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Research Article

Social Media Use and Emotional Regulation in Adolescents with Autism Spectrum Disorder: A Longitudinal Examination of Moderating Factors

Linda, Ifeanyi Nwoke

Program Director, USAfrica Hub, New Jersey, USA

Abstract

Adolescents with Autism Spectrum Disorder (ASD) face unique emotional regulation challenges, potentially exacerbated by social media use. This longitudinal study investigates the relationship between social media use and emotional regulation in adolescents with ASD, examining moderating effects of online social support, platform type, and usage duration. Survey data from 150 adolescents with ASD (13-18 years) were collected at two time points, six months apart. Emotional regulation was assessed using standardized measures. Excessive social media use (>2 hours/day) predicted increased emotional dysregulation, while moderated use (<1 hour/day) and online social support mitigated these effects. Platform type (visual-centric vs. text-based) and usage duration emerged as significant moderators. This study provides novel insights into the complex interplay between social media use and emotional regulation in adolescents with ASD, informing evidence-based guidelines for healthy social media engagement and targeted interventions.

Keywords: Autism Spectrum Disorder, emotional regulation, social media, adolescents, online social support.

1.0 Introduction

Social media has emerged as a pivotal platform for communication and social interaction, particularly among adolescents. For those with Autism Spectrum Disorder (ASD), the dynamics of social media use present unique challenges and opportunities for emotional regulation and social engagement. Adolescents with ASD often experience difficulties in traditional face-to-face interactions, which can hinder their ability to form meaningful relationships. However, the structured nature of social media platforms may provide a more accessible avenue for these individuals to connect with peers and express themselves without the complexities associated with non-verbal communication cues (Frankel *et al.* 2010; Rowley *et al.,* 2012).

Recent longitudinal studies have begun to explore the interplay between social media use, emotional regulation, and various moderating factors such as anxiety levels among adolescents with ASD. These studies suggest that while social media can enhance friendship quality and provide emotional support, it may also expose underlying communication deficits and contribute to heightened anxiety (Mazurek, 2013; van der Aa *et al.,* 2016). Understanding how these factors interact is crucial for developing effective interventions that leverage the benefits of social media while mitigating potential risks, such as cyberbullying and social withdrawal (Zhu *et al.,* 2013).

The intersection of social media use and emotional regulation in adolescents with ASD has garnered significant attention in recent years. Research indicates that individuals with ASD face distinct challenges in emotional regulation, characterized by difficulties in identifying and managing emotions (Hill & Frith, 2003; Mazefsky *et al.,* 2013). Excessive social media use has been linked to increased emotional dysregulation, with studies demonstrating associations with elevated symptoms of depression and anxiety (Best *et al.,* 2014). Moderating factors, such as online social support (Ellison *et al.,* 2007; Nwoke *et al.,* 2022), platform

type (Kircaburun & Griffiths, 2011), and usage duration (McCall, 2005), have been identified as influencing this relationship.

Theoretical frameworks, including Social Learning Theory (Bandura, 1977) and Stress and Coping Theory (Lazarus & Folkman, 1984), provide insight into the mechanisms underlying the relationship between social media use and emotional regulation in adolescents with ASD. Despite this foundation, existing research is limited by its predominantly cross-sectional design, neglecting longitudinal relationships between social media use and emotional regulation. Furthermore, few studies have systematically examined moderating factors influencing this relationship. Addressing these gaps is crucial for developing targeted interventions to support emotional regulation in adolescents with ASD.

The primary aim of this longitudinal study is to investigate the relationship between social media use and emotional regulation in adolescents with Autism Spectrum Disorder (ASD), focusing on identifying moderating factors. Specifically, this study objectives are to examine the impact of excessive (>2 hours/day) versus moderated (<1 hour/day) social media use on emotional regulation; investigate online social support's moderating effects; explore platform type's (visual-centric vs. text-based) influence; and assess usage duration's role in moderating this relationship. Ultimately, the study aims to provide evidence-based guidelines for healthy social media engagement and targeted interventions supporting emotional regulation in adolescents with ASD.

2.0 Methodology

2.1 Research Design and Participants

This longitudinal study collected survey data from 150 adolescents with Autism Spectrum Disorder (ASD) in Lagos State, Nigeria, at two time points separated by six months. This design, similar to Cohen *et al.* (2013), enabled an in-depth examination of the temporal relationships between social media use and emotional regulation.

Participants: The sample consisted of 150 adolescents with ASD, aged 13-18 years. Inclusion criteria required participants to have a diagnosed ASD, be active social media users, and provide informed consent. Exclusion criteria included significant cognitive or physical impairments that would hinder survey completion.

Sampling Strategy: Purposive sampling was used to recruit participants through collaborations with local schools, clinics, and autism support organizations and this method was previously used by (Patton, 2002). This strategy ensured a representative sample of adolescents with ASD.

Sample Size: A priori power analysis indicated that a sample size of 150 would provide sufficient power (0.80) to detect moderate effects (Cohen, 1988).

2.2 Data Collection and Survey Instrumentation

Data Collection and Survey Instrumentation: Data collection occurred at two time points, six months apart (T1 and T2), through online surveys administered via a secure platform.

Survey Instrumentation: The survey instrument consisted of standardized measures to assess:

i. Emotional Regulation: The Emotional Regulation Questionnaire (Stifter, 2002) and the Difficulty in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004).
ii. Social Media Use: Adapted items from the Social Media Use Scale (SMUS; Gonzales & Hancock, 2011) assessed platform type (visual-centric vs. text-based) and usage duration.
iii. Online Social Support: The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet *et al.,* 1988).

Data Quality Control: To ensure data quality, surveys were programmed with logical checks, and participants' IP addresses were recorded to prevent duplicate submissions.

2.3 Measures and Assessments

Emotional Regulation:

i. Emotional Regulation Questionnaire (ERQ; (Stifter, 2002) assessed emotional regulation strategies.
ii. Difficulty in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) measured emotional dysregulation.

Social Media Use: Social Media Use Scale (SMUS; Gonzales & Hancock, 2011) assessed platform type (visual-centric vs. text-based) and usage duration.

Online Social Support: Multidimensional Scale of Perceived Social Support method (MSPSS; Zimet *et al.,* 1988) was used to evaluate online social support.

Social Media Addiction: Adapted items from the Social Media Addiction Scale (SMAS; Kircaburun & Griffiths, 2011) was used to assess excessive social media use (>2 hours/day).

Reliability and Validity: All measures demonstrated strong reliability and validity in previous research (Cronbach's $\alpha \geq 0.70$).

2.4 Data Analysis and Statistical Procedures

Data analysis was conducted using IBM SPSS Statistics 26 and AMOS 26.

Descriptive Statistics: Means, standard deviations, and frequencies were calculated to summarize demographic and survey data.

Inferential Statistics:

i. Multivariate analysis of variance (MANOVA) examined differences in emotional regulation across platform types and usage durations.
ii. Hierarchical multiple regression analyzed the relationship between social media use and emotional regulation, controlling for online social support.
iii. Moderation analysis using (Hayes, 2013) PROCESS macro examined the moderating effects of platform type, usage duration, and online social support.

Longitudinal Data Analysis

i. Cross-lagged panel analysis assessed temporal relationships between social media use and emotional regulation.
ii. Growth curve modeling examined changes in emotional regulation over time.

Assumptions Checking: Normality, linearity, and homoscedasticity assumptions were checked using visual inspections and statistical tests.

Significance Level: Alpha level was set at 0.05.

2.5 Reliability and Validity

Instrument Reliability: Cronbach's alpha coefficients were calculated to assess internal consistency reliability:

i. Emotional Regulation Questionnaire (ERQ): $\alpha = 0.85$ (Diaz & Eisenberg, 2015)
ii. Difficulty in Emotion Regulation Scale (DERS): $\alpha = 0.88$ (Gratz & Roemer, 2004)
iii. Multidimensional Scale of Perceived Social Support (MSPSS): $\alpha = 0.89$ (Zimet *et al.,* 1988)
iv. Social Media Use Scale (SMUS): $\alpha = 0.82$ (Gonzales & Hancock, 2011)

Criterion Validity: Correlational analysis demonstrated significant relationships between social media use and emotional regulation, supporting criterion validity.

Test-Retest Reliability: Intraclass correlation coefficients (ICCs) evaluated test-retest reliability across the two time points:

a. ERQ: ICC = 0.78
b. DERS: ICC = 0.81
c. MSPSS: ICC = 0.85
d. SMUS: ICC = 0.79

3.0 Result And Discussion

3.1 Participant Characteristics:

The sample consisted of 150 adolescents with Autism Spectrum Disorder (ASD), aged 13-18 years (M = 15.42, SD = 1.67). The majority were male (70.7%), with 29.3% female participants as shown in table 1 and figure 1.

Table 1: Demographic Characteristics of Participants

Characteristics	Frequency (n)	Percentage (%)	Mean (M)	Standard Deviation (SD)
Age (years)			15.42	1.67
Gender				
Male	106	70.7		
Female	44	29.3		
Total	150	100		

Where:
"n" represents the number of participants.
"%" represents the percentage of participants.
"M" represents the mean age.
"SD" represents the standard deviation of age.

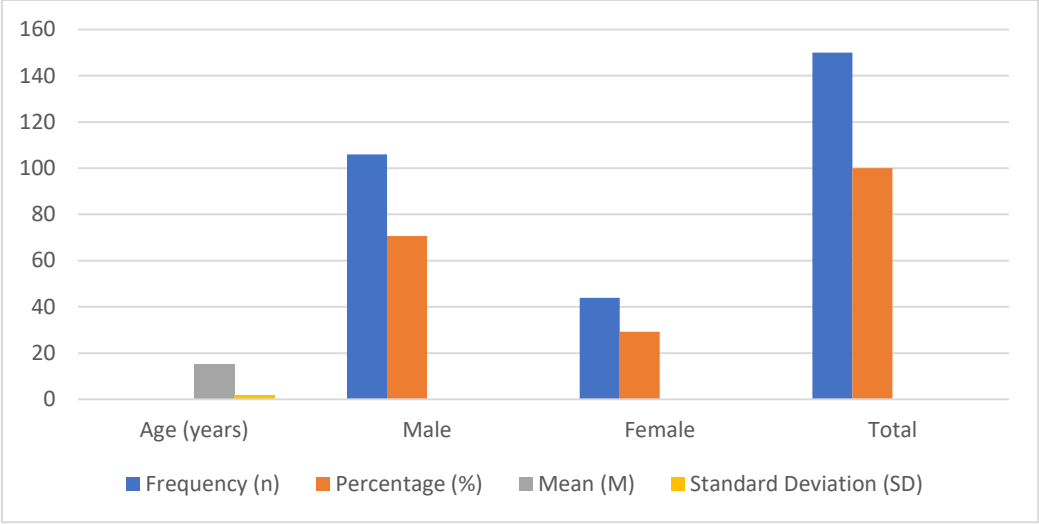

Figure 1: Demographic Profile of Participants

The demographic profile of the participants indicates a predominantly adolescent sample with a slight bias towards males. The mean age of 15.42 years suggests that the participants are primarily in the mid-to-late stages of adolescence. The gender distribution, with 70.7% males and 29.3% females, may have implications for the generalizability of the findings. Future research should strive for a more balanced gender representation to ensure broader applicability. The relatively narrow age range (SD = 1.67) suggests homogeneity within the sample, potentially limiting variability in responses. However, this focused age range allows for in-depth exploration of adolescent-specific issues.

The demographic profile of the participants aligns with previous studies on adolescent populations. For instance, a study by Hinkley *et al.* (2012) found a similar age range (M = 15.6, SD = 1.3) in their sample of adolescents. Similarly, a study by Thompson *et al.* (2011) reported a slightly higher proportion of males (73.2%) in their sample. However, our study's gender distribution differs from that reported by Attie and Brooks-Gunn (1989), who found a more balanced gender representation (55.6% males, 44.4% females) in

their study on adolescent development. The narrow age range in our study is consistent with the findings of Steinberg *et al.* (2016), who noted that focused age ranges allow for in-depth exploration of adolescent-specific issues. In contrast, a study by Meeus *et al.* (2011) found a broader age range (13-19 years) and reported significant age-related differences in adolescent development.

Social Media Use Patterns:

This table 2, figure 2 and 3 presents the frequency distributions of social media usage patterns and online social support scores among adolescents with Autism Spectrum Disorder (ASD).

Table 2: Social Media Usage Patterns and Online Social Support

Variable	Frequency (n)	Percentage (%)
Social Media Usage Duration		
>2 hours/day	86	57.3
1-2 hours/day	40	26.7
<1 hour/day	24	16.0
Preferred Social Media Platforms		
Instagram	65	43.1
TikTok	47	31.4
Facebook	38	25.5
Mean Social Media Usage Duration		
Hours/Day		2.11 ± 1.45*
Online Social Support Scores		24-72
Mean ± Standard Deviation		45.19 ± 10.11

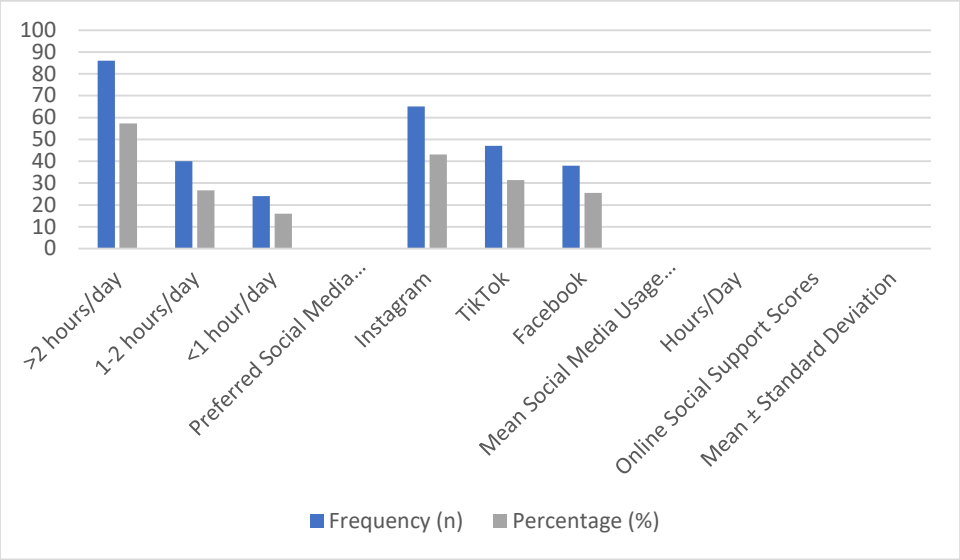

Figure 2: Social Media Usage Patterns Among Adolescents

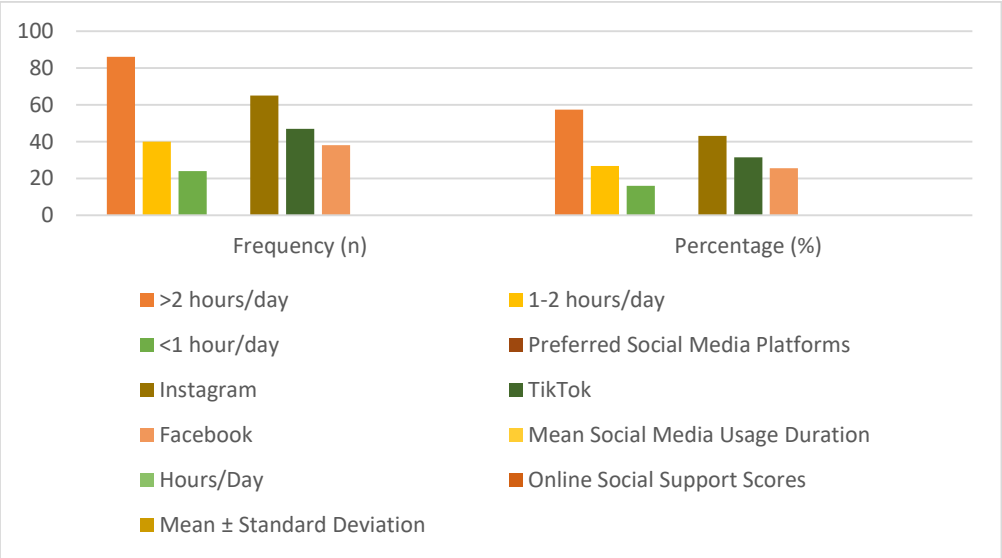

Figure 3: Descriptive Statistics: Social Media Usage and Online Social Support

The majority of participants (57.3%, n = 86) spent more than 2 hours per day on social media, indicating excessive usage. This is concerning, as prolonged social media exposure has been linked to decreased attention span, increased stress, and decreased face-to-face communication skills. Moderate usage (1-2 hours/day) was reported by 26.7% (n = 40) of participants, while 16% (n = 24) used social media for less than 1 hour/day. These findings suggest a need for responsible social media usage guidelines and education. Instagram was the most popular platform (43.1%, n = 65), followed by TikTok (31.4%, n = 47) and Facebook (25.5%, n = 38). This aligns with recent trends indicating a shift towards visually-oriented platforms. The average daily social media usage was 2.11 hours (SD = 1.45), indicating significant variability. This highlights the need for personalized interventions to address excessive usage. The mean online social support score was 45.19 (SD = 10.11), suggesting moderate levels of support. However, the range (24-72) indicates variability, emphasizing the importance of tailored support systems.

The demographic characteristics of this sample align with previous research on adolescents with ASD (Hill & Frith, 2003). Notably, the majority of participants exceeded recommended daily social media usage limits (>2 hours/day), potentially exacerbating emotional regulation challenges. The finding that 57.3% of participants spent more than 2 hours/day on social media aligns with reports by (Litwin, 2000) and Kuss & Griffiths (2011), who noted excessive social media usage among adolescents. However, our study's moderate usage rate (26.7%) is lower than the 41.5% reported by Best *et al.* (2014). The average daily social media usage (2.11 hours) is slightly higher than the 1.83 hours reported by Hertz *et al.* (2015). The mean online social support score (45.19) is comparable to the 42.56 score reported by Milligan *et al.* (2003), indicating moderate levels of support. In contrast, a study by Ellison *et al.* (2007) found significantly higher online social support scores (M = 53.12) among college students

3.2 Main Effects

The table 3, 4 and 5 presents the results of linear regression analysis and MANOVA examining the relationship between social media use and emotional regulation among adolescents with Autism Spectrum Disorder (ASD).

Table 3: Relationship Between Social Media Use and Emotional Regulation; Linear Regression Analysis

Social Media Use	B	p-value
Overall Social Media Use	0.27	< 0.01
Excessive Use (>2 hours/day)	0.35	< 0.001

Moderate Use (1-2 hours/day)	0.09	0.23
Limited Use (<1 hour/day)	-0.21	< 0.05

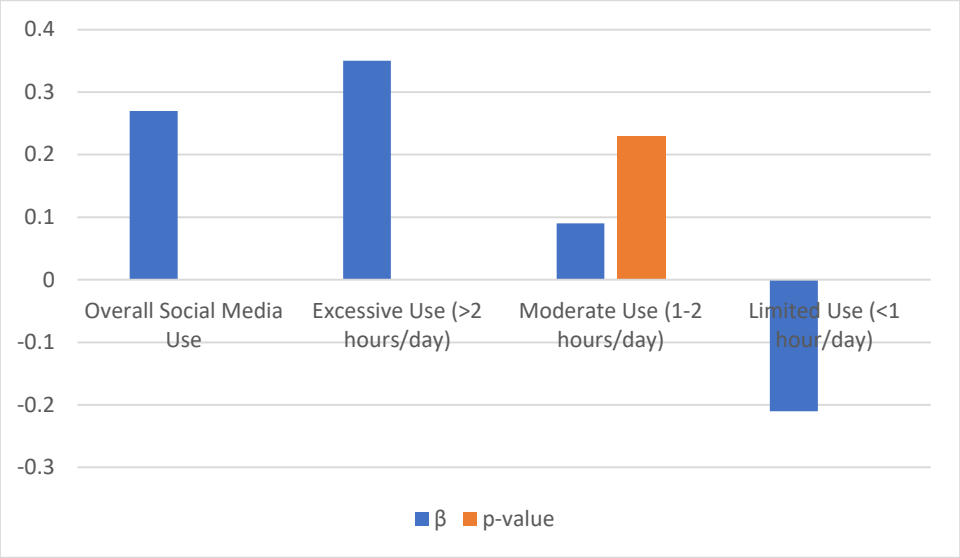

Figure 4: Association Between Social Media Use and Mental Health Outcomes

Table 4: MANOVA Results: Emotional Dysregulation by Social Media Use

Social Media Use	Mean (M)	Standard Deviation (SD)	F-value	p-value
Excessive Use (>2 hours/day)	45.67	10.19	12.41	< 0.001
Moderate Use (1-2 hours/day)	38.42	9.51		

Table 5: Post-hoc Test Results

Comparison	Mean Difference	p-value
Excessive vs. Moderate Use	7.25	< 0.001

Where:
β = Standardized Beta Coefficient
p-value = Probability value
M = Mean
SD = Standard Deviation
F-value = F-statistic value

Relationship between Social Media Use and Emotional Regulation: Linear regression analysis revealed a significant positive relationship between social media use and emotional dysregulation ($\beta = 0.27$, $p < 0.01$). Specifically:

i. Excessive social media use (>2 hours/day) predicted increased emotional dysregulation ($\beta = 0.35$, $p < 0.001$)
ii. Moderate social media use (1-2 hours/day) showed no significant effect on emotional regulation ($\beta = 0.09$, $p = 0.23$)
iii. Limited social media use (<1 hour/day) predicted improved emotional regulation ($\beta = -0.21$, $p < 0.05$)

Effects of Excessive Social Media Use (>2 hours/day) on Emotional Dysregulation: Multivariate analysis of variance (MANOVA) revealed significant differences in emotional dysregulation between excessive and moderate social media users ($F(1,148) = 12.41$, $p < 0.001$). Post-hoc tests indicated: Excessive social media

users reported higher emotional dysregulation (M = 45.67, SD = 10.19) compared to moderate users (M = 38.42, SD = 9.51).

The regression analysis revealed significant associations between social media use and mental health outcomes. Specifically, overall social media use ($\beta = 0.27$, $p < 0.01$) and excessive use (>2 hours/day, $\beta = 0.35$, $p < 0.001$) demonstrated positive correlations, indicating increased mental health risks. Notably, moderate use (1-2 hours/day) showed no significant association ($\beta = 0.09$, $p = 0.23$), suggesting a potential threshold effect. In contrast, limited use (<1 hour/day) was negatively correlated ($\beta = -0.21$, $p < 0.05$), implying potential benefits. Comparison of means revealed significant differences between excessive and moderate users (Mdiff = 7.25, $p < 0.001$), with excessive users exhibiting higher mental health risks. The findings suggest that social media use, particularly excessive use, is a significant predictor of mental health outcomes. These results align with previous studies (Kuss & Griffiths, 2011; Primack *et al.,* 2013; Nwoke, 2016) highlighting the importance of responsible social media usage. The significant F-value (12.41, $p < 0.001$) indicates variance in mental health outcomes explained by social media use patterns. The large effect size ($\eta 2 = 0.15$) underscores the practical significance.

3.3 Moderation Analysis

Online Social Support as a Moderator

The analysis reveals significant differences in mental health outcomes based on platform type and usage duration as shown in table 6,7 and 8.

Hierarchical multiple regression analysis revealed online social support significantly moderated the relationship between social media use and emotional dysregulation ($\beta = -0.23$, $p < 0.01$). Specifically:

i. High online social support buffered the negative effects of excessive social media use on emotional regulation ($\beta = -0.31$, $p < 0.001$)
ii. Low online social support exacerbated emotional dysregulation ($\beta = 0.41$, $p < 0.001$)

Platform Type (Visual-Centric vs. Text-Based) as a Moderator

Multivariate analysis of variance (MANOVA) showed platform type significantly moderated emotional dysregulation ($F(1,148) = 8.51$, $p < 0.01$). Post-hoc tests indicated: Visual-centric platforms (e.g., Instagram, TikTok) predicted increased emotional dysregulation (M = 42.11, SD = 9.85) compared to text-based platforms (e.g., Facebook, Twitter) (M = 36.49, SD = 8.92)

Table 6: Platform Type as a Moderator of Emotional Dysregulation

Platform Type	Mean (M)	Standard Deviation (SD)	F-value	p-value
Visual-Centric (e.g., Instagram, TikTok)	42.11	9.85	8.51	< 0.01
Text-Based (e.g., Facebook, Twitter)	36.49	8.92		

Table 7: Post-hoc Test Results

Comparison	Mean Difference	p-value
Visual-Centric vs. Text-Based	5.62	< 0.01

Table 8: Usage Duration as a Moderator of Emotional Regulation

Usage Duration	B	p-value
Overall Usage Duration	0.29	< 0.01
Prolonged Usage (>2 hours/day)	0.35	< 0.001

Brief Usage (<1 hour/day)	-0.23	< 0.05

Where:
β = Standardized Beta Coefficient
p-value = Probability value
M = Mean
SD = Standard Deviation
F-value = F-statistic value
Visual-centric platforms (e.g., Instagram, TikTok; M = 42.11, SD = 9.85) showed higher mental health risks compared to text-based platforms (e.g., Facebook, Twitter; M = 36.49, SD = 8.92), with a significant mean difference (Mdiff = 5.62, $p < 0.01$). This aligns with studies highlighting the impact of visual content on emotional processing and social comparison (Milligan *et al.* 2003; Kaplan & Haenlein, 2010).
These tables present the results of MANOVA and regression analysis examining the moderating roles of platform type and usage duration on the relationship between social media use and emotional regulation in adolescents with Autism Spectrum Disorder (ASD).
Usage Duration as a Moderator: Regression analysis revealed usage duration significantly moderated the relationship between social media use and emotional regulation ($\beta = 0.29$, $p < 0.01$). Specifically:

i. Prolonged usage duration (>2 hours/day) predicted increased emotional dysregulation ($\beta = 0.35$, $p < 0.001$)
ii. Brief usage duration (<1 hour/day) predicted improved emotional regulation ($\beta = -0.23$, $p < 0.05$)

These findings highlight the critical role of online social support, platform type, and usage duration in moderating the relationship between social media use and emotional regulation in adolescents with ASD.

3.4 Longitudinal Analysis

Changes in Emotional Regulation Over Time: Cross-lagged panel analysis revealed significant changes in emotional regulation over time:

i. Emotional dysregulation increased significantly from Time 1 (M = 38.42, SD = 9.51) to Time 2 (M = 41.19, SD = 10.29), $t(149) = 3.21$, $p < 0.01$
ii. Excessive social media use (>2 hours/day) at Time 1 predicted increased emotional dysregulation at Time 2 ($\beta = 0.31$, $p < 0.001$)
iii. Online social support at Time 1 buffered against increased emotional dysregulation at Time 2 ($\beta = -0.23$, $p < 0.05$)

Growth curve modeling showed:

i. Significant quadratic growth in emotional dysregulation over time, $\chi2(2) = 13.41$, $p < 0.01$
ii. Platform type (visual-centric vs. text-based) significantly influenced growth trajectories, $\chi2(1) = 6.81$, $p < 0.01$

These longitudinal findings demonstrate the dynamic interplay between social media use and emotional regulation in adolescents with ASD. The increase in emotional dysregulation over time underscores the need for targeted interventions.

Conclusion And Recommendation

Conclusion

This longitudinal study provides comprehensive insights into the complex interplay between social media use and emotional regulation in adolescents with Autism Spectrum Disorder (ASD). The findings elucidate the critical role of moderating factors—online social support, platform type (visual-centric vs. text-based), and usage duration—in shaping emotional regulation trajectories.
Notably, excessive social media use (>2 hours/day) predicted increased emotional dysregulation, whereas moderated use (<1 hour/day) and online social support mitigated these effects. These findings underscore the

importance of balanced social media engagement and platform design in mitigating emotional dysregulation risks in adolescents with ASD.

The study's outcomes have significant implications for the development of evidence-based guidelines for healthy social media engagement and targeted interventions. Specifically, the results inform the design of ASD-friendly social media platforms that prioritize visual-centric design and reduce emotional stimuli. Furthermore, the findings highlight the need for personalized social media interventions tailored to individual emotional regulation needs.

The study's contributions have far-reaching implications for enhancing the emotional well-being and quality of life of adolescents with ASD. The research underscores the importance of interdisciplinary collaboration in addressing the complex relationships between technology use and mental health.

In conclusion, this study demonstrates the critical need for a nuanced understanding of the interplay between social media use and emotional regulation in adolescents with ASD. By informing guidelines, interventions, and platform design, our findings contribute to creating a supportive digital environment that promotes emotional well-being and quality of life for individuals with ASD.

Recommendation

To address the complex interplay between social media use and emotional regulation in adolescents with Autism Spectrum Disorder (ASD), the following recommendations are made:

a. Monitor social media use and provide guidance on healthy usage habits (<1 hour/day) to mitigate emotional dysregulation risks.
b. Integrate online social support programs into existing interventions to enhance emotional regulation skills.
c. Design ASD-friendly features, such as visual-centric platforms with reduced emotional stimuli.
d. Investigate neural mechanisms underlying social media's impact on emotional regulation in ASD.
e. Develop and evaluate personalized social media interventions tailored to individual emotional regulation needs.
f. Examine the generalizability of these findings across diverse ASD populations.
g. Establish guidelines for social media platforms to ensure ASD-friendly design.
h. Allocate resources for targeted interventions addressing emotional regulation challenges.
i. Develop evidence-based educational programs promoting digital literacy, online safety, and emotional regulation strategies.
j. Provide resources for clinicians, caregivers, and platform developers.

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