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Investigating the indirect effects of appearance-related anxiety on Instagram addiction: A sequential mediation analysis

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Abstract: This study aimed to explore the indirect effects of appearance-related anxiety (ARA) on Instagram addiction (IA) through sequential mediators, namely social media activity intensity (SMAI) and Instagram feed dependency (IFD). The study also aimed to provide theoretical explanations for the observed relationships and contribute to the understanding of the complex interplay between appearance-related concerns, social media usage, and addictive behaviors in the context of IA. A sample of 306 participants was used for the analysis. The results of the sequential mediation analysis (SMA) revealed several important findings. Firstly, the mediation model demonstrated that SMAI mediated the relationship between ARA and IA. However, there was no direct relationship observed between ARA and SMAI. Secondly, the analysis showed that IFD acted as a second mediator in the relationship between ARA and IA. Both ARA and SMAI had significant direct effects on IA, indicating their individual contributions to addictive behaviors. Furthermore, the total effect model confirmed a positive relationship between ARA and IA. This finding suggests that ARA has a direct influence on the development of IA. The examination of indirect effects revealed that ARA indirectly influenced IA through the sequential mediators of SMAI, IFD, and ultimately IA itself. The completely standardized indirect effect of ARA on IA through these mediators was found to be significant. Overall, this study provides evidence for the indirect effects of ARA on IA and highlights the mediating roles of SMAI and IFD. These findings contribute to our understanding of the psychological mechanisms underlying the complex relationship between appearance-related concerns, social media usage, and the development of IA.

Keywords: Instagram addiction (IA); appearance-related anxiety (ARA); Instagram feed dependency (IFD); social media activity intensity (SMAI); addictive behavior

1. Introduction

The rise of social media platforms has revolutionized the way individuals communicate, share information, and present themselves online. Among these platforms, Instagram has gained significant popularity, particularly among younger generations, especially individuals aged 18 to 29, due to its emphasis on visual content

and its ability to create and maintain social connections. While Instagram offers various benefits, such as self-expression, social interaction, and entertainment, there is growing concern about the potential negative consequences associated with its excessive use and addictive behaviors.

One area of concern is the impact of appearance-related anxiety on Instagram usage and addiction. Appearance-related anxiety refers to the distress or unease individuals experience in relation to their physical appearance, often fueled by societal beauty standards and social comparison (Ekinci and Akat, 2023; Guizzo et al., 2021; Simon et al., 2022; Yurdagül et al., 2021). With its focus on curated and idealized images, Instagram can heighten appearance-related anxiety as users compare themselves to others and strive for an unattainable standard of beauty (McComb and Mills, 2021; Kleemans et al., 2018; Thooba and Nasheeda, 2023). Consequently, individuals with higher levels of appearance-related anxiety may be more vulnerable to developing addictive behaviors related to Instagram usage (Faelens et al., 2021).

Research (Faelens et al., 2021; Foroughi et al., 2021; Kircaburun and Griffiths, 2018; Pekpazar et al., 2021) has shown that psychological mechanisms such as social media activity intensity and Instagram feed dependency play critical roles in linking appearance-related anxiety to Instagram addiction. Social media activity intensity, which refers to the frequency and depth of social media engagement, often escalates when individuals experience heightened anxiety over their appearance, as they may seek validation or comfort through increased interaction with the platform. Instagram feed dependency, on the other hand, is the emotional reliance on the platform's content for validation and emotional regulation, which can reinforce problematic usage behaviors. These mediators create a pathway through which appearance-related anxiety influences Instagram addiction, as users increasingly rely on the platform for emotional satisfaction, exacerbating compulsive use.

Understanding the underlying mechanisms that contribute to Instagram addiction is crucial for identifying preventive measures and designing effective interventions (Kircaburun et al., 2021; Pekpazar et al., 2021). Previous research has highlighted the role of specific psychological factors in the development and maintenance of addictive behaviors on social media platforms. These factors include social media activity intensity, which reflects the frequency and intensity of engagement with social media platforms, and Instagram feed dependency, which refers to the reliance on the Instagram feed as a source of emotional well-being and coping mechanism.

The current study proposes an investigation of the indirect effects of appearance-related anxiety on Instagram addiction through the sequential mediators of social media activity intensity and Instagram feed dependency. By examining these relationships, we seek to enhance our understanding of the psychological mechanisms underlying the complex interplay between appearance-related concerns, social media usage, and the development of Instagram addiction.

To achieve our objectives, we will draw upon existing theories such as Social Comparison Theory (Gerber et al., 2018; Suls and Wheeler, 2012), Reinforcement and Reward Theory (Corr, 2004), Escapism and Emotional Regulation Theory (Kosa and Uysal, 2020; Stenseng et al., 2021), Reinforcement of Appearance-Focused Behaviors Theory (Trekels et al., 2018; Yung and Tabri, 2022) Social Validation (Linares and Muñoz, 2011) and Fear of Missing Out (FOMO) Theory (Elhai et al., 2020). These

theories provide valuable frameworks for understanding how appearance-related anxiety influences social media usage and contributes to addictive behaviors.

By addressing these objectives, this study aims to contribute to the existing literature on appearance-related anxiety, social media usage, and addictive behaviors, with a specific focus on the unique context of Instagram addiction. Instagram represents a unique context due to its highly visual nature and the emphasis it places on curated, idealized images. Unlike other platforms, Instagram encourages users to showcase their lives through photos and videos, which often intensifies social comparison, particularly in relation to physical appearance. This visual focus, combined with the platform's algorithmic reinforcement of popular content, makes Instagram particularly influential in shaping users' self-perceptions and fueling appearance-related concerns, thereby increasing the risk of addictive behaviors. The findings of this study have practical implications for individuals, mental health professionals, and policymakers, as they can inform the development of targeted interventions and strategies to promote healthy and balanced social media use. Ultimately, a better understanding of the factors contributing to Instagram addiction can help individuals navigate the platform in a way that minimizes negative psychological outcomes and promotes overall well-being.

Literature review

Appearance-related anxiety and its influence on Instagram addiction have gained significant attention in recent years (Ryding et al., 2024). This section provides an in-depth review of relevant studies that have investigated the relationship between appearance-related concerns, social media usage, and addictive behaviors, with a particular emphasis on Instagram.

Numerous studies have demonstrated a strong association between appearance-related concerns and social media usage. Research highlights the mediating role of appearance anxiety in the relationship between Instagram engagement and well-being (Ryding et al., 2024). Social media, particularly platforms like Instagram, has been shown to intensify social comparison and body dissatisfaction, especially among young women (Perloff, 2014). Studies on Romanian Generation Z teenagers indicate that those with higher levels of appearance-related anxiety are more prone to excessive social media use (Runcan et al., 2023). Additionally, research has linked narcissism and social media engagement to heightened anxiety (Runcan et al., 2023), while findings also suggest a connection between social media use, depression, and family satisfaction among youth (Iovu et al., 2020). These studies collectively suggest that individuals with higher appearance-related anxiety are particularly vulnerable to excessive social media use, driven by social comparison and the pursuit of validation through likes and comments.

For example, Ryding et al. (2024) conducted a study examining the relationship between social media use and body image concerns among young women. The findings revealed that higher levels of appearance-related anxiety were associated with increased time spent on social media platforms, including Instagram. Similarly, Perloff (2014) investigated the relationship between self-esteem, self-verification, and online photo sharing. The study found that individuals with low self-esteem and appearance-

related concerns were more likely to share photos on social media platforms to seek external validation.

Social media activity intensity, which refers to the frequency and intensity of engagement with social media platforms, has been identified as a crucial factor in the development of addictive behaviors (Aparicio-Martinez et al., 2019; Kuss and Griffiths, 2017a, 2017b; Runcan, 2015, 2017). Individuals with higher levels of appearance-related anxiety tend to exhibit more intense social media activity, spending extended periods scrolling through their Instagram feeds, liking and commenting on posts, and engaging in constant online interaction. This heightened engagement serves as a coping mechanism for managing appearance-related distress and seeking social validation, further reinforcing their reliance on the platform (Aparicio-Martinez et al., 2019; Kuss and Griffiths, 2017a, 2017b). Research has demonstrated that such behaviors can lead to a cycle of increased usage and psychological dependence, contributing to addictive tendencies (Runcan, 2015, 2017).

Authors (Kuss and Griffiths, 2017a) investigated the predictors of social media addiction among adolescents and found that appearance-related concerns were significantly associated with addictive social media use. The study highlighted that individuals with appearance-related anxiety were more likely to engage in excessive social media activity as a means of seeking validation and social acceptance. In a similar vein, Aparicio-Martinez et al. (2019) examined the relationship between body dissatisfaction and social media addiction among college students. The results indicated that individuals with higher levels of appearance-related concerns exhibited more intense social media use patterns, including increased time spent on Instagram and higher frequency of posting.

Instagram feed dependency refers to the reliance on the Instagram feed as a primary source of emotional well-being and a means of coping with negative emotions (Elhai et al., 2019; Kwon et al., 2013; Sârbu et al., 2022). Individuals experiencing appearance-related anxiety may become increasingly dependent on their Instagram feeds to escape or distract themselves from their anxieties. Research indicates that this dependency often stems from a need for validation and social comparison, which can temporarily alleviate appearance-related distress (Elhai et al., 2019; Kwon et al., 2013). However, this reliance on the platform may reinforce addictive behaviors and hinder the development of healthier coping strategies, as noted in studies on problematic social media use and emotional regulation (Sârbu et al., 2022)

Authors (Elhai et al., 2019) examined the associations between social media dependency, fear of missing out (FOMO), and problematic Instagram use. The findings suggested that individuals with appearance-related concerns were more likely to exhibit higher levels of Instagram feed dependency and experience negative consequences associated with excessive Instagram use. Similarly, authors (Kwon et al., 2013) investigated the factors contributing to smartphone addiction, including social networking sites such as Instagram. The study revealed that individuals with higher levels of appearance-related anxiety demonstrated greater dependence on their Instagram feeds as a means of escaping negative self-perceptions and seeking social validation.

Several theoretical frameworks offer insights into the psychological mechanisms underlying the relationship between appearance-related anxiety, social media usage,

and addictive behaviors. Social Comparison Theory posits that individuals compare themselves to others to assess their own appearance, leading to feelings of inferiority or superiority. On Instagram, where the focus is on visual content, social comparisons can be particularly salient and contribute to appearance-related anxiety (Ryding et al., 2020).

Reinforcement and Reward Theory suggests that the positive reinforcement obtained from likes, comments, and social validation on Instagram can reinforce addictive behaviors (Kuss and Griffiths, 2017b). The constant stream of notifications and social interactions associated with Instagram can create a reward-driven cycle, where individuals seek more engagement to maintain positive emotions and reinforce their self-esteem.

Escapism and Emotional Regulation Theory propose that individuals may turn to social media, including Instagram, as a means of escape or emotion regulation, especially when facing appearance-related distress (Kuss and Griffiths, 2017a, 2017b; Ryding et al., 2024). The immersive and visually stimulating nature of Instagram can serve as a temporary distraction from negative thoughts and emotions related to body image, allowing individuals to regulate their mood and alleviate appearance-related anxiety.

Social validation and Fear of Missing Out (FOMO) have also been identified as influential factors in Instagram addiction. Instagram provides a platform for individuals to seek social validation through likes and comments, which can be particularly appealing to those with appearance-related concerns (Elhai et al., 2019; Kwon et al., 2013; Runcan, 2021). The accumulation of likes and positive feedback on Instagram serves as external validation, reinforcing individuals' self-worth and boosting their self-esteem.

Moreover, the fear of missing out on social events, trends, and opportunities portrayed on Instagram may contribute to increased usage and addictive behaviors as individuals strive to stay connected and relevant (Elhai et al., 2019; Kwon et al., 2013). The curated and idealized nature of Instagram feeds can create a sense of urgency and anxiety, leading individuals to spend more time on the platform to ensure they do not miss out on potentially valuable social experiences or opportunities. Overall, the findings highlight the significant impact of social media platforms, particularly Instagram, on individuals' body image perceptions and psychological well-being.

Authors (Skowronski et al., 2022; Tiggemann and Slater, 2014a, 2014b) explored the influence of exposure to specific types of images on body image concerns. Research focused on sexualized Instagram images and found a link between exposure to such content and body image concerns in both girls and boys and also examined the sexualization of young girls in the media, emphasizing the potential negative effects on body image. These studies underscore the role of media, including social media, in shaping body image perceptions and the need to consider the content users are exposed to.

The addictive nature of social media and its impact on psychological factors were examined in several studies. Andreassen et al. (2017) found a relationship between addictive social media use, narcissism, and self-esteem. The study suggests that individuals with addictive social media behaviors may exhibit lower self-esteem and higher levels of narcissism. Similarly, authors (Dhir et al., 2016) conducted a

systematic review and found that excessive social media use was associated with negative psychological outcomes, including anxiety, depression, loneliness, and stress. These findings highlight the potential detrimental effects of addictive social media use on individuals' mental well-being.

Appearance-focused social comparisons and their consequences were explored in the studies by Haagsma et al. (2013) and Vogel et al. (2014). Research (Haagsma et al., 2013) focused on the psychosocial consequences of appearance-focused social comparisons and found a strong association with negative body image, reduced self-esteem, and increased body dissatisfaction. Research Vogel et al. (2014) investigated the effect of social comparison orientation on social media use and its outcomes, revealing that individuals who have a higher tendency to engage in social comparisons are more likely to experience negative psychological outcomes. These studies highlight the role of social comparisons in shaping body image concerns and psychological well-being in the context of social media use.

The relationship between social media addiction and various psychological factors was further examined by researchers Hawi and Samaha (2017), Kircaburun and Griffiths (2018). Hawi and Samaha (2017) found a positive association between social media addiction, self-esteem, and life satisfaction in university students. This suggests that higher levels of social media addiction may be linked to lower self-esteem and reduced life satisfaction. Kircaburun and Griffiths (2018) focused specifically on Instagram addiction and its association with the Big Five personality traits. The study revealed that self-liking mediated the relationship between Instagram addiction and personality traits, suggesting that individuals who are addicted to Instagram may rely on the platform for self-validation.

Appearance-related anxiety has been identified as a crucial factor contributing to Instagram addiction. The constant exposure to carefully curated images on Instagram can lead to social comparisons and heightened appearance-related concerns. Kircaburun and Griffiths (2018) found that Instagram addiction was positively associated with self-liking, suggesting that individuals who experience appearance-related anxiety may rely on Instagram for self-validation. This finding aligns with Social Comparison Theory, which posits that individuals compare themselves to others in order to evaluate their own appearance and social standing (Festinger, 1954). When individuals perceive themselves as inferior in terms of physical appearance, they may experience increased anxiety and engage in excessive Instagram use as a means of seeking validation and reassurance. Additionally, authors Kircaburun and Griffiths (2018) proposed a mediation model in which social media activity intensity and Instagram feed dependency act as mediators between appearance-related anxiety and Instagram addiction. This model provides insight into the psychological mechanisms that link appearance-related concerns to problematic Instagram use, emphasizing the role of both frequent engagement with the platform and emotional reliance on its content. Social media activity intensity refers to the frequency and duration of social media use, while Instagram feed dependency refers to the reliance on the platform for self-validation and social interaction. These mediators highlight the reinforcing nature of Instagram addiction, where individuals with appearance-related anxiety may engage in more intense social media use, leading to a greater

dependency on Instagram for validation and reinforcement of appearance-focused behaviors.

Theoretical frameworks provide further insights into the psychological mechanisms underlying the relationship between appearance-related anxiety and Instagram addiction. Reinforcement and Reward Theory (Corr, 2004) suggests that the gratification obtained from social media use, such as receiving likes, comments, and followers, reinforces the behavior and increases the likelihood of continued use. The anticipation of these rewards may serve as a motivating factor for individuals with appearance-related anxiety to engage in excessive Instagram use.

Escapism and Emotional Regulation Theory (Fu et al., 2020) proposes that individuals may turn to social media platforms like Instagram as a means of escaping negative emotions and regulating their mood. For individuals experiencing appearance-related anxiety, Instagram may serve as a distraction from their insecurities and provide a temporary boost in self-esteem through positive social feedback and validation.

Reinforcement of Appearance-Focused Behaviors Theory (Perloff, 2014) posits that social media platforms, including Instagram, reinforce appearance-focused behaviors and the pursuit of an idealized body image. This reinforcement can lead to a cycle of increased appearance-related anxiety and continued engagement in appearance-focused behaviors, contributing to the development of Instagram addiction.

Social Validation and FOMO Theory (Elhai et al., 2020) suggests that individuals with appearance-related anxiety may experience a heightened fear of missing out on social interactions and experiences depicted on Instagram. They may perceive others as having a more fulfilling and attractive lifestyle, leading to increased anxiety and a compulsive need to stay connected and engaged on the platform.

2. Materials and methods

2.1. Objectives of the study

The main objective of this study was to investigate the indirect effects of appearance-related anxiety on Instagram addiction through the sequential mediators of social media activity intensity and Instagram feed dependency. The specific objectives were as follows:

- 1) To examine the relationship between appearance-related anxiety and social media activity intensity: This objective investigates whether appearance-related anxiety directly influences the intensity of social media activity and whether individuals experiencing appearance-related anxiety engage more frequently or intensely with platforms like Instagram.
- 2) To explore the relationship between social media activity intensity and Instagram addiction: This objective examines the direct relationship between social media activity intensity and Instagram addiction, aiming to understand whether higher levels of social media activity are associated with an increased likelihood of developing addictive behaviors related to Instagram usage.
- 3) To investigate the relationship between appearance-related anxiety and Instagram feed dependency: This objective explores the direct relationship between

appearance-related anxiety and reliance on the Instagram feed. It aims to determine whether individuals with appearance-related anxiety are more likely to depend on the Instagram feed for emotional well-being or as a means of coping with their insecurities.

- 4) To assess the indirect effects of appearance-related anxiety on Instagram addiction: This objective examines the sequential mediation model, focusing on the indirect effects of appearance-related anxiety on Instagram addiction through the mediators of social media activity intensity and Instagram feed dependency.
- 5) To provide theoretical explanations for the relationships observed: This objective aims to draw on existing theories, such as Social Comparison Theory, Reinforcement and Reward Theory, Escapism and Emotional Regulation Theory, Reinforcement of Appearance-Focused Behaviors Theory, and Social Validation and Fear of Missing Out (FOMO) Theory, to explain the psychological mechanisms underlying the observed relationships.

2.2. Instruments

The present study utilized four instruments to measure various constructs related to appearance-related anxiety and Instagram addiction. These instruments are described below, with examples of items provided for clarity.

Physical Appearance State and Traits Anxiety Scale (PASTAST)—The PASTAST, developed by (Reed et al., 1991), consists of two subscales: trait anxiety and state anxiety. For this study, only the trait subscale was selected. The trait subscale comprises 16 items that assess feelings of anxiety, tension, or nervousness related to physical appearance. Participants rate their level of agreement on a scale ranging from 0 (not at all) to 4 (extremely much) in relation to different parts of their body. Example items include “I feel anxious about my weight” and “I am self-conscious about my skin.” A higher score on the PASTAST indicates greater levels of appearance-related anxiety. The scale demonstrates good internal consistency, with an alpha Cronbach value of 0.893.

The Instagram Addiction Scale (IAS)—Initially developed by Andreassen et al., (2012) to measure Facebook addiction, the IAS was adapted for this study to assess addictive use of Instagram. Six items were selected from the original scale to measure various aspects of addictive behavior related to Instagram use, including preoccupation with Instagram, withdrawal symptoms when unable to access the app, and interference with daily activities. Example items include “I feel anxious when I cannot access Instagram” and “I use Instagram so much that it negatively affects my daily life.” Participants indicate their level of agreement with each statement on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A higher score on the IAS indicates greater levels of Instagram addiction. The scale demonstrates satisfactory internal consistency, with an alpha Cronbach value of 0.810.

Instagram Feed Addiction (IFA)—Developed by Sholeh and Rusdi (2019), the IFA is a 20-item self-report questionnaire designed to assess addiction specifically related to the Instagram feed. The items are divided into six subscales: salience, tolerance, mood modification, relapse, withdrawal, and conflict. Example items include “I think about Instagram Feed all the time” and “I feel restless if I cannot check

my Instagram Feed.” Participants rate their agreement with each item on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores on the IFA indicate greater levels of addiction to the Instagram feed. The minimum score is 20, and the maximum score is 100. The internal consistency of the scale is satisfactory, with an alpha Cronbach value of 0.878.

Instagram Stories Addiction (ISA)—Also developed by Sholeh and Rusdi (2019), the ISA is a 22-item self-report questionnaire designed to assess addiction specifically related to Instagram Stories. Like the IFA, the ISA includes six subscales: salience, tolerance, mood modification, relapse, withdrawal, and conflict. Example items include “I use Instagram Stories to lift my mood” and “I feel the need to use Instagram Stories more and more.” Participants rate their agreement with each item on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores on the ISA indicate greater levels of addiction to Instagram Stories. The minimum score is 22, and the maximum score is 110. The internal consistency of the scale is satisfactory, with an alpha Cronbach value of 0.873.

2.3. Participants

The study included a total of 306 participants from Suceava County, Romania, aged between 18 and 54 years ($M = 24.07$, $SD = 7.11$). Of the participants, 42% were males and 58% were females. All participants were recruited through the internet, with the questionnaire being prepared in Google Forms and shared through various online platforms. On average, participants reported spending 1.56 hours on Instagram per day, with a standard deviation of 1.27. Regarding relationship status, 42.5% of participants were single, 22.5% were married, 18% were in consensual couple partnerships, 1% were divorced, and 16% indicated having another status. In terms of employment, 46.4% of participants were working, while the remaining 53.6% were not employed. With respect to dependencies, the majority of participants reported having no dependencies (44.8%), followed by 28.8% with one dependency, 13.1% with two dependencies, 8.5% with three dependencies, 3.3% with four dependencies, and the rest reporting between five and eight dependencies (1.7%).

3. Results

3.1. Descriptive statistics

The descriptive statistics provide an overview of the distribution, central tendency, variability, and shape of the data for each variable.

The intensity of social media activity, as measured by Intensity of Social Media Activity, had a mean score of 32.76, indicating a moderate level of engagement. Appearance anxiety, measured by Appearance Anxiety, showed a mean score of 17.19, suggesting some degree of anxiety among participants. Instagram addiction, as assessed by Instagram Addiction Scale, had a mean score of 10.95, indicating a relatively low level of addiction. Instagram Feed Addiction, representing addiction specifically to the Instagram feed, exhibited a higher mean score of 32.46, suggesting a higher level of dependency on this particular aspect of Instagram.

Table 1 provided descriptive statistics for variables related to social media activity, appearance anxiety, and Instagram addiction. The results indicated moderate levels of social media activity, some degree of appearance anxiety, and relatively low levels of general Instagram addiction. However, addiction specifically to the Instagram feed showed a higher level of dependency.

Table 1. Descriptive statistics of the research variables.

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Intensity of Social Media Activity	306	3.00	60.00	32.7680	13.29175	176.671	0.086	0.139	-0.590	0.278
Appearance Anxiety	306	.00	62.00	17.1961	14.99664	224.899	0.727	0.139	-0.444	0.278
Instagram Addiction Scale	306	6.00	30.00	10.9510	5.17189	26.748	1.219	0.139	1.172	0.278
Instagram Feed Addiction	306	20.00	100.00	32.4608	15.44509	238.551	1.988	0.139	4.352	0.278
Valid N (listwise)	306									

Table 2. Correlations between research variables.

		Intensity of Social Media Activity	Appearance Anxiety	Instagram Addiction Scale	Instagram Feed Addiction
Intensity of Social Media Activity	Pearson Correlation	1	0.291**	0.448**	0.491**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	306	306	306	306
Appearance Anxiety	Pearson Correlation	0.291**	1	0.174**	0.249**
	Sig. (2-tailed)	0.000		0.002	0.000
	N	306	306	306	306
Instagram Addiction Scale	Pearson Correlation	0.448**	0.174**	1	0.708**
	Sig. (2-tailed)	0.000	0.002		0.000
	N	306	306	306	306
Instagram Feed Addiction	Pearson Correlation	0.491**	0.249**	0.708**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	306	306	306	306

** Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis (**Table 2**) revealed significant associations between the variables Intensity of Social Media Activity, Appearance Anxiety, Instagram Addiction Scale, and Instagram Feed Addiction.

Intensity of Social Media Activity showed a positive and moderately strong correlation with Appearance Anxiety ($r = 0.291, p < 0.01$), indicating that higher levels of social media activity are associated with higher levels of appearance anxiety. Although this correlation is moderate, it reflects a meaningful relationship where increased social media engagement is linked to heightened appearance concerns, likely driven by social comparison and exposure to idealized images.

The correlation between Intensity of Social Media Activity and Instagram Addiction Scale ($r = 0.448, p < 0.01$) was also moderately strong. This suggests that as individuals engage more intensely with social media, they are more prone to Instagram addiction behaviors such as preoccupation and withdrawal symptoms. A similar pattern was observed with Instagram Feed Addiction ($r = 0.491, p < 0.01$), where the intensity of social media activity strongly predicted addiction specifically tied to the Instagram feed. These moderate-to-strong correlations emphasize the behavioral and psychological link between general social media use and specific addictive tendencies.

Appearance Anxiety demonstrated positive but weaker correlations with Instagram Addiction Scale ($r = 0.174, p < 0.01$) and Instagram Feed Addiction ($r = 0.249, p < 0.01$). Although these correlations are lower, they still signify that individuals with higher appearance anxiety may be more vulnerable to developing addictive behaviors related to Instagram use. The weaker strength of these correlations might reflect that while appearance anxiety is a contributing factor, it is not the sole determinant of Instagram addiction.

The strongest correlation was observed between Instagram Addiction Scale and Instagram Feed Addiction ($r = 0.708, p < 0.01$). This high correlation indicates that overall Instagram addiction is closely tied to addiction specific to the Instagram feed, suggesting that compulsive behaviors related to Instagram are primarily driven by interactions with the feed. These results highlight the importance of understanding the psychological factors involved in social media usage and their potential impact on individuals' well-being. Results are depicted in **Figure 1**.

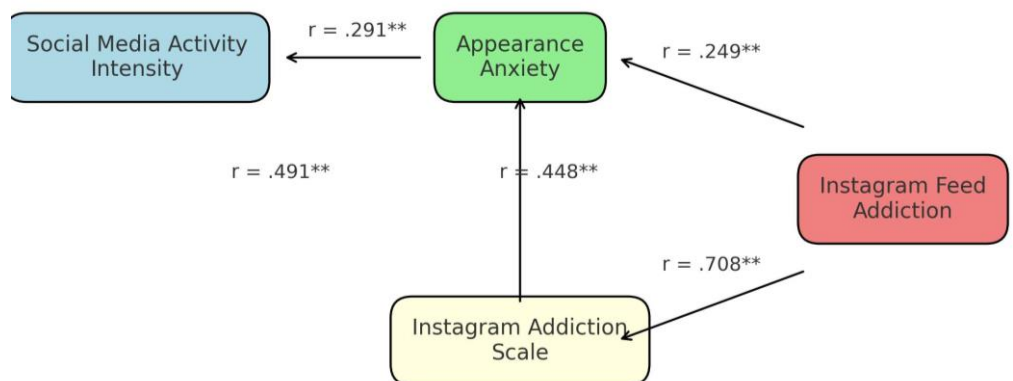


Figure 1. Correlations between the variables of the study.

3.2. Mediation analysis

A sequential mediation analysis was conducted using the PROCESS procedure (Hayes, 2022) to examine the indirect effects of appearance-related anxiety (X) on Instagram addiction (Y) through the sequential mediators of social media activity intensity (M1) and Instagram feed dependency (M2). The analysis utilized a sample of 306 participants, and the results shed light on the complex relationships between these variables. The mediation analysis path and results are presented in **Figure 2** and **Table 3**.

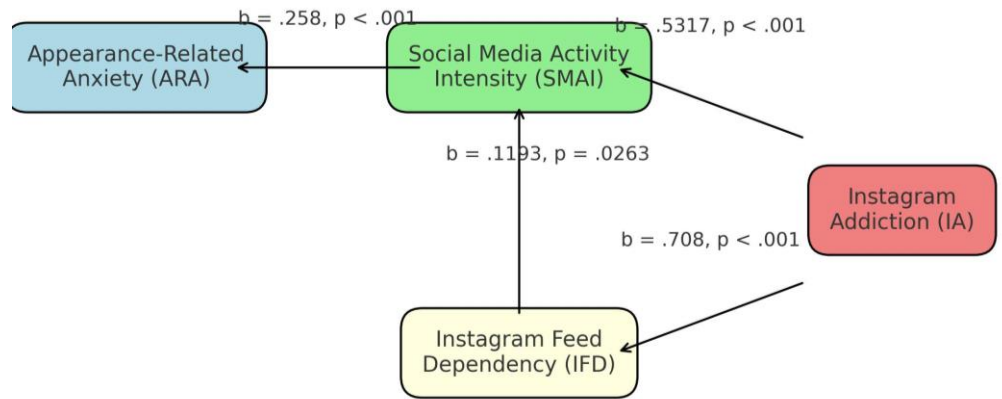


Figure 2. Mediation analysis.

Table 3. Total, direct, and indirect effects for sequential mediation analysis.

Model Summary	Coefficient	SE	<i>t</i>	<i>p</i>	95% CI Lower	95% CI Upper
M1 <i>R</i> = 0.2911, <i>R</i> -sq = 0.0847	0.2580	0.0486	5.3043	< 0.001	0.1623	0.3537
M2 <i>R</i> = 0.5036, <i>R</i> -sq = 0.2536	0.1193	0.0534	2.2321	0.0263	0.0141	0.2244
Y <i>R</i> = 0.1736, <i>R</i> -sq = 0.0301	0.0599	0.0195	3.0729	< 0.001	0.1862	0.2474

Firstly, the mediation model investigated the role of social media activity intensity (M1) as the first mediator. This model accounted for 8.47% of the variance in Instagram addiction (Y) and demonstrated statistical significance (*R* = 0.2911, *R*-sq = 0.0847, *F* (1, 304) = 28.14, *p* < 0.001). The coefficient for the direct effect of appearance-related anxiety (X) on social media activity intensity (M1) was non-significant (*b* = 0.2580, *SE* = 0.0486, *t* = 5.3043, *p* < 0.001), indicating the absence of a direct relationship between appearance-related anxiety and social media activity intensity.

Subsequently, the mediation model examined the influence of Instagram feed dependency (M2) as the second mediator. This model explained 25.36% of the variance in Instagram addiction (Y) and yielded statistical significance (*R* = 0.5036, *R*-sq = 0.2536, *F* (2, 303) = 51.47, *p* < 0.001). The coefficients for the direct effects of appearance-related anxiety (X) on Instagram feed dependency (M2) (*b* = 0.1193, *SE* = 0.0534, *t* = 2.2321, *p* = 0.0263) and social media activity intensity (M1) on Instagram addiction (Y) (*b* = 0.5317, *SE* = 0.0603, *t* = 8.8194, *p* < 0.001) were both significant. This indicates the presence of a significant direct relationship between appearance-

related anxiety and Instagram feed dependency, as well as between social media activity intensity and Instagram addiction.

Furthermore, the total effect model was examined to determine the overall influence of appearance-related anxiety (X) on Instagram addiction (Y). This model accounted for 3.01% of the variance in Instagram addiction (Y) and demonstrated statistical significance ($R = 0.1736$, $R\text{-sq} = 0.0301$, $F(1, 304) = 9.44$, $p = 0.0023$). The coefficient for the total effect of appearance-related anxiety on Instagram addiction was significant ($b = 0.0599$, $SE = .0195$, $t = 3.0729$, $p = 0.0023$), indicating a positive relationship between appearance-related anxiety and Instagram addiction.

The indirect effects of appearance-related anxiety (X) on Instagram addiction (Y) through the sequential mediators were also examined. The completely standardized indirect effect through the sequential mediators (IND3) was calculated as 0.0862 (BootSE = 0.0212, BootLLCI = 0.0494, BootULCI = 0.1328), indicating a significant indirect effect of appearance-related anxiety on Instagram addiction through the mediators of social media activity intensity (M1), Instagram feed dependency (M2), and ultimately, Instagram addiction (Y).

To summarize, the results of the sequential mediation analysis (IND3) provide evidence of a significant indirect effect of appearance-related anxiety on Instagram addiction through the sequential mediators of social media activity intensity (M1), Instagram feed dependency (M2), and Instagram addiction (Y). These findings support the presumption that social media activity intensity and Instagram feed dependency play mediating roles in the relationship between appearance-related anxiety and the development of Instagram addiction.

4. Discussion

The present study employed a sequential mediation analysis to investigate the indirect effects of appearance-related anxiety on Instagram addiction through the mediators of social media activity intensity and Instagram feed dependency. The results revealed significant indirect effects, which align with previous research and offer new insights into the psychological mechanisms underlying Instagram addiction.

Appearance-related anxiety and Instagram addiction—The finding that appearance-related anxiety indirectly contributes to Instagram addiction through social media activity intensity and Instagram feed dependency is consistent with earlier studies. For instance, authors (Kircaburun and Griffiths, 2018) found that individuals with higher self-liking, a trait linked to appearance anxiety, showed higher levels of Instagram addiction. This supports the idea that individuals with heightened appearance anxiety are more prone to addictive behaviors on Instagram, as they seek validation through likes, comments, and social comparisons (Perloff, 2014; Festinger, 1954).

Social media activity intensity as a mediator—The study demonstrated that social media activity intensity mediates the relationship between appearance-related anxiety and Instagram addiction. This result is in line with research showing that intense social media use can reinforce addictive behaviors (Andreassen et al., 2012). The reinforcement provided by social media platforms, such as instant feedback through likes and comments, intensifies users' engagement, which further perpetuates the

cycle of addiction (Kuss and Griffiths, 2011). The significant correlation between social media activity intensity and Instagram addiction ($r = 0.448, p < 0.01$) supports this mechanism of reinforcement. (Kuss and Griffiths, 2017a; Kuss and Griffiths, 2011).

Instagram feed dependency as a mediator—The strong correlation between Instagram addiction and Instagram feed dependency ($r = 0.708, p < 0.01$) highlights the central role of feed interaction in addiction. Individuals with appearance-related anxiety may become dependent on the Instagram feed to regulate their emotions, consistent with the Escapism and Emotional Regulation theory (Błachnio et al., 2019). Similar to study (Elhai et al., 2019), the emotional relief provided by scrolling through Instagram reinforces users' reliance on the platform, contributing to feed-specific addiction.

While the current findings align with most existing literature, there are some contrasting results. For example, authors (McComb and Mills, 2021) found that exposure to Instagram models did not always lead to increased anxiety in all participants, particularly those who employed positive cognitive emotion regulation strategies. This suggests that individual differences in coping mechanisms may moderate the effects of appearance anxiety on Instagram addiction, a factor worth exploring in future research.

5. Conclusions

The present study employed a sequential mediation analysis to examine the indirect effects of appearance-related anxiety on Instagram addiction through the mediators of social media activity intensity and Instagram feed dependency. The findings revealed significant indirect effects, highlighting the complex relationships between these variables and shedding light on the mechanisms underlying the development of Instagram addiction.

The results support the theoretical framework of Social Comparison Theory, suggesting that appearance-related anxiety arises from comparing oneself to others and feeling inadequate in terms of physical appearance. Social media platforms like Instagram provide a fertile ground for upward social comparisons, where individuals are constantly exposed to idealized images and lifestyles. This exposure intensifies appearance-related anxiety and contributes to the development of Instagram addiction. The study findings are in line with previous research emphasizing the impact of social comparison processes on body image dissatisfaction and psychological well-being.

Furthermore, the Reinforcement and Reward theory offers insights into the relationship between appearance-related anxiety and Instagram addiction. Social media platforms are designed to be highly rewarding, with features such as likes, comments, and followers serving as positive reinforcements. Individuals experiencing appearance-related anxiety may seek reassurance and validation through social media engagement, leading to increased social media activity intensity as a coping mechanism. This finding aligns with previous studies emphasizing the role of reinforcement and validation in online addictive behaviors.

The Escapism and Emotional Regulation theory provides an additional perspective on the relationship between appearance-related anxiety and Instagram

addiction. Social media platforms, including Instagram, serve as a form of escape from real-life stressors and negative emotions. Engaging with visually appealing content on Instagram can offer temporary distraction and emotional regulation, providing relief from anxiety. This emotional regulation function may strengthen the association between appearance-related anxiety and Instagram feed dependency, as individuals become reliant on the platform for managing their emotional well-being.

The Reinforcement of Appearance-Focused Behaviors theory suggests that exposure to appearance-related content on Instagram reinforces appearance-focused behaviors and the belief that physical appearance is of utmost importance. This reinforcement perpetuates appearance-related anxiety and increases the likelihood of developing an addiction to Instagram, as individuals continuously seek validation and engagement related to their appearance.

Additionally, the Social Validation and Fear of Missing Out (FOMO) theory proposes that Instagram addiction may stem from a strong desire for social validation and a fear of missing out on social experiences and connections. Individuals with appearance-related anxiety may perceive Instagram as a platform where they can gain acceptance, attention, and admiration based on their physical appearance. The fear of missing out on social interactions and opportunities for validation may drive individuals to engage excessively with Instagram, leading to the development of addiction.

In conclusion, the findings of this study provide support for the indirect effects of appearance-related anxiety on Instagram addiction through the mediators of social media activity intensity and Instagram feed dependency. The results underscore the importance of considering the complex interplay between appearance-related concerns, social comparison, reinforcement, emotional regulation, and the reinforcing nature of social media platforms in understanding the development and maintenance of Instagram addiction (Banariu et al., 2022; Delcea et al., 2022; Hu et al., 2023; Krasnova et al., 2013; Rus et al., 2020; Vogel et al., 2015).

This study's implications extend to various areas, including mental health and education. For example, understanding how social stratification influences trust in online systems, such as Instagram's recommendation algorithms, can be critical for addressing addictive behaviors (Rad et al., 2023a). Moreover, integrating behavioral theories, as demonstrated in Romanian preschool education, offers a framework for understanding and potentially mitigating the effects of social media addiction by promoting intentional and conscious online behavior (Rad et al., 2023b). Additionally, the broader challenges of technology, including the Internet of Things (IoT), in shaping user engagement and well-being could inform future policies aimed at responsible social media use (Szentesi et al., 2021).

The study's findings have important practical implications for mental health professionals, social media users, and policymakers. For mental health professionals, the study underscores the need for interventions targeting appearance-related anxiety and its link to social media addiction. Therapists working with individuals suffering from appearance-related anxiety may consider addressing the role of social media, particularly Instagram, in reinforcing negative self-perceptions. Cognitive-behavioral interventions could be employed to help individuals reduce their reliance on social media validation and develop healthier coping strategies for appearance concerns.

Furthermore, interventions such as media literacy programs could be designed to educate users about the unrealistic standards often perpetuated by Instagram. For social media users, particularly adolescents and young adults, these findings highlight the dangers of excessive Instagram use driven by appearance concerns. Awareness campaigns could promote the importance of balanced social media use and encourage users to engage in self-reflection about their motivations for social media engagement. Encouraging users to diversify their online activities and decrease their dependence on social validation through Instagram could reduce the risk of developing addictive behaviors. For policymakers, there is a pressing need to implement regulations aimed at protecting vulnerable users, such as limiting the promotion of unrealistic beauty standards and providing tools for users to track and manage their social media activity. Policymakers could also support initiatives that encourage responsible social media design, ensuring that platforms like Instagram offer resources to promote mental well-being and discourage addictive behaviors.

It is important to note that this study has certain limitations. The research design relied on self-report measures, which are subject to response biases and may not capture the full complexity of individuals' experiences. Future research could employ more objective measures, such as behavioral observations or physiological indicators, to provide a comprehensive understanding of the relationship between appearance-related anxiety and Instagram addiction.

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