photo editing (e.g., Vendemia & DeAndrea, 2021). However, they could corroborate a recent metanalysis that shed light on mixed findings on this relationship (McGovern et al., 2022). Thus, our study could suggest the need to address further the relationship between negative body image dimensions and this social media behavior, employing valid and reliable self-report measures and larger sample sizes. Concerning positive body image, this finding well aligned with a previous one that underscored a non-significant association between photo editing and body appreciation (Veldhuis et al., 2020); consequently, positive body image could not be associated with Instagram filter use. Similar to Instagram content, Instagram filters could mostly revolve around appearance, potentially lacking associations with psychological dimensions unrelated with physical appearance.

Limitations and future directions

These findings need to be interpreted considering several limitations. First, the cross-sectional nature of the study did

not allow to infer clear causality among the variables under investigation, and interpretation remains highly speculative. Second, the sample comprised undergraduate students, limiting the generalizability to the entire female population. However, they represent the most vulnerable population for body dissatisfaction (Cerea et al., 2021). Third, the method used to assess the self-reported frequency of following Instagram accounts and content could have been inadequate and may have excessively broadened the type of content the respondents referred to. Since participants were not asked to specify the accounts and content they followed, incoherent responses could have been collected. Fourth, a more appropriate measure to address filter use and manipulation behaviors on Instagram could have been utilized; however, at the time of the study, no Italian-validated measures were available. Fifth, objective measures of the frequency of content viewed on Instagram and Instagram filter use could have been useful: for example, an analysis of viewed and shared content on Instagram, conducted by requiring access to personal Instagram data, and of the degree of Instagram filter use, recorded with an adequate software, could be implemented in future studies. Sixth, female students at risk or with a current diagnosis of a body image disorder (i.e., BDD, bulimia nervosa, anorexia nervosa) were not detected and were not excluded from the analyses. This choice was made to have a more ecological and representative sample of the general female student population. Seventh, we did not assess the ethnicity of participants: according to their ethnic group, users could have different experiences during Instagram use (Rodgers & Rousseau, 2022). Eighth, we assessed participants according to their sex; thus, we included participants who self-identified as women only based on their attributed sex at birth. Finally, these findings could have been biased by demand characteristics due to the design of the study, its description, the instruments employed or their order of presentation. Thus, participants might have answered the items to comply or conflict with the research aims without reflecting their genuine feelings or thoughts. Demand characteristics could also explain inconsistencies in the findings already available in the literature. Future studies should address this issue and implement a more bias-free way to address this relationship, such as presenting the real aim of the study at the end of the questionnaire.

Future studies should include an analysis of the relationships in a male sample. Moreover, individuals with a diagnosis of BDD could be recruited to replicate these findings with a clinical sample. Furthermore, a different design could be implemented. For example, a longitudinal study would allow to analyze the relationship between the frequency of following specific accounts and content and body image dimensions in a selected group of students across different time points. Such a study could clarify and detect possible causality between constructs.

In conclusion, this study highlighted a weak association between Instagram use and body image dimensions. Self-reported frequency of following beauty and body positive accounts and content was non-significantly or weakly associated with BDD symptoms once Instagram appearance comparison and internalization of general attractiveness ideal were considered. As for positive body image, the relationship was overall non-significant. Finally, the role of Instagram filter use as an appearance-focused behavior was described. However, it was not directly related with BDD symptoms, body appreciation, and body functionality appreciation. Instead, it was associated with related dimensions (Instagram appearance comparison and internalization of general attractiveness ideal) and self-reported frequency of following beauty-related content.

Declarations

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