

Impact of Smartphone Addiction on Academic Performance of Adolescents in Rajasthan

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Abstract

Electronic screens are so enticing that it's hard for adolescents to avoid their addiction to gadgets like smartphones. Smartphones bring many benefits when used for their basic intended purposes, but excessive use of smartphones might turn problematic and consequently, impairs well-being, negatively impacts academic performance, and leads to various psychological and physical complications among adolescents. This article aims to investigate the impact of smartphone addiction on the academic performance of adolescents, especially among secondary and senior secondary school students in Rajasthan. The data was collected from a sample of 425 randomly selected students in the age group of 13-19 years through an online questionnaire. The findings suggest two important aspects to understand the impact of smartphone addiction on the academic performance of adolescents. The negative aspect indicates that excessive smartphone use by adolescents negatively impacts their learning and academic performance, while the positive aspect indicates that the use of smartphones by adolescents increases their skills and cognitive abilities, thereby improving their academic performance. The study recommends that good strategies should be encouraged in all educational settings to promote the proper and healthy use of smartphones among students.

Keywords : Adolescent Students, Academic Performance, Smartphone Addiction, Smartphone Usage.

I. INTRODUCTION

The 21st century has seen continuous progress and innovation in the field of information technology. The adoption of technology has changed the way people live, leaving a mark on every aspect of their lives [1]. One of these technological advancements is the development of smartphones and their applications which provide swift accessibility to the social networking sites and internet. This fascination with smartphones has led to greater human interaction with technology, even more than human interaction [2].

Smartphones are utilised for a variety of purposes, includes networking sites, entertainment, productivity, and communication [3]. In addition to conventional mobile phones, PCs and several other comparable devices were

also supplanted by smartphones. Smartphones have become into a vital component of modern life as users start to feel inseparable from them. One of the primary problems experts have noticed and are researching is the inappropriate utilization of smart phones, or more specifically, people's addictions to cellular phones. This is due to the ongoing advancement of new technologies and the usage of smartphones. Obsession to smartphones among teenage pupils was estimated to be as severe as 48%, according to research by Aljomaa et al. [4]. According to Doorn [5], this degree of addiction is a significant and thought-provoking result for comprehending individuals in the current world, particularly teenagers.

1.1. Positive Impacts of Using Smartphones:

Smartphones are great tools to support a variety of services and functions, and people, especially adolescents, feel better about using them. Smartphones with social media platforms and various specialized Apps are a key factor in providing a wide range of services, such as a better and broad means to communicate with people, follow news and updates, to facilitate learning, entertainment, business, and other applications. For adolescents, smartphones provide the greatest benefits in terms of education, social life, and entertainment [6], [7]. Undoubtedly, smartphones have brought about dramatic changes in the lifestyles of adolescents, and these devices are very helpful in providing them with a better communication platform and access to a broad range of specialized Apps [8]. Adolescents enjoy the diverse and comfortable services provided by smartphones, such as exposure for learning skills, methods for developing personality, and ideas for academic success [7], [9]. Past research studies [10] emphasizes that these smart devices can save time, provide access to a wide range of specialized Apps, internet, email, free calling, chat, Wi-Fi, and social networking sites.

Smartphones have become a significant part of adolescents' life that they feel incomplete without them [11]. Thus, the literature evidenced that smartphone technology has, to a large extent, revolutionized the lifestyle of adolescents in all their developmental affairs and has paved the way for multiple functions to enjoy their lives.

1.2. Negative Consequences of Excessive Use of Smartphones:

Mount (2012) observed that most adolescents use smartphones daily for not less than 5 hours, and their use of specialized Apps has also increased significantly. Consequently, this has led to the degradation of their physical and social interactions [12], [13], mental distractions [14], [15], lack of concentration, sleep disturbance [16], [17], technology

addiction, health problems [18], and other adverse impacts. These research studies expressed great concern about the addictive use of smartphones, which has become a serious phenomenon among adolescents. The study conducted by İnal et al. [18] observed that 60 percent of adolescents who use smartphones can't spend more than an hour without checking their devices. Excessive smartphone use has caused a wide range of health-related problems among adolescents, such as neurological problems, spinal problems, sore eyes, red ears, headaches, anxiety, and depression.

Boumosleh & Doris [19] observed that due to smartphone addiction, 36% of adolescent schoolchildren feel exhausted in day-time. As also, 38.1% of adolescent students experienced a decrease in sleep quality because they remained addicted to their smartphones until late at night. Similarly, excessive smartphone use can exacerbate thumb arthritis due to excessive texting [20]. At the same time, blue light with shorter wavelengths emitted by smartphones can cause health hazards such as neuralgia, shoulder pain, and back pain.

Thus, as evidenced from the aforementioned narrative, smart phone addiction has taken an unescapable place in the lives of adolescents. They are so addicted and dependent on their smartphones that they feel that life cannot go smoothly without them. Through the above literature review, many negative consequences have been identified.

Numerous studies have contributed to the effects of smartphone addiction, studying its overuse by gender, age, and social status. In addition, the impact of smartphone addiction in the workplace was investigated to examine employee competency levels. The impact of smartphone addiction has been examined leading to health problems such as sleep disturbance and emotional stress [21], [22]. Other studies have looked at peer relationships, such as student-student relationships, among teenagers and young adults as a result of smartphone addiction by calculating their morals, self-esteem, and values, and discovered that teens who are more obsessed to mobile

phones may have many other problems and weaker relationships.

Only a few research, meanwhile, have examined the problem of smartphone addiction and how it affects teenage students' academic performance. Given that teen smartphone addiction is on the rise, this is a topic worth considering. Many issues in education are caused directly or indirectly by smartphone addiction, which also has an impact on students' academic performance. Due to excessive smartphone usage, many students find it difficult to improve their academic performance. Students who use their cellphones excessively risk failing their classes [23]. This even makes teachers/parents worry about their students/children, not taking their learning seriously.

It is beyond any doubt that smartphones are creating new interactive spaces in all aspects of socializing, health, and education, making life easier and more convenient [24], [25]. However, students nowadays are more addicted to the use of smartphones in a destructive way. They are losing their social communication, physical activities, and academic interests, which consequently disturbs their academic performance [26]. To identify how smartphone addiction is affecting adolescent students, this research is an attempt to find the reasons why smartphone addiction is increasing among adolescent students, what is its impact on their academic performances, and to find its solutions.

Students will benefit from this research because they will get the proper information on how smartphones affect their academic performance and will be able to use the study's advice to overcome the detrimental effects of smartphone addiction on their education. Additionally, guardians and parents will be able to comprehend how smartphone addiction affects their ward's academic achievement. They will be able to apply the suggestions to raise their kids' academic achievement and provide them with sound guidance. Teachers who behave as their students' second parents will also be able to comprehend how smartphone addiction

affects educational achievement and be motivated to rein in students' conduct, enforce better rules, and pique students' enthusiasm in studying.

II. REVIEW OF LITERATURE

The conceptualization of smartphone addiction has been the subject of intense debate among researchers due to the surge in the usage of smartphones. Researchers have attempted to study this same issue under various terminologies, like "problematic mobile phone usage" [27], "mobile phone addiction" [28], "mobile phone dependence" [29], "heavy smartphone use" [30], "excessive smartphone use" [31], "smartphone overuse" [32], and "problematic smartphone usage" [33].

Covering all the terminologies used in the existing literature, smartphone addiction alludes to excessive usage of smartphones in uncontrollable situations, affecting basic activities of daily living and leading to negative consequences [34]. Most of the literature examining the impact of smartphone addiction reports varying degrees of negative outcomes on students' academic performance through decreased learning attention and distraction in the classroom [15], [35]–[39].

Few studies in the past [40], [41] have discussed smartphone addiction in terms of students' multitasking and the impact of such multitasking on students' academic performance. Findings on the impact of smart phone multitasking on academic performance suggest an inverse relationship between students' excessive utilization of smart phones and educational performances. Junco and Cotton [41] argue that multitasking, such as texting and viewing social media sites simultaneously while doing home-work or performing educational tasks can interfere with students' academics and negatively impact their overall GPA.

But prior research [32], [42] has also shown beneficial impacts of mobile phone addiction on adolescents' academic achievement, linked to changes in social behaviour that legitimise inappropriate smartphone use. Tessier [42] has discovered that even overuse of cellphones as a

learning aid might improve comprehension and learning, enhancing educational outcomes and the educational setting. Overall, studies on mobile phone addiction have shown contradictory results, and the literature is still

inconsistent. In order to better understand how smartphone addictions affects educational achievement, this research focused on teenage pupils in Rajasthan.

III. METHODOLOGY

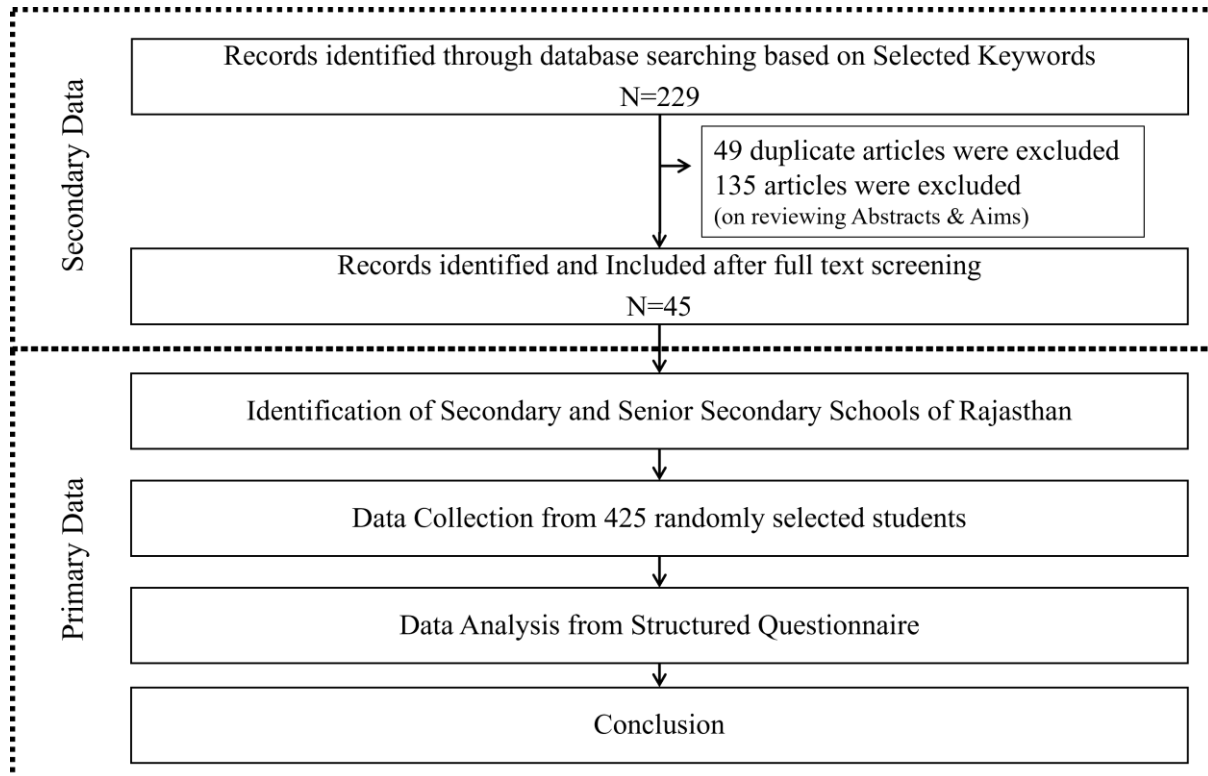


Figure 1: Representing the Flow of the Research Conducted in Two Folds

Based on the recommendations of Ng & Peh [43], this study conducted a systematic literature review following four steps, as listed below: (1) planning the review, (2) search & identify relevant literature, (3) quality assessment of identified literature, (4) extracting and synthesizing the literature. The research approach used in the study is presented in Figure 1. The initial step was to develop an overall plan for conducting a systematic literature review. The second step was to search and identify relevant research papers from various journals and conferences (published in English from January 2012) from leading search engines. 229 articles were initially identified and selected. In the final step, each of the 45 articles were independently examined to identify core characteristics of problematic smartphone use and to provide insights into the

identified research questions. The study then identified those factors that most scholars have assumed in the past to explain the problematic use of smartphones.

The present study was carried out during a period of six months (August 2021 to January 2022) on adolescent students in secondary and senior secondary schools of Rajasthan. The sample constitutes 425 randomly selected students in the age group of 13-19 years. The researcher created a structured questionnaire in this study that asked about participants' age, gender, self-reported smartphone use, and impact on academic activities. The Institutional Review Committee gave their clearance before this survey could be completed online. The researcher provided instructions on how to complete the survey and delivered the link to the survey form to the participants. Each

participant had a unique identification code to avoid dual responses. Subsequent to getting the consent, the identified respondents were required to fill and submit the online form. The form used self-administration approach to collect data, in which participants read questions on their own and provide answers/information about their usage of smartphones and academic performance. The collected data was analyzed utilizing simple statistical technique of depicting graphs and calculating percentages. The demographical characteristics of the responding students are summarized under the Table 1 below:

Table 1: Representing the Demographic Profile of Participants

Demographic Profile of Participants		Count (N = 425)	Percentage
Gender	Male	283	66.6%
	Female	142	33.4%
Age Group	13-15 years	94	22.1%
	15-17 years	137	32.2%
	17-19 years	194	45.7%

As evident from the above table, out of the total 425 respondents, 283 (66.6%) were male and remaining 142 (33.4%) were female. 94 (22.1%) respondents belong to group of age 13-15 years, 137 (32.2%) respondents belong to group of age 15-17 years, and remaining 194 (45.7%) respondents belong to group of age 17-19 years, with mean age of 16.5 years and SD of 1.22. It is worth mentioning here that all the 425 participants (100%) owned and were using smartphones.

The findings of the analysis of the data obtained from the responding students regarding smartphone addiction can be presented as follows. The majority of the participants (52.7%; 224/425) reported that they were using smartphones for about more than 4 years. A total of 117 (27.5%) participants reported that

they were using smartphones on an average for about 6-10 hours daily and 82 (19.3%) participants reported using smartphones more at late night. 184 (43.3%) participants reported that they keep their smartphones on the bed while sleeping. Further, the majority of the participants (39.5%; 168/425) reported that they were mainly using smartphones for social networking, followed by 108 (25.4%) participants using smartphones for communication purposes (calls, text messaging, etc.), and 97 (22.8%) participants using smartphones for entertainment purposes (playing games, listening music, etc.). Only 52 (12.2%) participants reported that they were using smartphones for academic (study, news update, or knowledge) purposes (Figure 2). 122 (28.7%) participants reported that they have a feeling of need to answer a text or call instantly. Among the total 425 participants, 182 (42.8%) informed that they feel curious to utilize their smart phones if any of his/ her friend is using smartphones nearby, while they are studying. All in all, 191 (44.9%) participating students accepted that they feel addicted to their smartphones.

Table 2: Representation of the Reliability Analysis of All Variables

Reliability Statistics			
		Cronbach's Alpha	No. of Items
Academic Performance	Time Slot maintenance for Smartphone Usage	0.904	6
	Smartphone Usage Time		
	Effect on Grades Due to Use of Smartphone		
	Planning for Studies		
	Concentration on Studies		
	Distraction		

The table above displays the reliability analysis of all variables. Uma Sekaran [44] asserts that the dependability increases when Cronbach's alpha, a measure of reliability, approaches 1.0.

Cronbach's alpha must be bigger than 0.55, claim Tabachnick and Fidell [45]. The information is trustworthy, as shown by the total dependability of 6 loaded items (Table 2).

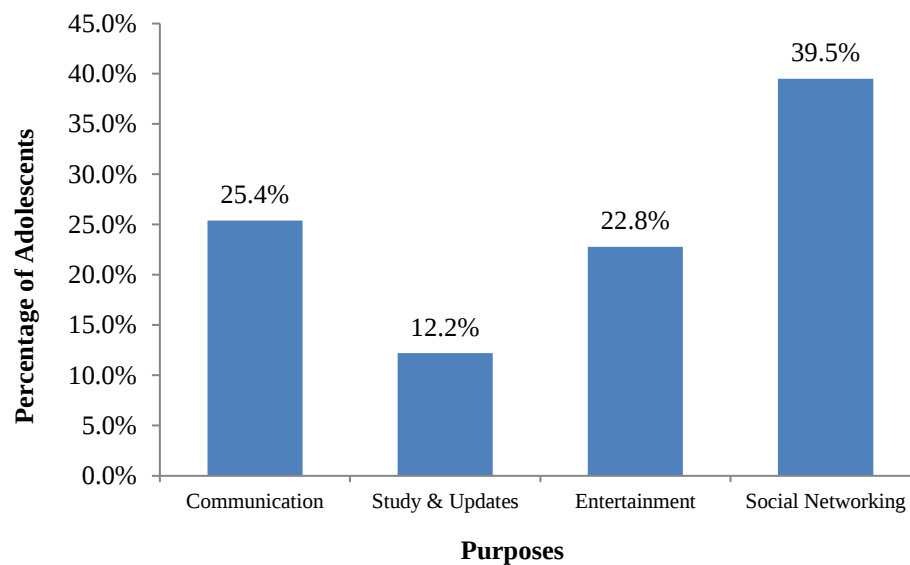


Figure 2: Illustrating the Purpose of Smartphone Usage by Participants

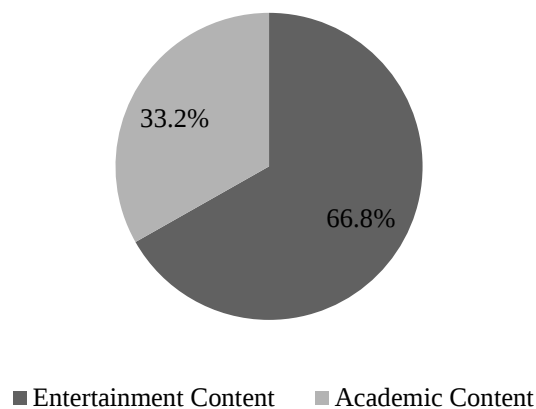


Figure 3: Illustrating the Major Contents Surfaced by Participants in Smartphones

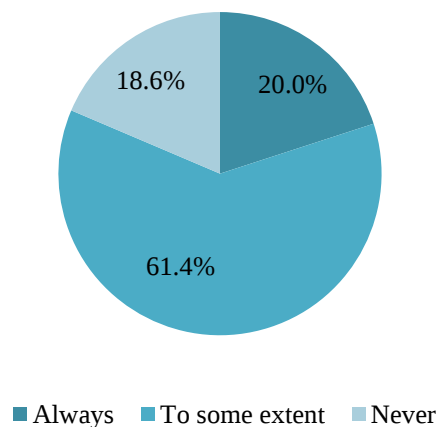


Figure 4: Representing the Perception of Participants on Enhancing the Academic Performance by Reducing Smartphone Use

Additionally, the following information may be used to provide the results of the analysis of the data collected from the responding students on the effects of mobile phone addiction on their academic achievement. The majority of the participants (66.8%; 284/425) agreed that their smartphones have more of the entertainment contents stored as compared to academic contents (Figure 3). Among the total 425 participants, 261 (61.4%) participants agreed that academic performance can be improved to some extent by reducing the usage of smartphones (Figure 4). Apart from the above findings, the analysis also evidenced some positive perceptions regarding smartphone usage by adolescents, for instance 229 (53.9%) respondents agreed that smartphones are assisting them in learning new skills.

IV. RESULTS AND DISCUSSION

The Table 3 below summarizes the statistical output (generated using SPSS 23.0) of the statements demonstrating how the participants' educational attainment was affected by their smartphone use. As evident from the above table, the χ^2 values generated significant results, with p -values $<.0001$. This signifies that the smartphone addiction impacts the academic performance of the adolescent students in Rajasthan.

Table 3: *Impact of Smartphones on Academic Performance*

Statements	χ^2 -value	p -value
I cannot maintain time slot for smartphone usage	110.941	$<.0001$
I cannot control my smartphone usage time	190.753	$<.0001$
My grades dropped due to excessive use of smartphone	159.647	$<.0001$
I feel a hard time implementing/ doing what I planned	75.718	$<.0001$
I feel a hard time in concentrating on my studies	211.224	$<.0001$
Smartphone usage distracts me from studying	114.047	$<.0001$

It is a well-known fact that smartphones play a significant role in our lives. People use smartphones to communicate anytime, anywhere. With the advent of the Internet and various professional applications, smartphones have become one of the survival tools most people carry around [46]. Today, smartphones have become a tool for self-expression and self-identification. Nevertheless, the overuse or addiction of cellphones has become a significant issue as a result of their widespread usage in our culture.

Past research studies around the world investigated how smartphones impact students' academic and socio-cultural activities. Smartphones can disrupt learning and reduce student attention in the classroom, affecting students' performance and leading to negative educational outcomes [47]. Even, most students blame their poor academic performance on their indiscriminate use of smartphones. They use their smartphones to visit social networking sites more often than they use for academic purposes [48]. Frequent calls and messages from friends and others distract students from completing their academic tasks on time or concentrating on their studies [49]. Students who stay up late at night and use smartphones during night hours are more likely to experience daytime sleepiness in class. This eventually interferes with their study results, which lowers their educational outcomes [36], [50].

Based on the findings of this study, past research [51] [50] has shown that smartphone technology increases students' academic activity to a certain extent. While students use smartphones as a optimistic instrument for taking class notes, it increases productivity and saves time, improves study skills, and creates positive feelings among their peers.

4.1. Strategies to Correct Problematic Usage of Smartphones:

It depends on the user's approach to maximizing the benefits of smartphones and minimizing their negative consequences in order to demonstrate that they are a productive tool

rather than a destructive tool to one's life. Electronic screens are so enticing that it's hard for adolescents to take interest in something else. Therefore, he/she can easily become a victim of smartphone addiction. Based on past research, several strategies have been identified to reduce the negative effects of smartphone addiction in adolescents.

- Adolescents should be kept engaged, both academically (homework) and physically (sports activities), to avoid their addiction to gadgets like smartphones.
- Adolescents should be encouraged to pursue their hobbies like painting, skill development, reading books, listening to music, etc.
- Explain to adolescents to make them understand that they can use their smartphones, but only for a short and limited time. They should not be allowed to use their smartphone during mealtime, study time, playtime, or bedtime.
- Explain to adolescents to make them understand the harmful consequences of excessive smartphone use.

V. CONCLUSION

To conclude, the results of this study suggest two important aspects to understand the influence of smartphones addiction on the academic performance of adolescents. The negative aspect indicates that excessive smartphone use by adolescents severely affects their educational achievement and knowledge, and the positive aspect indicates that the use of smartphones by adolescents increases the skills and cognitive abilities they need to succeed and improve their academic performance. Therefore, this study recommends making adolescents aware of the negative effects of smartphone addiction and how to use smartphones effectively to improve their skills and academic achievement. By using the results of this research and current literature, educators may include smartphone regulations into their curricula and inform their students about the possible negative impacts of mobile phone addiction on learning. In addition, good

strategies should be encouraged in all educational settings to promote the proper and healthy use of smartphones among students. Parents and educators should seriously reconsider introducing a rule to cut down on the amount of time spent by students/children on smartphones, especially among adolescents, to help them minimize heavy smartphone use and maximize study time.

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