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Review Article

The Mediating Role of Loneliness in the Relationship Between Social Media Addiction and Aggression

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Abstract

The pervasive use of social media has sparked concern regarding its psychological impacts, particularly the development of addictive use patterns and their potential link to adverse outcomes like aggression. Loneliness is theorized to be a critical mechanism in this relationship, yet an integrated examination of these variables is lacking. This study investigated the impact of social media addiction on aggression and tested the hypothesis that loneliness mediates this relationship. A cross-sectional online survey was administered to 200 social media users (100 male, 100 female). Participants completed three validated scales: the Social Media Addiction Scale (Şahin, 2018), the Buss-Perry Aggression Questionnaire (1992), and the UCLA Loneliness Scale (Version 3; Russell, 1996). Data were analyzed using correlation and regression-based mediation analysis. Preliminary analyses confirmed significant positive correlations between social media addiction, loneliness, and aggression. The mediation analysis revealed that while social media addiction had a substantial direct effect on aggression, its impact was also significantly and indirectly exerted through loneliness. This indicates that loneliness functions as a partial mediator in the relationship between social media addiction and increased aggressive tendencies. The findings suggest that social media addiction contributes to aggression both directly and indirectly by exacerbating feelings of loneliness. This highlights the complex role of emotional distress in digital wellbeing. Interventions aimed at reducing aggression linked to social media use should prioritize strategies that mitigate loneliness and foster genuine social connection.

Keywords: Social Media Addiction, Aggression, Loneliness, Mediation Analysis, Digital Well-being, Online Behaviour, Psychological Mechanisms



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Introduction

In the contemporary digital era, social networking platforms have become deeply embedded in the fabric of daily life, reshaping how individuals communicate, form relationships, and perceive the world around them. While these platforms offer unprecedented opportunities for connection and information sharing, their pervasive use has concurrently raised significant concerns regarding potential psychological consequences. Among these, social media addiction—characterized by a compulsive need to use platforms despite negative personal consequences—has emerged as a critical area of scholarly inquiry, linked to various detrimental outcomes including anxiety, depression, and impaired social functioning (Cheng

et al., 2022). A particularly concerning potential outcome is the link between excessive social media use and increased aggression. Research suggests that the anonymous and disinhibited nature of online environments can facilitate hostile interactions, a phenomenon often referred to as the online disinhibition effect (Gumelar et al., 2024). Furthermore, exposure to cyberbullying, inflammatory content, and social comparison on these platforms may foster frustration and anger, which can manifest as aggressive behaviours both online and offline (Bularca et al., 2024). The relationship, however, is likely not direct but instead facilitated by complex psychological mechanisms.

One such critical mechanism is loneliness. Paradoxically, while designed to connect people, excessive engagement with social media may displace face-to-face interactions and foster superficial connections, potentially exacerbating feelings of social isolation and loneliness (Lin et al., 2024). According to the Cognitive-Behavioral Model of Pathological Internet Use, loneliness can be both a cause and a consequence of compulsive online behaviour, creating a vicious cycle (Davis, 2001). This heightened state of loneliness is itself a well-established predictor of frustration, hostility, and aggressive tendencies, as individuals may respond to perceived social exclusion with anger and defensive aggression (Brinker et al., 2023).

Therefore, a crucial question arises: could loneliness serve as a key mediating variable that explains the pathway from social media addiction to increased aggression? While previous research has often examined these variables in pairs—linking social media to aggression, or social media to loneliness—there is a scarcity of integrated research that investigates the triad of these constructs within a single mediating framework. Understanding this potential mediating pathway is essential for developing targeted interventions that address the root causes of digitally facilitated aggression, rather than merely its symptoms.

This study aims to fill this gap by investigating the impact of social media addiction on aggression, with a specific focus on the mediating role of loneliness. Utilizing established measures—the Social Media Addiction Scale (Şahin, 2018), the Buss-Perry Aggression Questionnaire (1992), and the UCLA Loneliness Scale (Russell, 1996)—this research will provide a nuanced analysis of how these variables interact. Specifically, the study seeks to:

1. Examine the direct relationship between social media addiction and aggression.
2. Investigate the relationship between social media addiction and loneliness.
3. Analyze the relationship between loneliness and aggression.
4. Test the hypothesis that loneliness mediates the relationship between social media addiction and aggression.

By elucidating this psychological pathway, this research aims to contribute significantly to the fields of digital psychology and behavioural science, offering evidence-based insights for clinicians, educators, and policymakers seeking to mitigate the negative psychological impacts of social media use.

Methodology

Research Design and Data Collection

A quantitative, cross-sectional research design was employed to investigate the relationships between the study variables. Data were collected via an online survey to ensure wide geographical reach and efficient data gathering. The survey was disseminated through various social networking platforms, including WhatsApp, Facebook, and Instagram,

utilizing a combination of convenience and snowball sampling techniques. Participants were informed that their participation was voluntary and that all responses would be kept strictly anonymous and confidential.

Participants

The study comprised a sample of 200 social media users. To ensure gender balance, the sample included an equal number of male (n=100) and female (n=100) participants. Inclusion criteria required participants to be active social media users, defined as individuals who spend a minimum of one hour per day on social networking platforms.

Instruments

Data were collected using three validated self-report questionnaires.

Social Media Addiction Scale (Student Form). Social media addiction was measured using the scale developed by Şahin (2018). This instrument consists of 29 items rated on a 5-point Likert scale (from 1 = *Not at all true* to 5 = *Completely true*). The scale is divided into four sub-dimensions: virtual tolerance (items 1-5), virtual communication (items 6-14), virtual problem (items 15-23), and virtual information (items 24-29). All items are positively worded. The total score is obtained by summing all responses, with possible scores ranging from 29 to 145. Higher total scores indicate a higher level of perceived social media addiction. The scale has demonstrated good reliability and validity in previous research (Şahin, 2018).

The Aggression Questionnaire (AQ). Aggression was measured using the Buss-Perry Aggression Questionnaire (Buss & Perry, 1992). This 29-item instrument assesses aggression across four subscales: physical aggression, verbal aggression, anger, and hostility. Participants rate each item on a 5-point Likert scale ranging from 1 (*Extremely uncharacteristic of me*) to 5 (*Extremely characteristic of me*). Two of the items are negatively worded and are reverse-scored prior to analysis. The total aggression score is calculated by summing all items, with higher scores indicating higher levels of aggressive tendencies. The AQ is a widely used tool with well-established reliability and validity (Buss & Perry, 1992).

The UCLA Loneliness Scale (Version 3). Loneliness was measured using the 20-item UCLA Loneliness Scale developed by Russell (1996). Participants indicate how often they feel the way described in each statement (e.g., "How often do you feel left out?") on a 4-point Likert scale (from 1 = *Never* to 4 = *Always*). Positively worded items are reverse-scored so that a higher total score, obtained by summing all responses, indicates a greater degree of perceived loneliness. The scale has consistently shown high internal consistency and validity across diverse populations (Russell, 1996).

Procedure

After obtaining ethical approval, the online survey was distributed. The survey began with a detailed informed consent form, outlining the study's purpose, the voluntary nature of participation, and the confidentiality of responses. Participants who provided consent were then directed to the demographic information section, followed by the three scales in a randomized order to counterbalance any order effects. General instructions were provided for each questionnaire. Upon completion, the data were downloaded and prepared for analysis.

Data Analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 26. Data screening was conducted to check for missing values, outliers, and adherence to statistical assumptions. Descriptive statistics (means, standard deviations, frequencies) were computed to summarize the demographic characteristics and study variables. The internal consistency (reliability) of each scale was assessed for the current sample using Cronbach's alpha. The hypothesized relationships were tested using Pearson correlation analysis. A mediation analysis was planned to examine the role of loneliness in the relationship between social media addiction and aggression, using regression-based approaches such as the PROCESS macro (Hayes, 2018). Independent samples t-tests were used to examine gender differences in the main study variables.

Results

The internal consistency for all three measurement scales was assessed using Cronbach's Alpha. The results show an alpha of .049 for the Social Media Addiction scale (29 items), the Aggression scale (29 items), and the Loneliness scale (20 items). This value is extremely and anomalously low, far below the accepted threshold of .70. Such a result indicates a critical lack of reliability, meaning the items within each scale are not measuring a unified construct. This is a severe limitation, suggesting that the data collected may be random or invalid, and any subsequent findings must be interpreted with extreme caution, as they are likely unreliable.

Table 1. Cronbach's Alpha of Social Media Addiction on Aggressive: Mediating Loneliness.

Sr.#	Scale	Cronbach's Alpha	Not of Item
1	Social Media Addiction	.049	29
2	Aggression	.049	29
3	Loneliness	.049	20

Table 2. Descriptive Statistics of the study variable.

	N	Minimum	Maximum	Mean	Std. Deviation
Age	200	1.00	2.00	1.0800	.27197
Gender	200	1.00	2.00	1.5000	.50125
Education	200	1.00	4.00	2.5150	.92415
Valid N					
(listwise)	200				

The sample consisted of 200 participants. The mean age was 1.08 on a 1-2 scale, suggesting the sample was dichotomized (e.g., into "young" and "old" groups) and was overwhelmingly composed of the group coded as '1'. The mean for gender was 1.5, indicating a nearly perfect split between males (coded as 1) and females (coded as 2). The mean education level was 2.52 on a 1-4 scale, suggesting that the average participant had an education level around that of a "Bachelor's degree" if that was the midpoint.

Table 3. Frequency distribution of scales.

	AQ	LQ	SMA
Frequency	199	200	200
Percentage	89.6	90.1	90.1
Cumulative	100.0	100.0	100.0
Percentage			

This table appears to contain errors. It lists frequencies for Aggression (AQ: 199), Loneliness (LQ: 200), and Social Media Addiction (SMA: 200) but then shows percentages (89.6%, 90.1%, 90.1%) that do not correspond to an N of 200. The values suggest a calculation error or a misunderstanding in preparing the table, as 90.1% of 200 is 180.2, not 199 or 200.

Table 4. Correlation among aggression, social media addiction and loneliness.

Variables	Aggression	Loneliness	Social media Addiction
AQ	1		
LQ		1	160
SMA			1

The correlation matrix is incomplete and contains an error. The table is meant to show the interrelationships between Aggression (AQ), Loneliness (LQ), and Social Media Addiction (SMA). A value of "160" in the LQ/SMA cell is not a possible correlation coefficient (which must range from -1 to +1), indicating a significant data entry or formatting error. The available data (only a '1' on the diagonal) shows no interpretable correlations. A proper analysis would be needed to test the hypothesized relationships.

Table 5. Standard Regression model showing impact of social media addiction on aggression.

Model	Unstandardized Coefficients		Unstandardized Coefficients		
	B	Std. Error	Beta	T	Sig
1	Constant	99.859	8.066	12.381	.000
	SMA	.107		.211	.833
R ² = .000, Adjusted R ² = -.005, F(.045) = .833 ^b , p > .05					

A simple linear regression was conducted to predict Aggression from Social Media Addiction. The regression model was not statistically significant, $*p* > .05$. Social Media Addiction accounted for none of the variance in Aggression scores ($R^2 = .000$, Adjusted $R^2 = -.005$). Social Media Addiction was not a significant predictor of Aggression ($B = 0.107$, $*p* = .833$). This finding indicates that, in this model, there is no direct significant impact of social media addiction on aggression.

Independent samples t-tests were conducted to compare scores between males and females. No significant difference was found between males ($M = 95.46$, $SD = 9.43$) and females ($M = 93.62$, $SD = 8.64$); $*t* = 1.056$, $*p* = .106$. No significant difference was found between males ($M = 48.83$, $SD = 5.68$) and females ($M = 48.68$, $SD = 4.86$); $*t* = 0.201$, $*p* =$

.386. A statistically significant difference was found, with males ($M = 84.93$, $SD = 18.10$) reporting higher levels of addiction than females ($M = 82.53$, $SD = 14.11$); $*t^* = -1.569$, $*p^* = .002$.

Table 6. Independent sample T Test for gender difference in social media addiction, aggression, and loneliness scale.

	Male		Female				95%	
Variable	M	SD	M	SD	T	P	LL	UP
AQ	95.460	9.428	93.620	8.643	1.056	.106	-1.594	5.274
LQ	48.830	5.678	48.680	4.857	.201	.386	-1.323	1.623
SMA	84.930	18.098	82.530	14.113	-1.569	.002	-8.125	.925

Note CI= Confidence interval, LL= Lower Limit, UL=Upper Limit $P > .05$

Table 7. Independent sample T test for gender difference in social media addiction, aggression, and loneliness scale.

Age	1		SD				95% CI	
Variable	M	SD	M	SD	T	P	LL	UP
AQ	94.777	12.662	91.815	6.968	.923	.357	-3.369	9.298
LQ	48.885	5.306	5.306	4.739	1.192	.235	-1.070	4.342
SMA	86.342	16.392	16.392	14.7709	-1.142	.255	-13.210	3.520

Note CI= Confidence interval ,LL= Lower Limit, UL=Upper Limit $P > .05$

This table compares two age groups (coded as 1 and 2). The formatting is confusing, with SD and mean values seemingly misplaced in the columns for Group 2. No significant difference was found between Group 1 ($M = 94.78$, $SD = 12.66$) and Group 2 ($M = 91.82$, $SD = 6.97$); $*t^* = .923$, $*p^* = .357$.

Discussion

This study aimed to investigate the impact of social media addiction on aggression and to explore the potential mediating role of loneliness among social media users. The findings present a complex outcome that primarily underscores a significant divergence from the hypothesized model, highlighting critical methodological challenges that must be addressed.

The central finding of this research is the absence of a significant direct relationship between social media addiction and aggression. The regression analysis revealed that social media addiction accounted for none of the variance in aggression scores and was not a statistically significant predictor. This result stands in contrast to a body of existing literature that suggests a positive correlation between problematic social media use and increased aggressive behaviors or tendencies (Martínez-Monteaquedo et al., 2020; Zhang et al., 2022). This discrepancy invites several interpretations. It is possible that the relationship is not direct but is instead influenced by other mediating or moderating variables not captured in this model, such as the specific type of content consumed (e.g.,

violent vs. social comparison content), the platforms used, or individual personality traits like impulsivity. Alternatively, social media addiction may lead to other outcomes, such as anxiety or depression, which could have a more indirect link to aggression.

Furthermore, the analysis of gender differences yielded one significant result: males reported higher levels of social media addiction compared to females. This finding aligns with some studies indicating that males may be more prone to certain types of addictive technology use, potentially related to online gaming, gambling, or engagement with competitive platforms (Su et al., 2020). However, it is important to note that no significant gender differences were found for aggression or loneliness, suggesting that the experience of these constructs may be more universal in this sample or that the factors driving social media addiction are distinct from those influencing aggression and loneliness.

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