

The Effect of Instagram Photo Manipulation on Body Image Among Indonesian Emerging Adult Women and Social Comparison Frequency as Covariate: An Experimental Study

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Abstract

This experimental study examined the impact of manipulated Instagram photos on body image among Indonesian emerging adult women, with social comparison frequency included as a covariate. A total of 62 women aged 18–29 were randomly assigned to view either unedited or digitally edited influencer photos. Body image was assessed using the Multidimensional Body-Self Relations Questionnaire–Appearance Scale (MBSRQ-AS), while appearance-based social comparison frequency was measured using a single-item Likert scale. The results showed no significant differences in body image scores between the edited and unedited photo groups. However, social comparison frequency significantly influenced body image across multiple dimensions. The use of a single-item measure limited the scope of the construct, capturing only comparison frequency and omitting other psychological aspects such as directionality or emotional response. These findings suggest that frequent comparison behavior may play a more substantial role in shaping body image than exposure to manipulated visuals alone. The study highlights the importance of accounting for individual tendencies when evaluating media effects and encourages further research that integrates psychological, cultural, and technological factors to better understand body image in the digital age.

Keywords: *body image, emerging adults, Instagram, photo manipulation, social comparison frequency*

Abstrak — Penelitian eksperimen ini meneliti dampak paparan foto Instagram yang telah dimanipulasi terhadap citra tubuh pada perempuan emerging adult di Indonesia, dengan frekuensi perbandingan sosial dimasukkan sebagai kovariat. Sebanyak 62 partisipan perempuan berusia 18–29 tahun secara acak dibagi ke dalam dua kelompok: satu kelompok melihat foto influencer yang belum diedit, dan kelompok lainnya melihat foto yang telah diedit secara digital. Citra tubuh diukur menggunakan instrumen Multidimensional Body-Self Relations Questionnaire–Appearance Scale (MBSRQ-AS), sedangkan frekuensi perbandingan sosial berbasis penampilan diukur dengan satu butir skala Likert. Hasil menunjukkan tidak ada perbedaan signifikan dalam skor citra tubuh antara kelompok yang melihat foto diedit dan yang tidak diedit. Namun, frekuensi perbandingan sosial secara signifikan memengaruhi citra tubuh pada beberapa dimensi. Penggunaan ukuran satu butir membatasi cakupan konstruk

perbandingan sosial, karena hanya mencerminkan frekuensi tanpa menggambarkan arah maupun dampak emosional dari perilaku tersebut. Temuan ini menunjukkan bahwa perilaku membandingkan penampilan secara sering dapat berperan lebih besar dalam membentuk citra tubuh dibandingkan sekadar paparan terhadap visual yang dimanipulasi. Studi ini menekankan pentingnya mempertimbangkan kecenderungan individual saat mengevaluasi pengaruh media, dan mendorong penelitian lanjutan yang mengintegrasikan faktor psikologis, budaya, dan teknologi untuk memahami dinamika citra tubuh di era digital.

Kata Kunci: citra tubuh, dewasa muda, Instagram, manipulasi foto, frekuensi perbandingan sosial

INTRODUCTION

Body image refers to an individual's perception, thoughts, and feelings about their own body (Grogan, 2016). This self-perception can be accurate or distorted and is influenced by selective attention to certain body parts (Wertheim & Paxton, 2012). When individuals negatively evaluate their body image, especially due to a gap between their actual and ideal body, body dissatisfaction arises. One of the most significant contributors to body dissatisfaction is media exposure, particularly through the portrayal of unattainable beauty standards (Pedalino & Camerini, 2022). Traditional media such as television and magazines have long been associated with these effects, especially among women. However, with the rise of digital platforms, especially social media, new concerns have emerged regarding their psychological impact.

Instagram, one of the most widely used social media platforms, allows users to share and view curated visual content. It has popularized trends like body editing, filtered selfies, and the rise of "selebgram" culture in Indonesia—non-celebrity influencers with significant followings who set beauty and lifestyle standards (Nasiha, 2017; Putra, 2017). These selebgrams often showcase idealized, edited images that amplify beauty ideals such as fair skin, slim bodies, and flawless features—standards that are heavily emphasized in Indonesian media and popular culture (Sonata et al., 2024). The trend of pursuing "body goals" frequently promoted on Instagram intensifies social pressure, particularly for teenage girls and emerging adult women, to conform to unrealistic beauty ideals. Consequently, engaging with appearance-related content on social media platforms, such as browsing photos or profiles on Facebook, has been linked to increased internalization of the thin ideal, body dissatisfaction, and disordered eating behaviors (Tiggemann & Slater, 2013). Similarly, Instagram use, particularly viewing idealized body images, has shown comparable associations (Ghaznavi & Taylor, 2015).

One psychological mechanism that mediates the relationship between media exposure and body dissatisfaction is social comparison. According to Festinger's (1954) theory, individuals evaluate themselves by comparing with others when objective standards are unavailable. Social media platforms like Instagram facilitate this process by offering curated content from both peers and celebrities. Upward social comparisons—comparing oneself to those perceived as more attractive—are particularly damaging. They can decrease body satisfaction and increase the risk of mental health issues such as low self-esteem and depression (Apriliani & Soetjiningsih, 2023; O'Brien et al., 2009). Features like filters and beauty apps exacerbate these effects by presenting idealized, often unattainable images as realistic (Fardouly et al., 2015).

Empirical studies have highlighted the negative psychological outcomes of such comparisons. For instance, experimental research by Kleemans et al. (2016) demonstrated that exposure to manipulated images on Instagram significantly lowers body image among adolescent girls, particularly those prone to appearance comparisons. Supporting this, a systematic review by Fioravanti et al. (2022), synthesizing findings from 43 experimental studies, confirmed that viewing idealized images on social networking sites (SNS) consistently increased body dissatisfaction, with state appearance comparison acting as a key mediating factor. Faelens et al. (2021) also found that upward comparison content on Instagram led to decreased self-esteem and increased appearance-related anxiety. Such findings align with the idea that SNS heighten self-objectification and body dissatisfaction, particularly when self-worth depends on external validation (Stapleton et al., 2017).

While adolescents have been the primary focus of previous studies, emerging adults—individuals aged 18 to 25—also remain highly active on social media and vulnerable to its influence. According to Arnett (2000; 2023), this life stage is marked by identity exploration and instability, including challenges related to body image and social belonging. Despite being more independent than adolescents, emerging adults continue to face social pressures related to attractiveness, especially in the context of romantic relationships and career-building. Rodgers et al. (2020) emphasized that emerging adults experience comparable levels of body dissatisfaction, particularly due to appearance-related expectations. This is further supported by research showing that exposure to “fitspiration” content and edited images can significantly reduce appearance-based self-esteem (Tiggemann & Zaccardo, 2015; Cohen et al., 2019).

In the Indonesian context, this issue warrants urgent attention. Data Reportal (2023) reports that Indonesia has over 167 million social media users, with Instagram alone having 89 million users—51.6% of whom are female. Among them, individuals aged 18–24 constitute the largest demographic (37.3%), highlighting the relevance of this age group. Moreover, the ZAP

Beauty Survey (2019) found that 62.2% of Indonesian women reported experiencing body shaming due to their weight, acne, or facial features, and 54% of Gen Z women (aged 13–22) viewed beauty influencers as role models. This age range spans both adolescence and emerging adulthood—two developmental stages characterized by heightened self-consciousness and vulnerability to appearance-related evaluations (Berk, 2018; Arnett, 2023). These findings emphasize how deeply social media shapes beauty perceptions and how emerging adult women in these life stages may be particularly susceptible to social comparison and body dissatisfaction.

Despite these concerns, most experimental studies on body image and Instagram have focused on adolescents in Western contexts. According to our observation there is limited experimental research involving emerging adults in Indonesia, particularly exploring how manipulated Instagram images impact body image and the mediating role of social comparison. Given the cultural specificity of beauty ideals and the high social media usage in Indonesia, such studies are essential to provide locally relevant insights into mental health and digital behavior.

Thus, this study aims to address this research gap by experimentally examining the effects of manipulated Instagram photos on body image among emerging adults in Indonesia. The findings are expected to offer a deeper understanding of the psychological consequences of social media exposure and contribute to efforts in promoting healthier body image and digital literacy in young adults. Although the theoretical basis draws from Festinger's (1954) social comparison theory, this study focuses specifically on the frequency of appearance-based social comparison, measured using a single Likert-type item.

Body Image

Grogan (2016) defines body image as a person's perceptions, thoughts, and feelings about their body. This definition encompasses psychological concepts such as perceptions and attitudes toward the body, as well as the experience of embodiment. Perceptual body image is typically measured by assessing an individual's accuracy in estimating their body size compared to their actual size. Meanwhile, attitudinal body image is evaluated through four components: global subjective satisfaction (evaluation of the body), affect (feelings related to the body), cognition (the extent to which a person is invested in appearance and their beliefs about the body), and behavior (e.g., avoiding situations where the body might be seen or exposed) (Grogan, 2016). Social comparison is the process by which individuals evaluate their opinions and abilities by subjectively comparing themselves to others (Festinger, 1954). More specifically, physical appearance comparison refers to the process of comparing one's physical appearance to that of others (Schaefer & Thompson, 2014). This comparison can take the form of upward social

comparison (comparing oneself to someone perceived as superior) or downward social comparison (comparing oneself to someone perceived as inferior).

Hypothesis

This study hypothesizes that women exposed to retouched and digitally modified photos of influencers will report significantly higher levels of body dissatisfaction than those exposed to unedited, original photos with the frequency of appearance-based social comparison statistically controlled.

METHOD

Participants

The participants in this study were Indonesian emerging adult women who (1) were between 18 and 29 years old, (2) resided in Indonesia, (3) had a personal Instagram account, and (4) possessed sufficient English proficiency to complete the questionnaire. We employed an accidental sampling technique, selecting participants who met the specific inclusion criteria and were conveniently accessible to the researchers (Gravetter & Forzano, 2018).

Design

This study employs an experimental intervention design with a between-subjects structure and a quantitative approach (Sugiyono, 2017). A total of 62 participants were randomly assigned to one of two experimental conditions: (1) a group exposed to original, unedited Instagram photos, and (2) a group exposed to digitally manipulated photos featuring retouched skin tone, smoother complexion, and virtual makeup. The manipulated photos featured retouching techniques such as smoother skin, lighter complexion, and virtual makeup enhancement.

Each participant was exposed to a total of four photos corresponding to their assigned condition. The photos were shown once, sequentially, within an online Google Form, without a time limit, allowing participants to view them at their own pace. Before viewing the images, participants received a brief cover story stating that the study aimed to explore how contextual factors affect appearance preferences. This procedure was used to reduce bias and minimize demand characteristics. After viewing the images, participants immediately completed the online questionnaire. The research aimed to assess whether brief exposure to idealized Instagram photos influences participants' body image, and to what extent this effect is associated with their frequency to compare their appearance to others.

The independent variable was the type of photo exposure (edited vs. unedited), while the dependent variable was body image perception, measured via the Multidimensional Body-Self Relations Questionnaire–Appearance Scale (MBSRQ-AS). The frequency of appearance-based social comparison, assessed using a single Likert-type item, was included as a covariate to statistically control for individual differences in comparison behavior and to isolate the effect of the independent variable. Although single-items measures have limitations, this approach was chosen for brevity. All experimental tasks were administered online to maximize accessibility and maintain standardization across participants.

All data collection and experimental tasks were conducted online using Google Forms to maximize accessibility and ensure procedural standardization across participants. Participants first received an informed consent form and a brief cover story stating that the study aimed to investigate how contextual factors influence appearance preferences. They were instructed to complete the study in a quiet, distraction-free environment.

Upon agreeing to participate, they viewed four sequential Instagram photos—either digitally manipulated or unedited—according to their randomly assigned group. The photos were presented one at a time without a time limit. After viewing all the images, participants proceeded to the next section of the form, where they completed the Multidimensional Body-Self Relations Questionnaire–Appearance Scale (MBSRQ-AS) and a single-item measure assessing the frequency of appearance-based social comparison. All responses were automatically recorded and compiled through Google Sheets for analysis.

To test the effects of image manipulation on body image while statistically controlling for individual tendencies in appearance-based comparison, Analysis of Covariance (ANCOVA) was employed as the main statistical approach. The use of ANCOVA enabled statistical control over individual differences in comparison frequency, allowing for more accurate attribution of body image outcomes to the manipulated photo stimuli. The use of ANCOVA enabled statistical control over individual differences in comparison frequency, allowing for more accurate attribution of body image outcomes to the manipulated photo stimuli.

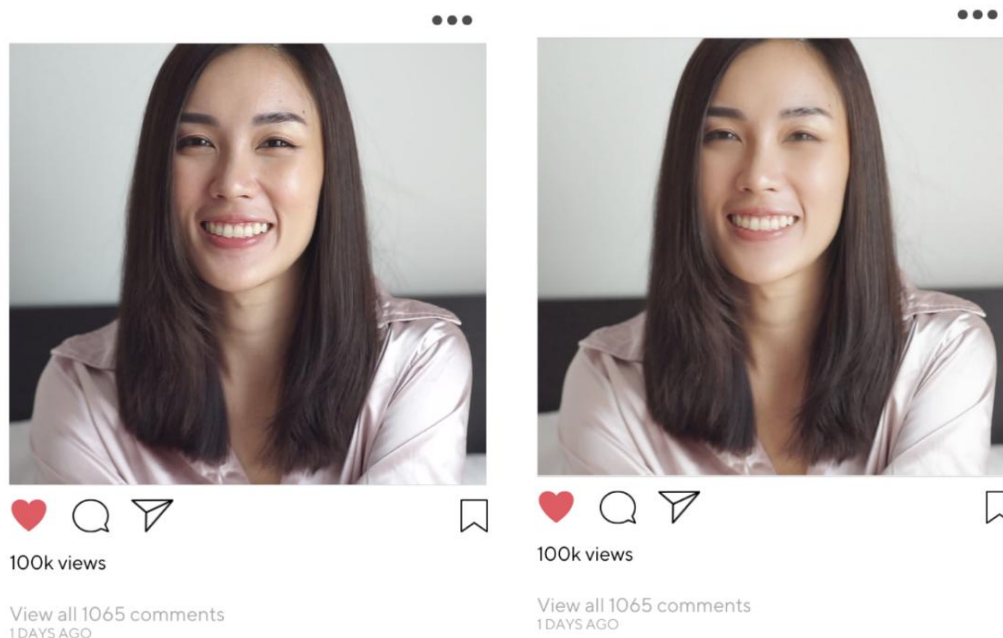
Procedure

The procedure began with the preparation of research instruments, which included the Multidimensional Body-Self Relations Questionnaire–Appearance Scale (MBSRQ-AS) to assess body image perception and a single-item measure to assess appearance-based social comparison frequency. At the same time, eight Instagram photos were selected for stimulus material—divided into two sets of four: one set consisting of original, unedited images, and the other set comprising

digitally manipulated images, edited to enhance attractiveness through lighter skin tone, improved skin texture, and digitally applied makeup.

Figure 1

Examples of original versus manipulated Instagram photos



Participants who met the inclusion criteria were recruited online and randomly assigned to one of the two experimental groups. Before beginning the study, they received a Google Form containing an informed consent form and a cover story. The cover story stated that the study aimed to examine how contextual factors influence appearance preferences, without disclosing the actual focus on body image and social comparison. This strategy was designed to reduce bias and prevent demand characteristics that could arise from participants knowing the true purpose of the study. The script read:

“Kami sedang melakukan penelitian untuk memahami bagaimana faktor kontekstual dapat memengaruhi preferensi terhadap berbagai tipe penampilan. Dalam penelitian ini, Anda akan melihat beberapa foto dan menjawab beberapa pertanyaan terkait.”

The use of a cover story was ethically justified to minimize demand characteristics and maintain the internal validity of the study. Deception of this kind is accepted practice in psychological experiments when full disclosure would bias participants' responses and compromise the research objectives (Aronson, Wilson, & Brewer, 1998). The procedure posed no harm or distress to participants. Participants were informed about the true purpose of the study and given the opportunity to withdraw their data if they felt uncomfortable with the use of deception, in accordance with APA ethical guidelines (APA, 2017). Only participants who agreed and signed the consent form proceeded to the experiment.

Participants were instructed to complete the study in a quiet, undisturbed setting and to avoid multitasking during the experiment. They were then shown four Instagram photos corresponding to their assigned group—either original or manipulated images. Each image was displayed only once, and participants could view them at their own pace without time limits. A brief narrative was provided beforehand to direct their focus and standardize the context of viewing.

Immediately after viewing the photos, participants completed a questionnaire via Google Forms that included the MBSRQ-AS and one item measuring the frequency of appearance-based social comparison. The survey responses were collected anonymously and used for statistical analysis to test the study's hypotheses.

This procedure was designed to simulate a naturalistic Instagram browsing experience while maintaining experimental control over stimulus type and response measurement. The findings were intended to shed light on how exposure to idealized digital images may shape body image perceptions among emerging adult women in Indonesia.

Instruments

This study used the Multidimensional Body-Self Relations Questionnaire–Appearance Scale (MBSRQ-AS) developed by Cash (2002) to measure body image perception. The MBSRQ-AS, consisting of 24 items, has been adapted into Indonesian by Henryan and Simanjuntak (2022) and has undergone items-validity testing and Alpha-Cronbach reliability testing. This instrument covers three core dimensions: Appearance Evaluation (AE), which reflects individuals' satisfaction with their overall physical appearance; Appearance Orientation (AO), which measures the level of importance and investment individuals place on their appearance; and Body Areas Satisfaction Scale (BASS), which assesses satisfaction with specific body parts (e.g., face, waist, hips, thighs). The MBSRQ-AS is a self-report questionnaire that uses a 5-point Likert scale for each item (1 = “Strongly Disagree” to 5 = “Strongly Agree”). Although the MBSRQ-AS does not directly assess specific facial features such as skin color or texture—which were manipulated in the photo stimuli—it captures global and component-based body image evaluation, which is conceptually relevant. Edits that enhance facial features may influence broader satisfaction with appearance, thus making the MBSRQ-AS a valid and appropriate tool for capturing body image outcomes in this study.

Appearance-based social comparison frequency was assessed using a single-item question, asking participants how often they compare their appearance to others (1 = never, 5 = very often).

Analysis Strategies

The data analysis in this study was carried out in several stages to ensure the validity and reliability of the results. All statistical procedures were conducted using the Jeffrey's Amazing Statistics Program (JASP). First, descriptive statistics were computed to summarize the distribution of the data, including the mean, standard deviation, and range for each research variable. Next, data normality was assessed using the Shapiro-Wilk or Kolmogorov-Smirnov tests ($p > .05$), followed by Levene's Test to examine the homogeneity of variances between experimental groups. Assumptions for ANCOVA were tested prior to analysis. Although the covariate was not normally distributed, ANCOVA is considered robust to violations of normality under certain conditions (Field, 2013), and Levene's test confirmed homogeneity of variances.

To test the research hypothesis, Analysis of Covariance (ANCOVA) was employed to examine the main effect of photo manipulation (edited vs. unedited images) on body image scores. The covariate entered into the model was the frequency of appearance-based social comparison, measured via a single Likert-type item. The use of ANCOVA allowed for the control of individual differences in social comparison frequency, ensuring that any observed differences in body image could be more confidently attributed to the experimental manipulation rather than extraneous variables. If ANCOVA results revealed significant effects, post-hoc comparisons were planned to identify which experimental condition showed greater differences in body image scores.

This analytical approach was chosen to evaluate both the direct impact of manipulated photo exposure and the moderating influence of social comparison frequency, thus providing a more nuanced understanding of how Instagram photo manipulation may affect the body image of emerging adult women.

RESULTS

Table 1. Descriptive Statistics

Dimension	<i>N</i>	Mean	<i>SD</i>	Shapiro-Wilk	<i>p</i> -value	Min	Max
Appearance Evaluation	62	30.5	4.497	0.965	0.076	16	39
Appearance Orientation	62	24.048	3.466	0.983	0.525	16	31
Body Area Satisfaction	62	28.952	5.259	0.937	0.003	18	37
Social Comparison	62	3.097	1.02	0.911	< 0.001	1	5
TOTAL	62	86.597	9.234	0.987	0.756	65	106

There were 62 participants in this study. Participants were randomly assigned to view either 4 unedited photos ($N = 31$) or 4 digitally manipulated photos ($N = 31$). All participants were female, aged between 18 and 29 years ($M = 24.7$, $SD = 2.9$). The dimensions of Appearance Evaluation ($M = 30.5$, $p = 0.076$), Appearance Orientation ($M = 24.05$, $p = 0.053$), and the total score ($M = 86.6$, $p = 0.756$) were normally distributed. However, the Body Area Satisfaction dimension ($M = 28.95$, $p = 0.003$) were not normally distributed. The Social Comparison Frequency variable was not normally distributed, as indicated by the Shapiro-Wilk test ($p < .001$). This may be due to the use of a single-item Likert scale with limited response options, which often results in a skewed distribution.

Table 2. *ANCOVA Results for Appearance Evaluation, Appearance Orientation, Body Area Satisfaction and Total Scores*

Cases	Sum of Squares	df	Mean Square	F	p	η^2
Appearance Evaluation						
Photo Type	11.790	1	11.790	0.588	0.451	0.01
Social Comparison Frequency	14.372	1		0.703	0.405	0.12
Residuals	1205.563	59	20.433			
Appearance Orientation						
Photo Type	3.458	1	3.458	0.359	0.551	0.005
Social Comparison Frequency	158.121	1	158.121	16.345	<.001	0.216
Residuals	567.121	59	9.621			
Body Area Satisfaction						
Photo Type	16.213	1	16.213	0.783	0.380	0.010
Social Comparison Frequency	457.906	1	457.906	22.111	<.001	0.271
Residuals	1221.836	59	20.709			
Total Scores						
Photo Type	31.369	1	31.3569	0.395	0.532	0.006
Social Comparison Frequency	494.390	1	494.390	6.221	0.015	0.095
Residuals	4688.965	59	279.474			

Table 3 *Descriptives for Appearance Evaluation*

Photo Type	N	Mean	SD	SE
Appearance Evaluation				
Edited	31	30.032	4.355	0.782
Unedited	31	30.968	4.658	0.837

The ANCOVA results showed that the type of photo viewed, whether digitally edited or unedited, did not significantly affect scores on the Appearance Evaluation (AE) dimension, $F(1, 60) = 0.588$, $p = .451$, $\eta^2 = .01$. The covariate, social comparison frequency, also did not have a significant effect on AE scores, $F(1, 60) = 0.703$, $p = .405$, $\eta^2 = .12$. These effect sizes indicate a negligible influence from both the photo manipulation and comparison frequency on participants' evaluations of their appearance.

Descriptively, the group that viewed unedited photos had a slightly higher AE score ($M = 30.968$, $SD = 4.66$) than the group that viewed edited photos ($M = 30.032$, $SD = 4.36$), but this difference was minimal and not meaningful. The Coefficient of Variation for both groups was also low and comparable (unedited = 0.150; edited = 0.145), indicating similar relative variability. Additionally, Levene's test for homogeneity of variance confirmed that the assumption of equal variances between groups was met, $F(1, 60) = 0.013$, $p = .910$. Therefore, the ANCOVA assumptions were satisfied, and the non-significant results are considered statistically valid.

In this study, participants viewed four Instagram photos—either original or digitally manipulated—and completed the Appearance Evaluation subscale of the MBSRQ-AS immediately afterward. The research employed a post-test only between-subjects design, without baseline measurement. The findings suggest that brief exposure to digitally altered images does not significantly impact appearance evaluation among Indonesian emerging adult women under these conditions.

Table 4. Descriptives for Appearance Orientation

Photo Type	<i>N</i>	Mean	<i>SD</i>	<i>SE</i>
Appearance Orientation				
Edited	31	24.387	3.471	0.623
Unedited	31	23.710	3.485	0.626

The ANCOVA results showed that the type of photo viewed, whether digitally edited or unedited, did not significantly affect scores on the Appearance Orientation (AO) dimension, $F(1, 60) = 0.359$, $p = .551$, $\eta^2 = .005$. In contrast, the covariate social comparison frequency had a significant effect on AO scores, $F(1, 60) = 16.435$, $p < .001$, with a large effect size ($\eta^2 = .216$), indicating that individuals who more frequently compare their appearance with others tend to score higher on appearance orientation.

Descriptively, participants who viewed edited photos had a slightly higher mean AO score ($M = 24.39$, $SD = 3.47$) compared to those who viewed unedited photos ($M = 23.71$, $SD = 3.49$), but this difference was minimal and not statistically significant. The Coefficient of Variation was also comparable between groups (edited = 0.142; unedited = 0.147), suggesting similar relative variability.

Furthermore, Levene's test for homogeneity of variance confirmed that the assumption of equal variances between groups was met, $F(1, 60) = 0.002$, $p = .964$, supporting the validity of the ANCOVA results for this dimension.

Table 5. Descriptives for Body Area Satisfaction

Photo Type	<i>N</i>	Mean	<i>SD</i>	<i>SE</i>
Body Area Satisfaction				
Edited	31	28.613	5.239	0.941
Unedited	31	29.290	5.343	0.960

The ANCOVA results showed that the type of photo viewed, whether edited or unedited, did not significantly affect scores on the Body Area Satisfaction (BAS) dimension, $F(1, 60) = 0.783$, $p = .380$, $\eta^2 = .010$. In contrast, the covariate social comparison frequency had a significant and strong effect on BAS scores, $F(1, 60) = 22.111$, $p < .001$, with a large effect size ($\eta^2 = .271$), indicating that individuals who frequently compare their appearance with others tend to report lower satisfaction with specific body areas. Furthermore, Levene's test for homogeneity of variance confirmed that the assumption of equal variances was met, $F(1, 60) = 0.139$, $p = .711$, supporting the validity of the ANCOVA results for this dimension.

Table 6. Descriptives for Total Scores

Photo Type	<i>N</i>	Mean	<i>SD</i>	<i>SE</i>
Total Scores				
Edited	31	86.065	9.055	1.626
Unedited	31	87/129	9.528	1.711

The ANCOVA results showed that the type of photo viewed, whether digitally edited or unedited, did not significantly affect the total body image score, $F(1, 60) = 0.395$, $p = .532$, $\eta^2 = .006$. In contrast, the covariate social comparison frequency had a significant effect, $F(1, 60) = 6.221$, $p = .015$, with a moderate effect size ($\eta^2 = .095$), indicating that participants who more frequently compare their appearance with others tend to report lower overall body image satisfaction.

Additionally, Levene's test for homogeneity of variance confirmed that the assumption of equal variances between groups was met for the total score, $F(1, 60) = 0.724$, $p = .398$. This test also indicated homogeneity across all three subscale dimensions, supporting the validity of the ANCOVA results.

DISCUSSION

The results showed no significant differences between the groups. However, social comparison frequency significantly influenced body image across dimensions, suggesting that habitual appearance comparisons may play a stronger role than media exposure. Although this covariate was measured using a single-item Likert scale, such measures are considered appropriate for assessing specific and clearly defined behaviors like frequency (Bergkvist &

Rossiter, 2007). While the data were not normally distributed ($p < .001$), ANCOVA is robust to non-normality when assumptions like homogeneity of variance are met—which was confirmed by Levene’s test (Tabachnick & Fidell, 2019; Field, 2013). Thus, the results remain statistically valid and methodologically acceptable.

One of the key differences between this study and the reference study by Kleemans et al. (2016) lies in the age and number of participants. Kleemans et al. (2016) recruited 144 adolescent girls aged 14–18, while the current study involved 62 emerging adult women aged 18–29. Adolescence is a developmental stage marked by heightened sensitivity to peer influence, unstable self-concept, and increased vulnerability to external appearance ideals (Santrock, 2018). In contrast, emerging adulthood involves more developed cognitive regulation, identity consolidation, and critical media literacy, which may buffer against the immediate effects of manipulated images. These developmental differences likely contributed to the discrepancy in findings, where adolescents in Kleemans et al. showed a stronger negative effect of photo manipulation on body image, while no such effect was observed in the current study.

Moreover, unlike Kleemans et al., who measured both the frequency and direction of social comparison (e.g., upward or downward), this study focused solely on the frequency of appearance-based comparison using a single-item measure. This limited operationalization may not fully capture the evaluative and emotional aspects of social comparison that influence body image, potentially reducing the sensitivity of the analysis to detect significant effects.

The lack of a significant effect of photo manipulation may be attributed to two key contextual and methodological factors. First, although this study draws from broader social comparison theory (Festinger, 1954), the construct was operationalized through a single-item measure that captured only the frequency of appearance-based comparisons. This limited measurement did not assess the direction (upward or downward) or emotional impact of the comparisons, potentially reducing the analytical sensitivity to detect subtle variations in body image outcomes. As a result, even if participants engaged in comparison during the photo exposure, the instrument may not have been nuanced enough to capture its psychological implications.

Second, the cultural normalization of filters and photo editing on social media may have attenuated the emotional salience of manipulated visuals. Contemporary Instagram usage among Gen Z has shifted toward more casual, ephemeral content—such as Stories, Reels, and unfiltered “photo dumps”—accompanied by rising transparency about digital alterations. This evolving media environment fosters greater media literacy and a preference for authenticity (Neufeld-Wall, 2023; Aguilar, 2024), which may buffer against the internalization of unrealistic beauty

standards. For emerging adult women in Indonesia, these shifts may reduce the perceived credibility and emotional impact of edited images, thereby weakening the manipulation's influence on body image.

Research by McGovern et al. (2022) also shows that the impact of exposure to edited photos on women's body image is not always consistent and appears to be moderated by cultural context. While negative effects are commonly found in Western samples, studies in Asian contexts often report non-significant results. The findings of the present study align with this pattern: exposure to manipulated Instagram photos did not significantly affect body image among Indonesian emerging adult women. One possible explanation is that participants in this study—Indonesian women aged 18 to 29—may have developed greater media literacy and critical awareness toward digitally altered images. With increasing exposure to social media trends, such as photo dumps, transparency in editing, and body positivity narratives, especially among Gen Z users, manipulated visuals may no longer carry the same persuasive power. In addition, cultural values emphasizing modesty, family influence, and religious norms may serve as psychological buffers, reducing the internalization of idealized beauty standards. Thus, the lack of significant findings may reflect both psychological resilience and cultural adaptation to visual media.

This similarity may be due to several culturally specific factors. First, many Indonesian women—particularly Gen Z—may have become accustomed to photo editing practices and no longer perceive them as deceptive or harmful. Jung and Lee (2023) found that selfie-editing behavior is often driven by the desire for ideal online self-presentation through social comparison, rather than dissatisfaction with one's appearance. Second, cultural beauty standards in Indonesia—while still idealized—may coexist with increasing body acceptance and media literacy, especially in response to evolving digital trends. The rise of casual photo dumps, Instagram Reels, and transparency about editing has contributed to a growing preference for authenticity among young users (Neufeld-Wall, 2023; Aguilar, 2024). Third, local media representations have begun to reflect more realistic portrayals of women's bodies. For example, the Indonesian film *Imperfect* promotes body diversity and self-acceptance, helping viewers feel more represented and valued regardless of appearance (Aeni et al., 2022). These cultural dynamics may help explain why photo manipulation alone did not significantly influence body image in this study.

Awareness that an image has been digitally manipulated also plays a key role in reducing its impact on body perception. When individuals recognize that a photo has been edited, the negative effects on body image tend to diminish (McGovern et al., 2022). This may be particularly relevant for Gen Z in Indonesia, who are increasingly exposed to transparent editing practices,

beauty filter disclosures, and critical conversations about authenticity on social media platforms. As Neufeld-Wall (2023) notes, Gen Z users are more likely to value genuine and unfiltered content, and tend to be more skeptical of highly curated images. Similarly, Aguilar (2024) highlights how evolving digital behaviors—such as the shift toward casual photo sharing and reduced pressure for perfection—have reshaped how younger users interpret and engage with visual content. As a result, digitally altered images may no longer carry the same persuasive power or emotional weight they once did. These shifting perceptions may have contributed to the absence of a significant effect of manipulated photos on body image in the current study.

Amid the strong social pressures stemming from dominant beauty standards in Indonesia—which often lead to insecurity and health-damaging behaviors—there is a growing shift toward values of inclusivity and acceptance of body diversity. This shift may help explain why exposure to manipulated images did not significantly affect body image in this study, as individuals—particularly emerging adults—may be increasingly internalizing more flexible and self-compassionate appearance standards. Such cultural changes can serve as protective buffers, reducing vulnerability to visual comparison and idealized media portrayals.

This study has several limitations. One notable limitation of this study is the relatively small sample size ($N = 62$), which may have reduced the statistical power to detect significant effects of photo manipulation on body image. With fewer participants in each condition, the study may have been underpowered, increasing the likelihood of Type II error—failing to detect an existing effect. This limitation is common in psychological research and highlights the importance of aligning sample size with the expected effect size and desired statistical sensitivity (Lakens, 2022). Moreover, the sample consisted of Indonesian emerging adult women with specific characteristics, which may limit the generalizability of the findings to broader or more diverse populations. Future studies with larger and more representative samples are recommended to validate and extend the present results.

Methodologically, the use of a single-item measure to assess social comparison frequency limited the depth of psychological interpretation, as it did not capture the direction, intensity, or emotional impact of comparison behavior. In addition, the absence of a pre-test design restricted the ability to detect subtle intra-individual changes that may have occurred as a result of photo exposure. Future research should consider using multi-item validated instruments, employing baseline measurements, and exploring how internalized psychological factors—such as self-acceptance and appearance ideal internalization—interact with media exposure to influence body image outcomes.

Another limitation lies in the limited availability of local literature that specifically addresses the effects of Instagram photo manipulation on body image and social comparison among emerging adult women in Indonesia. This lack of culturally specific research made it difficult to compare the findings directly with existing studies and may have constrained the depth of cultural interpretation. Consequently, further studies that are more contextually grounded are needed to strengthen understanding of how media and cultural values intersect to shape body image experiences in the Indonesian context.

Despite these limitations, the findings provide important insights into the role of personal and cultural resilience in shaping body image. Promoting self-acceptance and appreciation of diversity remains a vital pathway to building positive body image and supporting individual well-being in culturally specific contexts (Alfikriyah & Suwandi, 2024).

CONCLUSION AND RECOMMENDATIONS

Conclusion

Although this experimental study hypothesized that exposure to manipulated Instagram photos would lead to significantly lower body image scores compared to unedited photos, the results did not support this hypothesis. No significant differences were found between the two groups. However, the significant effect of social comparison frequency on body image suggests that individual tendencies to frequently compare one's appearance with others may have a greater impact on body image than photo manipulation itself. These findings underscore the importance of personal cognitive habits in shaping body-related self-perceptions, and indicate that interventions targeting comparison behaviors may be more effective than focusing solely on media content.

Differences in findings compared to previous research may be attributed to variations in participant age as well as cultural shifts in digital trends that increasingly promote more authentic representation. While previous studies, such as Kleemans et al. (2016), focused on adolescents, the participants in the current study were emerging adult women aged 18–29. This age group may possess more stable self-concepts, greater media literacy, and stronger cognitive-emotional regulation, which could buffer the effects of manipulated images. This is reflected in our results, where no significant differences in body image were found between the edited and unedited photo conditions, despite participants' frequent exposure to social media. However, it is also important to acknowledge that the relatively small sample size may have reduced the statistical power to detect subtle group differences, meaning that nonsignificant findings could partly reflect methodological limitations rather than psychological or cultural resilience alone.

Moreover, the role of media and awareness of visual manipulation adds further complexity to this dynamic. In our study, many participants reported high levels of social media use and appearance-based social comparison frequency, yet manipulation exposure still did not significantly influence their body image. This may suggest a growing critical awareness among young users about how digital content is curated and altered. In addition, several methodological factors may have contributed to the non-significant findings, including the relatively small sample size, the brief and one-time exposure to only a few photo stimuli, and the limited visual manipulation scope (e.g., only facial features). The specific characteristics of the sample—Indonesian emerging adult women with varying levels of media literacy—may also have moderated the impact of the manipulation. Therefore, approaches to understanding and improving body image must consider not only demographic and psychological factors, but also methodological design and the evolving landscape of media influence that shape how users interpret and internalize appearance ideals.

Theoretical Recommendations

Future studies should adopt approaches that are more aligned with the current digital landscape, where the boundaries between edited and authentic content have become increasingly blurred. Given the evolving aesthetic norms and increased transparency about photo manipulation, it is important to understand how individuals interpret, internalize, or resist idealized imagery within this context.

To strengthen the robustness of future findings, researchers are encouraged to recruit larger samples, as small sample sizes can reduce statistical power and increase the likelihood of Type II error—thus limiting the ability to detect subtle psychological effects (Lakens, 2022). In addition, replacing single-item measures with multi-item, validated instruments would allow for a more nuanced assessment of appearance-based social comparison, including its frequency, direction, and emotional consequences (Bergkvist & Rossiter, 2007).

Lastly, because this study did not include other psychological constructs that are theoretically linked to body image—such as self-esteem, media literacy, and internalization of beauty standards—future research would benefit from incorporating these variables. Including such factors would allow for a more comprehensive understanding of the psychological mechanisms that influence body image in Indonesian cultural contexts, especially given the growing complexity of social media engagement and visual self-presentation. These additions would help clarify individual differences in susceptibility to photo manipulation and guide the development of more targeted and culturally sensitive interventions.

Practical Recommendations

Although this study did not find a significant effect of manipulated Instagram photos on body image, prior research has consistently shown that exposure to idealized and edited images can negatively impact appearance satisfaction, particularly among young women. Therefore, it is still important to encourage individuals—especially emerging adults—to remain critically aware that much of the visual content on social media has been digitally manipulated. Reminding oneself that such images are edited may help buffer against harmful appearance comparisons.

This recommendation is particularly relevant for adolescents and emerging adults who are still developing media literacy skills and may have difficulty distinguishing between natural and retouched visuals. Digital literacy education should emphasize the prevalence of image editing and its psychological effects, empowering users to question the realism of what they see online.

Parents, educators, and mentors play a crucial role in providing guidance during early exposure to social media. Parental mediation and school-based interventions can help young people interpret digital content more critically and reduce the likelihood of internalizing unrealistic beauty standards. Moreover, social media platforms could contribute by including clear visual indicators or disclaimers when filters or editing tools are used—similar to warning labels on cigarette packaging—thereby enhancing user awareness and promoting healthier self-perceptions.

Supplementary Material

All photo stimuli used in this study (original and digitally manipulated versions) are provided in a separate [supplementary file](#) submitted with this manuscript.

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