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HOW CHRONIC SCREEN EXPOSURE RESHAPES ATTENTION, MEMORY AND EMOTIONAL PROCESSING

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Abstract

Objective

The purpose of this study is to investigates the effect of chronic screen exposure on attention, memory, and emotional processing among adolescents aged 13–18 years.

Methods

The study used a quantitative cross-sectional design to gather data from 101 adolescents who completed a structured questionnaire. The study assessed three different screen usage patterns which showed how screen time affected cognitive performance and emotional reactions and the user's actual experience of using screens. The study calculated composite scores before performing data analysis with SPSS through four different statistical tests which included Spearman correlation and linear regression and independent samples t-test and one-way ANOVA.

Findings

The research results show that longer screen time leads to more severe attention problems which were measured by an attention difficulty scale ($r = 0.511$, $p < 0.01$). The research results show that different content types lead to different effects which impact both attention and memory and emotional processing ($p < 0.05$). Perceived impact of screen use serves as a strong predictor for memory difficulties ($R^2 = 0.508$, $p < 0.001$) because adolescents understand how screens affect their memory abilities.

Implications

The study demonstrates that adolescents need digital screen time balance because they should manage their screen time while choosing their content.

Originality

The study provides an integrated perspective by examining screen time, content type, and perceived impact within a single framework, offering insights into adolescent cognitive and emotional development in the digital age.

Keywords: Screen Exposure, Adolescents, Attention, Memory functioning, Emotional processing.

1. Introduction

1.1 Background of the study

Digital technology has progressed at an extremely fast pace throughout the last twenty years which has brought about complete changes to how adolescents experience their growth period(Benvenuti et al., 2023). Young people today experience more screen time than ever before because smartphones and tablets and internet platforms have become widely accessible(Andersson, 2022; George et al., 2023). Adolescents today use screens for their daily activities because they need to watch content and study materials and stay in touch with others and build their social connections through digital media platforms which have become essential for their everyday routines(Weinstein & James, 2022). The

rising use of digital devices has created major problems which scientists must study because these devices affect how adolescents develop their cognitive and emotional skills during their crucial brain development period which includes maximum brain growth and high brain plasticity (Bastos Depianti et al., 2025).

The new evidence shows that people who watch screens for long periods will experience changes in their basic cognitive function because their ability to maintain attention will be affected(George et al., 2023). The digital environment creates two main problems because it delivers information at high speeds and lets users perform multiple tasks while receiving continuous alert sounds which interrupt their ability to concentrate for long times(Leonhardt et al., 2025). Research demonstrates that people who watch screen-based media more often will experience greater difficulty maintaining focus and they will show decreased ability to concentrate and their executive functions will suffer (Kundra et al., 2026). The study results show that adolescents who spend more time watching screens will perform worse on tests that measure their ability to pay attention because digital devices will disrupt their ability to focus (Jourdren et al., 2023). The results demonstrate that excessive digital stimulation leads to alterations in brain regions which control attention and cognitive functions.

The growing reliance on digital devices for storing and retrieving information has led to changes in how individuals encode, retain, and recall information(Pooja, 2025). People who use screens excessively lose their ability to think actively which results in problems for both memory consolidation and memory retrieval (Călinescu, 2024). The study found that children and adolescents experience working memory deficits because they watch screens too much which also makes it harder for them to learn and adapt to new situations (Liu, 2022). Digital media use triggers two main factors which make these effects worse: people who use media tend to multitask and they process information at shallower levels.

Emotional processing and regulation show dependency on screen exposure because it serves as an essential factor. Adolescents undergo greater emotional susceptibility because their brain regions responsible for emotional control, which include the prefrontal cortex and amygdala, continue to develop. The research findings indicate that extended time spent on digital media, particularly through social media networks, leads to higher levels of anxiety and depression as well as stress and emotional instability (Verma, 2025). Social media platforms allow users to interact with content while comparing themselves to others, which causes people to judge themselves negatively and compare themselves to others, resulting in emotional reactions that harm their mental health (Paulus et al., 2023). The research demonstrates that excessive screen time leads to emotional regulation problems and decreased stress management abilities, which shows how screen time affects adolescents' emotional stability (Hanly, 2025).

People choose different types of content to watch because their screen time activities because their screen time activities different from their actual screen time usage. The research shows that digital media effects exhibit different patterns because they depend on how content is created and what content actually contains. Educational and interactive content helps people develop cognitive skills which include reasoning and problem-solving when used in moderation and with proper guidance (Benjamin, 2025). People who passively watch entertainment content or who spend too much time on social media and gaming platforms will People who passively watch entertainment content or who spend too much time on social media and gaming platforms will experience negative effects on their cognitive abilities

and emotional well-being because these activities lead to shorter attention spans and higher levels of emotional distress (Shanmugasundaram & Tamilarasu, 2023). The research findings show that screen exposure requires assessment through both quantity and quality measurements because these two factors together determine all screen exposure effects (Puzio et al., 2022).

The effects of excessive screen exposure have been studied through biological and neurophysiological mechanisms which study believe explain these effects(Lopes, 2024). The research shows that extended screen time leads to sleep disturbances and circadian rhythm changes and increased stress hormone production which together create negative effects on cognitive abilities and emotional control (Chen et al., 2022). The increased sensory stimulation from digital media consumption leads to brain structural and functional changes which result in alterations of gray and white matter that affect cognitive and emotional functions (Hutton et al., 2024). The research demonstrates that extended screen time creates lasting effects which impact both brain development and mental health outcomes(Nagata et al., 2024).

The existing research has not yet established a clear relationship between screen exposure and its effects on cognitive and emotional performance. Some studies report negative effects, whereas other studies show potential advantages that have no significant effect because their determination depends on usage patterns and individual differences and environmental influences. This finding was established in the research conducted by(Paulus et al., 2023). The study requires more research because its results need to consider both screen time and different media content that people watch.

The research investigates how adolescents aged 13 to 18 years watch screens throughout their daily activities because study want to know how different types of screen content affect their ability to concentrate, remember things, and handle their emotions. The study employs a holistic research method to achieve better understanding of how people use digital media in modern society which affects their cognitive abilities and emotional responses.

1.2 Problem Statement

The contemporary studies have not determined how screen time affects adolescent learning abilities and emotional health despite digital devices becoming common in the daily activities of teenagers. The research indicates that people who spend too much time watching screens experience two outcomes which are shorter attention spans and memory problems and increased anxiety and mood swings (Neophytou et al., 2021). The research shows that educational digital content offers students cognitive advantages while interactive content benefits learning however, the research shows that students who watch screens passively or excessively face negative effects which prevents research from reaching an overall conclusion about screen time effects. The existing research mainly centers on early childhood development while there exists a research gap about how 13 to 18 year olds develop during their formative years which includes crucial changes in their attention, memory and emotional control abilities. The studies need to conduct a comprehensive investigation that studies how adolescents experience screen time and different types of content which affect their ability to focus and remember and process emotions.

1.3 Significance of the study

The research study demonstrates its importance because it helps people understand how chronic screen time affects both cognitive abilities and emotional responses in teenagers who live in today's more computerized world. The research study examines digital media effects on child development by

studying two aspects of screen time which include how much time people spend watching screens and what specific content they choose to watch. The research results show practical value to three groups which include educators and parents and policymakers. The study provides educators with information about how students' screen usage patterns impact their ability to focus and remember information which will help them create better educational methods. The study provides parents with scientific guidance about how to control their children's screen time while supporting their development of better digital usage patterns. The research findings establish guidelines which help policymakers create standards that protect people from cognitive and emotional harm caused by excessive screen time(Santos et al., 2023). The research study expands academic knowledge about digital media effects through its exclusive study of young people which examines their screen time habits through both numerical data and personal accounts of their screen time experiences.

1.4 Objectives of the study

The main aim of the study is to investigate the effect of chronic screen exposure on attention, memory, and emotional processing among adolescents aged 13–18 years.

The objective of the study is as follows:

1. To examine the effect of screen time on attention among adolescents.
2. To analyze the impact of screen time on memory functioning.
3. To assess the influence of screen time on emotional processing.
4. To evaluate the effect of content type on attention, memory, and emotional processing.

1.5 Research Questions

1. Does screen time significantly affect attention among adolescents?
2. What is the effect of screen time on memory functioning among adolescents?
3. How does screen time influence emotional processing among adolescents?
4. Does the type of content consumed significantly affect attention, memory, and emotional processing among adolescents?

2. Literature Review

Current research investigates how digital technology impacts human cognitive and emotional development because digital technology now spreads worldwide at an accelerated pace. The growing concern about screen exposure among adolescents developed because it creates dangerous effects on their ability to focus, remember, and regulate their emotions.Excessive and unregulated digital media usage leads to developmental problems even though digital media provides users with learning and social connection opportunities. The existing literature shows contradictory results which require to understand how screen time and screen content exposure affect adolescent development in a detailed manner.

2.1 Screen time and attention

Attention functions as a core cognitive ability which essential to both educational processes and student achievement. People who consume digital media through fast-moving content that contains high levels of stimulation will develop different patterns of attention according to research. The first studies show that people who watch audiovisual content will develop attentional problems because their brains learn to anticipate quick changes which decreases their capacity to remain focused on tasks that require slow-paced work (Christakis et al., 2018).

Theoretical research shows that people in digital environments face constant information flow which makes them pay attention to multiple tasks at once. This practice results in diminished ability to maintain their focus and control their cognitive functions. The study results prove that teenagers who spend more time looking at screens will show lower capacity to concentrate which will result in worse performance on tests that measure their ability to focus (Poujol et al., 2022). Neurophysiological research proves that people who watch screen media for long periods show changes in brain activity patterns which affect their ability to pay attention (Zivan et al., 2019). The research results demonstrate that people who watch screens for long periods develop patterns of attention which lead to their ability to focus on external things being disrupted.

2.2 Screen time and Memory Functioning

Memory functioning, which includes processes such encoding and storage and information retrieval, gets affected by screen time. Research indicates that early and excessive exposure to screens may reduce opportunities for active cognitive engagement and social interaction, both of which are essential for memory development (NASIRI, 2023). The displacement of cognitively demanding activities through passive screen watching leads to decreased memory consolidation.

People who spend too much time watching screens experience sleep disturbances which affect their ability to remember information. People who spend extended periods looking at screens experience sleep problems which disrupt their brain functioning for learning and memory retention (Lissak, 2018). People who continuously use digital media from a neurodevelopment standpoint experience permanent changes to their brain development through constant sensory input which affects their cognitive abilities (Neophytou et al., 2021). Recent studies demonstrate that people who spend too much time using digital devices experience detrimental effects on their executive functions which include working memory and cognitive flexibility needed for academic achievement (Maeneja et al., 2025). The research findings demonstrate that screen time affects memory through two separate processes which include direct brain effects and changes in how people behave and their body functions.

2.3 Screen Time and Emotional Processing

Digital media usage now impacts two essential components which develop during adolescence. The research established a connection between excessive screen time and various emotional and psychological disorders which include anxiety and depression and mood instability (Nakshine et al., 2022). Digital platforms create an immersive experience which users find difficult to resist and this leads to emotional dependency and people lose their capacity to manage their emotions.

Social media platforms have increased their effects because teenagers witness carefully chosen portrayals of other people's lives which leads them to evaluate themselves against others. Research shows that screen time affects social understanding because it decreases empathy and harms social relationships while creating more behavioral issues (Madi, 2025).

People who study screen behavior and emotional control have shown that screen time creates emotional problems which people who experience emotional difficulties use screens to cope with their distress (Hanly, 2025). The study found that emotional distress acts as a link between screen time and problems with attention because people demonstrate a connection between their emotional and cognitive abilities (Hernandez, 2025). The results demonstrate that screen time affects emotional functioning through multiple complex pathways.

2.4 Role of Content Type in Cognitive and Emotional Outcomes

The length of time spent using screens matters, but the specific content that people watch has a greater impact on their results. Research shows that screen time does not pose total danger because its effects depend on content that people watch and their viewing objectives. Educational and interactive media, when used appropriately, can enhance cognitive skills such as reasoning, problem-solving, and learning (Kiragu & Waitamba, 2025).

The study found that people who passively watch entertainment shows and spend too much time on social media and video games, face two main problems which include shorter attention spans and greater emotional distress (Panjeti-Madan & Ranganathan, 2023). The research demonstrates that screen time affects people differently based on the interactive abilities and pacing speed of content as well as their personal traits and environmental conditions (Dewi et al., 2025).

Theoretical frameworks which extend beyond their current boundaries require to study digital media through social and environmental elements which shape human development. The study results demonstrate that understanding screen time effects requires to assess both how much time people spend watching screens and the content quality of their viewing material.

2.5 Neurobiological and Developmental Perspectives

Recent developments in neuroscience research have offered scientists new understanding of how screen time affects human biological processes. Studies show that extended digital media consumption leads to neuroinflammatory brain damage which affects cognitive control and emotional regulation functioning (Verma et al., 2025).

People who watch screens too much during important growth stages their brains develop structural changes because their gray matter and white matter increase, which results in cognitive and emotional problems (Manwell et al., 2022). The concept of neuroplasticity further suggests that repeated exposure to digital environments will shape neural pathways, which will create permanent changes in how people process information (de Barros, 2024).

The rising presence of digital devices has been growing faster than scientists can study their extended developmental impacts thus requiring ongoing research for this subject (Clemente-Suárez et al., 2024). The research results demonstrate that screen time exposure affects both behavioral development and fundamental biological mechanisms in test subjects.

2.6 Research Gap

The research about screen time and its psychological effects on people has produced extensive results yet there are still important research areas that need to be studied. First, most studies in the current body of research concentrate on early childhood development while only a few studies investigate how adolescents develop their attention skills and memory capabilities and emotional control abilities between the ages of 12 and 18(Sapsaglam & Birak, 2023). Second, the existing research findings show contradictory results because some studies show negative outcomes, whereas other studies reveal possible positive results, which create a need for research that examines specific local contexts.

The third point shows that numerous studies have investigated screen time as an isolated factor yet failed to assess how different content types affect digital media usage because research shows that various digital media types produce different results on cognitive and emotional development (Panjeti-Madan & Ranganathan, 2023). The current research field lacks studies which investigate multiple

cognitive domains together with emotional processing through a unified research framework. The growing use of digital technology by adolescents has progressed faster than scientists can study its long-term effects which creates a gap between real-life exposure and scientific knowledge about digital technology's lasting effects (Clemente-Suárez et al., 2024). The study will fill existing research gaps by showing how screen time and content type affect adolescent attention and memory and emotional processing.

2.7 Conceptual Framework

The research study demonstrates that adolescents who use digital media create crucial pathways which help them build their cognitive skills and emotional development (Figure 1). Screen exposure extends beyond its basic definition to include two separate components which measure screen time and assess content type through its quality of engagement. The study components function as fundamental factors which influence both attention memory cognitive processes and emotional information processing. The study framework demonstrates that continuous screen time functions as the main element which determines three different dependent variables: attention memory functioning and emotional processing. People use screen time to measure the duration of their content viewing while content type predicts how viewers will experience emotional and mental reactions to the material. The two components of adolescent information processing together with their emotional management capacities and their cognitive abilities create their learning process.

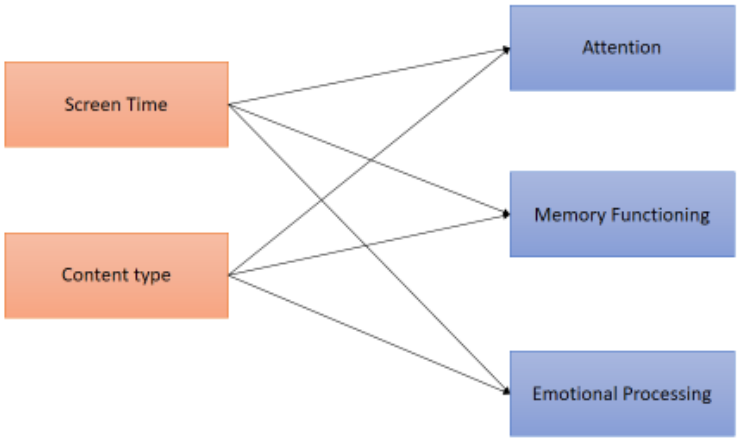

Figure 1 Conceptual Framework

The framework receives backing from dual cognitive and neuro developmental fields which show that digital stimulation leads to excessive digital interruption which breaks attention systems and prevents deep information processing and blocks emotional control (Clemente-Suárez et al., 2024).

2.8 Hypothesis Development

The research hypotheses of this study develop from both empirical evidence and theoretical evidence which examines the connection between screen time and its cognitive and emotional effects.

2.8.1 Screen Time and Attention

Attention functions as the primary cognitive system which permits people to concentrate on important data while ignoring all other stimuli. The research findings show that people who watch digital media content for extended periods will experience difficulty focusing their attention because their ability to concentrate will begin to decline. The brain develops a preference for brief activities instead of extended concentration which results from continuous task switching and fast-paced information exposure (Firth et al., 2019).

Empirical studies have found that adolescents who spend more time watching screens show greater levels of inattentiveness and perform worse on tasks (Poujol et al., 2022). Excessive sensory stimulation from screen-based media has been shown to create cognitive and behavioral deficits that affect attention span (Christakis et al., 2018). The evidence shows that increased screen time will have a negative impact on attention span.

H_{01}: Screen time has no significant effect on attention among adolescents.
H_{11}: Higher screen time significantly reduces attention among adolescents.

2.8.2 Screen Time and Memory Functioning

Memory functioning serves as a vital component that enables learning and information retention while supporting academic performance. Excessive screen exposure decreases chances for active cognitive engagement which results in complete memory consolidation failure. Research shows that people who depend on digital devices for information storage face changes in their memory processes which results in decreased ability to remember information (Neophytou et al., 2021).

Excessive screen time leads to sleep pattern disturbances which disrupt both memory consolidation and cognitive functions according to research (Lissak, 2018). The study found that adolescents who spent more time using digital technologies experienced declines in both working memory and cognitive flexibility according to the study (Maeneja et al., 2025). The research study proposes that increased screen time will lead to memory impairments based on the evidence from their research.

H_{02}: Screen time has no significant effect on memory functioning among adolescents.
H_{12}: Higher screen time significantly impairs memory functioning among adolescents.

2.8.3 Screen Time and Emotional Processing

Emotional processing describes how people handle their emotions by first understanding their feelings and then managing their emotional states. The ongoing brain development process makes adolescents more vulnerable to emotional experiences. The research conducted by (Nakshine et al., 2022) demonstrated that people who spent excessive time on social media and interactive platforms experienced higher levels of emotional distress and anxiety and mood disturbances.

The interactive functions of digital platforms work together with their comparative capabilities to create conditions that lead users to assess themselves negatively while experiencing emotional instability (Verma et al., 2025). Research shows that screen time affects emotional regulation in two ways because increased screen use results in emotional difficulties yet screen time also creates emotional challenges for users. The research findings show that people who spend more time watching screens demonstrate changes in their ability to process emotions.

H_{03}: Screen time has no significant effect on emotional processing among adolescents.
H_{13}: Higher screen time significantly affects emotional processing among adolescents.

2.8.4 Content Type and Psychological Outcomes

The content people watch has greater effects on their cognitive development and emotional response than their total screen time. Research demonstrates that educational interactive content improves users' cognitive abilities through correct usage of its material (Kiragu & Waitamba, 2025).

The study demonstrates that prolonged viewing of entertainment content which includes social media and gaming platforms leads to shorter attention spans and greater emotional distress (Panjeti-Madan & Ranganathan, 2023). Research shows that screen time impacts different results based on the nature of content being viewed and the specific situation in which viewing occurs (Dewi et al., 2025). The research expects different content types to produce distinct effects on attention abilities and memory function and emotional processing.

H_{04}: Type of content consumed has no significant effect on attention, memory, or emotional processing among adolescents.
H_{14}: Type of content consumed significantly affects attention, memory, and emotional processing among adolescents.

3. Research Methodology

3.1 Research design

The current research uses a quantitative research design to study how extended screen time affects attention and memory and emotional processing in adolescents. A cross-sectional survey approach was employed, wherein data were collected at a single point in time using a structured questionnaire. The research design allows to study how screen time and content type together affect cognitive-emotional results. The study uses a descriptive and correlational research framework which allows to describe how adolescents use screens while they study the relationship between screen time and their attention and memory and emotional processing abilities.

3.2 Sample size and Techniques

The study included 101 adolescents who were between 13 and 18 years old as research participants. The study used convenience sampling to select participants because they chose respondents who were easily accessible and willing to take part in the study. The sample includes students from different grades and educational backgrounds, which enables to study different screen usage patterns and various behavioral reactions. The research used convenience sampling because it restricts research findings but enables to conduct exploratory studies while obtaining valuable data about trends and relationships that exist within their target group.

3.3 Study area

The research study focused on Indian adolescents as its primary subject. The participants were selected from schools located in this region, representing primarily urban and semi-urban settings where digital device usage is highly prevalent. The research area was selected because adolescents in the region have easy access to smartphones and digital media which enables researchers to study their screen time patterns and resulting effects on cognitive and emotional development.

3.4 Research Instruments

The research employed a structured questionnaire which was designed to evaluate screen viewing patterns of individuals and their resulting effects on attention span and memory retention and emotional processing capabilities. The questionnaire contained multiple parts which required participants to provide their demographic details and report their screen time habits while the scales assessed their ability to pay attention and remember information and process emotions and their perceived effects of screen time. The instrument used Likert-scale items which measured attention through five-point scale items that went from "Never" to "Always" and it assessed memory and emotional processing through five-point scale items that went from "Strongly Disagree" to "Strongly Agree." The research obtained composite scores for attention and memory and emotional processing by summing all test item responses. The research used Cronbach's alpha to assess internal consistency which they used to test the instrument's reliability.

3.5 Data Collection

Data were collected through a self-administered questionnaire distributed to adolescent participants. The research explained the study's purpose and objectives to respondents before data collection while assuring them that their answers would remain confidential and used only for academic research purposes. The study allowed participants to choose whether to take part while asked them to give honest and accurate information. The research coded data after they completed collection and then transferred it to SPSS software for statistical analysis.

3.6 Data Analysis

The Statistical Package for the Social Sciences (SPSS) was used to analyze the gathered data. The study used both descriptive statistical methods and inferential statistical methods to achieve their research goals and validate their research hypotheses. The study used descriptive statistics which included frequencies and percentages to describe the demographic characteristics and screen usage patterns of the study participants. The researchers applied inferential statistical techniques to examine the interactions between various variables and their impact on research outcomes. The study used Spearman correlation analysis to study the relationship between screen time and attention while they used linear regression analysis to determine how screen time affected memory performance. The researchers used independent samples t-test to measure emotional processing differences between participants with low screen time and those with high screen time. The study established statistical significance by using a significance level of $p < 0.05$ in all their statistical analyses.

4. Results

4.1 Demographic analysis

Table 1 Demographic Summary

Category	Respondents	Frequency	Percentage
Gender	Female	53	52.5%
	Male	47	46.5%
	Prefer not to say	1	1.0%
School Type	Private	85	84.2%
	Government	14	13.9%
	Others	2	2.0%
Grade	UG (Undergraduate)	12	11.9%
	12th	30	29.7%

	11th	29	28.7%
	10th	14	13.9%
	9th	10	9.9%
	8th	4	4.0%
	7th	2	2.0%
Smartphone Ownership	Yes	91	90.1%
	No	10	9.9%
Total		**101**	**100%**

The demographic data shows that respondents have equal gender distribution because females make up 52.5% of the group and males account for 46.5% whereas 1.0% of the respondents chose not to share their gender information (Table 1). The sample consists mainly of private school students who make up 84.2% of the participants while 13.9% come from government schools and 2.0% from other institutions. Most respondents belong to higher secondary grades which include 12th grade students who make up 29.7% of the group while 11th grade students follow with 28.7% and 7th and 8th grade students have very low numbers. The study included 11.9% of undergraduate students which showed that educational background among participants varied. The study found that 90.1% of respondents owned a personal smartphone while 9.9% did not, which shows that most adolescents use digital devices. The study found that adolescent participants from private schools who owned smartphones formed the main demographic group of the research.

4.2 Statistical Analysis

Hypothesis 1

Screen Time and Attention

Table 2 Correlations

			Screen_Avg	**Attention_score**
Spearman's rho	Screen_Avg	Correlation Coefficient (Cr)	1.000	.511**
		Sig. (S)	.	.000
		N	101	101
	Attention_score	Cr	.511**	1.000
		S	.000	.
		N	101	101

A Spearman correlation analysis was conducted to examine the relationship between average screen time and attention among adolescents (Table 2). The study results showed that screen time showed moderate positive correlation with attention score because the two variables had a correlation coefficient of 0.511 and a p-value that measured below 0.01. The positive correlation between screen time and higher attention scores demonstrates that increased screen time leads to greater attention problems which include reduced concentration abilities and increased distractibility.

The relationship between screen time and attention shows statistical significance because screen time produces a substantial effect on attention. The study results show that rejection of null hypothesis H_{01} while they should accept alternative hypothesis H_{11}. The study shows that increased screen time leads to decreased attention capacity in adolescents.

Hypothesis 2

Screen Time and Memory Functioning

Table 3 Model				
Mod	R	R^2	Adj. R^2	SE of the Est
1	.398[a]	.158	.150	3.99201
a. P: Screen_Avg				

Table 4 ANOVA[a]						
Model		SOS	df	M^2	F	S
1	Regression (Re)	297.075	1	297.075	18.642	.000[b]
	Residual (R)	1577.677	99	15.936		
	Total	1874.752	100			
a. DV: Memory_score						
b. P:, Screen_Avg						

Table 5 Coefficients[a]						
		Unstd Coeff.		Std Coeff.		
Model		B	SE	β	t	S
1	(Constant)	7.145	1.424		5.017	.000
	Screen_Avg	1.160	.269	.398	4.318	.000
a. DV: Memory_score						

The study conducted linear regression analysis which measured how screen time impacted memory performance. The model summary indicates that screen time explains 15.8% of the variance in memory scores ($R^2 = 0.158$), which demonstrates moderate strength of explanatory power (Tables 3-5). The ANOVA results show that the regression model is statistically significant ($F = 18.642$, $p < 0.001$), which establishes screen time as a key factor that predicts memory functioning. The regression coefficient for screen time ($\beta = 0.398$, $p < 0.001$) indicates a positive relationship between screen time and increased memory-related difficulties because the results reached statistical significance. The findings show that adolescents who spend more time watching screens experience worse memory problems because higher memory scores indicate greater memory problems. The analysis results show that the null hypothesis (H_{02}) has been rejected while the alternative hypothesis (H_{12}) has been accepted. The study confirmed that higher screen time results in severe memory deficits.

Hypothesis 3

Table 6 Emotional Processing by Screen Time Group

Variable	Group	N	M	SD	t	df	p-value	MD	Cohen's d
Emotional Score	Low Screen Time	43	11.19	3.76	-4.235	99	.000	-3.90	-0.85
	High Screen Time	58	15.09	5.09					

The study used independent samples t-test to compare emotional processing abilities between participants who watched screens for short time periods and those who watched screens for extended time periods.The results show that adolescents in the high screen time group (Mean = 15.09) have significantly higher emotional difficulty scores compared to those in the low screen time group (Mean = 11.19). The t-test results indicate a statistically significant difference between the two groups (t = -

4.235, $p < 0.001$). The p-value shows statistical difference between the two groups because it falls below 0.05 threshold for emotional processing evaluation, which proves significant results (Table 6).
The effect size measurement through Cohen's d shows a value of -0.85, which indicates large effects that reveal screen time duration creates major changes to emotional processing abilities. Higher screen time leads to increased emotional difficulties, which include anxiety and mood fluctuations and irritability. The null hypothesis (H_{03}) gets rejected because it accepted the alternative hypothesis (H_{13}). Adolescents who spend more time on screens show noticeable changes to their emotional processing abilities.

Hypothesis 4

Content Type and Attention, Memory and Emotional Processing

Table 7 ANOVA

		SOS	df	M^2	F	S
Attention_score	Between Groups (BG)	745.558	5	149.112	7.380	.000
	Within Groups (WG)	1919.432	95	20.205		
	Total (T)	2664.990	100			
Memory_score	BG	255.315	5	51.063	2.995	.015
	WG	1619.438	95	17.047		
	T	1874.752	100			
Emotional_score	BG	400.790	5	80.158	3.718	.004
	WG	2047.903	95	21.557		
	T	2448.693	100			

The study performed a one-way ANOVA test to determine whether different content types affected the attention abilities and memory performance and emotional processing skills of adolescents. The findings demonstrated that content type produces a significant impact on all three assessed outcome measures (Table 7). Attention scores displayed a content type dependent difference ($F = 7.380$, $p < 0.001$) which demonstrated that different digital content types produce varying levels of attentional difficulties. The memory functioning test results showed a significant difference across content categories ($F = 2.995$, $p = 0.015$) which indicates different content types lead to different levels of memory performance.

The F value for emotional processing results showed a significant difference ($F = 3.718$, $p = 0.004$), which shows that different digital content types lead to different emotional difficulties between anxiety and mood fluctuations and irritability. The assessment results demonstrate that content type delivers essential cognitive and emotional impacts which adolescents exhibit through their educational performance. The research results demonstrate that different types of screen activity create different effects on people because their attention and memory and emotional health suffer from the content they watch. The research established that content type impacts psychological outcomes for adolescents because they rejected the null hypothesis (H_{04}) and accepted the alternative hypothesis (H_{14}).

In addition to primary hypothesis, the study conducted a second analysis to assess how people believe screen time impacts their memory capabilities. The study added this variable because it required to assess whether adolescents understand their own cognitive abilities through self-assessment.

Table 8 Model Summary				
Model	R	R^2	Adj. R^2	SE of the Est
1	.713[a]	.508	.503	3.05257
a. Predictors: (Constant), PI_score				

Table 9 ANOVA[a]						
Model		SOS	df	M^2	F	S
1	Re	952.250	1	952.250	102.192	.000[b]
	R	922.502	99	9.318		
	Total	1874.752	100			
a. DV: Memory_score						
b. P: PI_score						

Table 10 Coefficients[a]						
Model		Unstd Coeff.		Std Coeff.	t	S.
		B	SE	β		
1	(Constant)	4.329	.915		4.734	.000
	PI_score	.573	.057	.713	10.109	.000
a. DV: Memory_score						

The study conducted a linear regression tests to verify whether those teenagers that negatively associate the effects of screen use display memory problems (Tables 8-10). The model summary indicates that perceived impact explains a substantial proportion of variance in memory scores, with an R^2 value of 0.508, suggesting that 50.8% of the variation in memory functioning is explained by perceived screen impact. The model shows strong explanatory power through its results. The ANOVA results show that the regression model is statistically significant ($F = 102.192$, $p < 0.001$), confirming that perceived impact is a significant predictor of memory functioning. The regression coefficients show that perceived impact causes a strong positive effect on memory functioning which reaches statistical significance ($\beta = 0.713$, $p < 0.001$). The study finds that as people perceive negative effects from screen use their memory problems increase at a substantial rate.

The findings show that adolescents who perceive higher negative effects from screen time show worse memory performance. The alternative hypothesis (H_{15}) received acceptance while the null hypothesis (H_{05}) received rejection. The research confirms that screen use perceived effects create significant memories impacts which affect adolescent memory function.

5. Discussion

The current research studied how continuous screen time affects adolescent attention and memory and emotional processing abilities. The research discovered that current screen time and the type of content people watched both affected their cognitive abilities and emotional reactions. The study found that adolescents who used digital media showed better memory performance when they believed their screen time had more effect on their memory abilities. The study results confirm existing research about adolescent screen time concerns which have reached critical levels.

The results showed that screen time content leads to attention difficulties because people who spend more time watching screens show less ability to pay attention and higher levels of being distracted. Earlier research established that digital media usage which extends for long periods and features fast-moving content leads to users experiencing divided attention and difficulty maintaining their focus (Firth et al., 2019). The study have found that adolescents who spend more time watching screens show greater signs of inattentiveness and perform worse on tasks that measure their attention abilities (Poujol et al., 2022). The findings support previous research which showed that people who frequently watch audiovisual content which contains fast-paced changes develop a brain pattern that needs ongoing stimulation which results in decreased ability to focus (Christakis et al., 2018). Excessive screen time leads to changes in brain activity that controls attention according to neurophysiological research which demonstrates that digital environments create disruptions in cognitive processing (Zivan et al., 2019). The current study demonstrates that continuous screen time affects how adolescents develop their ability to pay attention according to research the study presents.

The research established that screen time functions as a primary predictor of memory problems which demonstrates that greater screen time leads to memory decline. The finding supports existing research which shows that people who depend too much on digital devices experience decreased mental activity which prevents them from storing and retrieving memories (Neophytou et al., 2021). The results support earlier research which demonstrates that sleep disruption functions as the main pathway through which screen time causes cognitive decline because excessive screen time consumption leads to poor sleep patterns which hinder memory consolidation (Lissak, 2018). The research results support previous studies which established that adolescents who consume digital media at high rates experience decreased working memory capacity and cognitive flexibility (Maeneja et al., 2025). The results indicate that memory problems which occur because of extended screen time result from two types of factors which include both behavioral changes that decrease deep processing and physiological issues that result from sleep disturbances.

The research found that teenagers who spent more time watching screens showed stronger emotional problems which included anxiety and mood changes and increased irritability. The finding confirms previous studies which showed that people who use screens excessively develop more emotional and psychological issues (Nakshine et al., 2022). The results of the study support existing research which demonstrates that social media usage causes emotional distress because people use social comparison and negative self-evaluation methods to assess themselves (Verma, 2025). The research results show that people who watch more screens lose their ability to manage their emotions because screen time and emotional control problems exist in a two-way relationship (Hanly, 2025). The study found that emotional distress functions as a middle factor which connects screen usage to cognitive results because both emotional and cognitive processes work together in the study (Hernandez, 2025). The research demonstrates that screen time decreases adolescents' cognitive abilities and emotional health because it has negative effects on both their mental capabilities and emotional state.

The analysis of content type further revealed that different forms of digital content have varying effects on attention, memory, and emotional processing, which demonstrates that the impact of screen exposure varies between different content types. This finding is consistent with previous research which shows that digital media effects depend on both content type and content quality (Dewi et al., 2025). Educational and interactive content has been shown to enhance cognitive skills when used appropriately (Kiragu & Waitamba, 2025) while excessive time spent on entertainment-based content

which includes social media and gaming leads to decreased attention capacity and greater emotional distress (Panjeti-Madan & Ranganathan, 2023). The results demonstrate that assessment of both screen time and screen time content quality when they study how screen time impacts the development of teenagers.

The study discovered that people who study screen time effects on their memory ability show a strong connection between their screen time perception and their memory abilities which explains about 30 percent of their memory problems. The research shows that adolescents who believe screen time has negative effects will experience memory problems during their cognitive development. The research study shows how people believe about their screen time affects their memory problems because adolescents already know about the bad effects of excessive screen time. The study results show that research needs to include both actual screen time data and how people subjectively perceive their screen time. The research results show that awareness training programs should become a main strategy to decrease screen time which leads to negative health effects.

The study results support existing research which shows that chronic screen exposure affects adolescents' abilities to focus, remember information, and manage their emotions. The research study establishes a complete understanding of digital media's effects on cognitive and emotional growth by examining both screen time and content type together with user-perceived effects.

5.1 Limitations

The study is limited by the use of a convenience sampling method, which may restrict the generalizability of the findings to a broader population. The cross-sectional design of the study prevents from establishing cause-and-effect relationships between screen exposure and cognitive-emotional outcomes. The study results become less accurate because the research depends on self-reported data, which creates response bias.

6. Conclusion

The current research studied how chronic screen use affects adolescent attention and memory and emotional processing abilities. The study results showed that the length of time spent watching screens and the specific materials watched both determine how people will experience emotional and cognitive effects. Research shows that people who watch more screens experience more attention problems and memory issues and emotional disturbances. Different content types create different results which affect three main areas. The study establishes that adolescents consider their screen time usage to be dangerous. Unsupervised digital media access during adolescence creates serious problems according to these findings which show that unregulated digital media access takes place during a vital stage of human development. The current research provides a complete study that connects screen time with content type and personal viewer experience. The research shows that adolescents need to learn about appropriate screen time practices together with parents and educators about their screen time practices. Schools should support students in using digital devices responsibly while parents need to check their children's device usage. The research should use longitudinal studies to find cause-and-effect links between the two variables while researching more diverse groups to see how well results apply to different populations which will help understand screen time through actual usage data. The study results show that digital technology provides important advantages but its excessive use creates problems.

6.1 Implications

The study results show vital consequences for various groups who need to understand how screen time affects teenage development which includes educators and parents and policymakers. The results require organizations to create procedures which establish between screen usage and content monitoring and screen usage limits. The findings show educators should implement structured digital activities into their classrooms while developing methods which enable students to focus their attention and perform cognitive tasks. The study shows parents should monitor their teenagers screen time while they build proper digital usage habits in their household. The research results provide backing for policymakers to create regulations which establish public awareness programs that reduce cognitive and emotional harms caused by excessive screen time. The results demonstrate that people who perceive direct influence of the intervention will experience actual behavior changes as shown by the strong connection between these two factors. The study enables to create specific interventions which will help teenagers develop better digital habits.

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