

## Consequence Of Excessive Digital Device Use On Academic Outcome And Family Cohesion Among Adolescents

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### Abstract

**Background:** The widespread integration of digital devices in adolescents' daily lives has revolutionized education and communication. However, excessive device use has raised significant concerns regarding its impact on academic performance and family cohesion. This study aimed to assess the relationship between digital device overuse, academic outcomes, and family relationships among adolescents. **Methods:** A descriptive quantitative study was conducted among 80 adolescents aged 12–17 years at a Government Higher Secondary School in Tamil Nadu, India. Data were collected using a structured questionnaire on socio-demographic variables, a 5-point Likert scale assessing digital device use, the Carson Birchmeier Academic Performance Scale, and the Carl V. Rabstejnek Family Interaction Scale. Descriptive and inferential statistics, including Pearson's correlation and Chi-square tests, were used for analysis. **Results:** The findings revealed that 40% of participants reported mild device usage, 17.5% moderate, and 2.5% high. A negative correlation was observed between excessive digital device use and academic performance ( $r = -0.42$ ,  $p < 0.01$ ), as well as between device use and family cohesion ( $r = -0.39$ ,  $p < 0.01$ ). Age, gender, and mother's education were significantly associated with digital device use ( $p < 0.05$ ). **Conclusion:** Excessive digital device use adversely affects both academic outcomes and family cohesion among adolescents. Promoting digital literacy, parental guidance, and school-based awareness programs can foster balanced device use and support adolescents' holistic development.

**Keywords:** Digital Device Use, Academic Performance, Family Cohesion, Adolescents

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### Introduction

The digital revolution has transformed how adolescents learn, communicate, and interact. Smartphones, tablets, and computers are now integral to education and socialization. However, the growing dependence on digital devices raises critical public health concerns. Adolescents, in particular, are vulnerable to the psychological, behavioral, and social consequences of excessive screen time. According to the International Telecommunication Union (2023), over 92% of adolescents in urban India have access to smartphones<sup>1</sup>. While digital tools enhance educational access, their overuse has been linked to diminished academic performance, reduced family interaction, and heightened mental health risks (Kaur & Saini, 2023; Twenge et al., 2019)<sup>2</sup>. Studies indicate that adolescents spending more than five hours daily on screens exhibit lower academic achievement and reduced emotional bonding with family members (Odgers & Jensen, 2020; Wang et al., 2020)<sup>3</sup>. Family cohesion plays a crucial role in adolescents' psychosocial well-being. Excessive digital engagement limits meaningful communication, increases conflicts, and fosters emotional detachment (Lewis et al., 2023)<sup>4</sup>. Moreover, the COVID-19 pandemic intensified digital dependence due to online learning, blurring the boundaries between educational and recreational use (Dhanya, 2020)<sup>5</sup>. Given these dynamics, this study sought to examine how excessive digital device use affects academic outcomes and family cohesion among adolescents in a semi-urban Indian context. The findings aim to guide educators, parents, and policymakers in developing balanced technology-use strategies that promote academic success and emotional well-being.

### Objectives

1. To assess the extent of digital device use, academic performance, and family cohesion among adolescents.
2. To determine the relationship between digital device use, academic performance, and family cohesion.
3. To identify associations between digital device use and selected socio-demographic variables.

### Methods

#### Research Design and Setting

A descriptive quantitative research design was adopted. The study was conducted at Government Adi Dravidar Welfare Higher Secondary School, Kolappancheri, Tamil Nadu, India, which enrolls over 500 students from diverse socio-economic backgrounds.

### Participants and Sampling

Eighty adolescents aged 12–17 years were selected using a convenience sampling technique. Inclusion criteria comprised students currently enrolled and willing to participate; exclusion criteria included those with medical or psychological illness or absent during data collection.

### Instruments

1. **Demographic Proforma:** Captured details such as age, gender, parental education, occupation, income, and residence.
2. **Digital Device Usage Scale:** A 5-point Likert-type tool (score range 1–100), categorizing use as normal (1–25), mild (26–50), moderate (51–75), or high (76–100).
3. **Carson Birchmeier Academic Performance Scale:** Measured commitment, completion, and achievement (Cronbach's  $\alpha = 0.87$ ).
4. **Carl V. Rabstejnek Family Interaction Scale:** Assessed emotional bonding and communication (Cronbach's  $\alpha = 0.82$ ).

### Reliability and Validity

Content validity was established through expert review ( $n = 6$ ). Tool reliability was tested using Cronbach's alpha and test–retest methods, yielding high internal consistency ( $>0.8$ ).

### Ethical Considerations

Approval was obtained from the Institutional Ethics Committee of Panimalar College of Nursing. Written informed consent was secured from school authorities, parents, and participants. Confidentiality and anonymity were maintained throughout.

### Data Collection Procedure

Data were collected over two weeks using self-administered questionnaires during school hours. Clarifications were provided when necessary to ensure comprehension.

### Data Analysis

Data were analyzed using SPSS version 25. Descriptive statistics (frequency, percentage, mean, SD) described sample characteristics. Pearson's correlation tested relationships between variables, and Chi-square assessed associations with demographic factors. A  $p$ -value  $< 0.05$  was considered statistically significant.

**Table 1: Frequency percentage distribution of socio demographic variables**

**N=80**

S. NO	VARIABLES	FREQUENCY	PERCENTAGE
1	<b>Age</b>		
	a. 12 – 13 years	32	40
	b. 14 – 15 years	40	50
	c. 16 – 17 years	8	10
2	<b>Gender</b>		
	a. Male	36	45
	b. Female	44	55
3	<b>Standard</b>		
	a. 8 <sup>th</sup>	42	52.5
	b. 9 <sup>th</sup>	18	22.5
	c. 10 <sup>th</sup>	4	5
	d. 11 <sup>th</sup>	10	12.5
	e. 12 <sup>th</sup>	6	7.5
4	<b>Education of the father</b>		
	Non formal education	12	15
	b. Primary	26	32.5
	c. High school	26	32.5
	d. Higher secondary	14	17.5
	e. Diploma	0	0
	f. Degree	2	2.5
	<b>Occupation of the father</b>		

5	a. Coolie	54	67.5
	b. Business	6	7.5
	c. Government employee	6	7.5
	d. Private employee	14	17.5
6	<b>Education of mother</b>		
	a. Non formal education	4	5
	b. Primary	28	35
	c. High school	32	40
	d. Higher secondary	10	12.5
	e. Diploma	0	0
	f. Degree	6	7.5
7	<b>Occupation of the mother</b>		
	a. Housewife	28	35
	b. Coolie	42	52.5
	c. Government employee	0	0
	d. Private employee	8	10
	e. Entrepreneur	2	2.5
8	<b>Family monthly income</b>		
	a. 10000 – 15000	54	67.5
	b. 15001 – 20000	20	25
	c. 20001 – 25000	4	5
	d. Above 25000	2	2.5
9	<b>Religion</b>		
	a. Hindu	58	72.5
	b. Christian	22	27.5
	c. Muslim	0	0
	d. Others	0	0
10	<b>Place of residence</b>		
	a. Urban	28	35
	b. Rural	52	65
11	<b>Type of the family</b>		
	a. Nuclear family	52	65
	b. Joint family	28	35
	c. Extended family	0	0
12	<b>Availability of devices</b>		
	a. Television	30	37.5
	b. Video games	6	7.5
	c. Internet	0	0
	d. Mobile phone	44	55
13	<b>Hobbies</b>		
	a. Reading books	4	5
	b. Playing indoor games	20	25
	c. Playing outdoor games	30	37.5
	d. Chatting on net	26	32.5
14	<b>Social gathering</b>		
	a. Going to religious places	2	2.5
	b. Attending family festivals	26	32.5
	c. Attending parties	6	7.5
	d. Family tour	46	57.5

Table 2: Frequency distribution of adolescents according to their level of excessive digital use

N=80

S. NO	EXCESSIVE DIGITAL USE	FREQUENCY	PERCENTAGE
1	Normal usage	32	40
2	Mild usage	32	40
3	Moderate usage	14	17.5
4	High usage	2	2.5

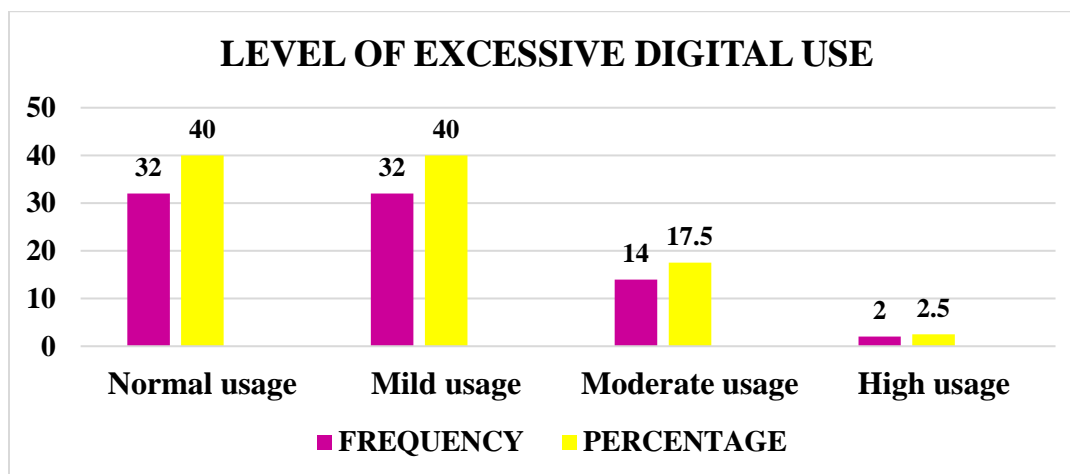


Table 3: Frequency distribution of adolescents according to their level of academic performance

N=80

S. NO	ACADEMIC PERFORMANCE	FREQUENCY	PERCENTAGE
1	Excellent Performance	8	10
2	Good Performance	26	32.5
3	Moderate Performance	30	37.5
4	Poor Performance	14	17.5
5	Failing Performance	2	2.5

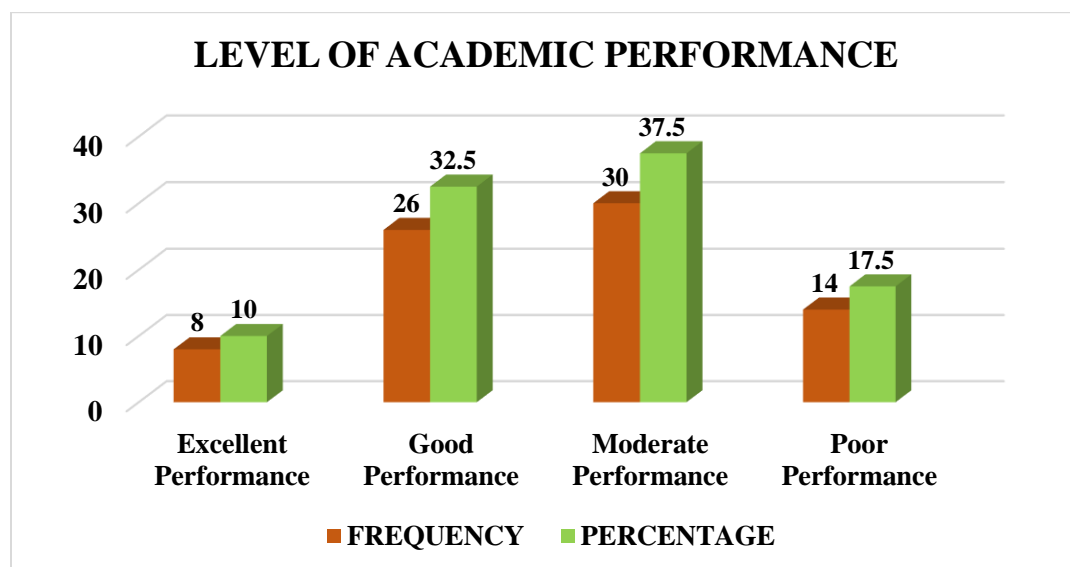


Table 4: Frequency distribution of adolescents according to their level of family cohesion

N=80

S.NO	FAMILY COHESION	FREQUENC Y	PERCENTA GE
1	Optimal Family Functioning	34	42.5
2	Healthy Family Functioning	24	30
3	Moderate Family Dysfunction	22	27.5
4	Severe Family Dysfunction	0	0

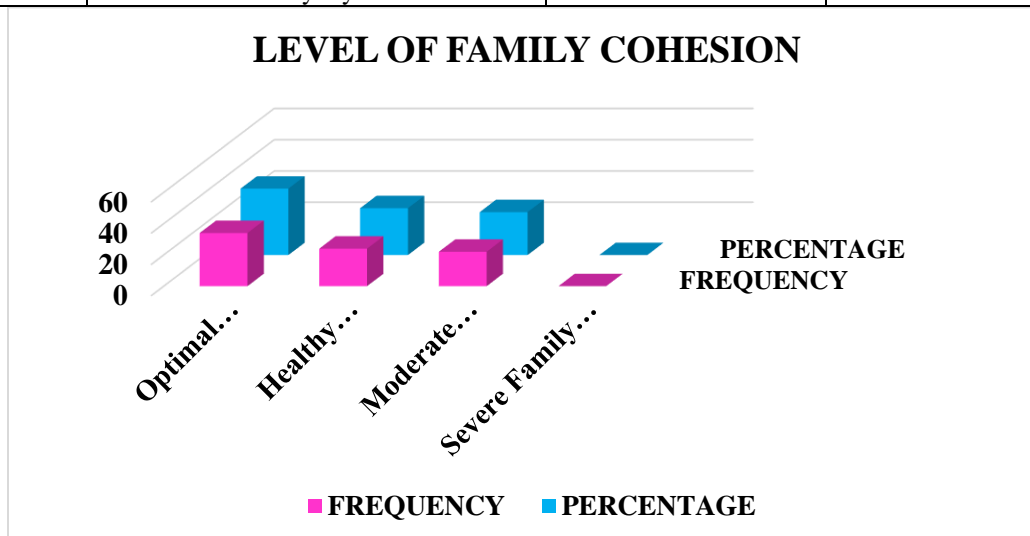


Table 5: Mean and Standard deviation of excessive digital device, academic performance, family cohesion among adolescents

N=80

VARIABLES	MEAN	STANDARD DEVIATION
Excessive digital use	1.825	0.803
Academic performance	3.30	0.95
Family cohesion	3.15	0.81

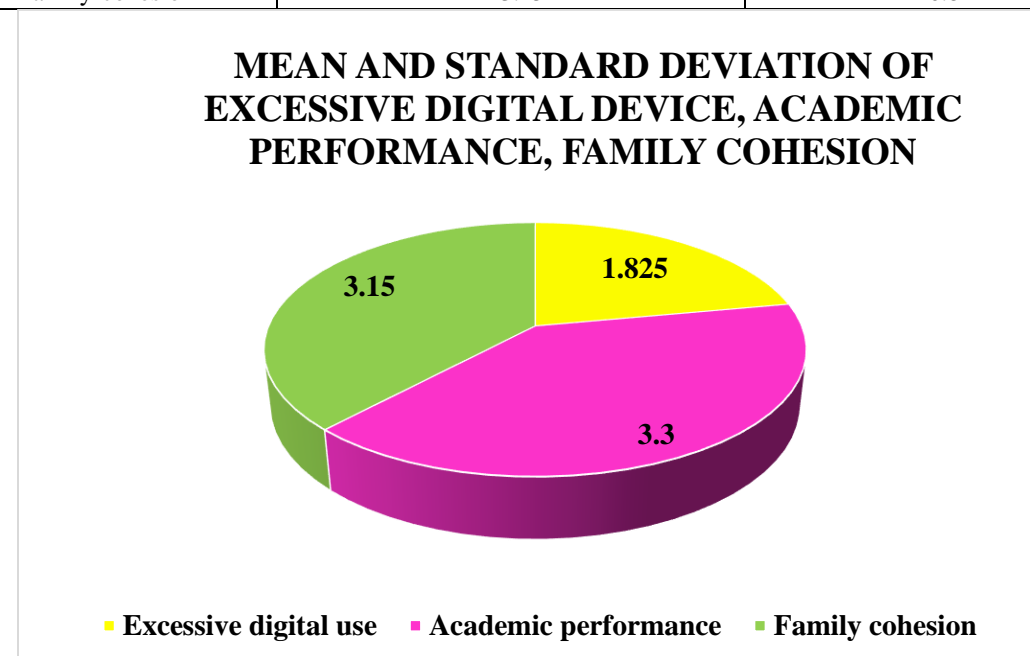


Table 6: Correlation between excessive digital use and academic performance

N=80

VARIABLES	MEAN	SD	“r” VALUE	“p” VALUE (p < 0.05)
Television	23.85	4.87	- 0.213	0.0578
Academic Performance	69.18	12.86		
Mobile	22.31	3.09	- 0.265	0.0175***
Academic Performance	69.18	12.86		
Video games	14.01	2.46	- 0.269	0.0158***
Academic Performance	69.18	12.86		
Internet	15.59	2.67	- 0.262	0.0189***
Academic Performance	69.18	12.86		

Table 4.7: Correlation between excessive digital use and family cohesion

N=80

VARIABLES	MEAN	SD	“r” VALUE	“p” VALUE (p < 0.05)
Television	23.85	4.87	- 0.249	0.0259***
Family cohesion	34.96	5.09		
Mobile	22.31	3.09	- 0.211	0.0603
Family cohesion	34.96	5.09		
Video games	14.01	2.46	- 0.475	0.00000851***
Family cohesion	34.96	5.09		
Internet	15.59	2.67	- 0.436	0.0000529***
Family cohesion	34.96	5.09		

## Results

### Demographic Characteristics

Among 80 participants, 55% were female, and 45% male. Most (50%) were aged 14–15 years, with the majority (65%) residing in rural areas. Fathers were predominantly daily wage laborers (67.5%), and 68% of families had monthly incomes below ₹15,000, indicating a lower socio-economic profile.

### Level of Digital Device Use

Approximately 40% reported mild digital device use, 17.5% moderate, and 2.5% high. Smartphones (55%) were the most commonly used devices, primarily for gaming, social media, and entertainment.

### Academic Performance and Family Cohesion

Only 10% of adolescents demonstrated excellent academic performance, while 37.5% showed moderate and 17.5% poor performance. Regarding family cohesion, 45% displayed moderate functioning, and 15% reported signs of family dysfunction.

### Correlation Analysis

- **Digital Device Use vs. Academic Performance:**  $r = -0.42$ ,  $p < 0.01$
- **Digital Device Use vs. Family Cohesion:**  $r = -0.39$ ,  $p < 0.01$

These results suggest that increased device use is associated with lower academic success and weaker family relationships.

### Association with Demographic Variables

Significant associations were found between excessive device use and age ( $\chi^2 = 8.12$ ,  $p = 0.02$ ), gender ( $\chi^2 = 7.45$ ,  $p = 0.04$ ), mother's education ( $\chi^2 = 10.23$ ,  $p = 0.01$ ), and family income ( $\chi^2 = 6.89$ ,  $p = 0.03$ ).

## Discussion

The present study demonstrates that excessive digital device use adversely impacts adolescents' academic outcomes and family cohesion. These findings align with prior studies indicating that overreliance on digital media leads to academic distraction, reduced sleep quality, and impaired interpersonal relationships (Fang et al., 2024; Limniou, 2024)<sup>6</sup>. Adolescents often use smartphones not only for academic purposes but also for leisure activities such as social networking and gaming. This dual use blurs the boundary between productive and recreational screen time (Han et al., 2023)<sup>7</sup>. Excessive exposure reduces concentration and memory retention, directly affecting scholastic performance (Levine et al., 2022)<sup>8</sup>. From a psychosocial perspective, the study also supports existing literature emphasizing the role of family cohesion as a protective factor against digital addiction. Families with open communication and emotional bonding show better regulation of adolescents' device use (Hartati, 2022; Lian et al., 2023)<sup>9</sup>. Conversely, lack of supervision or parental engagement correlates with increased online dependency and emotional detachment. The findings reinforce the **Health Belief Model (HBM)** framework applied in this study. Adolescents' perception of susceptibility to negative academic or familial consequences influences their motivation to regulate device use. Health education programs focusing on perceived severity and benefits of controlled usage can encourage behavioural change. Similar findings were reported by Wang et al. (2020)<sup>10</sup>, who observed that family meal-time screen use was inversely related to communication quality and cohesion. Likewise, Rachmat et al. (2021) emphasized that parental involvement and empathy mitigate digital addiction and emotional dysregulation<sup>11</sup>. In the Indian socio-cultural context, gender and socio-economic disparities further shape device-use patterns. Male adolescents often engage in prolonged gaming and internet browsing, while females utilize devices more for communication (Koh et al., 2021)<sup>12</sup>. Moreover, low-income families may lack digital literacy, leading to unsupervised use and potential misuse. Overall, this study highlights the urgent need for multi-level interventions integrating parents, schools, and community health nurses to manage adolescents' digital habits.

## Implications for Nursing Practice

1. **Health Education:** School health nurses can design digital wellness programs emphasizing balanced device use and mental health awareness.
2. **Parental Involvement:** Family-centered counseling sessions can enhance parental monitoring and communication.
3. **Community Outreach:** Community nurses can organize awareness campaigns on the effects of screen addiction and strategies for digital detoxification.
4. **Policy Development:** Findings can inform guidelines for school-based digital literacy curricula promoting responsible technology use.

## Limitations

- The study was limited to one school with a small sample (n = 80), limiting generalizability.
- Self-reported data may involve response bias.
- Cross-sectional design restricts causal inference.

## Conclusion

The study concludes that excessive digital device use among adolescents significantly affects academic outcomes and family cohesion. Moderate to high usage levels correlate with poor academic performance and weakened family relationships. Nursing professionals can play a pivotal role in promoting awareness, parental engagement, and behavioural interventions to ensure adolescents' balanced digital engagement. Future research should employ longitudinal designs to examine long-term behavioural and psychological consequences of digital device overuse in diverse populations.

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