

The Effects of Instagram Use on Body Image, Body Satisfaction and Ways of Losing Weight – A Quantitative Study¹

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The present study investigates the direct effect of Instagram use on various ways of losing weight, examines the mediation effects of body satisfaction and body image, and the moderator effects of gender and marital status. A total of 520 people who both used Instagram and undertook body surgery participated in the study and filled in the online and printed versions of our questionnaire. Partial least squares regression was used to test the research hypotheses and the relationships among the variables. The results revealed that body image mediated the effect of the purpose of Instagram use on ways of losing weight; however, no mediation effect of body image and body satisfaction was found for patterns and purposes of Instagram use apart from exercise. The relationship between the purposes and pattern of Instagram usage on body satisfaction was significant. However, patterns of Instagram use had no impact on body image, while this relationship for purpose was significant. The implications of the study are discussed.

Keywords: Instagram, body image, body satisfaction, ways of losing weight, Iran

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Introduction

Instagram is one of the social media applications and websites that have become quite popular as technologies advanced. Owned by Facebook, more recently known as Meta, Instagram focuses on video and photo sharing. In December 2021, more than 2 billion people were using Instagram globally. The largest group of users belonged to the 25–34 year-old cohort followed by 18–24 year-olds of whom 51.6% were men (Dixon, 2022). In Iran, however, women welcome Instagram to a greater extent as it provides a proper working base for them despite some limitations that have been imposed. Moreover, most online businesses (83%) use social media platforms, including Instagram, in order to increase their sales, which in turn explains why 11 million Iranian jobs depend on online social media networks. Iranian influencers also use their Instagram accounts for business purposes. Some Instagram users in Iran pay money to be advertised on famous pages while others use Instagram as a free place to promote their goods and services (Zigma8, 2022).

The conception of the perfect body displayed on Instagram and other social media platforms engages young women's minds in comparing themselves to the models they see there (Verduyn et al., 2020). Previous findings have confirmed that an individual comparing their own body to social media models engenders more negative feelings in them about the way they look in contrast to other real-world examples (Fardouly et al., 2017). Spending excessive amounts of time in the virtual social media world, and the use of filtering or even Photoshop to manipulate reality could be explanations (Hogue & Mills, 2019). Frequent checking of users' profile photos, videos and posts, as well as liking, sharing, saving, and commenting on their posts leads to constant unintentional self-comparison of the individual to the models on display, thereby fostering negative feelings towards their own body (Kim & Chock, 2015).

The term *body image* was first introduced by the psychologist John Money, an expert in various aspects of social identity (Grunewald et al., 2021). Voelker et al. (2015) considered body image to be a complex and vital element that includes self-perception and the way individuals feel about their own bodies; and it can vary across a spectrum of positive and negative feelings. Cash et al. (2004) propose the idea that certain physical features are idealised in the way we receive information about physical appearance. There has been a plethora of reports confirming that social media use and body image are strongly connected (Manago et al., 2015). For instance, Instagram users with a positive body image share more pictures of themselves (Butkowski et al., 2019).

In this study, we have attempted to detect links between Instagram use and various ways of losing weight by examining the mediating role of body satisfaction and body image. We further tested the roles of gender and marital status as moderators. Moreover, the issues the present study investigates are five-fold: (1) Are there any relationships between patterns of Instagram usage, body image, and body satisfaction? (2) Is there any relationship between patterns of Instagram usage and different ways of losing weight? (3) Are there any relationships between reasons for using Instagram, body image, and body satisfaction? (4) Is there any relationship between reasons for using Instagram and different ways of losing weight? (5) Are there any significant mean differences between

gender groups and marital status in the relationships of independent variables (IVs) and dependent variables (DVs)?

Literature review

Patterns of Instagram usage, body image and body satisfaction

Media has always played an important role in forming social norms among people. Traditionally, television and magazines determined the beauty of models, but with the advancement of technologies, social media has a significant impact on body image among the youth of today (Mills et al., 2017). The influence of modern social media here is greater than traditional media because of it is frequently accessed by the users and there is a greater availability of perfect body types through the use of hashtags (Mills et al., 2017). The widespread images of slim, idealised bodies portrayed in the media conveys the message to its audience that this body type is favoured, and if women fail to conform, the way they look will be unsatisfactory (Cafri et al., 2005).

Similarly, Sultan (2023) confirmed the negative effects of social media use on body image depending on the amount of time spent online on such platforms; that is, the more time users spent on the media, the greater were the negative effects on their body image. By the same token, the amount of time spent using Instagram is considered as a pattern of use for Instagram in the present study.

Instagram users are allowed to use editing and filtering when posting photos and creating stories, consequently they tend to spend more time on editing to create their ideal look (Brown & Tiggemann, 2016). According to Kim and Kim (2023), Instagram users who tend to use filtering and editing options when uploading posts and sharing stories have more concerns about their body image and are more vulnerable to social comparisons. Being constantly exposed to perfect body images on Instagram pushes the users towards comparing their own appearances to the idealised figures, which may lead to body dissatisfaction (Marengo et al., 2018).

Furthermore, Ahadzadeh (2017) found a positive correlation between the time spent on Instagram and the degree to which its users internalise the thin body as the ideal. This is a byproduct of presenting one's best photos on Instagram, it contributes to body dissatisfaction. Moreover, Alfonso-Fuertes et al. (2023) reported a higher level of body dissatisfaction and lower self-esteem among the users who spent more time on Instagram.

Reason for using Instagram, body image and body satisfaction

Individuals use social media for a wide range of reasons, some for personal or private purposes and some for their businesses. Huang and Ha (2021) found that the reasons for using Instagram, in comparison to Facebook, are more personal and that users experience a more pleasant sense of self-satisfaction once they are able to present a better image of themselves and win approval.

Brandtzæg & Heim (2009) outlined 12 different motives for using social media: establishing new relationships, keeping in touch with family and friends, socialisation, receiving new information, talking, cost free texting, passing time, sharing content, having fun, checking profiles, shopping and other similar activities. Similarly, Krasnova, Veltri, Eling, and Buxmann (2017), outlined four basic motives for using Instagram: building relationships, self-development getting information, and having fun.

Ridgway and Clayton (2016) discovered a relationship between posting Instagram selfies and body image satisfaction, suggesting that when body image satisfaction is promoted through posting selfies, negative romantic relationships might occur as well. Kim and Kim (2023) suggested that the type and quality of contents people share could be related to their self-esteem and body image. Kim (2020) concluded that people who post on Instagram with less desire for popularity are capable of growing their self-esteem positively in contrast to users who are thirsty for attention and consequently receive negative impacts in using social media.

Marques et al (2022) also found that the more someone uses social media, the greater their dissatisfaction are with their body image; thus it is essential to inform them of the positive ways of using social media. In another study, McComb and Mills (2021) also confirmed that when people compare themselves to social media figures, they feel less confident about their appearance, in particular those who are perfectionists suffer more about their body image.

Jung, Barron, Lee, and Swami (2022) concluded that internalising a perfect image significantly mediated the relationship between using social media and body image perception.

Gender and Instagram use

Several research projects have found differences between men and women in their social media usage. Hogue and Mills (2019) found the perfectly thin bodies displayed on Instagram bring about negative feelings and body frustration among young women. Such ideally thin bodies do not necessarily have to belong to celebrities, models, or Instagram influencers but also to female peers of the same age (Brown & Tiggemann, 2016; Fardouly & Holland, 2018). According to Gobin, McComb, and Mills (2022) modern social media platforms can increase the chances of body dissatisfaction among younger females once they have compared themselves to the figures displayed. According to Sharp and Gerrard (2022), teenage girls are more vulnerable to the negative effects of using Instagram regarding their appearance; as a result, the researchers employed a variety of strategies in an attempt to keep the girls safe from the potential risks of using the media.

Butkowski et al. (2019) reported that slim Instagram users post quite differently with regard to displaying their bodies; slimmer men and women tended to show more of their bodies rather than more impersonal posts. Haferkamp et al. (2012) also confirmed that women are more likely to present their bodies in the media if they are slim. People with higher BMIs, however, were more reluctant to show their bodies online (Bue, 2020). Moreover, Butkowski et al. (2019) revealed significant differences on body satisfaction

among slim versus non-slim men and women: people with higher BMIs were more reluctant to show their physique online while that was not the case for those of regular-weight ones. Ridgway and Clayton (2016) also confirmed that Instagram users who share more photos of themselves were more satisfied with their bodies.

Along with the effect of thin bodies presented in the media, McComb and Mills (2022) examined the way the western media preferred a type of body termed the slim-thin figure that has more curves, large hips, small waist and a flat stomach. They found that women who compared themselves to such ideal bodies were more dissatisfied with their body image than those exposed to thin bodies. Moreover, women with physical appearance perfectionism were even more dissatisfied with their weight and self-image.

Constant exposure to slim bodies on Instagram was reportedly connected with reduced body satisfaction, self confidence and cheerfulness (McComb et al., 2021); the previous research also confirms those findings and stated that women are no longer interested in comparing their bodies to those of other women (Brown & Tiggemann, 2016; Hogue & Mills, 2019). The reason is that slim Instagram images are considered a threat to the ordinary women's attitudes towards their bodies, and they try to avoid comparison in order not to lose the competition. Avoiding comparisons is regarded as a technique for dealing with body image threats by eliminating stressful situations (Cash et al., 2005).

Instagram, body surgery, dieting and exercise

Khanjani et al. (2022) examined the direct effect of social media addiction and body image anxiety on both attitudes towards cosmetic surgery and its indirect effect through the mediating variable of body image. He concluded that body image concerns have a mediatory role in the relationship between social and media addiction and attitudes towards cosmetic surgery. Body dissatisfaction was reported to be one of the main factors that led to people commissioning cosmetic surgery (Nerini et al., 2019; Walker et al., 2021). Positive correlations were also found between body dissatisfaction and women undergoing cosmetic surgery, which confirmed the way that surgery is viewed as a means of achieving social acceptance and self-love (Lunde, 2013; Menzel et al., 2011).

Similarly, Schettino, Capasso, and Caso (2023) concluded that even if people are satisfied with their body image, they will consider cosmetic surgery in order to gain social approval. It is worth noting that as the Instagram users have grown in number, so has the number of cosmetic surgery, particularly among young women (Walker et al., 2021). Beauty standards are constantly being displayed in a variety of ways on Instagram, motivating people to follow their principles (Alberga et al., 2018; Tiggemann et al., 2020). The positive relationship between media usage and undergoing cosmetic surgery has also been documented in a number of other studies (Carrotte et al., 2017; Caso et al., 2019; Chen et al., 2019; Gattino et al., 2018; Martel et al., 2020; Walker et al., 2021).

H1: Instagram users will be more likely to engage in cosmetic surgery.

According to Tamannaei and Nejat (2023), there was a significant relationship between the type of image that users are exposed to and the tendency towards cosmetic surgery; viewing images of beauty influencers motivated users to undergo cosmetic body surgery more than those who viewed images of actresses.

Pilgrim and Bohnet-Joschko (2019) concluded that creating body-centred visual content is a key element in winning public trust for Instagram influencers. Dieting and workouts are identified by influencers as the perfect way of achieving body perfection. Furthermore, Tiggemann and Zaccardo (2015) stated that lifestyle is the ideal position for influencers to adopt to attract audience attention. Gender and age are among the influential variables of social network behaviour (such as searching for diets and proper exercises) among the youth (López-de-Ayala et al., 2020). In addition, Pessoa et al., (2023) referred to self-care content as a remarkable issue on Instagram for both men and women.

H2: Instagram users will engage more in dieting.

H3: Instagram users will engage more in exercising.

Theories

According to the theory of uses and gratification, people use the media based on their taste and requirements, and once they have been gratified, they then tend to use it frequently (Casaló et al., 2017; Hwang & Cho, 2018; Mahmoud et al., 2021). Alhabash and Ma (2017) reported that the best indicators for using social media are entertainment and socialisation; Sheldon and Bryant (2016) named surveillance, documentation, and having fun as the main reasons for using Instagram. Some users take refuge on Instagram from problems in their everyday life (Hartmann et al., 2010; Sheldon & Bryant, 2016). In addition, interesting characteristics of Instagram attract users and then provide them with happy hours (Hartmann et al., 2010).

Based on the theory of social comparison (Festinger, 1954), people constantly compare themselves to those they see in the media (Lee, 2014; Mills et al., 2017; Stapleton et al., 2017), and Instagram is a perfect place for such comparisons (Moon et al., 2016), although being exposed to slim bodies in the media can raise body dissatisfaction among younger women (Cafri et al., 2005; Carter & Vartanian, 2022; Lewis-Smith et al., 2019), and at the same time reduce their self-confidence (Fardouly & Holland, 2018; Hogue & Mills, 2019; McComb & Mills, 2021). Lee (2022) also stated that as a result of comparison, excessive use of Instagram is closely related to a desire to look slim.

Based on the mood management theory of Frederick et al. (2017), being constantly exposed to idealised slim figures in the media can lead to body dissatisfaction and lower spirit which is consistent with the influence of traditional media on young women (Brown & Tiggemann, 2016; Frederick et al., 2017; Hogue & Mills, 2019). Consequently, young adults are more influenced by Instagram use because they are the largest group of users, ranging from 25 to 34 years old (Dixon, 2022).

In this study, two variables of patterns and purposes of Instagram use were considered as independent variables. Each variable directly affected different ways of

losing weight through body image and body satisfaction. The question is whether the gender and marital status of the subject is important in the quality of Instagram use and different ways of losing weight through body image and satisfaction. The research framework is presented below (Figure 1).

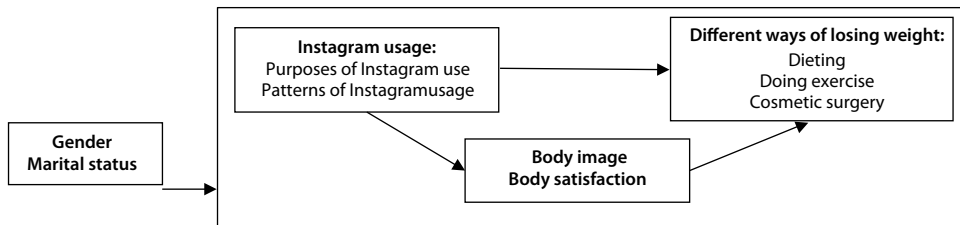


Figure 1: The mediation effects of body image, body satisfaction, and Instagram usage on different ways of losing weight
 Source: Compiled by the author.

Methodology

Location and sampling

The sample for the present study was drawn from among patients who had visited a doctor for cosmetic body surgery. A selection was made from the list of general and specialist doctors in Mashhad, Iran. They are the most renowned and successful surgeons with the largest number of patients for cosmetic and body surgery in the medical system in that city. First, we went to the doctors’ surgeries and asked for their permission, and then we asked the patients to answer a questionnaire. In addition, if the participants did not have time, we asked them to fill in the online versions of questionnaires through the survey link. The required data was collected via questionnaires from both male and female subjects who had undergone body surgery as a result of using Instagram.

Participants

A group of people who used Instagram and had cosmetic body surgery participated in this study. The researcher distributed online and paper questionnaires among 520 male and female individuals who had undergone cosmetic body surgery or wished to do so. Some of them had several body surgery procedures. Purposive sampling was applied, and we asked the participants to fill in the survey questionnaire that addressed topics such as purposes and patterns of Instagram use, body image, body satisfaction, different ways of losing weight, as well as some demographic variables such as gender, marital status, age, the student’s income and parents’ income, parents’ education, students’ and fathers’ jobs, and field of study.

Of the respondents, 63% were female and 37% were male, almost half of whom were students of social sciences; with 47.1% and 33.8% being in the field of science; and 6% had no academic education. More than half of the respondents were married (72%) and 26.3% were single. Of the respondents, 40% were employees and 37.8% were students or householders with no income, followed by 10% who were freelance. The last and smallest group were retired people (2.7%).

The respondents were aged between 15 and 80 years old with the majority of them (36%) located in the 20–40 category, followed by 40–60 year-olds at 29.2%; and 60–80 year-old participants who constituted 23.6% of the respondents. The last group belonged to those aged below 19 years old, which constituted 3.7% of the respondents. Regarding the respondent's income, 32.3% of the subjects earned 5–10 million Tomans per month (109.37– 218.73 € at the time of writing), followed by the no income group of students and housewives at 27.3%. 12.9% of the subjects earned income above ten million Tomans per month (above 218.73 €), followed by 6% who earned between one and five million per month (21.87–109.37 €). The last and smallest group belonged to 2.2% of subjects who earned less than one million Tomans per month (less than 21.87 €).

Regarding their fathers' education, almost half had not completed a diploma (53.3%), 17.9% had a diploma and 9.2% held a bachelor's degree. The three last groups belonged to the 7.4% of fathers with a Master's degree, the 5.5% with a qualification associate degree, and the 4.6% with a PhD. As for mothers' education, more than half of the respondents' (64.7%) mothers had not completed a Diploma, 19.4% had a Diploma, 5.5% had a bachelor's degree, 3.2% had a qualification associate degree, and 2.7% had Master's degree.

Regarding fathers' jobs, 30% of fathers had freelance occupations, 23.5% were retired, 16.9% were employees, 9.7% had passed away, and 1.3% were unemployed. Almost half of the participants' fathers (43%) earned 10–15 million Tomans per month; 10.4% earned above 15 million Tomans, the same percentage earned 5–10 million Tomans in a month. The last two and smallest groups had either no income (7%) or 1–5 million Tomans per month (0.8%).

Regarding patterns of Instagram use as years of use, they were divided into two groups of less than 5 years and more than 5 years. More than half of the respondents (63.6%) had used it for less than 5 years and 24.4% had used it for more than 5 years. Checking Instagram was divided into the following three groups: less than five times per day (67.2%), 6 to 12 times per day (12.2%), and more than 13 times per day (7.7%). The amount of time spent on Instagram per day was divided into two groups: less than 5 hours in a day, and more than 5 hours. Most of the respondents (78%) spent less than 5 hours a day on Instagram, and 8.7% spent more than 5 hours.

The number of friends on Instagram was divided into the following three groups: below 100, between 100–200, and more than 200. The largest group of respondents (11.5%) had more than 200 friends, 5.7% had less than 100 friends, and 4.6% had 100–200 friends. From the point of the number of received Likes, two groups were specified: less than 100 Likes and more than 100 Likes. More than half of the subjects (60.5%) received less than 100 Likes, and 20.2% received more than 100 Likes. The number of

followers on Instagram in the present study was divided into three groups of: less than 100 (43.7%), from 100 to 200 (14%), and more than 200 (29.8%).

Most of the participants in the present study (75.2%) mentioned that receiving Likes is not important to them while 12.1% stated that it is fairly important ($M = 3.62$, $SD = 0.79$). Regarding the importance of followers on Instagram, more than half of the participants (77.1%) mentioned that it was not important, and 8.9% stated that it was fairly important ($M = 3.62$, $SD = 0.84$). More than half of the participants (61%) mentioned that friends on Instagram are not important; and 19.8% said it was fairly important ($M = 3.40$, $SD = 0.90$).

Regarding, the respondents' point of view on body satisfaction, 87.1% preferred medium body size, 7.7% preferred thin and just 1.4% liked above average weight body size. From the point of doing exercise, 31.9% of the respondents exercised frequently, 27% exercised very frequently, and 27% had a medium exercise routine schedule. In addition, 30% of the respondents were very frequently on a weight loss diet; the same percentage is true for frequent dieters ($M = 2.29$, $SD = 1.28$). Also, 72.6% of the subjects mentioned that they were on a diet under the supervision of doctors while 23.3% went on diets independently. Moreover, 63.8% of the participants used weight loss medications very frequently and 13.7% used them frequently ($M = 1.64$, $SD = 1.06$). Finally, 28.6% of the respondents were not satisfied with their cosmetic surgery while 24.8% were completely satisfied ($M = 2.60$, $SD = 1.33$). From a maximum of 20, more than half of the respondents (79.7%) scored their beauty more than 15 and 16.2% scored their beauty at less than 15.

Measures

Patterns of Instagram use were measured through 10 items. The following three open-ended questions measured Instagram usage by the number of years, times, and hours per week:

- How long have you been using Instagram?
- How often do you use Instagram?
- How many hours do you spend using Instagram each week?

Three open-ended questions measured the number of followers, friends on Instagram, and also the number of likes:

- How many followers do you have on social media?
- Approximately how many friends do you have on your Instagram account?
- How many likes do you usually receive on your Instagram posts?

Three questions measured the importance of Likes, followers and friends on Instagram for users, ranging from 5 = "extremely important" to 1 = "not important at all". We used this dimension developed by Limniou, Ascroft, and McLean (2021). We asked "do you use Instagram" with the answer of "Yes" or "No", just to make sure that all respondents do use it.

The purpose of Instagram use was measured by 20 items, on a five-point Likert scale. Respondents were asked about media usage ranging from 1 = “*Strongly disagree*” to 5 = “*Strongly agree*” for each statement. The range of scores for this dimension was from 20 to 100. To measure this dimension, we used Pertegal, Oliva, and Rodríguez-Meirinhos’s model (2019). They divided purposes for Instagram use into three dimensions: sense of belonging, self-expression, and documentation/current.

Body image was measured by 21 items ranging from 1 = “*Very much*” to 5 = “*Very little*” for each statement. The range of scores for this dimension ranged from 21 to 105; and we used body image developed by Dakanalis et al. (2017). It was divided into three dimensions of body surveillance, body shame, and appearance control beliefs.

Body satisfaction was measured by four items ranging from 1 = “*Very satisfied*” to 5 = “*Very unsatisfied*”. The range of the scores was from 4 to 20 which was developed by Madan, Beech, and Tichansky (2008). In addition, one item asked “how do you feel your looks compare to an average person’s looks” ranging from 1 to 5 from “*Much better*” to “*Much worse*”. We also asked the respondents to rank their ideal body type with three answers of thin, average, and fat. They were also asked to score their beauty out of 20.

Different ways of losing weight were measured by four questions about diet, exercise and surgery. Each item was measured by four separate questions ranging from 1 = “*Very much*” to 5 = “*Very little*”. The range of the scores was from 1 to 20.

The demographic of the respondents were measured as gender, marital status, age, students’ income, and their parents’ income, parents’ level of education, students’ and fathers’ jobs, and participants’ field of study.

Data analysis

The partial least squares variance method (PLS) of SmartPLS 3 was used for structural model analysis, which is the most commonly used method in the current research (Hair et al., 2021). The main reason for using this method in this study is that PLS is used to deal with mixed and complex model studies (Sarstedt et al., 2020), and the most important motivations, exploration and prediction, are recommended at an early stage of theoretical development in order to test and validate exploratory models. It is also suitable for prediction-oriented research (Henseler et al., 2009). In addition, “PLS path modelling will produce parameter estimates even when the sample size is very small” (Rigdon, 2016, p. 600).

In addition, descriptive analysis was employed to determine patterns and purposes of Instagram use as independent variables of the present study, and different ways of losing weight such as dieting, doing exercise and undergoing surgery as dependent variables; also, body satisfaction and body image were mediators. Furthermore, respondents’ personal information (gender, marital status, age, students’ income and their parents’ income, parents’ education, students and their fathers’ job, and their field of study) was analysed via frequency, percentage, mean, and standard deviation. PLS analysis was employed for the regression analysis for moderation effects of gender and marital status.

Results and Discussion

Descriptive statistics

For the *body image* index, the majority of women (85.6%) considered it to be moderate. More than half of the respondents (55.3%) have high *body satisfaction* (Table 1).

Table 1:
Descriptive Statistics Summary of all Variables

Variable	Level n (%)			Mean	SD
	Low	Moderate	High		
Body image	42 (7.0)	511 (85.6)	31 (5.2)	61.72	10.07
Body satisfaction	43 (7.2)	209 (35.0)	330 (55.3)	18.68	4.01

Source: Compiled by the author.

Measurement model

The measurement model is the part of the model that examines associations between the latent variables and their measures.

Convergent validity

The convergent validity of the measurement is usually ascertained by examining the loadings, average variance extracted (AVE) and also the composite reliability (Rahman et al., 2015). The composite reliabilities were all higher than 0.7 and the AVE of all constructs were also higher than 0.5.

Table 2 shows the outer loadings of all items for all variables in the initial and modified measurement model. According to these results, all outer loadings are accepted except the following items: in pattern of Instagram use, in years of Instagram use, in body satisfaction, C5, and in purpose of Instagram usage, A1, A3, A4, A8 to A13, A15, A17 to A20, in body image B1 to B4, B 6, 7, 8, B11 to B21, in surgery D9 was eliminated from the initial measurement model due to low loading factor which were less than 0.5 confirming their low contribution to the related constructs. Regarding the findings of this study, the Composite Reliability (CR) ranged between 0.83 and 0.88 and AVE ranged between 0.50 and 0.79. In addition, to measure collinearity at the indicator level, the variance inflation factor (VIF) was used. Results indicated that all values are below 5 revealing that there is no collinearity issue (Table 2).

*Table 2:
The result of convergent validity*

Construct	Item	Factor Loading (> 0.5)	Cronbach's Alpha (> 0.7)	Composite Reliability	Average Variance Extracted (AVE) (> 0.5)	Collinearity Statistics (VIF)
Purpose of Instagram use			0.772	0.835	0.52	1.573
	A14	0.62				1.462
	A16	0.576				1.485
	A2	0.66				1.269
	A5	0.79				2.307
	A6	0.777				2.107
	A7	0.61				1.464
Body image			0.719	0.826	0.549	
	B10	0.753				1.441
	B14	0.777				1.491
	B22	0.67				1.576
	B5	0.534				1.177
	B9	0.861				1.772
Body satisfaction			0.832	0.88	0.602	
	C1	0.781				1.976
	C2	0.856				2.646
	C3	0.891				2.996
	C4	0.65				1.369
Diet			0.626	0.838	0.722	
	D3	0.806				1.26
	D5	0.894				1.26
Pattern of Instagram use			0.77	0.882	0.79	
	Hours in Day	0.94				1.629
	Time Per Day	0.83				1.567

Source: Compiled by the author.

Discriminant validity

Discriminant validity demonstrates the extent to which a construct is empirically distinct from another construct. Regarding the assessment of the discriminant validity of this model, the value of the heterotrait-monotrait ratio of correlations (HTMT) is 0.47, which is lower than 0.90 (Henseler et al., 2015) or 0.80 (Hair et al., 2019). The results revealed that discriminant validity has been ascertained (Table 3).

Table 3:
Discriminant validity for all variables

	1	2	3	4	5	6
Body satisfaction	0.47					
Diet	0.42	0.17				
Exercise	0.03	0.36	0.09			
Pattern of Instagram use	0.09	0.211	0.15	0.01		
Purpose of Instagram usage	0.32	0.24	0.10	0.09	0.30	
Surgery	0.21	0.098	0.40	0.04	0.15	0.08

1) Body image 2) Body satisfaction 3) Diet 4) Exercise
5) Pattern of Instagram use 6) Purpose of Instagram usage

Source: Compiled by the author.

Path model using bootstrap

RQ1: Is there any relationship between “patterns of Instagram use”, “body image,” and “body satisfaction”?

RQ2: Is there any relationship between “patterns of Instagram use” and different ways of losing weight?

RQ3: Is there any relationship between “purposes of Instagram usage,” “body image,” and “body satisfaction”?

RQ4: Is there any relationship between “purposes of Instagram use” and different ways of losing weight?

The path coefficients obtained from this model were consistent. The respective confidence intervals can be obtained by bootstrapping (Streukens & Leroi-Werelds, 2016). This step also provides estimates for indirect and total effects.

There was relationship between patterns of Instagram use and body satisfaction ($p < 0.05$). Patterns of Instagram use had no impact on body image, dieting and exercising ($p > 0.05$), but this relationship was meaningful and positive for undergoing cosmetic surgery ($\beta = 0.12, p < 0.05$). Therefore, H1, was not rejected.

There was a significant relationship between purposes of Instagram usage, body image, and body satisfaction with ($\beta = 0.24, p < 0.05$) and ($\beta = -0.10, p < 0.05$)

respectively. There was no relationship between purposes of Instagram usage and different ways of losing weight (diet, exercise and surgery) ($p > 0.05$). H2 and H3 were, therefore, rejected.

The impact of body image on exercise, dieting and undergoing surgery was positive and significant ($\beta = 0.123$, $p < 0.05$), ($\beta = 0.28$, $p < 0.05$) and ($\beta = 0.17$, $p < 0.05$) respectively. Body satisfaction just had positive and significant impact on doing exercise ($\beta = 0.38$, $p < 0.05$). However, the impact of body satisfaction on dieting and surgery was not significant ($p > 0.05$). In addition, the impact of body image on body satisfaction is significant ($p < 0.05$).

Mediation test of “body image” and “body satisfaction” with IVs and DVs

No mediation effect was found between body image, patterns of Instagram use, and different ways of losing weight (diet, exercise and surgery) ($p > 0.05$). The mediation effects of body satisfaction on different ways of losing weight (diet, exercise and surgery) and pattern of Instagram use were not significant ($p > 0.05$), only body satisfaction has mediation effects with the pattern of Instagram use on exercise ($p < 0.05$).

The mediation effects of body satisfaction and purpose of Instagram use on different ways of losing weight (diet and surgery) were not significant ($p > 0.05$), however, this relationship was significant for doing exercise ($\beta = -0.038$, $p < 0.05$).

The mediation effects of body image on body satisfaction and the purposes of Instagram use were negative and significant ($\beta = -0.087$, $p < 0.05$). The mediation effects of body image and purposes of Instagram use on different ways of using methods such as diet, exercise, and surgery is significant and positive ($\beta = 0.07$, $p < 0.05$) ($\beta = 0.03$, $p < 0.05$) ($\beta = 0.042$, $p < 0.05$) respectively. The mediation effects of body satisfaction and body image on exercise were negative and significant ($\beta = -0.13$, $p < 0.05$) and there was no relationship with diet and surgery ($p > 0.05$). (Table 4, and Figure 2).

*Table 4:
Results of mediation tests*

Mediation effects	β	T	P Values
Pattern of Instagram use > Body image > Body satisfaction	-0.009	0.667	0.505
Pattern of Instagram use > Body image > Diet	0.008	0.682	0.495
Pattern of Instagram use > Body image > Body satisfaction > Diet	0	0.113	0.91
Pattern of Instagram use > Body image > Exercise	0.003	0.618	0.537
Pattern of Instagram use > Body image > Body satisfaction > Exercise	-0.004	0.653	0.514
Pattern of Instagram use > Body image > Surgery	0.005	0.62	0.535
Pattern of Instagram use > Body image > Body satisfaction > Surgery	0	0.038	0.969
Pattern of Instagram use > Body satisfaction > Exercise	-0.045	2.789	0.005
Pattern of Instagram use > Body satisfaction > Diet	0.001	0.199	0.843
Pattern of Instagram use > Body satisfaction > Surgery	0	0.064	0.949

Mediation effects	β	T	P Values
Purpose of Instagram use > Body image > Body satisfaction	-0.087	4.539	0
Purpose of Instagram use > Body image > Diet	0.07	3.759	0
Purpose of Instagram use > Body image > Exercise	0.03	2.331	0.02
Purpose of Instagram use > Body image > Surgery	0.042	2.591	0.01
Purpose of Instagram use > Body image > Body satisfaction > Exercise	-0.034	3.849	0
Purpose of Instagram use > Body image > Body satisfaction > Surgery	0	0.063	0.95
Purpose of Instagram use > Body image > Body satisfaction > Diet	0.001	0.193	0.847
Purpose of Instagram use > Body satisfaction > Exercise	-0.038	2.087	0.037
Purpose of Instagram use > Body satisfaction > Surgery	0	0.061	0.952
Purpose of Instagram use > Body satisfaction > Diet	0.001	0.177	0.86
Body image > Body satisfaction > Exercise	-0.138	5.863	0
Body image > Body satisfaction > Diet	0.003	0.202	0.84
Body image > Body satisfaction > Surgery	-0.001	0.066	0.947

Source: Compiled by the author.

Effect Size f^2

The change in the R^2 value, while a particular independent construct is eliminated from the model, can be used to evaluate whether the omitted construct had a basic influence on the dependent construct or not. This measures indicators for the f^2 or effect size. Recommended guidelines for assessing effect size are: $f^2 \geq 0.02$, $f^2 \geq 0.15$ and $f^2 \geq 0.35$ respectively, representing the small, medium, and large effect sizes of the exogenous construct (Cohen, 1988). The result of f^2 revealed that effect size of exogenous construct for body image indicated the effect size for body satisfaction ($f^2 = 0.146$), diet ($f^2 = 0.07$), exercise ($f^2 = 0.014$) and surgery ($f^2 = 0.026$) in medium, and small effect sizes.

The effect size for body satisfaction, diet and surgery equals ($f^2 < 0.001$), and for exercise $f^2 = 0.14$. The effect size is small and medium. The effect size for patterns of Instagram use and body image is ($f^2 = 0.001$), for body satisfaction ($f^2 < 0.015$), for surgery ($f^2 = 0.016$), for exercise ($f^2 = 0.002$) and for diet it equals ($f^2 = 0.011$). The effect size is small. The effect size for purposes of Instagram use and body image is ($f^2 = 0.06$) and for body satisfaction ($f^2 = 0.011$), for exercise and diet ($f^2 = 0.001$), and for surgery equals ($f^2 < 0.001$). The effect sizes are medium and small.

Coefficient of determination (R^2) and (Q^2)

Patterns and purposes of Instagram usage were able to explain 3% for body image, 9% for body satisfaction, 6% for diet, 11% for exercise, and 2% for surgery. A blindfolding procedure was employed to establish cross-validated redundancy measurement for each construct. The results revealed that the R^2 value of body image (0.05), body satisfaction (0.17), diet (0.08), exercise (0.12) and surgery (0.04) are larger than zero, recommending

that the independent construct has predictive power for mediator and dependent construct under the conditions of the present study (Hair et al., 2011) (Table 5).

Table 5:
Results of coefficient of determination (R²) and Q²

Endogenous latent variable	R ²	Adj R ²	Q ²
Body image	0.063	0.059	0.031
Body satisfaction	0.18	0.176	0.098
Diet	0.095	0.089	0.06
Exercise	0.127	0.123	0.114
Surgery	0.05	0.044	0.029

Source: Compiled by the author.

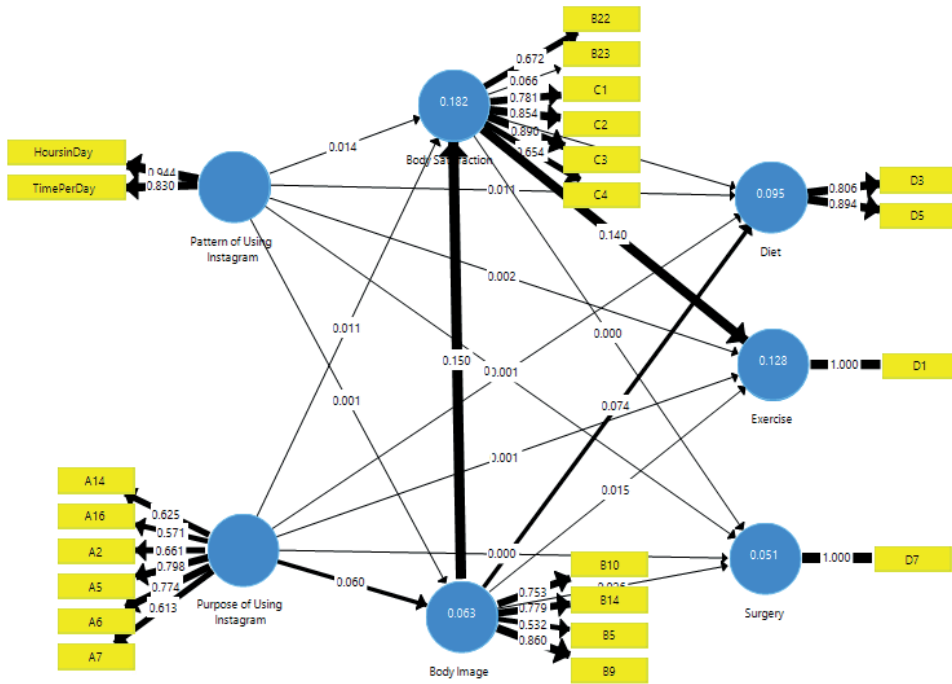


Figure 2: The mediation effects of body satisfaction, and image on different ways of losing weight and Instagram usage
Source: Compiled by the author.

RQ5: Are there any significant mean differences between groups of gender and marital status in the relationship of IVs and DVs?

Multiple group analysis for gender and marital status

Table 6 reported the path coefficients for each group and the significance test for the differences of group specific results based on the method of PLS-MGA (Partial least squares multi-group analysis). The notable variation between gender (male vs. female) is not significant ($p > 0.05$), just significant for the relationship between pattern of Instagram use and body image. Regardless of the group differences, marital status (married vs. single) is not significant ($p > 0.05$).

Table 6:
Multi-group analysis

Gender	Difference (Female-Male)	p-value
Body image > Body satisfaction	0.126	0.924
Body image > Diet	0.076	0.792
Body image > Exercise	0.036	0.346
Body image > Surgery	0.03	0.623
Body satisfaction > Diet	0.101	0.85
Body satisfaction > Exercise	0.074	0.81
Body satisfaction > Surgery	0.01	0.477
Pattern of Instagram use > Body image	0.221	0.008
Pattern of Instagram use > Body satisfaction	0.138	0.075
Pattern of Instagram use > Diet	0.094	0.23
Pattern of Instagram use > Exercise	0.047	0.337
Pattern of Instagram use > Surgery	0.092	0.192
Purpose of Instagram usage > Body image	0.08	0.293
Purpose of Instagram usage > Body satisfaction	0.112	0.799
Purpose of Instagram usage > Diet	0.053	0.692
Purpose of Instagram usage > Exercise	0.042	0.656
Purpose of Instagram usage > Surgery	0.139	0.832
Marital status	Difference (Married-Single)	
Body image > Body satisfaction	0.08	0.17
Body image > Diet	0.07	0.27
Body image > Exercise	0.01	0.43
Body image > Surgery	0.07	0.27
Body satisfaction > Diet	0.14	0.92
Body satisfaction > Exercise	0.19	0.99
Body satisfaction > Surgery	0.02	0.44
Pattern of Instagram use > Body image	0.04	0.68

Pattern of Instagram use > Body satisfaction	0.07	0.24
Pattern of Instagram use > Diet	0.47	1
Pattern of Instagram use > Exercise	0.22	0.97
Pattern of Instagram use > Surgery	0.2	0.87
Purpose of Instagram usage > Body image	0.07	0.78
Purpose of Instagram usage > Body satisfaction	0.14	0.89
Purpose of Instagram usage > Diet	0.06	0.28
Purpose of Instagram usage > Exercise	0.005	0.46
Purpose of Instagram usage > Surgery	0.05	0.66

Source: Compiled by the author.

Discussion

The present study was conducted as an attempt to find out if any relationship exists between the patterns and purposes of Instagram use and different ways of losing weight (diet, exercise and surgery) with the mediation effects of body image and body satisfaction. Moreover, the moderating effects of gender and marital status were also analysed.

The current investigation had 10 main findings which are enumerated below:

- 1) The relationship between patterns of Instagram use and body image was not significant while this relationship is significant for body satisfaction.
- 2) The relationship between patterns of Instagram use, dieting and exercising was not significant; however, this relationship proved significant for those undergoing surgery.
- 3) There was a significant relationship between purposes of Instagram usage, body image and body satisfaction.
- 4) There was no relationship between purposes of Instagram use and different ways of losing weight.
- 5) There was a significant relationship between body image and different ways of losing weight.
- 6) There was a significant relationship between body satisfaction and doing exercise, but this relationship was not significant for surgery and diet.
- 7) The mediation effects of body image and body satisfaction on different ways of losing weight (diet, exercise and surgery) and patterns of Instagram use were not significant except for body image and pattern of Instagram use and exercise.
- 8) The mediation effects of body image and purpose of Instagram use on ways of losing weight proved to be significant.
- 9) The mediation effect of body satisfaction and purposes of Instagram use on doing exercise was significant, but this mediation effect was not significant for dieting and undergoing surgery.
- 10) The moderating effect of gender and marital status was not significant; however, gender had a significant moderating effect on Instagram usage and body image.

The first main finding is that the relationship between patterns of Instagram use and body image was not significant while this relationship was significant for body satisfaction which is in line with previous findings that stated, spending more time on social media has a positive relationship on body dissatisfaction (Ahadzadeh et al., 2017;

Alfonso-Fuertes et al., 2023; Brown & Tiggemann, 2016; Fardouly & Vartanian, 2015; Graff & Czarnomska, 2019; Kim & Kim, 2023; Kleemans et al., 2018; Marques et al., 2022; Sultan, 2023). Moreover, Fardouly and Holland (2018), along with Hogue and Mills (2019) confirmed a significant relationship between media usage and negative body image.

The second main finding is that the relationship between patterns of using Instagram, dieting, and doing exercise was not significant; however, this relationship proved to be significant for undergoing surgery. This result is not consistent with the findings of Tarsitano et al. (2022), Curtis et al. (2020), Boepple and Thompson (2016), Graff and Czarnomska (2019) who reported a positive relationship between using Instagram, dieting and doing exercise. In addition, Mabe et al. (2014) observed a positive association between time spent on social media and disordered eating. However, this result is consistent with the findings of Tamannaie and Nejat (2023) who found that viewing beauty influencers' images led to a greater tendency to undertake cosmetic body surgery.

The third main finding is that the relationships between purposes of using Instagram, body image and body satisfaction are significant; which is consistent with the findings of Ridgway and Clayton (2016) who also reported significant association between posting a large number of selfies on Instagram and negative romantic relationship outcomes; suggesting that showing one's body satisfaction in the media could lead to Instagram-related disagreements. Butkowski et al. (2019) found that Instagram users who are most satisfied with their body image tend to make more selfies.

The fourth main finding showed no relationship between purposes of Instagram use and different ways of losing weight; which is consistent with the outcomes of Khanjani et al. (2022) who observed that addiction to social media is directly related to body image anxiety and tendency towards cosmetic surgery.

The fifth main finding showed significant relationship between body image and different ways of losing weight. This result is in line with the findings of McComb and Mills (2021) who reported that social comparison to media displayed figures led to lower self-confidence and body dissatisfaction. In addition, Holland and Tiggemann (2017) found that women who posted ordinary or travel photos on Instagram suffered more from disordered eating compared to women who posted exercise routines. Furthermore, those users viewing edited images might compare themselves with unrealistic beauty ideals leading to body dissatisfaction or extreme dieting (Alperstein, 2015). In contrast to our fifth outcome, women with a positive body image frequently quoted regular exercise as a way of improving their health and lifestyle rather than losing weight (Wood-Barcalow et al., 2010). Social media addiction indirectly influenced attitude towards cosmetic surgery through the mediating variable of body image concern (Khanjani et al., 2022).

The sixth main finding revealed a significant relationship between body satisfaction and doing exercise, but an insignificant one for surgery and dieting. This result is in line with the findings of Nerini et al. (2019) and Walker et al. (2021). However, it is in contrast with some similar studies that have shown a positive association between body dissatisfaction and undergoing cosmetic surgery among women (Lunde, 2013; Menzel et al., 2011).

Furthermore, this study found a significant relationship between the mediation effects of body image and purposes of Instagram use on ways of losing weight. This result is consistent with the findings of Knobloch-Westerwick and Crane (2012) who found that dieting mediated the impact of exposure to slim media figures on body satisfaction.

The last but not least of the findings belongs to the insignificant moderating effect of gender and marital status; however, gender had a moderating effect for pattern of Instagram use and body image. This result is not consistent with the findings of Huang and Su (2018), Pessoa et al., (2023), Butkowski et al. (2019), Haferkamp et al. (2012), and Sultan (2023) who found that gender matters in Instagram use. Likewise, Van den Berg et al. (2007) observed gender differences in body mediated relationships between friend dieting and body dissatisfaction.

Conclusion

Overall, these findings provide information on the role that Instagram use plays in different ways of losing weight through the mediation effects of body satisfaction and body image. The study highlighted the importance of Instagram in different ways of losing weight between single and married male and female users. The results showed that social media, especially Instagram, has undeniable impacts on its users because of the prevalence of idealised body images which provides ample opportunity for the younger generations to get involved in the process of comparing themselves with the figures displayed in the media (Verduyn et al., 2020).

Recommendations

In general, media literacy programs attempt to illustrate to the youth the way slim bodies are displayed in the media. With the aid of audiovisual tools, different processes of advertisement production with models are shown, so that the audience realises there is a lot of professional editing behind a single image. The main purpose of such tutorials is to depict that reality could be quite different from what is displayed in the media. Once the youth attend media literacy programs, their critical thinking abilities will increase, and as a result they will not fall for the media images.

According to McComb et al. (2021), certain disclaimers might function similarly to media literacy programs by raising awareness about the way images are edited and changed before posting on Instagram. Once they are aware of such facts, social comparisons, and their negative consequences will reduce to a great extent. Therefore, women who are well aware of manipulated images have a more positive body image towards themselves compared to those with lower media literacy skills (McLean et al., 2015). Body image researchers are truly qualified to suggest specific strategies to moderate media content for the betterment of society.

During the process of data collection, some participants were observed who believed in normal beauty standards, some of them were married, and mentioned that their husbands were satisfied with their bodies, yet they still wished to change their body image because they were not happy with their own bodies. Consultation with a psychologist is advised before undertaking any beauty surgery. Once the normal condition of the patients is confirmed, they are allowed to undergo cosmetic surgery because many people undergo such cosmetic procedures as a result of an inferiority complex, low self-esteem, or lack of self-confidence.

Preparing documentaries about people who have done cosmetic surgery to change their body image (those with side effects and those without any) could be a valuable source of information for the youth to make wise decisions. Also, cosmetic surgeons and doctors can be invited to educate people about the advantages and disadvantages of body surgery. They can show people, supported with scientific documentation, who do need to undergo such surgery. Given that, we found that Instagram use does have an impact on people's body image, even leading them towards surgery, it follows that via the same instrument, that is Instagram itself, we can inform people of the irreversible side effects of body operations.

Limitations of this study

The present study came up with new knowledge and helpful information about the ways in which Instagram can influence its users' lifestyles; nevertheless it has certain limitations as well. As the survey questionnaires were distributed online, the respondents could have completed the forms in a less controlled setting which would in turn increase the chances of lower engagement in the study. In addition, the sample size of the study is not sufficient to represent an entire national population.

Implications

The younger generations in every society are among the greatest assets of any community; it is therefore important to develop fruitful strategies to reduce the negative effects of being exposed to slim bodies in the media. In order to do so, the youth need to be informed of popular photo editing techniques that are widely used in the virtual world. The youth should also be warned against the hazards of comparing themselves to idealised figures displayed in the media through media literacy workshops and programs. Informative workshops and relevant programs need to be well designed with the purpose of protecting the body image, self-confidence, and body satisfaction of individuals.

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