



**BETWEEN LIKES AND ANXIETY:
UNDERSTANDING INSTAGRAM ADDICTION'S ROLE
IN APPEARANCE CONCERNS**

Marius MARICI¹,

Ștefan cel Mare University of Suceava, Romania

marius.marici@usm.ro

Remus RUNCAN

Aurel Vlaicu University of Arad, Romania

remus.runcan@uav.ro

Abstract

Intense use of Instagram and comparable social media networks can have adverse effects on an individual's psychological health and overall wellness. This research aimed to explore the mediating role of addiction to Instagram in the relationship between the duration of Instagram use and anxiety over physical appearance. A total of 203 young adults, hailing from Suceava County in Romania and aged between 19 and 23 years old (mean age = 20.7, standard deviation = 0.86), responded to an online self-report questionnaire. The study utilized the Physical Appearance State and Traits Anxiety Scale, Bergen Social Media Addiction Scale, along with specific scales for Instagram Feed Addiction (IFA) and Instagram Stories Addiction (ISA). Using mediation in Jamovi, findings revealed that addiction to Instagram and to its Feed feature act as mediators in the link between average daily time spent on Instagram and anxiety related to physical appearance traits. However, addiction to Instagram Stories did not show a significant mediating effect. This research highlights the connection between Instagram addiction and concerns over appearance, underscoring the importance of management of screen time and the role of parental guidance in early education for prevention.

Keywords: *physical appearance, trait anxiety, social media addiction, time spent on Instagram, young adults.*

1. Introduction

Spending time on Instagram has become a pervasive social phenomenon with profound impacts on daily life, especially during and after the pandemic (Ferrara et al., 2022; Marici et al., 2022). By 2018, 36% of the global population used smartphones (Statista, 2018), and as of January 2023, Instagram boasts around 2 billion users, with an average daily usage of 28 minutes (Biggest social media platforms, 2023; Instagram by the Numbers, 2023). Despite its widespread use, little is known about how time spent on Instagram relates to social media addiction and anxiety about physical appearance (Faelens et al., 2021). This study aims to explore the mediating role of Instagram addiction between time spent on the platform and trait anxiety related to physical appearance.

2. Time Spent on Instagram and Physical Appearance Trait Anxiety

Trait anxiety refers to an individual's typical inclination to feel distressed during challenging situations, or the average anxiety level experienced over an extended time, as described by Demyttenaere et al. (1989).

Females tend to spend more time on Instagram than males (Mackson, et al., 2019), and that is why more studies focused on females. Most users of Instagram have indicated that they access the platform on a daily basis (Desilver, 2013). Platforms like Instagram and Snapchat, which predominantly focus on images, are categorized as intensely visual social media sites. Instagram is a visually-focused platform where any text shared must be accompanied by an image. Users frequently upload modified body photos to appear nearly 'flawless'. Frequent time spent on Instagram may induce social comparison with individuals who are more physically attractive (Chou, & Edge, 2012). A study, conducted by Sherlock & Wagstaff (2019), found that there is a positive correlation between the amount of time spent on Instagram and physical appearance anxiety, generalised anxiety, and body dissatisfaction. Additionally, the average time spent on Instagram is positively correlated with trait anxiety, physical appearance anxiety, and body image disturbance. The study also found that social comparison plays a significant role in mediating the relationship between time spent on Instagram and trait anxiety and body image disturbance. The Social Comparison Theory, proposed by Festinger in 1954, suggests that individuals tend to compare themselves with others whom they perceive to be similar to them. Individuals compare themselves with others leading to increased internalization and motivation to enhance their appearance, potentially leading to greater dissatisfaction or anxiety regarding their body image.

Body evaluation refers to an individual's personal assessment of their body, encompassing aspects like weight and shape, often termed as body satisfaction (Casale, 2021). Physical appearance comparison may lead to body dissatisfaction (Marici et al., 2023), and this connection between the two variables may moderate the association between Instagram use frequency and high-anxiety body region attention.

There are studies that suggest that the more time spent on Instagram, the higher the trait anxiety concerning body image. Social networking sites are related in general to anxiety, found a systematic review (Keles et al., 2020), and to body image devaluation (Holland, & Tiggemann, 2016). Spending time on Instagram triggers more social comparison with individuals who have a better body image (Chou, & Edge, 2012).

Sherlock and Wagstaff (2019) found that social comparison played a mediating role in the link between the frequency of Instagram use and factors like trait anxiety, concerns about physical appearance, or symptoms of depression while “Instagram use frequency predicts visual attention to high-anxiety body regions” (Bue, 2020, p. 1). Kim & Chock (2015) showed that there is a correlation between social grooming activities such as leaving comments, posting status updates, and searching social media feeds, and the drive for thinness and appearance comparison. These findings shed light on the potential negative impact of social media on anxiety regarding body image.

Contrary to these findings, research has linked the use of social media focused on photos to certain beneficial psychological effects such as, enhancing self-validation or fostering a sense of community and belonging (Allen, Ryan, Gray, McInerney, & Waters, 2014; Toma & Hancock, 2013). Other studies did not find any association between Instagram engagement and body dissatisfaction or desire to look thinner (Arroyo, & Brunner, 2016). In a systematic review, Faelens *et al.* (2021) found that there is inconclusive evidence related to the association between Instagram use and mental health indicators such as anxiety, for example.

3. Time Spent on Instagram and Instagram Addictions

Most studies investigated social network sites altogether than separately. Yet, Instagram was even studied rarer as a potential source of addiction (Foroughi et al., 2021).

Increased online duration is commonly associated with addiction indicators. Consequently, extended daily usage of Instagram suggests a heightened addiction propensity (Faelens *et al.*, 2021). Many individuals find themselves losing track of time while scrolling through their Instagram Feeds, ultimately hindering their productivity and focus (Gezgin &

Mihci, 2020; Szentesi et al., 2021). The pandemic has accentuated social media use, including Instagram (Ferrara, et al., 2022). Among users aged 16 to 24 Instagram remains the preferred social media platform (GWI).

According to a study conducted by Cohen, Newton-John & Slater (2017), young women who follow models or fitness bloggers on Instagram tend to be more fixated on their physical appearance than those who follow accounts that are not focused on appearance. Additionally, the study found that Instagram users are more likely to engage in body surveillance than non-users. Constantly viewing fitspiration images on Instagram can negatively impact one's body image in young women. This is because of the internalization of the images, as well as of the tendency to compare oneself to others, particularly those featured in fitspiration images (Fardouly, Willburger & Vartanian, 2017). Consequently, daily use of Instagram has been found to be positively related to social media addiction (Longobardi *et al.*, 2020). It seems that there is a vicious circle meaning that more time spent on Instagram leads to Instagram addiction and Instagram addiction leads to more time spent on the application (Yesilyurt, & Solpuk Turhan, 2020).

However, some authors suggest that Instagram use might not be associated with negative psychological outcomes. A study found that "Overall, these results show that Instagram is associated with psychological well-being. However, when Instagram users experience Instagram anxiety or engage in social comparison, it is associated with poorer psychological outcomes." (Mackson et al., 2019, p. 2160) This might suggest that problematic Instagram use is related to anxiety and social comparison. Some other factors might also contribute to healthy or unhealthy Instagram use: intensity of multimedia use, type of content viewed, age, interaction of multimedia use with personality characteristics – all these representing future research possibilities.

4. Instagram Addiction and Physical Appearance Trait Anxiety

Studies showed that there is a link between excessive Social Network Sites or Instagram use and anxiety (Griffiths et al., 2018) and the association is positive (Keles et al., 2020). Yet, there are insufficient studies which deal with the association between Instagram addiction and trait anxiety regarding physical appearance in adults. According to a study conducted by Primack *et al.* (2017), being active on Instagram can potentially increase one's social capital. However, it can also lead to heightened levels of anxiety. Mills *et al.* (2018) conducted a study which revealed that taking and sharing selfies can lead to negative emotional outcomes. Specifically, participants reported heightened levels of anxiety, reduced

self-assurance, and decreased physical attractiveness. Another study (Foroughi, et al., 2021) found that Instagram addiction leads to more social anxiety. Faelens et al. (2021) found four studies which show that the intensity of Instagram use is positively correlated with trait anxiety related to body attention, with an effect size from small to moderate.

5. Research Methodology

5.1. The Present Study

The aim of the present study was to investigate the effect of time spent on Instagram on Physical Appearance Trait Anxiety, a relationship mediated by Internet addiction.

5.2. Hypotheses

H1: Instagram addiction will mediate the relationship between hours per day on Instagram and physical appearance trait anxiety.

H2: Instagram FEED addiction will mediate the relationship between hours per day on Instagram and physical appearance trait anxiety.

H3: Instagram stories addiction will mediate the relationship between hours per day on Instagram and physical appearance trait anxiety.

5.3. Instruments

The present study used four instruments which are described below.

Physical Appearance State and Traits Anxiety Scale (PASTAST) – a scale that contains the trait and the state anxiety subscales and that was developed by Reed et al. (1991). The scale was previously used (Aguirre et al., 2022) and validated on participants aged 18-45 years old (Reed et al., 1991) and on adolescents, males and females (Ornelas et al., 2021). We selected only the trait subscale. The subscale contains 16 items, referring to feeling anxious, tensioned, or nervous about physical appearance. The items ask respondents to indicate how they feel about different issues such as thighs, hips, legs etc. The answers are recorded on a scale from 0 (not at all) to 4 (extremely much). Alpha Cronbach for the scale is 0.893.

Instagram Addiction Scale – We adapted the Bergen Social Media Addiction Scale [BSMAS], a self-report questionnaire developed by Andreassen et al. (2016) to measure social media addiction. The scale was previously used in Romanian context (Stănculescu, 2022). In order to assess the addictive use of Instagram we translated the measure, according to the scientific regulations, and made the six items refer to Instagram addiction. The six

items that measure various aspects of addictive behaviour related to Instagram use, such as: spending time thinking about Instagram or planning how to use it, feeling an urge to use Instagram more and more, using the platform in order to forget about personal problems, trying to cut down Instagram without success, becoming restless or troubled when prohibited to use Instagram, or the use of Instagram impacts school or job. Respondents rate their level of agreement with each statement on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total score ranges from 6 to 30, with higher scores indicating greater levels of Instagram addiction. Alpha Cronbach for the scale is 0.810.

Instagram Feed Addiction (IFA) – developed by Sholeh & Rusdi (2019), is a 20-item self-report questionnaire designed to assess Instagram Feed addiction. The items are divided into six subscales: salience, tolerance, mood modification, relapse, withdrawal, and conflict. Example items include: “I often think of any photos/videos posted by others on the Instagram feed”. Each item on the IFA is rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores on the IFA indicate greater levels of Instagram addiction. The minimum score is 20 and the maximum is 100. In the present research we only used the total score of the multidimensional Instagram Feed Addiction. Alpha Cronbach for the scale is 0.878.

Instagram Stories Addiction (ISA) – developed by Sholeh and Rusdi (2019), is a 22-item self-report questionnaire designed to assess Instagram Stories addiction. The items are divided into six subscales: salience, tolerance, mood modification, relapse, withdrawal, and conflict. Example items include: “I think before sharing a photo on Instagram Stories whether to share it to public or close friends”. Each item is rated on a 5-point Likert scale, ranging from 1 (strongly agree) to 5 (strongly disagree). Higher scores on the IFA indicate lower levels of Instagram addiction. However, the scale was reversed by recoding all items. The minimum score is 22 and the maximum is 110. In the present research we only used the total score of the multidimensional Instagram Stories Addiction scale. Alpha Cronbach for the scale is 0.873.

Time spent on Instagram – participants were asked directly to indicate how many hours they spend on Instagram a day. There were just one item and they wrote a number of hours. Participants were instructed to look in their phone profile, read the usage statistics and indicate a mean time. Time spent on Instagram was important to be measured in the present research as Instagram addiction comes mainly from its daily use.

5.4.Participants

There were 203 participants from Suceava County, Romania, aged 19-23 ($M_{age} = 20.7$, $SD = 0.86$). At this age young adults are the most interested in Instagram (GWI). Of them, 36.9% were males and 63.1% were females. All the participants were recruited from the Internet. The questionnaire was prepared in Google Forms and more posts on social media were created to spread the form. The participants were informed about the purpose of the study, confidentiality, duration to fill up the form, and how the data would be further processed. The participants had to have an Instagram account. The average time participants spent on Instagram was 1.77 h with a standard deviation of 1.21. Most respondents were single (42.5). About 6.9% were married, 21.2% were cohabitating couples, 50.7% were single, and 21.2% indicated that they had another status; 40.4% were working, while the rest 59.6% were not employed.

5.5.Statistical Analysis

The current study employed descriptive analyses, including means, standard deviations, medians, minimum and maximum values, Skewness, and Kurtosis values. We also constructed histograms. The majority of the analyses were executed using Jamovi or IBM SPSS software. Inferential statistics incorporated Pearson correlations and a GLM Mediation Model in Jamovi. For tabulation, we utilized Microsoft Office Tools.

5.6.Results

5.6.1. Descriptive Statistics

Table 1: Descriptive statistics for continuous variables (N =203)

Variables	N	Mean	SD	Median	Min	Max	Skew	Kurtosis
Age	203	20.7	0.86	21	19	23	0.437	0.341
Physical appearance traits anxiety scale	203	17.5	14.5	15	0	56	0.634	- 0.607
The Instagram addiction scale	203	11.8	5.32	11	0	30	0.947	0.596
Instagram FEED addiction	203	35.3	16.5	31	20	100	1.80	3.47
Instagram Stories addiction ¹	203	78.5	30.2	91	10	110	- 0.833	- 0.735
Time spent on Instagram in h/day	203	1.77	1.21	1.5	0	6	1	0.863

Notes: ¹High scores mean low addiction, as the variable has a reversed scale.

In Table 1, descriptive statistics for a sample of 203 participants are provided, highlighting key variables related to age, anxiety levels, Instagram addiction, and time spent on Instagram. The average age of participants was approximately 20.7 years, with a range from 19 to 23 years. Scores on the Physical Appearance Traits Anxiety Scale ranged from 0 to 56, indicating diverse levels of anxiety concerning physical appearance. The Instagram addiction Scale scores ranged from 6 to 30, reflecting varying degrees of addictive behaviors associated with Instagram usage. Participants spent an average of around 1.80 hours per day on Instagram, with usage ranging from 0 to 8 hours. Skewness and kurtosis values indicate the distribution characteristics, with some variables showing positive or negative skewness and varying degrees of peakedness or tail thickness.

5.6.2. Preliminary Analyses

Firstly, we performed a Pearson correlation between the continuous variables of the research (Table 2).

Table 2: Pearson correlation between the main variables of the research. The table presents the r values (Pearson correlations) and the significance levels.

	Trait anxiety (PATA)	Instagram addiction	Instagram FEED addiction	Instagram Story addiction
Trait anxiety (PATA)	-			
Instagram addiction	0.239***	-		
Instagram FEED addiction	0.248***	0.681***	-	
Instagram Story addiction	-0.140*	-0.268***	-0.225***	-
Hours using Instagram	0.207**	0.356***	0.315***	-0.174*

Note: (1) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, (2) PATA = physical appearance trait anxiety (3) The measurement scale for Instagram Story addiction is reversed.

The results indicated that there is a significant correlation between PATA and: Instagram addiction ($r = 0.239$, $p < 0.001$), Instagram FEED addiction ($r = 0.248$, $p < 0.001$) or Story addiction ($r = -0.140$, $p = 0.047$). All the other correlations reported significant associations, most of them at a significance level below 0.001. The highest correlation is between Instagram addiction and Feed addiction ($r = 0.681$) and the smallest is between PATA and Story addiction ($r = -0.140$).

Further Pearson correlations between the subscales of Instagram Feed Addiction and those of Instagram Story Addiction indicated that there are 36 positive and significant correlations, 5 non-significant correlation, and 0 negative correlations among all Feed subscales and Stories subscales. The largest significant correlation is between Tolerance Feed and Tolerance Stories ($r = 0.373$), and the smallest significant correlation is between Relapse Feed and Withdrawal Stories ($r = 0.087$).

To explore the potential impact of demographic variables on the primary research variables, we utilized the ClinicoPath module in jamovi. This tool aids researchers in producing natural language summaries of their data and creating cross tables with accompanying statistical tests. The analyses indicated that the variables income, marital status, or professional status have no significant effect on the five main variables (physical appearance trait anxiety, Instagram addiction scale, Instagram feed addiction, Instagram Stories addiction, time spent on Instagram). In case of the variable sex, males ($M = 2.3$, $SD = 1.3$) spend less time on Instagram than females ($M = 1.5$, $SD = 1.2$): $p < 0.001$, the same being found in other studies (Desilver, 2013).

5.6.3. Mediation Testing

Further on, we performed the mediation analysis in Jamovi. In order to address the non-normality of the distribution in the variables, we used Bootstrapping method of estimation for structural equation, in MedMod module, in Jamovi for 1000 samples. Bootstrap methods are non-parametric and do not assume normality of the data, making them particularly useful for dealing with skewed distributions. The results are presented below.

H1: Instagram addiction will mediate the relationship between hours per day on Instagram and physical appearance trait anxiety.

In this mediation analysis, the role of Instagram addiction in the relationship between average daily time spent on Instagram and anxiety about physical appearance was examined. The indirect effect (path $a \times b$) was significant ($b = 0.809$, $SE = 0.390$, 95% CI [0.1148, 1.64], $Z = 2.07$, $p = 0.038$), accounting for 32.5% of the total effect, indicating a mediating role of Instagram addiction. The direct effect (path c) of time on Instagram on anxiety was not significant ($b = 1.679$, $SE = 0.979$, 95% CI [-0.022, 3.77], $Z = 1.72$, $p = 0.086$), comprising 67.5% of the total effect. The total effect (path $c + a \times b$) was significant ($b = 2.487$, $SE = 0.879$, 95% CI [0.854, 4.32], $Z = 2.83$, $p = 0.005$). Path a from daily time on Instagram to Instagram addiction was highly significant ($b = 1.573$, $SE = 0.313$, $p < .001$), as

was path b from Instagram addiction to anxiety ($b = 0.514$, $SE = 0.230$, $p = 0.026$). These results suggest that Instagram addiction fully mediates the relationship between the time spent on Instagram and anxiety about physical appearance, through Instagram addiction. The hypothesis is confirmed (see *Figure 1*).

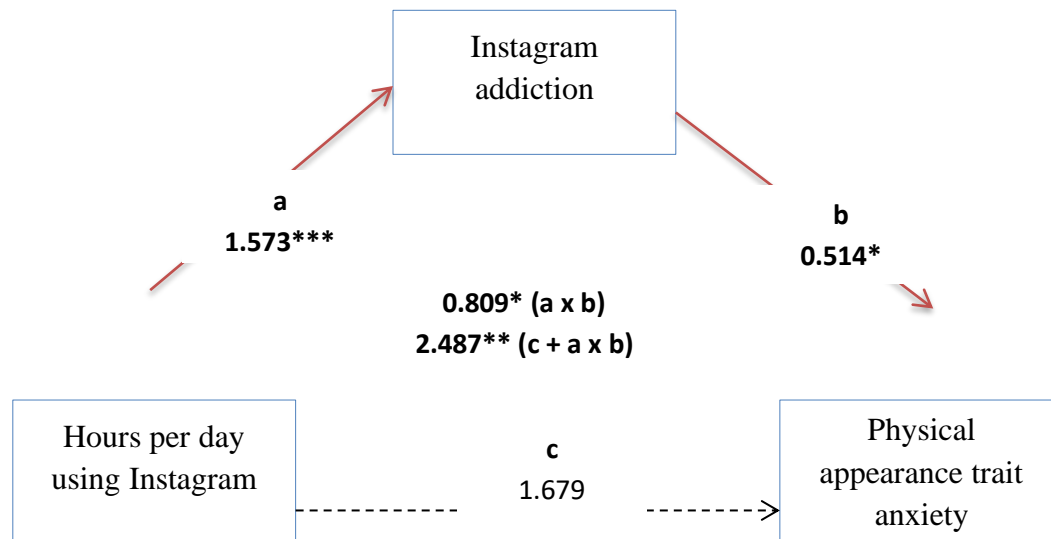


Figure 1: Standardized regression coefficients for the relationship between hours per day using Instagram and physical appearance trait anxiety as mediated by Instagram addiction.

* $p < .05$, ** $p < .01$, *** $p < .001$

H2: Instagram FEED addiction will mediate the relationship between hours per day on Instagram and physical appearance trait anxiety.

In the mediation model, the indirect effect of the average daily time spent on Instagram on anxiety about physical appearance through Instagram FEED addiction (path $a \times b$) was significant ($b = 0.769$, $SE = 0.383$, 95% CI [0.159, 1.63], $Z = 2.01$, $p = 0.044$), accounting for 30.9% of the total effect. The direct effect (path c) of time on Instagram on anxiety was not significant ($b = 1.718$, $SE = 0.920$, 95% CI [-0.162, 3.55], $Z = 1.87$, $p = 0.062$), accounting for 69.1% of the total effect. The total effect (path $c + a \times b$) was significant ($b = 2.487$, $SE = 0.859$, 95% CI [0.771, 4.18], $Z = 2.90$, $p = 0.004$). Path a from daily time on Instagram to Instagram FEED addiction was highly significant ($b = 4.325$, $SE = 0.962$, $p < .001$), as was path b from Instagram FEED addiction to anxiety ($b = 0.178$, $SE = 0.0705$, $p = .012$). These findings indicate that Instagram FEED addiction significantly fully

mediates the relationship between the time spent on Instagram and anxiety about physical appearance. The hypothesis is confirmed (see *Figure 2*).

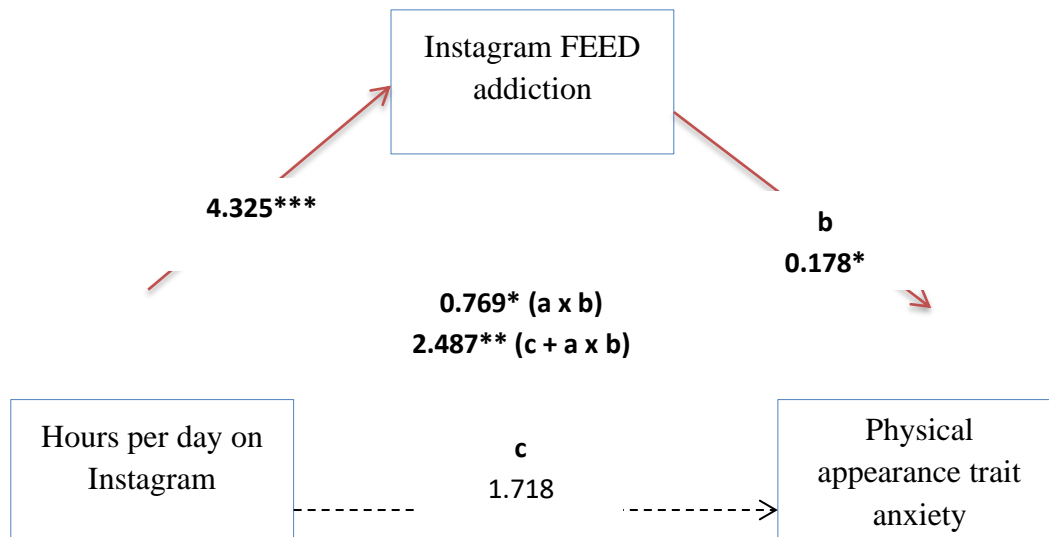


Figure 2: Standardized regression coefficients for the relationship between hours per day on Instagram and physical appearance trait anxiety as mediated by Instagram FEED addiction.

* $p < .05$, ** $p < .01$, *** $p < .001$

H3: Instagram stories addiction will mediate the relationship between hours per day on Instagram and physical appearance trait anxiety.

In the mediation analysis, the indirect effect of the average daily time spent on Instagram on anxiety about physical appearance through Instagram Stories Addiction (path $a \times b$) was not significant ($b = 0.223$, $SE = 0.179$, 95% CI $[-0.0615, 0.605]$, $Z = 1.25$, $p = 0.211$), accounting for a small percentage of the total effect (8.98%). The direct effect (path c) of time spent on Instagram on anxiety was significant ($b = 2.264$, $SE = 0.920$, 95% CI $[0.608, 4.163]$, $Z = 2.46$, $p = 0.014$), suggesting that the majority of the effect (91.02%) was not mediated by Instagram Stories Addiction. The total effect (path $c + a \times b$) was significant ($b = 2.487$, $SE = 0.912$, 95% CI $[0.827163, 4.374]$, $Z = 2.73$, $p = 0.006$). Path a from daily time on Instagram to Instagram Stories Addiction was significant ($b = 4.366$, $SE = 1.789$, $p = 0.015$), but path b from Instagram Stories Addiction to anxiety was not ($b = -0.0511$, $SE = 0.033$, $p = 0.123$). These results suggest that while Instagram Stories Addiction is influenced by the time spent on the platform, it does not significantly contribute to anxiety about physical appearance. The hypothesis is infirmed (see *Figure 3*).

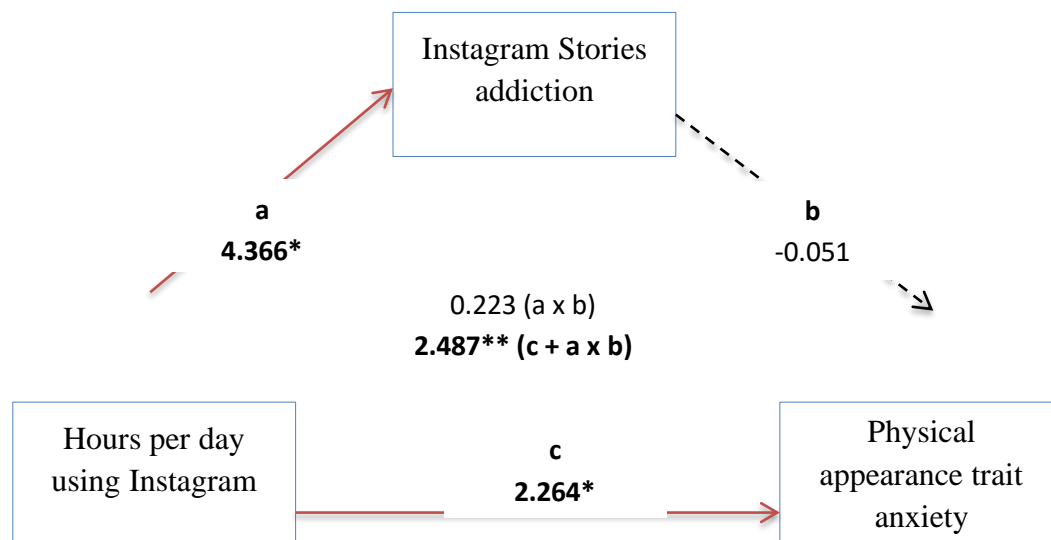


Figure 3: Standardized regression coefficients for the relationship between hours per day using Instagram and physical appearance trait anxiety as mediated by Instagram stories addiction.

* $p < .05$, ** $p < .01$, *** $p < .001$

6. Discussion

The purpose of the present research was to investigate the mediating effect of Instagram addiction on the relationship between time spent on Instagram and physical appearance-related trait anxiety.

Our results indicated that two from four hypotheses testing the mediating role of Instagram addiction or of Instagram FEED addiction were confirmed. The reliability of the tools used to measure time on Instagram and addiction to stories could greatly impact the outcome, potentially resulting in complete mediation if assessed correctly. In case of Instagram stories addiction we did not find any significant evidence of mediation, thus the hypothesis was infirmed.

Instagram addiction is usually referred as excessive interactions with the media platforms, which leads to problematic, compulsive or irrational use, due to gratification seeking (Griffiths, 1999). Recent research has suggested that excessive use of Instagram may have negative consequences for mental health, particularly in relation to body image concerns (Runcan *et al.*, 2023). Several studies have found that excessive use of social media, including Instagram, is associated with negative body image outcomes such as increased levels of body dissatisfaction and physical appearance trait anxiety (Fardouly *et al.*, 2015).

For instance, a study conducted by Fardouly *et al.* (2015) found that Facebook use was positively correlated with body dissatisfaction and mood disturbances in young women. Research has also suggested that Instagram addiction may mediate the relationship between time spent on Instagram and negative body image outcomes. For example, a study conducted by Andreassen *et al.* (2017) found that addictive use of social media was positively correlated with symptoms of psychiatric disorders.

Several theoretical frameworks elucidate the mechanisms behind Instagram addiction and its impact on body image. The Gratification Theory posits that individuals engage in media use to fulfil various needs and desires, which can lead to compulsive behaviors when gratification-seeking becomes excessive (Griffiths, 1999). Instagram's instant feedback through likes and comments can create a cycle of seeking validation that exacerbates addictive behavior. The Social Comparison Theory suggests that individuals evaluate their appearance by comparing themselves to others, a behavior intensified by Instagram's image-centric platform. Constant exposure to curated, idealized images can lead to unfavorable self-comparisons, fostering feelings of inadequacy and body dissatisfaction (Thompson *et al.*, 1999). This theory highlights how social media magnifies the tendency to compare oneself to others, which can negatively impact self-esteem and body image. Additionally, the Self-Discrepancy Theory indicates that exposure to idealized images on social media increases the gap between one's actual self and ideal self. This disparity can lead to feelings of body dissatisfaction and anxiety, as individuals perceive a significant mismatch between their real appearance and the idealized images they consume online (Higgins, 1999). This theory underscores the psychological impact of social media, where the constant bombardment of perfection can lead to heightened self-criticism and mental distress. Given the fact that mobile access is easier today and the perceived scarcity of content (Lynn, 1991) might be enhanced by the properties of this platform users might resist harder not to check Instagram stories. Yet, few studies if any investigated the moderating effect of Instagram stories addiction between time spent on Instagram and trait anxiety concerning body image, and we did not find any evidence regarding these variable relationships in the present study. Further research should clarify these associations.

The absence of a significant mediation effect of Story Addiction in the relationship between time spent on Instagram and body anxiety can be elucidated through several perspectives. Firstly, the influence of Instagram Stories on body image anxiety may differ from that of other activities on the platform. Unlike browsing the main feed or exploring fitness and beauty hashtags, viewing Stories might not evoke comparable levels of

comparison or focus on body image. Secondly, inadequate time allocation specifically to Instagram Stories among participants could have limited its potential impact. The overall time spent on Instagram might overshadow the influence of Stories, thereby reducing the detectability of any mediation effect. Thirdly, the content featured in Stories typically varies from posts and Reels, potentially presenting a less polished or idealized portrayal that might attenuate its impact on body image anxiety. Furthermore, there could be alternative variables that serve as stronger mediators in the relationship between Instagram usage and body image anxiety, such as general social media addiction, overall body dissatisfaction, or the specific nature of content consumption.

Overall, our findings still suggest that Instagram addiction, as a general concept, might explain the relationship between time spent on Instagram and physical appearance trait anxiety.

7. Conclusions

The study explored how Instagram addiction mediates the link between Instagram usage and anxiety over physical appearance. In two cases, it found that daily usage time did not directly increase appearance-related anxiety. However, these factors contributed to Instagram addiction, which significantly raised anxiety about physical appearance. Instagram addiction and Instagram Feed were identified as specific mediators, with Stories addiction not showing a significant mediating effect based on daily usage.

However, it is important to note that this study has some limitations. The data was collected through self-reported questionnaires. Reliance on self-reported questionnaires may introduce biases such as social desirability and recall bias, potentially impacting the accuracy and reliability of data. The study's sample size, a non-representative sample of convenience with just 203 participants, limit the generalizability of findings to broader populations and cultural contexts, warranting caution in extrapolating results. In addition, the present study investigated only the very broad variables such as mean time spent on Instagram a week. Thus, the present study did not differentiate between active or passive users of social network sites (Escobar-Viera et al., 2008; Verduyn et al., 2017; Valkenburg et al., 2022), which might lead to variations in statistical results.

To further explore these associations, future research should consider additional variables such as the age of participants, the presence of other addictions, family history of Instagram addiction, parental styles in monitoring of Instagram activity (Marici et al., 2022), and peer pressure to use the platform (Sârbu et al., 2023). Valkenburg et al. (2022) suggests

that studies on social media should take into account features of the content of social media, who are the senders or the receivers. The study primarily focuses on Instagram addiction as a mediator, overlooking potential moderating or mediating variables that could influence the relationship between Instagram usage and appearance concerns. A broader analysis could provide a more nuanced understanding of this complex phenomenon.

8. Implications

The present study delves into the impact of social media platforms on Instagram addiction and physical appearance trait anxiety, offering several important implications.

The findings serve as a red flag for young adults, highlighting the risks associated with Internet addiction and anxiety. It emphasizes the importance of adhering to international regulations on screen time use, based on extensive research and expertise.

Unfortunately, screen time management remains a prevalent issue nowadays, as Internet addiction problems may start early in childhood or adolescence and persist into adulthood (Marici, 2015b; Marici, 2015a; Marici, 2015; Runcan, 2020, Runcan, 2010, Runcan et al. 2023). Social work interventions should focus on educating young adults and parents, who have the power to influence behaviours and habits, about the significance of time monitoring. This overlooked strategy proves highly effective in reducing the negative impact of unhealthy Internet use on the psychological and social health of young adults. In addition, developing an awareness of the social media landscape is an essential competency for everyone in the modern digital age (Rad et al., 2020; Turliuc, & Marici, 2013).

Author Contributions:

Conceptualisation, M.M.; Methodology, M.M.; Software, M.M.; Validation, M.M.; Visualisations, M.M.; R.R. Formal Analysis, M.M.; Investigation, M.M. Resources, M.M. Writing-Original Draft Preparation, M.M. R.R. Writing-Review & Editing, M.M.; R.R.

All authors have read and agreed to the published version of the manuscript.

Declarations of interest: None.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and ethically approved by the Aurel Vlaicu University of Arad,

Faculty of Educational Sciences, Psychology and Social Work, Centre of Research Development and Innovation in Psychology (ID no. 15/ 10.Jan. 2023).

Bibliography

- Aguirre, J. F., Rangel-Ledezma, Y. S., Jurado-García, P. J., Blanco, H., Ornelas, M., Jiménez-Lira, C., ... & Aguirre, S. I. (2022). Validation of a computerized version of the trait subscale of the physical appearance state and trait anxiety scale in mexican preadolescents. *Children*, 9(1), 64.
- Allen, K. A., Ryan, T., Gray, D. L., McInerney, D. M., & Waters, L. (2014). Social media use and social connectedness in adolescents: The positives and the potential pitfalls. *The Educational and Developmental Psychologist*, 31(1), 18-31.
- Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss, D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. *Psychology of Addictive Behaviors*, 30(2), 252.
- Andreassen, C. S., Pallesen, S., & Griffiths, M. D. (2017). The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey. *Addictive Behaviors*, 64, 287-293.
- Arroyo, A., & Brunner, S. R. (2016). Negative body talk as an outcome of friends' fitness posts on social networking sites: Body surveillance and social comparison as potential moderators. *Journal of Applied Communication Research*, 44(3), 216-235.
- Biggest social media platforms 2023. (n.d.). Statista. Retrieved July 24, 2023, from <https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/>
- Bue, A. C. C. (2020). The looking glass selfie: Instagram use frequency predicts visual attention to high-anxiety body regions in young women. *Computers in Human Behavior*, 108, 106329. <https://doi.org/10.1016/j.chb.2020.106329>
- Casale, S., Gemelli, G., Calosi, C., Giangrasso, B., & Fioravanti, G. (2021). Multiple exposure to appearance-focused real accounts on Instagram: Effects on body image among both genders. *Current Psychology*, 40, 2877-2886.
- Chou, H. T. G., & Edge, N. (2012). "They are happier and having better lives than I am": The impact of using Facebook on perceptions of others' lives. *Cyberpsychology, Behavior, and Social Networking*, 15(2), 117-121.
- Cohen, R., Newton-John, T., & Slater, A. (2017). The relationship between Facebook and Instagram appearance-focused activities and body image concerns in young women. *Body Image*, 23, 183-187. <https://doi.org/10.1016/j.bodyim.2017.10.002>
- Demyttenaere, K., Nijs, P., Evers-Kiebooms, G., & Koninckx, P. R. (1989). The effect of a specific emotional stressor on prolactin, cortisol, and testosterone concentrations in women varies with their trait anxiety. *Fertility and Sterility*, 52(6), 942-948.

- DeSilver, D. (2013, October 4). Chart of the week: The world's most popular web sites. *Pew Research Center*. Retrieved from <https://www.pewresearch.org/fact-tank/2013/10/04/chart-of-the-week-the-worlds-most-popular-web-sites/>
- Escobar-Viera, C. G., Shensa, A., Bowman, N. D., Sidani, J. E., Knight, J., James, A. E., & Primack, B. A. (2018). Passive and active social media use and depressive symptoms among United States adults. *Cyberpsychology, Behavior, and Social Networking*, 21(7), 437-443. <https://doi.org/10.1089/cyber.2017.0537>
- Faelens, L., Hoorelbeke, K., Cambier, R., van Put, J., Van de Putte, E., De Raedt, R., & Koster, E. H. (2021). The relationship between Instagram use and indicators of mental health: A systematic review. *Computers in Human Behavior Reports*, 4, Article 100121. <https://doi.org/10.1016/j.chbr.2021.100121>
- Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015). Social comparisons on social media: The impact of Facebook on young women's body image concerns and mood. *Body Image*, 13, 38-45. <https://doi.org/10.1016/j.bodyim.2014.12.002>
- Fardouly, J., Willburger, B. K., & Vartanian, L. R. (2017). Instagram use and young women's body image concerns and self-objectification: Testing mediational pathways. *New Media & Society*, 20(4), 1380-1395. <https://doi.org/10.1177/1461444817694499>
- Ferrara, M., Langiano, E., Falese, L., Diotaiuti, P., Cortis, C., & De Vito, E. (2022). Changes in physical activity levels and eating behaviours during the COVID-19 pandemic: Sociodemographic analysis in University students. *International Journal of Environmental Research and Public Health*, 19(9), 5550. <https://doi.org/10.3390/ijerph19095550>
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7, 117-140.
- Foroughi, B., Griffiths, M. D., Iranmanesh, M., & Salamzadeh, Y. (2021). Associations Between Instagram Addiction, Academic Performance, Social Anxiety, Depression, and Life Satisfaction Among University Students. *International Journal of Mental Health and Addiction*, 29, 2221-2242. <https://doi.org/10.1007/s11469-021-00510-5>.
- Gezgin, D. M., & Mihci, C. (2020). Smartphone addiction in undergraduate athletes: Reasons and effects of using Instagram intensively. *International Journal of Technology in Education and Science*, 4(3), 188-202.
- Griffiths, M. (1999). Internet addiction: Fact or fiction?. *The Psychologist*.
- Griffiths, M. D. (1999). Internet addiction: Internet fuels other addictions. *Student British Medical Journal*, 7(1), 428-429.
- Griffiths, S., Murray, S. B., Krug, I., & McLean, S. A. (2018). The contribution of social media to body dissatisfaction, eating disorder symptoms, and anabolic steroid use among sexual minority men. *Cyberpsychology, Behavior, and Social Networking*, 21(3), 149-156. <https://doi.org/10.1089/cyber.2017.0375>.
- GWI. (n.d.). GWI - Audience Insight Tools, Digital Analytics & Consumer Trends. Retrieved July 24, 2023, from <https://www.gwi.com>
- Hayes, A. F. (2018). Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-based Approach. Guilford Press.
- Higgins, E. T. (1999). When do self-discrepancies have specific relations to emotions? The second-generation question of Tangney, Niedenthal, Covert, and Barlow (1998).

- Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image*, 17, 100-110.
- Instagram by the Numbers (2023): Stats, Demographics & Fun Facts. (2023, February 28). <https://www.omnicoreagency.com/instagram-statistics/>
- Instagram by the Numbers (2023): Stats, Demographics & Fun Facts. (2023, February 28). <https://www.omnicoreagency.com/instagram-statistics/>
- Keles, B., McCrae, N., & Grealish, A. (2020). A systematic review: The influence of social media on depression, anxiety and psychological distress in adolescents. *International Journal of Adolescence and Youth*, 25(1), 79–93. <https://doi.org/10.1080/02673843.2019.1590851>.
- Kenny, D. A., & Judd, C. M. (2014). Power anomalies in testing mediation. *Psychological Science*, 25(2), 334-339.
- Kim, J. W., & Chock, T. M. (2015). Body image 2.0: Associations between social grooming on Facebook and body image concerns. *Computers in Human Behavior*, 48, 331–339.
- Longobardi, C., Settanni, M., Fabris, M. A., & Marengo, D. (2020). Follow or Be Followed: Exploring the Links Between Instagram Popularity, Social Media Addiction, Cyber Victimization, and Subjective Happiness in Italian Adolescents. *Children and Youth Services Review*, 113, 104955. <https://doi.org/10.1016/j.childyouth.2020.104955>.
- Lynn, M. (1991). Scarcity effects on value: A quantitative review of the commodity theory literature. *Psychology & Marketing*, 8(1), 43-57.
- Mackson, S. B., Brochu, P. M., & Schneider, B. A. (2019). Instagram: Friend or foe? The application's association with psychological well-being. *New Media & Society*, 21(10), 2160–2182. <https://doi.org/10.1177/1461444819840021>.
- Marici, M. (2015). Influențe asupra rezilienței adolescenților: controlul parental și conflictul părinte–adolescent. *Studii și cercetări*, 61(2).
- Marici, M. (2015a). A holistic perspective of the conceptual framework of resilience. *Journal of Psychological and Educational Research (JPER)*, 23(1), 100-115.
- Marici, M. (2015b). The influence of parent-child conflict intensity and frequency in social-cognitive domains on the psycho-behavioural consequences in adolescents. *Analele Științifice ale Universității "Alexandru Ioan Cuza" din Iași. Psihologie*, (1), 19-37.
- Marici, M., Clipa, O., Runcan, R., & Iosim, I. (2022). Perceptions of Parenting during the COVID-19 Quarantine Period, in Suceava, the Epicenter of the COVID-19 Outbreak in Romania. *International Journal of Environmental Research and Public Health*, 19(23), 16188.
- Marici, M., Runcan, R., Cheia, G., & David, G. (2024). The Impact of Coercive and Assertive Communication Styles on Children's Perception of Chores: An Experimental Investigation. *Frontiers in Psychology*, 15, 1266417. <https://doi.org/10.3389/fpsyg.2024.1266417>
- Marici, M., Runcan, R., Iosim, I., & Haisan, A. (2023). The effect of attire attractiveness on students' perception of their teachers. *Frontiers in Psychology*, 13, 1059631.
- Mills, J. S., Musto, S., Williams, L., & Tiggemann, M. (2018). "Selfie" harm: Effects on mood and body image in young women. *Body Image*, 27, 86-92. <https://doi.org/10.1016/j.bodyim.2018.08.007>.

- O'Rourke, H. P., & MacKinnon, D. P. (2018). Reasons for testing mediation in the absence of an intervention effect: A research imperative in prevention and intervention research. *Journal of Studies on Alcohol and Drugs*, 79(2), 171-181.
- Ornelas, M., Rodríguez-Villalobos, J. M., Viciana, J., Guedea, J. C., Blanco, J. R., & Mayorga-Vega, D. (2021). Composition Factor Analysis and Factor Invariance of the Physical Appearance State and Trait Anxiety Scale (PASTAS) in Sports and Non-Sports Practitioner Mexican Adolescents. *Journal of sports science & medicine*, 20(3), 525–534. <https://doi.org/10.52082/jssm.2021.525>
- Primack, B. A., Shensa, A., Escobar-Viera, C. G., Barrett, E. L., Sidani, J. E., Colditz, J. B., & James, A. E. (2017). Use of multiple social media platforms and symptoms of depression and anxiety: A nationally-representative study among U.S. young adults. *Computers in Human Behavior*, 69, 1-9. DOI: 10.1016/j.chb.2016.11.013.
- Rad, D.; Balas, V.; Lile, R.; Demeter, E.; Dughi, T.; Rad, G. (2020). Statistical Properties of a New Social Media Context Awareness Scale (SMCA)—A Preliminary Investigation. *Sustainability*, 12, 5201. <https://doi.org/10.3390/su12125201>
- Reed, D. L., Thompson, J. K., Brannick, M. T., & Sacco, W. P. (1991). Development and validation of the Physical Appearance State and Trait Anxiety Scale (PASTAS). *Journal of Anxiety Disorders*, 5(4), 323–332. [https://doi.org/10.1016/0887-6185\(91\)90032-O](https://doi.org/10.1016/0887-6185(91)90032-O)
- Runcan, P. (2010). One minute more: adolescent addiction for virtual world. *Procedia Social and Behavioral Sciences*, Vol. 2, pp. 3706-3710. www.wces2012.org. <http://www.sciencedirect.com/science/article/pii/S1877042810006166>.
- Runcan, P. (2020). Depression in Adolescence: A Review of Literature. *Revista de Asistență Socială*, XIX(2), 1-9.
- Runcan, R., Nadolu, D. & David, G. (2023). Predictors of Anxiety in Romanian Generation Z Teenagers. *International Journal of Environmental Research and Public Health*, 20(6), 4857. <https://doi.org/10.3390/ijerph20064857>.
- Runcan, R., Rad, D. Runcan, P. Măduța, C. (2023). A network analysis approach toward adaptive overt narcissism network. *Behavioral Sciences*. 13(6):468.
- Sârbu, E. A., Marici, M., Bostan, S., & Gavrilă-Ardelean, L. (2023). Physical and Recreational Activities, Sedentary Screen Time, Time Spent with Parents and Drug Use in Adolescents. *International Journal of Environmental Research and Public Health*, 20(2), 1434.
- Sârbu, E. A., Nadolu, B., Runcan, R., Tomiță, M. & Lazăr, F. (2022). Social predictors of the transition from anomie to deviance in adolescence. *PLoS ONE*, 17(6): e0269236. <https://doi.org/10.1371/journal.pone.0269236>.
- Sherlock, M. & Wagstaff, D. L. (2019). Exploring the relationship between frequency of Instagram use, exposure to idealised images, and psychological wellbeing in women. *Psychology of Popular Media Culture*, 8(44), 1-30. DOI: 10.1037/ppm0000182.
- Sholeh, A., & Rusdi, A. (2019). A New Measurement of Instagram Addiction: Psychometric Properties of The Instagram Addiction Scale (TIAS). *CISAK*, 91-97.
- Stănculescu, E. (2022). The Bergen social media addiction scale validity in a Romanian sample using item response theory and network analysis. *International journal of mental health and addiction*, 1-18.

- Statista. (2018). Number of smartphone users worldwide from 2014 to 2020 (in billions). Retrieved 10 April, 2018, from: <https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/>.
- Szentesi, S. G., Cuc, L. D., Lile, R., & Cuc, P. N. (2021). Internet of Things (IoT), Challenges and Perspectives in Romania: A Qualitative Research. *Amfiteatru Economic*, 23(57), 448-464.
- Thompson, J. K., Coover, M. D., & Stormer, S. M. (1999). Body image, social comparison, and eating disturbance: A covariance structure modeling investigation. *International Journal of Eating Disorders*, 26(1), 43-51.
- Toma, C. L., & Hancock, J. T. (2013). Self-affirmation underlies Facebook use. *Personality and Social Psychology Bulletin*, 39(3), 321-331.
- Turliuc, M. N., & Marici, M. (2013). Teacher-student relationship through the lens of parental authoritative features. *International Journal of Education and Psychology in the Community*, 3(1), 43.
- Valkenburg, P. M., van Driel, I. I., & Beyens, I. (2022). The associations of active and passive social media use with well-being: A critical scoping review. *New media & society*, 24(2), 530-549.
- Verduyn, P., Ybarra, O., Résibois, M., Jonides, J., & Kross, E. (2017). Do social network sites enhance or undermine subjective well-being? A critical review. *Social Issues and Policy Review*, 11(1), 274-302.
- Yesilyurt, F., & Solpuk Turhan, N. (2020). Prediction of the Time Spent on Instagram by Social Media Addiction and Life Satisfaction. *Cypriot Journal of Educational Sciences*, 15(2), 208-219.