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Research Article

Smartphone Use and Academic Performance

A Study on Relationship Between Early Smartphone Use and Academic Performance in College Going Students in and Around Karad

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Abstract: Smartphones are being used by each and every one today as smartphone technology continues its rapid development. Smartphones are undeniably convenient, helpful study tools and can be a hurtful source of distraction depending on a student's attitude and use pattern. A nationwide survey conducted in 2010 shows that mobile phones are adolescents' most necessary communication medium. It has virtually affected society's accessibility, security, safety, and coordination of business and social activities and has hence become a part of the culture of the whole world. Our aim and objective is to determine the prevalence of early use of smartphones and co-relate with academic performance and to find out the Prevalence of early use of smartphones in college-going students. 95 college-going students from the College of Physiotherapy who met the inclusion criteria and were between the ages of 18 and 26 were chosen for this observational study, which was conducted. The procedure was described, and the appropriate consent was obtained. Data on demographics were collected. The goal of the investigation was stated to them. Questionnaires were used for assessment, and participants' mark sheets from the first to fourth years of physiotherapy college and from seventh to twelfth grade were gathered. Most students were found to be using smartphones longer than necessary, which had a detrimental effect on their academic performance. It was particularly evident in those who acquired their smartphone between the seventh and tenth grades, according to a comparison of the questionnaire and mark sheets that were gathered.

Keywords: Smartphone, Smartphone Addiction, Low Academic Performance.

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1. INTRODUCTION

A cell phone is a device that can make and receive telephone calls over a radio link while moving around a wide geographic area. It connects to a cellular network provided by a mobile phone operator, allowing access to the public telephone network [2]. Now -a -days, smartphones are an integral part of our daily life as well as of college-going students. Even a casual observation of today's college-going students will reveal cell phones being used, both overtly and covertly, in every possible campus setting, including the classrooms; while beneficial in numerous ways, they also have disadvantages such as reduction in work efficacy, personal attention social nuisance, and psychological addiction [1]. Smartphone addiction among students is progressively increasing every year; signs - include constantly checking the phone for no reason, feeling anxious or restless without the phone, and waking up in the middle of the night to check the mobile and communication updates. Withdrawal may lead to increased anger, tension, depression, irritability, and restlessness, which may alter physiological behavior and reduce student work efficacy [3]. Students spend more time chatting in class, so marks can substantially decrease. A nationwide survey conducted in 2010 shows that mobile phones are adolescents' most necessary communication medium. It has virtually affected society's accessibility, security, safety, and coordination of business and social activities. It has hence become a part of the whole world's culture, stating that traditional agents of socialization are families and schools. The expansion of the educational system due to the need for highly skilled workers led to the school system taking increasingly larger responsibilities in socialization. Surprisingly, research on the influence of mobile phones on our schools today has not been given much attention. There is a conflicting priority of young people, parents, and teachers about the mobile phone device, with teachers more concerned about classroom discipline and parents worried about means of contacting their children at every point. As Ling and Helmerson state, the mobile phone is "at cross purpose with the school's mission." While in school, students are supposed to take on their prescribed roles as students with full concentration on their studies and free from contact with the outside world. However, the mobile phone allows students to blend roles with other roles, thus distracting and disrupting the students' academic work. In the past, when fixed telephones were the norm in schools, there were minimum distractions and disruptions. Still, with the invasion of mobile phones and the eagerness of parents to maintain contact with their wards, the device is becoming part of the classroom[4]. As a group, adolescents are heavy users of newer electronic communication forms such as instant messaging, e-mail, browsing, uploading and downloading, games, and text messaging, as well as communication-oriented Internet sites such as blogs, social networking, and other sites for sharing photos, videos, and ideas, all of which is as a result of the mobile phone. Internet access has exposed many adolescents to different kinds of content. Recently, the availability of affordable Android mobile phones made it easy for adolescents to access different types of social media. The situation is worsened by the ignorance and carefree attitudes of parents who are mostly oblivious to and careless about these adolescents' needs and challenges. Also, guidance and counseling services are absent or inactive in most schools, and the teachers are not helping the situation.

2. MATERIALS AND METHODS

2.1. Procedure

Ethical [Protocol number- 0142/2019-2020] approval was taken from the institutional ethical committee, and permission from respective authorities was taken. After the protocol and ethical clearance, the study was started. The study was done in 6 months and was conducted in Karad, Maharashtra, India. A total of 95 individuals were included in the study based on inclusion and exclusion criteria. The participants were allocated by a simple random sampling method. The samples were split into three groups depending on when they acquired their smartphones in their respective high school or college years. Participants in three groups were included: Group A, which included students who acquired cell phones in grades 7 through 10; Group B, which included students in grades 11 and 12; and Group C, which included students who got smartphones in 1 to 4 years of physiotherapy college The procedure was described, and the appropriate consent was obtained. Data on demographics were collected. The goal of the investigation was stated to them. Questionnaires were used for assessment, and participants' mark sheets from the first to fourth years of physiotherapy college and from seventh to twelfth grade were gathered.

Subject criteria	
INCLUSION CRITERIA	**EXCLUSION CRITERIA**
• Age:18 to 26 years' old • College-going students use smartphones for at least 1 hour or more than 1 hour daily. • Only students from Krishna College of Physiotherapy were taken.	• Psychological issues • Anxiety, depression • Insomnia Using simple phones Slow learners

2.2. Outcome Measures

1. Questionnaire
2. Marksheets of 7^{th},8^{th}, 9^{th},10^{th}.11^{th}.12^{th}.1^{st} to 4^{th} year of college

3. STATISTICAL ANALYSIS

Statistical analysis was done using INSTAT software, student's "t" test was used for the comparison analysis. The data were presented as mean standard $\pm$ standard deviation (SD). A probability value (p) of less than 0.05 was considered statistically significant.

4. RESULTS

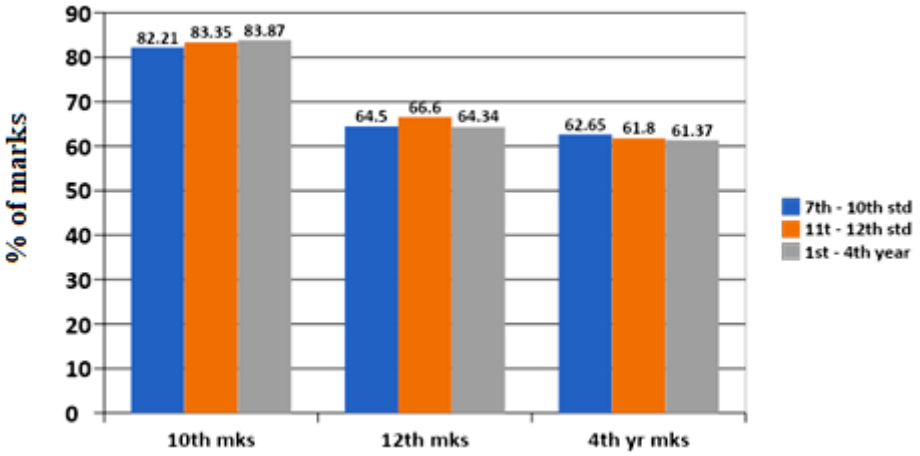

Fig 1. Distribution of Marks according to the Groups

Table 1: Distribution of Marks according to the Groups									
Final Marks in Percentage Mean	**10th std**			**12th std**			**4th year**		
Group A	82.21			64.5			62.65		
Group B	83.35			66.6			61.8		
Group C	83.87			64.34			61.37		
Group	A			B			C		
Standard Deviation	10th	12th	4th	10th	12th	4th	10th	12th	4th
	6.3	7.75	6.28	6.67	5.75	6.09	4.91	7.44	4.63
P Value	0.5991			0.3095			0.7109		
Interference	Not Significant			Not Significant			Not Significant		

Graph 1 denotes the distribution of the students' marks per group. For example, it can be seen in Table 1 that most of the students who received the smartphone in group A had poor academic scores compared to those who received it in groups B and C.

A. Correlation between academic performance and use of smartphone

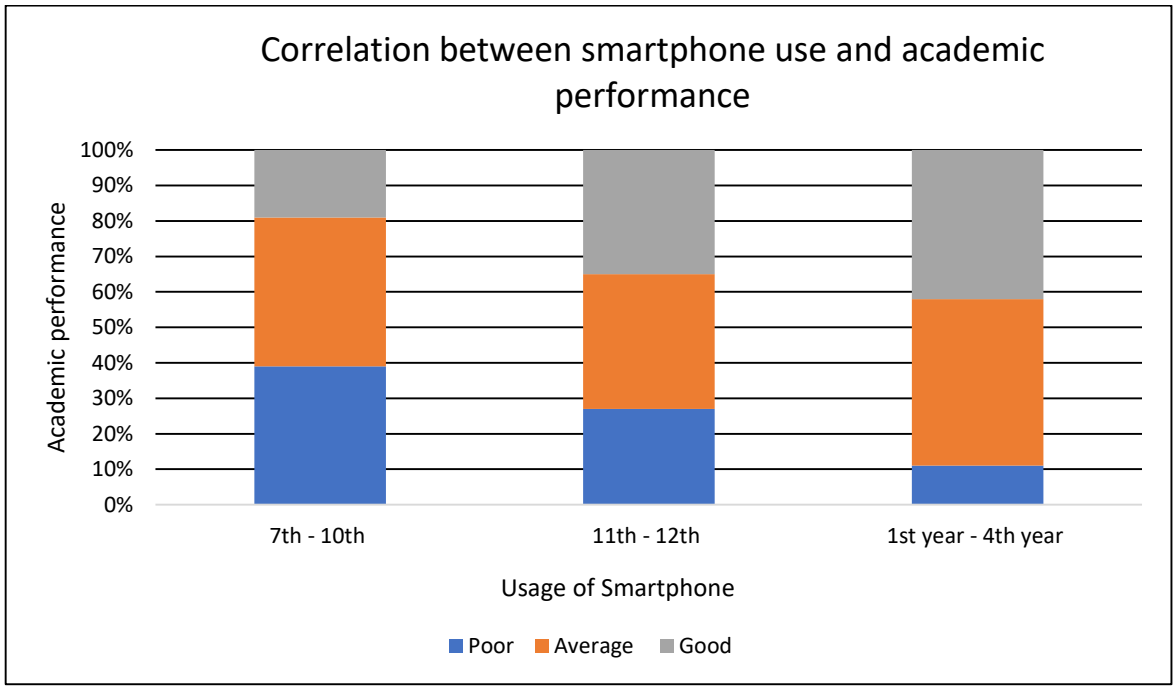

Fig 2: Correlation between academic performance and use of smartphone

Table 2: Correlation between academic performance and smartphone use	
Correlation coefficient (r)	0.7108
Correlation coefficient squared (r^2)	0.5053
p-value	<0.0001 (significant)

Figure 2 shows the correlation between academic performance and smartphone usage. It can be seen that Group A has poor scoring as compared to Group B and Group C. It shows a p-value < 0.0001, which suggests that the Correlation between academic performance and the use of smartphones is significant.

B. Correlation between dependency on smartphone and smartphone use

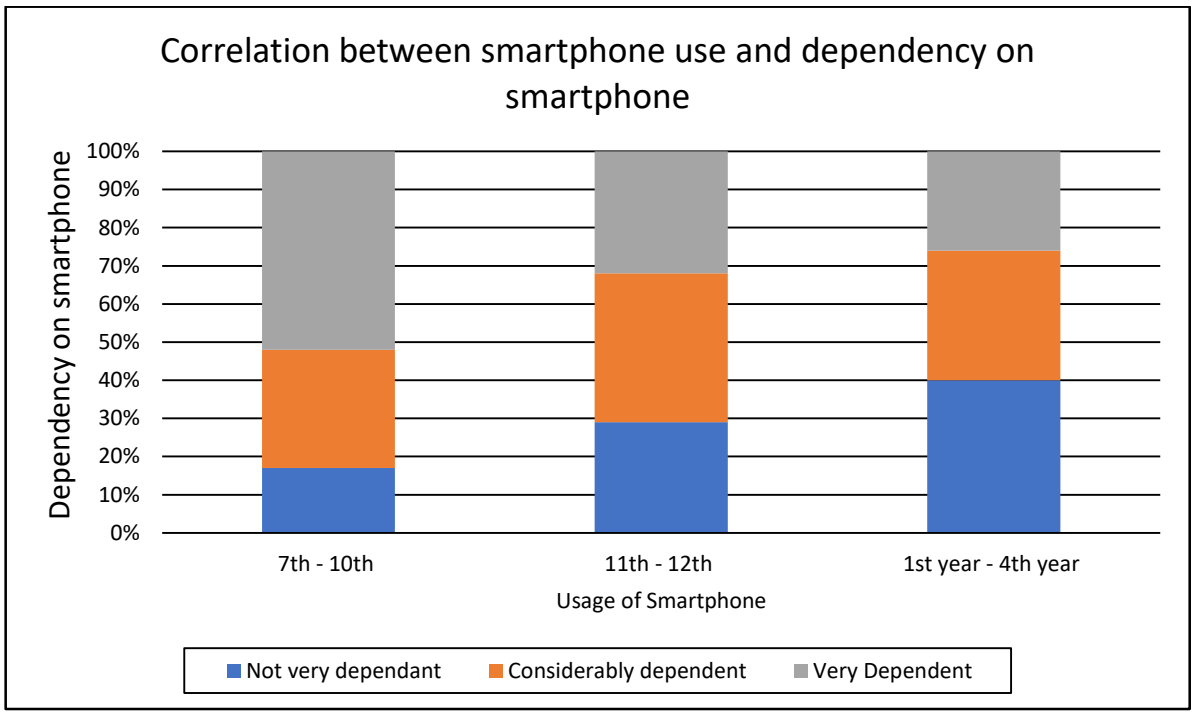

Fig 3: Correlation between smartphone use and dependency on smartphone

Table 3: Correlation between smartphone use and dependency on smartphone	
Correlation coefficient (r)	0.7108
Correlation coefficient squared (r^2)	0.5053
p-value	<0.0001 (significant)

C. Figure 3 depicts the Correlation between smartphone use and dependency on it. The students who got smartphones in the 7^{th} to 10^{th} standard of school are more dependent on the smartphone than those who got them in high school and college. Correlation between Smartphone Use and its Effect on Health and social interactions

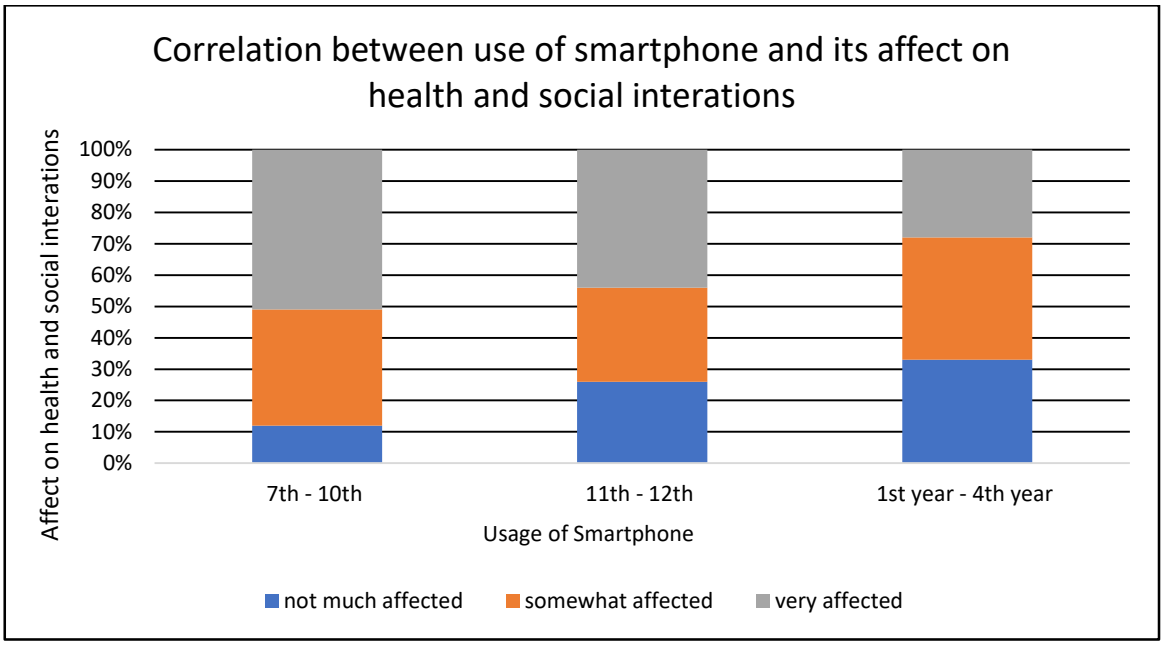

Fig 4: Correlation between the use of smartphones and its effect on health and social interactions

Table 4: Correlation between the use of smartphones and its effect on health and social interactions	
Correlation coefficient (r)	0.9291
Correlation coefficient squared (r^2)	0.8633
p-value	<0.0001 (significant)

Figure 4 depicts the Correlation between the use of smartphones and their effect on health and social interactions; it can be seen that for those students who got their smartphones in the 7th to 10th standard of school, their health and social interactions are more affected.

5. DISCUSSION

The study was done to check the correlation between the use of smartphones and the academic performance of students. A structured questionnaire comprising a total of 15 questions was used for the study. Based on the questionnaire, the study was done in 3 parts, use of smartphones and its effect on academic performance, use of smartphones and dependency on smartphones, and use of smartphones and its effect on health and social interactions. The first part of the study indicates the use of smartphones and its effect on academic performance. From Figure 1 and Table 1, it can be seen that students who acquired a smartphone early in their life, between the age of 7th – 10th STD had poor academic performance compared to those who acquired their smartphones between the 1st and 4th year of graduation. The students who acquired their mobile phones between the 11th – 12th standard showed average performance. In a similar study done on the impact of mobile phone usage on academic performance in Bangladesh, it was seen that 75% of the respondents thought that the calls/messages received just before class impact their ability to concentrate, 32.5% of respondents said that the frequent use of mobile phone sometimes interferes their learning whereas 36.5% are of the agreement that it also assists them in learning sometimes.[1] Another study on the Impact Of Mobile Phone Usage On Academic Performance Among Secondary School Students In Taraba State, Nigeria, found a significant difference in the influence of mobile phone usage on academic performance among male and female senior secondary school students (p=0.02).[3] A similar study was done on the impacts of mobile phone usage in Thailand; it could be seen that Smartphone addiction negatively affected students' academic performance.[7] The second part of the study focused on the use of smartphones and dependency on mobile phones. From Figure 2 and Table 2, it can be seen that among the students who acquired smartphones between the 7th – 10th standard, the majority showed more dependency, those who acquired between the 11th and 12th standards, the majority showed moderate dependency, whereas those who acquired phones between 1st year – 4th year of graduation majority showed less dependency. A similar study conducted among the Malaysian population showed that 36.7% of the study participants have the habit of checking mobile phones during sleep. In comparison, 27.1% felt inconvenienced by mobile phone use. The study also showed that 70.4% of participants use smartphones longer than intended, and 66.5% are engaged longer with smartphones.[3] Another study conducted in Thailand on the impacts of smartphone addiction, it could be seen that Smartphone addiction has the highest impact on mood disorders (r=.667), followed by social relationships (r=.625), family relationships (r=.620), academic performance (r=.570), and health problem (r=.481) respectively.[7] A study on relationships between smartphone addiction, stress, academic performance, and satisfaction with life showed that smartphone addiction risk was positively related to perceived stress. Still, the latter was negatively related to satisfaction with life.[12] The third part of the study focuses on the use of smartphones and its effect on health and social interactions. The results of the study show that participants who acquired smartphones early in their life, i.e., between 7th – 10th standard, experienced higher levels of addiction as well as had a higher effect on their health and hence had fewer interactions as compared to those who acquired their smartphones later in their life, i.e., between 1st year and 4th year. A study on the common health effects of cell phones

amongst college students showed that many felt indisposed due to the continuous stress caused by cell phones in their daily routines. Individuals elaborated that they got frequent headaches, neck pains, limb pains, and backaches. They had redness in their eyes and tinnitus in their ears due to continuous mobile usage on some days. [2] In Another study conducted by Sue K Adams, it was seen that they use cell phones before bed and in bed, thus interfering with their ability to fall asleep and remain asleep. Many college students will answer texts as they try to fall asleep or wake up to answer them. These behaviors may be related to a feeling of missing out or social norms that dictate the need to acknowledge text messages immediately.[6] A study done on gender differences in the relationship between internet addiction and depression showed that it was found that males and females exhibit different behavioral patterns and motivations for Internet usage. Males were more likely to use the Internet for pleasure and less likely to surf the Internet to search for information than females. Although males and females were prone to surfing the Internet alone, males were likelier to go online with friends than females.[8] Thus, the results of this study show a significant impact of smartphone usage on not only academic performance but on health, social interactions as well as dependency/addiction to smartphones. Various terms have been used to define problematic smartphone behavior. The terms commonly used by some researchers are nomophobia and smartphone overuse.[9] Very few studies have been conducted to measure behavior directly. These studies have shown conflicting results.[10] A study has also demonstrated positive results on the relationship between smartphone addiction and depression in adults.[11] Thus, adequate measures need to be taken to tackle and explain to the students the effects of smartphones.

6. CONCLUSION

The study concluded that there was a significant negative effect of early use of smartphones on the academic performance of the students. In addition, the health and social interactions among the students decreased as there was an increased dependency on smartphones.

7. AUTHORS CONTRIBUTION STATEMENT

The study was conceptualized and designed by Mr. Rahul Suryavanshi and Mr. Akshay Rupnawar. The data was collected, processed, analyzed, and interpreted by Mr. Rahul Suryavanshi and Mr. Akshay Rupnawar under Dr. Trupti Warude. Mr. Rahul Suryavanshi and Mr. Akshay Rupnawar did the manuscript preparation and the literature search. Dr. Trupti Warude critically reviewed the manuscript.

8. CONFLICT OF INTEREST

Conflict of interest declared none.

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