

Navigating the Digital Landscape: Examining Screen Usage, Digital Stress, and Academic Attention in Adolescent Girls

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Abstract

Digital devices are now a regular part of adolescent education, communication, and leisure. This increased use has raised concerns about cognitive overload, stress, and attention. The present study examined the relationships among screen usage, digital stress, and academic attention in 230 adolescent girls aged 13 to 17 years. A quantitative, non-experimental, cross-sectional survey design was used. The Smartphone Addiction Scale–Short Version (SAS-SV), Digital Stress Scale, and Mindful Attention Awareness Scale–Adolescents (MAAS-A) were administered. Pearson correlation and multiple linear regression were used for analysis. Participants showed moderate levels of digital stress, academic attention, and smartphone usage. Digital stress had a weak positive relationship with academic attention, $r = .146$, $p = .027$. Smartphone usage was not significantly related to academic attention, $r = .051$, $p = .437$, or digital stress, $r = -.096$, $p = .146$. The regression model was not statistically significant, $F(2, 227) = 2.98$, $p = .053$, and explained 3% of the variance in academic attention. Digital stress was a significant predictor within the model, but its practical contribution was small. Smartphone usage was not a significant predictor. The findings suggest that the effects of digital technology cannot be understood by screen duration alone. The nature and quality of digital engagement may be more important. Other factors, including self-regulation, academic pressure, sleep, motivation, and the school environment, may also influence academic attention.

Keywords: adolescents, adolescent girls, digital stress, smartphone usage, academic attention, screen usage, self-regulation, digital engagement.

1. Introduction:

Digital technology has changed how people learn, communicate, and spend their leisure time. For adolescents, smartphones and other screen-based devices are used for education, social interaction, identity development, emotional expression, and entertainment. The use of online learning platforms and virtual classrooms has increased the academic role of digital devices. At the same time, social media, gaming, streaming, and other online activities have increased recreational screen exposure. This combination has raised concerns about possible psychological, emotional, and cognitive effects.

Adolescence is an important period of biological, emotional, and cognitive development. Executive functions such as sustained attention and impulse control continue to develop during these

years. Adolescents may therefore be more sensitive to immediate rewards, notifications, and other forms of digital stimulation. Adolescent girls may also experience pressures related to social approval, appearance, and peer comparison. Online standards of beauty and popularity can create anxiety and emotional strain. These experiences may affect academic concentration and confidence.

2. Theoretical Framework

Cognitive Load Theory provides one way to understand the possible effects of digital environments. Working memory has limited capacity. When learners receive too much information at the same time, learning and attention may be affected. Digital notifications, multimedia content, and media multitasking can increase this load.

Attention Restoration Theory suggests that sustained cognitive effort can produce mental fatigue. Periods of mental rest may therefore be necessary for attention to recover. Continuous digital engagement may reduce opportunities for such recovery.

Social Comparison Theory is also relevant to adolescent digital experiences. Social media often presents idealized images of peers and lifestyles. Comparing oneself with these images may reduce self-esteem and academic confidence. Self-Regulation Theory further suggests that frequent exposure to immediate rewards can make it harder to control thoughts and behaviours in pursuit of long-term goals. Ecological Systems Theory adds a broader view. Digital technology has become part of the environments in which adolescents develop, including family, school, and peer settings.

The Present Study

Many studies have examined screen use and mental health separately. Fewer studies have considered screen usage, digital stress, and academic attention together among adolescent girls. The present study therefore examined whether screen usage and digital stress were related to academic attention and whether these variables could predict academic attention.

3. Method

Research Design

The study used a quantitative, non-experimental, correlational research design. A cross-sectional survey was conducted, and data were collected at one point in time. The design allowed relationships among the variables to be examined without manipulating them.

Participants

The sample included 230 adolescent girls between 13 and 17 years of age. They were studying in middle and higher secondary classes. Convenience sampling was used. Participation was based on availability and willingness to respond. Students were included if they were enrolled in regular schooling and could complete the questionnaires. Students with severe psychiatric or neurological conditions were excluded.

Measures

Three standardized measures were used. The Smartphone Addiction Scale–Short Version (SAS-SV) assessed smartphone use and problematic engagement. Its reported reliability was $r = .85$. The Digital

Stress Scale assessed psychological strain related to experiences such as fear of missing out and approval anxiety. Its reported reliability was $r = .81$. The Mindful Attention Awareness Scale–Adolescents (MAAS-A) assessed present-moment attention and academic attention. Its reported reliability was greater than .80.

Procedure

Permission was obtained from the relevant school authorities. Informed consent and assent were obtained from parents and participants. The questionnaires were administered in paper-and-pencil form during school hours. Participants were informed that their responses would remain confidential and anonymous.

Statistical Analysis

Descriptive statistics were calculated for the study variables. Pearson correlation was used to examine relationships among digital stress, academic attention, and smartphone usage. Multiple linear regression was used to examine whether digital stress and smartphone usage predicted academic attention.

4. Results

Descriptive Statistics

Variable	M	SD	Min	Max
Digital Stress	48.33	5.47	36	66
Academic Attention	52.38	6.53	37	68
Smartphone Usage	35.13	5.37	19	48

Note. M = mean; SD = standard deviation.

Correlations

Variable	Digital Stress	Academic Attention	Smartphone Usage
Digital Stress	—	.146*	-.096
Academic Attention	.146*	—	.051
Smartphone Usage	-.096	.051	—

Note. $p < .05$.

Multiple Linear Regression

Predictor	B	SE	t	p
Constant	40.79	4.95	8.24	< .001
Digital Stress	0.18	0.08	2.31	.022
Smartphone Usage	0.08	0.08	1.00	.316

Note. $R = .16$, $R^2 = .03$, adjusted $R^2 = .02$, $F(2, 227) = 2.98$, $p = .053$.

The participants showed moderate levels of digital stress, academic attention, and smartphone usage. The significant correlation between digital stress and academic attention was weak and positive, $r = .146$, $p = .027$. Smartphone usage was not significantly related to academic attention, $r = .051$, $p = .437$. It was also not significantly related to digital stress, $r = -.096$, $p = .146$. Thus, most of the study variables showed limited association.

The overall regression model was not statistically significant, $F(2, 227) = 2.98$, $p = .053$. The model explained 3% of the variance in academic attention. Digital stress was a significant predictor within the model, $p = .022$, but its contribution was small. Smartphone usage was not a significant predictor, $p = .316$.

5. Discussion

The main purpose of this study was to examine the relationships among screen usage, digital stress, and academic attention in adolescent girls. The findings present a more complex picture than the common belief that greater screen use automatically reduces attention. The participants reported moderate levels of digital stress, academic attention, and smartphone usage. However, smartphone usage was not significantly related to academic attention.

Screen Time and Academic Attention

The absence of a significant relationship between smartphone usage and academic attention, $r = .051$, $p = .437$, challenges the assumption that the amount of screen exposure alone determines academic focus. Digital devices can support learning as well as create distraction. Students may use the same device for online classes, academic research, communication, entertainment, and social media. These different uses may have different effects on attention.

The findings therefore support a shift from measuring screen time alone to examining the quality and purpose of digital engagement. A high level of device use does not necessarily mean that the student is disengaged from learning. Educational activities may contribute to the total amount of screen use while also supporting academic attention. In contrast, certain online activities may be distracting even when they occupy less time.

Digital Stress and Academic Attention

A weak positive relationship was found between digital stress and academic attention, $r = .146$, $p = .027$. This result was unexpected because stress is commonly associated with poorer functioning. The small effect means that the finding should be interpreted cautiously. One possible explanation is that adolescents who are highly alert to digital feedback may also be highly attentive to academic demands.

Social approval may be important in both digital and academic settings. Adolescents who are sensitive to social feedback may also place strong importance on academic performance. However, this interpretation is only a possible explanation. Other factors, such as academic pressure, motivation, conscientiousness, and self-regulation, may influence this relationship. Digital stress should still be viewed as a psychological burden because continued exposure to online demands may contribute to emotional exhaustion.

Smartphone Usage and Digital Stress

Smartphone usage was not significantly related to digital stress, $r = -.096$, $p = .146$. This finding suggests that longer smartphone use does not automatically produce greater digital stress. Stress may depend more on the type of online experience than on the amount of time spent online.

For example, social comparison, fear of missing out, online evaluation, and repeated notifications may create stress even during a short period of use. In contrast, activities such as gaming or watching videos may sometimes be used for relaxation. The present findings therefore support the view that digital stress is influenced by the nature of online experiences rather than by duration alone.

Predictive Value of the Variables

The regression findings further demonstrate the limited predictive value of the variables studied. The overall model was not statistically significant, $p = .053$, and accounted for only 3% of the variance in academic attention. Although digital stress was statistically significant as an individual predictor, its practical contribution was small. Smartphone usage did not significantly predict academic attention.

Academic attention is likely to be influenced by many factors. These may include cognitive abilities, self-regulation, sleep, motivation, academic pressure, family relationships, peer influences, and the physical learning environment. Digital technology is only one part of this wider developmental context. From an ecological perspective, adolescents develop within several interacting systems. Digital technology is now one of these systems, but it does not operate in isolation.

Developmental and Gender-Specific Considerations

The focus on adolescent girls is important because adolescence involves continuing development of executive control and increased sensitivity to social evaluation. Online feedback may affect how some girls view themselves and their social standing. However, the present results do not show strong evidence of widespread digital dependence or major attentional decline. The mean scores for digital stress and smartphone usage were moderate.

Overall, the findings suggest that concerns about the effects of digital technology should not be based only on screen duration. Digital stress showed a stronger relationship with attention than smartphone usage, but even this relationship was weak. Interventions may therefore be more useful when they address online vigilance, approval anxiety, self-regulation, and healthy patterns of digital engagement rather than relying only on strict screen-time limits.

6. Conclusion

The study found weak and limited relationships among screen usage, digital stress, and academic attention in adolescent girls. Smartphone usage was not significantly related to academic attention or digital stress. Digital stress showed a weak positive association with academic attention and was a statistically significant predictor within the regression model, although its practical effect was small. The overall regression model was not statistically significant and explained only 3% of the variance in academic attention.

These findings suggest that screen time should not be treated as a single measure of digital impact. Greater attention should be given to the quality, purpose, and psychological meaning of digital engagement. Broader factors that influence adolescent attention should also be considered.

7. Limitations and Future Directions

The study has several limitations. Convenience sampling limits the generalizability of the findings. The sample included only adolescent girls, so the results cannot be assumed to apply to boys or to the wider adolescent population. The cross-sectional design also prevents conclusions about cause and effect. In addition, self-report measures may be affected by recall or response bias.

Future studies should use longitudinal designs to examine how digital stress, smartphone use, and academic attention change over time. Research should also include more diverse samples and both genders. Future work could examine sleep, academic pressure, motivation, self-regulation, and the specific purpose of digital use. Comparing educational, social, gaming, and entertainment activities may provide a clearer understanding of how digital engagement affects adolescent attention and well-being.

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