



Retouched or Unaltered? That is the Question. Body Image and Acceptance of Cosmetic Surgery in Young Female Instagram Users



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Abstract

Background Viewing Instagram altered images of attractive women has negative effects on women's body image. This study examined the effects of exposure to a 'before' and 'after' retouched image, in combination with a disclaimer, on female Instagram users' thin-ideal internalization, body dissatisfaction and acceptance of cosmetic surgery.

Methods An experimental design with a control group without pretesting was adopted. Participants ($N = 105$) were randomly assigned to one of three groups: Group 1 was exposed to a replica of an Instagram post with an enhanced image of a woman; Group 2 was shown the same enhanced image and the original one in combination with a disclaimer that the enhanced image had been digitally

edited; Group 3 (the control) was exposed to a neutral image.

Results The MANOVA showed that participants in Group 2 reported lower levels of thin-ideal internalization and acceptance of cosmetic surgery for social reasons compared to those in Group 1. Contrary to our hypothesis, the degree of body dissatisfaction was not significantly different among the three groups.

Conclusions The present study could be promising for the development of brief interventions aimed at reducing the negative effects of Instagram exposure on young women's body image.

Level of Evidence V This journal requires that authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors www.springer.com/00266.

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Introduction

Currently, the use of social network sites (SNSs) is pervasive, with reports of young people spending more than two hours per day on them worldwide [1]. Viewing images of attractive women on appearance-based SNS seems to increase the risk of developing negative consequences on one's body satisfaction especially among young women [2], who are the main users of appearance-based SNS, such as Instagram [1]. The aim of the current study was to assess the effects that the exposure to a 'before' and 'after' retouched image, in combination with a disclaimer, on

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Instagram, might have on women's body image and acceptance of cosmetic surgery.

Social Network Sites, Body Dissatisfaction and Acceptance of Cosmetic Surgery

Body dissatisfaction derives from discontent with one's body shape in general or specific body parts, and this might arise from a psychological inconsistency between the perception of one's body and an internalized body ideal [3]. Dissatisfaction with body image can have negative effects on the physical and psychological health of an individual [4, 5] and increase the desire for unnecessary cosmetic surgery procedures [6, 7]. Cosmetic plastic surgery has increased substantially worldwide in recent years [8]. Several physical and psychological undesirable outcomes have been reported after cosmetic surgeries, including chronic and neurological disease, anxiety, depression and persistent body dissatisfaction [9].

SNS may foster a positive attitude toward cosmetic surgery acting on intrapersonal factors, such as body dissatisfaction, as well as, according to the Tripartite Influence Model of body image [10], on social factors, such as the exposure to images of beauty ideals and engagement in appearance-based comparisons with such images, which makes people try to change their appearance to attain these ideals [6, 11, 12]. Several studies have shown that users tend to post images on SNSs that offer the best esthetic version of themselves through the use of digital editing tools [13, 14]. Nevertheless, the use of editing software might alter individuals' perception of their appearance making them lose touch with reality, because they expect to look filtered in real life as well [15]. When they find that this is not possible, they might consider cosmetic enhancement [16, 17]. Indeed, some studies found an association between the use of some social media and photograph editing applications and acceptance of cosmetic surgery [6, 18]. Di Gesto et al. [6] reported that engagement with self-image and celebrity material on Instagram predicted higher interest in cosmetic surgery as a consequence of increased appearance-based comparisons and body dissatisfaction.

Disclaimers and 'Before' and 'After' Photographs

Many authors [19] have developed some strategies with the aim of increasing individuals' critical sense of skepticism toward idealized images to reduce the detrimental effects of exposure to digitally modified social media images on women's perceptions of body image. Recent studies have shown that viewing natural images of women without make-up, rather than idealized images, decreased dissatisfaction with facial appearance [20], resulted in higher

perceived attainability of these models [21] and slightly mitigated the negative effects of idealized make-up images [22]. In line with this perspective, Tiggemann and Anderberg [23] established that women who were exposed to unaltered images only or to a comparison of enhanced and unaltered images of the same woman experienced less body dissatisfaction than those exposed to the enhanced image only. Nevertheless, the authors acknowledged that pictures alone could be not sufficiently effective, because they might be perceived as not realistic for Instagram users, who are used to view photographs accompanied by captions or comments.

To mitigate the damaging effects of exposure to idealized body images posted on SNSs, some authors used a disclaimer (i.e., a warning that the photographs have been digitally edited) [24] with the digitally modified images. A disclaimer signals that the appearance of the person portrayed in the photograph is unrealistic and thus is not suitable for comparative purposes; as a consequence, a positive body image can be preserved [25, 26].

Some studies [19, 27, 28] showed that specific self-disclaimers that inform SNS users about the unrealistic nature of images of digitally modified body parts were ineffective in reducing body dissatisfaction. Slightly different findings emerged in the study by Bue and Harrison [29] in which young women reported increased body anxiety after exposure to the images with comments that supported a body ideal, but not after exposure to the images accompanied by the disclaimer. Tiggemann and Velissaris [30] found that viewing images of attractive women accompanied by comments by Instagram users that served as a reality check (i.e., accentuated that the body image of the portrayed woman was not representative of most women) successfully reduced the detrimental effects of positive appearance comments on women's body dissatisfaction.

Given the mixed findings of past research [23, 26, 30, 31], more data on the effects of a combination of an enhanced and unaltered image of the same women with a third part general disclaimer could contribute to our understanding of their potential importance in reduced detrimental effects of exposure to idealized Instagram images. In addition, to the best of our knowledge, no study experimentally investigated how strategies aimed to facilitate a more critical approach to SNSs idealized images could affect young women's interest in cosmetic surgery.

The Present Study

The objective of the current study was to experimentally evaluate the effects of the exposure to a 'before' and 'after' retouched image, in combination with a third-party general disclaimer, on young women's thin-ideal internalization,

body dissatisfaction and acceptance of cosmetic surgery. A sample of young Italian women was presented with an enhanced image of a woman inserted into a frame that made it look like a photograph taken from Instagram (Group 1, enhanced image only). A second group was shown the same enhanced image together with the original (i.e., unaltered) image; these participants were also given a disclaimer that the enhanced image had been digitally edited (Group 2, original and enhanced images, plus a disclaimer). A third group (Group 3, the control) was exposed to a neutral image (i.e., of the image background). It was hypothesized that the participants in Group 2, who had been made aware of changes made to the image, would report lower levels of thin-ideal internalization, body dissatisfaction and acceptance of cosmetic surgery, compared to those in Group 1, who saw the enhanced image only; it was also assumed that, in this regard, Group 2 would report similar levels of those in the control group, who saw the neutral image only.

Method

Participants

The participants were 105 young women aged 18–30 years (mean \pm standard deviation [SD] = 24.30 \pm 3.47) with an active Instagram account. Their mean body mass index (BMI) was 22.33 kg/m² (SD = 2.68). Most of them (98.1%) were Italian; 1% were Albanian, and 1% were Bengali. Half of the participants (52.3%) had high school diplomas; 40% had a bachelor's degree; 6.7% had a middle school diploma, and 1% had another qualification. Most of the participants (43.8%) were students; 27.6% had full-time jobs; 16.2% had part-time work; 8.6% worked occasionally, and 3.8% were looking for employment for the first time. Almost all of them (98.1%) had never undergone a cosmetic procedure.

Power analysis was performed using G*Power[®] software [32], and it was determined that a minimum sample of 99 was needed to detect a small- to medium-size effect (Cohen's $f = .15$) with 95% power using multivariate analysis of variance (MANOVA) (three groups and seven variables) and alpha of .05.

Participation in the study was voluntary, and incentives to participate were not provided to the participants. The respondents were recruited in public spaces, such as university, sport clubs and libraries, and prospective participants were invited to take part in a study related to the use of Instagram and perceptions of their bodies.

To be eligible for the study, the participants had to be aged 18–30 years, of the female sex, and have an active Instagram account. Informed consent was obtained from all

the participants prior to the dispensation of the questionnaire, which was administered on an individual basis. Anonymity was guaranteed, and personal data were used in full compliance with privacy laws (D.Lgs. 51/2018). Participation in the study took 15–20 minutes in total. The participants completed the questionnaire using a paper and pencil in the presence of the researcher. The study received ethical approval from the ethical committee of the university with which the authors are affiliated (Ref. No. 119_17.09.2020).

Design

An experimental design, without pretesting, was applied. After collecting preliminary information through the administration of a brief questionnaire to obtain the participants' socio-demographic information, height and weight, personal experience of cosmetic surgery and use of Instagram, the participants were randomly assigned to one of the three groups (with 35 women in each group). Immediately after being presented with the stimulus, the participants were asked to complete a questionnaire whose objective was to identify the dependent variables (thin-ideal internalization, body dissatisfaction and acceptance of cosmetic surgery). Three manipulation check questions were presented before the dependent variables.

Stimulus Materials

Initially, several photographs of young women were taken in different settings. The images were evaluated by five independent judges. The image was considered appropriate if it fulfilled the following criteria: (1) it had to clearly depict a young woman with at least three quarters of her body visible since one of the goals was to observe the effects of the stimulus on the participants' perceptions of body image, (2) the setting had to be neutral (i.e., without the addition of elements with the potential to influence the dependent variables) and (3) each image had to depict only one woman.

Given that appearance-based comparisons on Instagram occur more frequently in relation to images shared by their peers [33], images depicting unknown women, approximately of the same age as the eventual participants, were selected. Peers can constitute a reference point through which media are interpreted [34], and they reinforce the values and attitudes that they convey. Following an evaluation by the judges, a final image was selected, which represented a selfie taken by a young woman in her bedroom while looking in the mirror; in the background, partially obscured from view by the woman, is a dog lying on the bed. The image shows approximately three quarters of the woman's body (see Fig. 1).



Fig. 1 The Original Image. *Note* The face of the young woman has been encrypted for privacy reasons

The GNU Image Manipulation Program[®], digital image processing software, was used to moderately modify parts of her body to make her look more attractive according to sociocultural thin ideal; the rest of the image was left unchanged. Each judge rated both the attractiveness and extent to which the enhanced image was representative of the thin ideal. The edited image (see Fig. 2) was deemed suitable by the judges because the modifications, although moderate, ensured that the woman conformed to the Western ideal of being thin.

Group 1: The Enhanced Image

The Group 1 participants were shown only the enhanced image of the woman. The image was presented in a frame that made it look like a photograph taken from Instagram. They were asked to carefully examine it for a minute, which was timed by the researcher.

Group 2: The Original and Enhanced Images, Plus a Disclaimer

The Group 2 participants were shown the same enhanced image; subsequently, they were shown two images of the woman before and after digital enhancement, accompanied by a generic disclaimer: ‘Several photographs that are shared on SNSs are modified through the use of popular, easy-to-use software. The images below show the changes

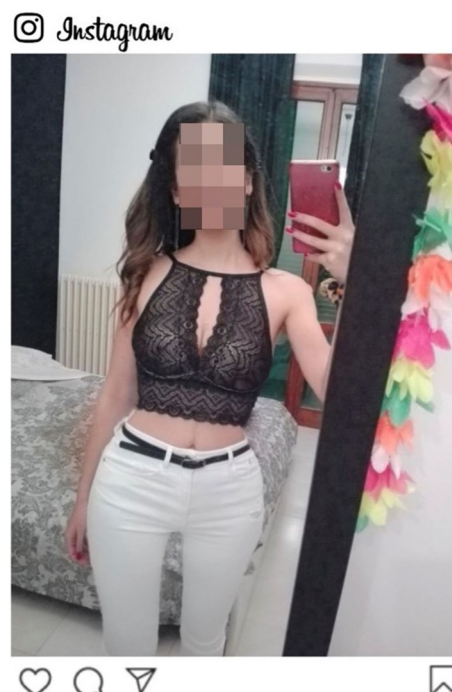


Fig. 2 The Enhanced Image. *Note* The face of the young woman has been encrypted for privacy reasons

made and allow a comparison of the images (i.e., before and after retouching)’. The use of a generic disclaimer was selected because specific disclaimers have been shown to increase appearance-based comparisons on social media and body dissatisfaction through the focus of increased attention on specific body parts [31]. The participants were asked to carefully examine the two images, accompanied by the disclaimer, for a minute and a half. The disclaimer was placed above the images.

Group 3: The Neutral Image (control)

The Group 3 (the control) participants were presented with an image (see Fig. 3) that depicted the room and the dog lying on the bed, but without the woman (i.e., a neutral image). The procedure and times were the same as the Group 1.

Measures

In the first section of the questionnaire, socio-demographic information, such as age, occupation and educational level, was collected. BMI was measured using the participants’ self-reported weight and height. The participants were asked if they had undergone any prior cosmetic surgery. The Instagram Image Activity Scale [35] was used to assess the frequency with which image-related activities were carried out on Instagram by the participants. The



Fig. 3 The Neutral Image

scale included 13 items (e.g., ‘Post a photograph or video that portrays you’) evaluated using a five-point scale (from 1 = ‘almost never’ to 5 = ‘almost always’). High scores indicated extensive use of Instagram for image-related activities. This scale has been demonstrated to have good internal consistency and good predictive validity in relation to body dissatisfaction in Italian women [35]. Cronbach’s alpha was .82 for this measure.

Manipulation Checks

Retouched Image To gauge and compare the perceptions of the enhanced photograph of the woman by participants in Groups 1 and 2, their responses to an item in the questionnaire were evaluated. The question posed to the Group 1 participants was as follows: ‘How much do you think the image of the woman has been retouched?’ Similarly, the Group 2 participants were asked, ‘How much do you think the image of the woman in the second photograph has been retouched?’ The scoring ranged from 1 (‘not at all’) to 10 (‘very much’).

Attractiveness The responses of the participants in Groups 1 and 2 to a specific question were assessed to gauge and compare their perceptions of whether the woman in the enhanced photograph was attractive. The

question put to the Group 1 participants (who saw the enhanced image only) was as follows: ‘How attractive is the woman depicted in the image?’ and the question that the Group 2 participants were asked to answer was, ‘How attractive is the woman depicted in the retouched image?’ The scoring ranged from 1 (‘not at all’) to 10 (‘very much’).

Effectiveness of the Enhancement To determine whether the changes made to the image were effective in making the woman appear more attractive, the participants in Group 2 were asked, ‘When thinking about the two images, how attractive do you think the woman was before the image was retouched?’ The scoring ranged from 1 (‘not at all’) to 10 (‘very much’). To determine whether the changes made to the image were effective in making the woman more attractive, the mean score for this item was compared to the mean score obtained for the evaluation of whether the woman in the enhanced photograph was attractive.

Dependent Variables

Thin-Ideal Internalization To assess the extent of thin-ideal internalization, the Internalization-Thin subscale of the Italian version [36] of the Sociocultural Attitudes Toward Appearance Questionnaire-4 Revised (SATAQ-4R) [37] was administered. The female version of the subscale comprises four items (e.g., ‘I want my body to look very thin’) rated using a five-point Likert scale (from 1 = ‘strongly disagree’ to 5 = ‘strongly agree’). High scores corresponded with higher levels of thin-ideal internalization. The Italian version of the SATAQ-4R has been shown to have good psychometric properties with regard to internal consistency, test–retest validity and convergent validity in relation to body dissatisfaction, eating disorder symptoms, self-esteem and the influence of family and peers [36]. Cronbach’s alpha was .86 for this measure.

Body Dissatisfaction The Italian version [38] of the Body Shape Questionnaire-14 [39] was adopted to evaluate dissatisfaction in women in relation to their appearance. The scale consisted of 14 items (e.g., ‘Worry about my shape made me diet’) rated using a six-point Likert scale (from 1 = ‘never’ to 5 = ‘always’). High scores on the scale corresponded with augmented body dissatisfaction. The scale has been proved to have good convergent and predictive validity. Cronbach’s alpha was .94 for this measure.

Acceptance of Cosmetic Surgery The Italian version [40] of the Acceptance of Cosmetic Surgery Scale [41] was used to measure the participants’ acceptance of cosmetic surgery. The scale comprised 15 items rated using a seven-point

Likert scale (from 1 = ‘strongly disagree’ to 7 = ‘strongly agree’). The scale contained three subscales, namely intrapersonal, social and consider. The intrapersonal subscale (e.g., ‘It makes sense to have minor cosmetic surgery rather than spend years feeling bad about the way you look’) ($\alpha = .90$) measured acceptance of cosmetic surgery for intrapersonal reasons, such as the desire to feel more attractive and/or symmetrical, as well as feel better about oneself. The social subscale (e.g., ‘I would seriously consider having cosmetic surgery if my partner thought it was a good idea’) ($\alpha = .79$) evaluated the social motivations that can lead to cosmetic surgery and how to appear more attractive to others to gain social benefits. The consider subscale (e.g., ‘I would never have any kind of plastic surgery’) ($\alpha = .91$) measured the likelihood that a person would consider cosmetic surgery. High scores indicated high levels of acceptance of cosmetic surgery.

The Italian version of this scale has been shown to have good convergent and discriminating validity and good nomological validity in relation to body dissatisfaction and sociocultural influences (thin-ideal internalization and media pressure). The three subscales of the Italian version were demonstrated to have good internal consistency in a prior study [40].

Data Analysis

Descriptive statistical analysis was conducted for the variables. Preliminary analysis of variance (ANOVA) was conducted to verify whether BMI, age and the use of Instagram differed between the three groups. Subsequently, ANOVA was performed to determine whether the manipulation was effective. In Group 2 only, an evaluation was performed of whether the changes made to the image were effective in making the woman appear more attractive using the paired sample *t* test (i.e., effectiveness of the enhancement check).

MANOVA was conducted to compare the mean scores obtained for the three groups in relation to the dependent variables (thin-ideal internalization, body dissatisfaction and acceptance of cosmetic surgery). If significant differences between the three groups were observed, Tukey’s post hoc test was conducted in order to know which groups are significantly different or similar. Statistical significance was set at a *p* value of .050.

Results

Less than 1% of the data were missing. A mean imputation process was used to replace the missing values. Table 1 shows the mean, SD and minimum and maximum values for each variable in the three groups.

The results of the checks confirmed that the manipulation was effective. Specifically, the difference in perceptions of the attractiveness of the woman (i.e., attractiveness check) in the enhanced image between the participants in Group 1 (mean \pm SD of 6.37 ± 1.81) and those in Group 2 (mean \pm SD of 6.37 ± 2.40) was not statistically significant ($F_{[1; 69]} = 0.000$, $p = 1.000$).

The difference in perceptions of whether the image had been enhanced (i.e., retouched image check) between the participants in Group 1 (mean \pm SD of 4.00 ± 3.17) and those in Group 2 (mean \pm SD of 8.49 ± 1.12) was significantly higher in Group 2 ($F_{[1; 69]} = 62.236$, $p < .001$, $\eta_p^2 = 0.478$).

Lastly, based on the findings of the evaluation of the effectiveness of the enhancement, the participants in Group 2 deemed that the woman in the image was more attractive in the modified photograph, compared to the original one ($t = 2.490$, $p = .018$).

The preliminary ANOVA did not reveal any statistically significant differences between the three groups regarding BMI ($F_{[2; 102]} = 2.169$, $p = .120$), age ($F_{[2; 103]} = 0.906$, $p = .407$, $\eta_p^2 = 0.017$) and the use of Instagram for image-related activities ($F_{[2; 102]} = 2.082$, $p = .130$). The mean scores of these items are depicted in Table 1.

In testing the hypotheses using MANOVA, a significant multivariate effect (Wilks $\lambda = 0.704$, $F_{[2; 102]} = 2.631$, $p = .002$, $\eta_p^2 = .161$) was observed. The mean scores of for all the variables are depicted in Table 1.

In line with our hypothesis, the participants in Group 2 reported less thin-ideal internalization than those in Group 1 ($F_{[2; 102]} = 5.436$, $p = .006$, $\eta_p^2 = .096$). The differences between Groups 1 and 2, and between Groups 1 and 3, were not statistically significant.

With regard to body dissatisfaction, a significant difference was not found between the mean scores of the three groups ($F_{[2; 102]} = 0.858$, $p = .427$). With respect to acceptance of cosmetic surgery, partially in line with our hypothesis, the Group 2 participants obtained a significantly lower average score for the social subscale, compared to the Group 1 participants ($F_{[2; 102]} = 3.639$, $p = 0.030$, $\eta_p^2 = .067$). A statistically significant difference was not found between Groups 1 and 2, and the control (Group 3). Lastly, the difference between the mean scores of the three groups for the intrapersonal ($F_{[2; 103]} = 1.166$, $p = .316$) and the consider ($F_{[2; 103]} = 1.152$, $p = .320$) subscales was without statistical significance.

Discussion

Instagram is a SNS that is based primarily on image-related activities, and several studies have demonstrated that its use is associated with negative effects related to body

Table 1 Descriptive statistics for the three groups

	Group 1 (enhanced images only)		Group 2 (original and enhanced images, plus a disclaimer)		Group 3 (control)	
	<i>M</i> (SD)	Min-max	<i>M</i> (SD)	Min-max	<i>M</i> (SD)	Min-max
Age	23.83 (3.35)	18–29	24.14 (3.85)	18–30	24.91 (3.18)	18–30
BMI	21.67 (2.33)	17.30–25.39	23.00 (3.08)	19.10–32.27	22.30 (2.45)	16.90–29.38
Instagram use for image-related activities	3.11 (.53)	1.85–4.00	3.35 (.61)	2.38–5.00	3.39 (.71)	1.77–4.69
Thin-ideal internalization	3.19 (1.06)	1.00–5.00	2.47 (.86)	1.00–3.75	2.79 (.81)	1.50–4.50
Body dissatisfaction	2.61 (1.27)	1.00–5.43	2.61 (1.25)	1.00–5.07	2.31 (.74)	1.14–3.57
Acceptance of cosmetic surgery- <i>intrapersonal</i>	3.80 (1.62)	1.00–6.40	3.96 (1.49)	1.00–7.00	4.37 (1.68)	1.20–7.00
Acceptance of cosmetic surgery- <i>social</i>	1.85 (.99)	1.00–4.00	1.33 (.47)	1.00–2.40	1.57 (.86)	1.00–4.20
Acceptance of cosmetic surgery- <i>consider</i>	3.34 (1.92)	1.00–7.00	2.77 (1.87)	1.00–7.00	2.78 (1.57)	1.00–6.80

image evaluations by young women. The current study broadened knowledge of the effectiveness of a rapid intervention in countering some negative effects that exposure to Instagram appearance-based content can have on body image.

In support of our hypothesis, our findings showed that the exposure to a ‘before’ and ‘after’ retouched image of a young woman, in combination with a third-party disclaimer that the retouched photograph had been edited digitally, seems to protect participants from the internalization of the beauty standards that idealized body images posted on SNSs promote. Indeed, participants who saw both the altered and enhanced images of the young woman (i.e., Group 2), in combination with the disclaimer, reported lower levels of thin-ideal internalization than those who only saw the digitally modified image. The Group 2 participants showed similar levels of internalization than those in control group exposed to a neutral image. The findings suggest that this strategy, albeit simple, produced an effect that was comparable to that obtained through longer and more structured interventions, whereby a reduction in thin-ideal internalization in women was achieved through their participation in a multimedia literacy program [42]. Nevertheless, the absence of a follow-up in the present study raises the question of whether the observed effect would be sustained over time; therefore, a multisession version of the intervention may be necessary to achieve temporally lasting improvements.

Contrary to the findings in the study by Tiggemann and Anderberg [23], our intervention was not effective in reducing body dissatisfaction. Indeed, the average score of the Group 2 participants, exposed to the original and enhanced images plus a disclaimer, did not differ significantly from the average scores of the other two groups. Considering that body dissatisfaction is a relatively stable variable, it is possible that the exposure to the stimulus was too short to adequately determine any change

in this regard. Nevertheless, the level of body dissatisfaction did not differ significantly between the participants exposed to the enhanced image only and those in the control group. This finding suggests that a single instance of exposure to an Instagram-edited photograph was too short to produce a deleterious effect on body image.

Our hypothesis was partially confirmed regarding the acceptance of cosmetic surgery. Participants exposed to the original and enhanced images, plus a disclaimer, obtained a significantly lower average score than participants exposed to the enhanced image only when evaluated using the social subscale. It is possible that viewing an idealized image of an attractive woman was perceived by the Group 1 participants as pressure to improve their appearance, which differed to the reaction of the Group 2 participants who were aware that digital editing had taken place. Indeed, the social component of acceptance of cosmetic surgery relates to social factors, such as the internalization of sociocultural messages, media pressure to change one’s physical appearance and the extent to which surgery is considered a useful means of obtaining social benefits. Since Instagram users express their appreciation of an image through likes and comments, it can be assumed that feedback could be considered a social reward for an attractive physical appearance; therefore, the fact that the participants in Group 1, exposed to the retouched image only, were accepting of cosmetic surgery for social reasons could be associated with a desire to receive more likes and positive comments related to their photographs. However, by way of qualification, in the current study, photographs of people who had changed their appearance with cosmetic surgery were not shown.

To the best of our knowledge, our study is the first to have experimentally analyzed the effects of the exposure to a replica of an Instagram post with an original and retouched Instagram image of the same woman, together with a generic disclaimer, on young women’s acceptance of

cosmetic surgery. Another strength of this study was that it demonstrated the effectiveness of a brief yet simple intervention, following which female participants showed lower levels of thin-ideal internalization and acceptance of cosmetic surgery as a method of appearing more attractive to others and gaining social benefits. However, the hypothesized effects on body dissatisfaction were not observed.

The study had limitations. Firstly, the sample exclusively comprised women aged 18–30 years, and the sample size was relatively small, which meant that the results could not be generalized to the entire population. Secondly, the Body Shape Questionnaire, not specifically designed to assess state body dissatisfaction, was adopted to measure body dissatisfaction in the current study, whereas a state body dissatisfaction scale (e.g., a Visual Analog Scale) might have been more sensitive to identifying changes in body dissatisfaction levels. In addition, the familiarity of participants with photograph-editing techniques was not determined in the current study. It is plausible that participants who were more familiar with these techniques would be more capable of recognizing changes made to an image. The time permitted to observe the image in the present study was significantly longer than the average time that Instagram users take looking at photographs that appear in their feed. The average users are more likely to scroll through the images in the Instagram feed, passively assimilating what they see without critically filtering their perceptions. Another limitation could be the use of a single stimulus, nevertheless the use of a scrupulous selection of the target stimuli could limit the risk that specific characteristics of the photograph could cause the observed effects. Finally, the lack of a follow-up study, necessary to verify whether the changes would be maintained over time and the extent to which this would occur, was another limitation. Therefore, although the results were interesting, similar studies, with some variations, are needed. The sample should be larger and more stratified to enhance generalizability of the results to the general population. In addition, it would be interesting to determine the effects of the intervention on men; although the literature suggests that men are less susceptible to the negative effects of media on body image [2], the use of SNSs is pervasive for both genders. Another important aspect to consider would be the participants' ages since the results might differ if the sample comprised adolescents rather than young adults, especially since adolescence is a distinctive period of psychosocial development, and adolescent girls are particularly vulnerable to the effects of images portrayed on SNSs, especially Instagram [43]. The study could also be replicated with participants of a culture other than Western to consider different sociocultural influences on body image.

Conclusions

From a practical point of view, the findings have relevant consequences for the development of strategies aimed at reducing the negative effects of SNS exposure on acceptance of cosmetic surgery, thus avoiding the potential physical risks associated with these procedures. Awareness that images of women posted on Instagram might have been enhanced had a protective effect against the desire to undergo cosmetic surgery for social reasons; therefore, the exposure to Instagram posts informing SNS users that the idealized images has been digitally edited could result in less consideration being given to cosmetic procedures as a means of improving one's appearance to conform with mutable social norms. In this vein, with respect to clinical practice, our findings might help cosmetic surgery practitioners to better understand the reasons behind women's intention to undergo cosmetic surgery procedure and might offer some guidelines for planning interventions (e.g., counseling) aimed at discouraging individuals from undergoing cosmetic surgery when it is not necessary. Women should be made aware that cosmetic surgery produces permanent body changes; it is necessary to understand if their interest in surgical procedures is determined by stable reasons or by temporary and more superficial considerations. If cosmetic surgery appears unnecessary, surgeons might propose alternative strategies that could help women to improve their satisfaction; for instance, surgeons might help women to discover that many images they view on social networks are digitally modified and therefore unrealistic.

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Data availability The datasets generated for this study are available on request to the corresponding author.

Declarations

Conflict of interest The authors declare that they do not have any conflict of interest.

Ethical Approval The Ethical Committee of the University of Florence approved the study procedures. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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