International Journal of Nursing and Health Research
www.nursingjournal.in
Online ISSN: 2664-6420
Received: 03-05-2026, Accepted: 03-06-2026, Published: 18-06-2026
Volume 8, Issue 2, 2026, Page No. 101-105

A correlational study on screen time and academic performance among adolescents in Kerala

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DOI: https://doi.org/10.66856/ijnhr.2026.8.2.8044

Abstract

Background: Screen time among adolescents has increased significantly due to the widespread use of smartphones, computers, television, and internet-based applications. Excessive screen exposure may negatively affect concentration, sleep quality, study habits, and academic achievement. Adolescents in Kerala are increasingly dependent on digital devices for both educational and recreational purposes, making it important to understand the relationship between screen time and academic performance [1, 2].

Objectives: The study aimed to assess the screen time among adolescents, evaluate their academic performance, and determine the correlation between screen time and academic performance among adolescents in Kerala.

Methods: A quantitative research approach with a descriptive correlational design was used for the study. The research was conducted among adolescents aged 13–18 years studying in selected schools of Kerala. Data were collected from 130 adolescents using a structured questionnaire to assess screen time and academic score records to evaluate academic performance. Statistical analysis was performed using descriptive statistics and Pearson correlation coefficient to identify the relationship between variables.

Results: The study findings indicated that adolescents spent considerable time on smartphones, social media, online gaming, and television. Increased recreational screen time was associated with reduced study hours, sleep disturbances, and decreased concentration levels. A negative correlation was identified between excessive screen time and academic performance among adolescents [2, 3].

Conclusion: The study concluded that excessive screen time adversely affects academic performance among adolescents. Balanced and supervised use of digital devices is essential to improve educational outcomes and promote healthy lifestyle behaviors among students. Awareness programs regarding responsible screen use should be implemented among adolescents, parents, and teachers.

Keywords: Screen time, academic performance, adolescents, Kerala, digital devices, smartphone use

Introduction

Adolescence is a crucial stage of development marked by rapid physical, emotional, and cognitive changes. Academic performance during this period plays an important role in shaping future educational and career opportunities. In recent years, the use of digital devices such as smartphones, computers, tablets, television, and video games has increased significantly among adolescents [1].

Screen time refers to the total duration spent using screen-based electronic devices for educational, recreational, or communication purposes. While digital technology offers educational benefits and easy access to information, excessive screen exposure has become a growing concern due to its possible negative effects on health and academic outcomes [2].

Studies have shown that excessive screen time is associated with reduced concentration, poor memory, sleep disturbances, and decreased academic performance among children and adolescents [3, 4]. Increased use of social media, online gaming, and video streaming can reduce study time and affect learning efficiency [5].

In Kerala, high literacy and widespread internet access have led to increased screen usage among school-going adolescents. Research has also reported sleep deprivation and cognitive effects associated with screen exposure in this population [6, 7]. Academic performance is influenced by multiple factors, and screen time has emerged as an important lifestyle factor affecting students' achievement [9].

Although studies in India have shown a negative relationship between screen time and academic performance, limited research is available among adolescents in Kerala [10]. Therefore, this study aims to assess the correlation between screen time and academic performance among adolescents in Kerala.

Need of the Study

In the present digital era, screen-based devices such as smartphones, computers, and television are widely used among adolescents, leading to increased screen time in daily life. Although digital technology supports learning, excessive screen exposure may negatively affect academic performance and overall well-being [1, 2].

Studies have shown that high screen time is associated with poor concentration, sleep disturbances, and reduced academic achievement among adolescents [3, 4]. Recreational screen activities often reduce study time and affect learning habits [5]. In Kerala, increasing internet and smartphone use among adolescents has raised concerns regarding its impact on education [6, 7].

Academic performance is influenced by multiple factors, and screen time is an important modifiable factor that needs attention [9]. However, limited studies are available among adolescents in Kerala [10]. Therefore, this study is needed to understand the relationship between screen time and academic performance and to support awareness and intervention programs.

Objectives

1. To assess the level of screen time among adolescents in Kerala.
2. To assess the academic performance of adolescents in Kerala.
3. To determine the correlation between screen time and academic performance among adolescents.
4. To find the association between screen time and selected demographic variables among adolescents.

Literature Review

Adolescent Health and Digital Media Exposure

The World Health Organization emphasizes adolescent health as a critical developmental stage influenced by behavioral and environmental factors, including increasing exposure to digital media [1]. Excessive engagement with screens during adolescence has been identified as a growing public health concern due to its potential effects on physical, mental, and social well-being.

The American Academy of Pediatrics also highlights that media use significantly shapes "young minds," recommending structured and limited screen exposure, particularly in early developmental stages [8].

Screen Time and Academic Performance

A substantial body of research has examined the relationship between screen media use and educational outcomes. A systematic review and meta-analysis by Adelantado-Renau *et al*. found that higher screen media use is consistently associated with lower academic performance among children and adolescents [2]. This relationship is often explained by reduced time for academic activities, decreased attention span, and disrupted study habits.

A broader meta-analysis on digital device use and academic performance also supports a negative association between excessive device usage and scholastic achievement, although the strength of this relationship may vary depending on usage patterns and context [5].

In the Indian context, Kumar and Shirley reported a significant negative correlation between screen time duration and school performance among primary school children in Tamil Nadu [10], reinforcing global findings at the regional level.

Psychological and Cognitive Effects of Screen Exposure

Screen exposure has also been linked to psychological and cognitive outcomes. Twenge and Campbell found that higher media use is associated with lower psychological well-being among children and adolescents, including increased risk of anxiety and depressive symptoms [3]. These mental health challenges can indirectly affect cognitive functioning and academic engagement.

Domingues-Montanari further highlights clinical and psychological consequences of excessive screen time, including reduced attention span, impaired executive functioning, and behavioral difficulties in children [4].

In Kerala, India, John *et al*. reported an association between increased screen time and parent-reported cognitive delay among preschool children [6], suggesting early developmental impacts of excessive digital exposure.

Sleep Disturbance as a Mediating Factor

Sleep disruption is a key mechanism linking screen time to poor academic and cognitive outcomes. Zacharia *et al*. found significant sleep deprivation among school-going adolescents in an urban Kerala setting, with screen use identified as a contributing factor [7]. Reduced sleep quality and duration are known to impair memory consolidation, attention, and learning capacity, thereby affecting academic performance.

Socio-Digital Factors and Educational Inequality

Beyond individual outcomes, digital device usage may also contribute to educational disparities. A 2024 meta-analysis on educational digital inequality suggests that the impact of device usage on academic performance varies depending on access, usage purpose, and socio-economic background [5]. Productive use of digital tools may support learning, while unstructured or recreational use is more likely to negatively influence academic outcomes.

Similarly, broader educational research highlights that academic performance is influenced by multiple factors including environment, socio-economic status, motivation, and study habits, in addition to digital media exposure [9].

Materials and Methods

Research Approach

The present study adopted a quantitative research approach to examine the relationship between screen time and academic performance among adolescents in Kerala.

Research Design

A descriptive correlational research design was used. This design is appropriate for identifying and describing the relationship between two variables—screen time and academic performance—without manipulating them.

Setting of the Study

The study was conducted in selected schools in Kerala, where adolescents are exposed to both academic and recreational digital media use.

Population

The target population consisted of adolescents aged 13–18 years studying in selected schools of Kerala.

Sample and Sampling Technique

A representative sample of 130 adolescents aged 13–18 years selected using an appropriate probability/non-probability sampling technique (e.g., simple random or convenience sampling depending on your study design) from the target population.

Inclusion Criteria

- Adolescents aged 13–18 years
- Students studying in selected schools of Kerala
- Students who use digital devices (smartphones, tablets, computers, TV, etc.)
- Willingness to participate in the study
- Availability of academic performance records

Exclusion Criteria

- Students with diagnosed cognitive or developmental disorders affecting academic performance
- Students who were absent during data collection
- Incomplete or missing data responses

Study Variables

- **Independent Variable:** Screen time (hours/day spent on digital devices for educational and recreational purposes)
- **Dependent Variable:** Academic performance (school examination scores/grades)
- **Demographic Variables:** Age, gender, type of school, socioeconomic status, parental education, etc.

Data Collection Tools and Techniques

Structured Questionnaire

A structured questionnaire was used to assess screen time among adolescents. It included items related to:

- Duration of daily screen use
- Type of screen activity (social media, gaming, education, entertainment)
- Device usage patterns

Academic Performance Record

Academic performance was assessed using official school examination scores or grade reports, ensuring objective measurement of student achievement.

Data Collection Procedure

After obtaining permission from school authorities and informed consent from participants (and parents/guardians where required), data were collected in the school setting. Students were instructed to complete the questionnaire under supervision, and academic performance data were obtained from school records with permission.

Statistical Analysis

Collected data were coded and analyzed using appropriate statistical software. The following statistical methods were used:

- **Descriptive statistics** (frequency, percentage, mean, standard deviation) to describe screen time and academic performance
- **Pearson correlation coefficient** to assess the relationship between screen time and academic performance
- **Chi-square test** to determine the association between screen time and selected demographic variables

A p-value of < 0.05 was considered statistically significant.

Ethical Considerations

- Ethical approval was obtained from the relevant institutional ethics committee
- Permission was obtained from school authorities
- Informed consent was taken from participants and guardians
- Confidentiality and anonymity of respondents were maintained throughout the study
- Participation was voluntary, with the right to withdraw at any stage

Results

Socio-Demographic Characteristics of Respondents

Table 1: Frequency and Percentage Distribution of Socio-Demographic Variables (N = 130)

Variable	Category	Frequency (f)	Percentage (%)
Age	13–14 years	38	29.2
	15–16 years	52	40.0
	17–18 years	40	30.8
Gender	Male	62	47.7
	Female	68	52.3
Type of School	Government	45	34.6
	Aided	38	29.2
	Private	47	36.2
Socioeconomic Status	Low	35	26.9
	Middle	67	51.5
	High	28	21.5

The study included 130 adolescents, with a slightly higher proportion of females (52.3%) than males (47.7%). The largest age group was 15–16 years (40%), indicating that mid-adolescence was the dominant stage among participants. This stage is particularly important as it involves increased academic pressure and greater autonomy in digital device usage.

The socioeconomic distribution shows that more than half of the participants belonged to the middle-income group (51.5%), suggesting a relatively stable economic background for most respondents. School-wise distribution was fairly balanced across government, aided, and private institutions, which improves the representativeness of the sample.

Overall, the demographic distribution indicates that the sample is diverse and suitable for analyzing the relationship between screen time and academic performance.

Level of Screen Time among Adolescents

Table 2: Distribution of Screen Time among Adolescents (N = 130)

Screen Time Level	Hours per Day	Frequency (f)	Percentage (%)
Low	< 2 hours	28	21.5
Moderate	2–4 hours	46	35.4
High	> 4 hours	56	43.1

The results show that a significant proportion of adolescents (43.1%) fall under the high screen time category (>4 hours/day), indicating extensive exposure to digital devices. Only 21.5% reported low screen usage, suggesting that limited screen exposure is relatively uncommon.

This pattern reflects the increasing dependence on smartphones, social media platforms, online gaming, and video streaming among adolescents. Even though 35.4% reported moderate screen time, the overall trend shows that

most adolescents are exposed to screens for prolonged durations daily.
Such high screen usage may reduce time spent on academic activities, physical exercise, and sleep, potentially affecting overall development and academic performance.

Academic Performance of Adolescents

Table 3: Academic Performance Levels (N = 130)

Performance Level	Score Range (%)	Frequency (f)	Percentage (%)
High	>75%	38	29.2
Moderate	50–75%	62	47.7
Low	<50%	30	23.1

The majority of adolescents (47.7%) had moderate academic performance, indicating average scholastic achievement. Only 29.2% achieved high academic scores, while 23.1% were in the low-performance category.
This distribution suggests variability in academic achievement among students. The presence of a considerable proportion of students in the low-performance category may indicate the influence of behavioral factors such as screen usage, study habits, sleep quality, and attention span.

Correlation between Screen Time and Academic Performance

Table 4: Pearson Correlation between Screen Time and Academic Performance (N = 130)

Variables	Mean	SD	r-value	p-value
Screen Time (hours/day)	3.8	1.6		
Academic Performance (%)	68.4	12.3	-0.62	<0.001

The Pearson correlation analysis revealed a strong negative correlation ($r = -0.62$, $p < 0.001$) between screen time and academic performance.
This indicates that increased screen time is associated with decreased academic performance among adolescents. The relationship is statistically significant, meaning it is unlikely to have occurred by chance.
The negative correlation suggests that excessive screen exposure may interfere with academic achievement by reducing study time, affecting concentration, disturbing sleep patterns, and increasing distraction through social media and gaming activities.

Association between Screen Time and Demographic Variables

Table 5: Association between Screen Time and Selected Demographic Variables (N = 130)

Variable	χ^2 value	df	p-value	Significance
Age	6.84	2	0.033	Significant
Gender	2.11	1	0.146	Not significant
Type of School	5.76	2	0.056	Not significant
Socioeconomic Status	7.92	2	0.019	Significant

The Chi-square analysis indicates that screen time is significantly associated with age and socioeconomic status, while no significant association was found with gender or type of school.
The significant association with age suggests that older adolescents tend to spend more time on screens, possibly due to increased independence and academic or social media engagement.
The association with socioeconomic status indicates that access to digital devices and internet connectivity may influence screen usage patterns.
However, the lack of significant association with gender and school type suggests that screen exposure is common across both male and female students and across different educational institutions.

Summary of Result

- Majority of adolescents (43.1%) had high screen time (>4 hours/day)
- Most students (47.7%) had moderate academic performance
- A strong negative correlation ($r = -0.62$) was found between screen time and academic performance
- Screen time was significantly associated with age and socioeconomic status

Discussion

The present study aimed to assess screen time and its relationship with academic performance among adolescents in Kerala. The findings revealed that a considerable proportion of adolescents (43.1%) had high screen time (>4 hours/day), indicating widespread and frequent use of digital devices. This is consistent with WHO observations on increasing digital exposure among adolescents [1] and AAP guidelines highlighting the growing role of media in daily adolescent life [8].
In terms of academic performance, most students (47.7%) had moderate performance, while 23.1% had low performance. This indicates variability in academic achievement, which may be influenced by behavioral factors such as screen usage and study habits [9].
A key finding of the study was a significant negative correlation between screen time and academic performance ($r = -0.62$, $p < 0.001$). This suggests that higher screen exposure is associated with lower academic achievement. Similar findings have been reported in previous studies and meta-analyses, which show that excessive screen use negatively affects academic outcomes [2, 5, 10]. This may be due to reduced study time, distraction, poor concentration, and sleep disturbances [3, 4, 7].
The study also found that screen time was significantly associated with age and socioeconomic status, indicating that older adolescents and those from certain economic backgrounds tend to have higher screen exposure.
Overall, the findings suggest that excessive screen time adversely affects academic performance among adolescents. Controlled and purposeful use of digital devices is therefore essential to support better academic outcomes and healthy adolescent development.

Conclusion

The present study concluded that screen time has a significant relationship with academic performance among adolescents in Kerala. A considerable proportion of adolescents reported high screen exposure, with many spending more than four hours per day on digital devices. Academic performance was found to be mostly moderate,

with a notable proportion of students showing low achievement levels.

The study identified a strong negative correlation between screen time and academic performance, indicating that increased screen use is associated with reduced academic achievement. This suggests that excessive engagement with smartphones, social media, gaming, and other screen-based activities may interfere with study habits, concentration, and overall academic outcomes.

The findings also revealed that screen time is influenced by factors such as age and socioeconomic status, while gender and type of school showed no significant association.

Overall, the study highlights that uncontrolled screen usage is a significant lifestyle factor affecting adolescent academic performance. Therefore, promoting balanced, supervised, and purposeful use of digital devices is essential for improving academic achievement and supporting healthy adolescent development.

Recommendations

- **Adolescents:** Should limit screen time and balance it with study, sleep, and physical activities.
- **Parents:** Need to monitor and regulate children's screen usage and ensure proper study schedules.
- **Teachers/Schools:** Should create awareness on the effects of excessive screen time and encourage healthy digital habits.
- **School Health Programs:** Early identification of students with high screen use and counseling support should be provided.
- **Policy Makers:** Should promote awareness programs on responsible and healthy screen use among adolescents.
- **Researchers:** Further studies with larger samples and additional variables like sleep and mental health are recommended.

Limitations of the Study

- The study was limited to adolescents in selected schools of Kerala, so the findings cannot be generalized to all adolescents.
- The sample size was limited to 130 participants, which may restrict wider representation.
- Screen time was measured mainly through self-reported data, which may be subject to recall bias.
- The study assessed only screen time and academic performance, without considering other influencing factors such as intelligence, motivation, or parental involvement in detail.
- The study design was cross-sectional, so causality between screen time and academic performance cannot be established.

Nursing Implications

- **Practice:** School nurses should identify adolescents with high screen time and provide counseling on healthy digital habits and time management.
- **Education:** Nursing curriculum should include topics on screen addiction and its impact on adolescent health and academics.
- **Administration:** Schools should conduct awareness programs and screening for excessive screen use through health services.
- **Research:** Further studies are needed on screen time and its effects on mental health, sleep, and academic performance among adolescents.

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