Original Research Article

A smartphone use and its impact on academic performance of medical students: a cross sectional study

Praveen Kumar R. S., Kaki Aruna, Aravind Kumar, Venkatalakshmi P.*

Department of Psychiatry, Panimalar Medical College Hospital and Research Institute, Chennai, Tamil Nadu, India

*Correspondence:
Dr. Venkatalakshmi P.,
E-mail: dr.rspraveen@gmail.com

ABSTRACT

Background: Smartphones are unavoidable technology in this modern era. Though there are several advantages with the use of smartphones, there is another school of thought is that due to excessive use of smartphones and addiction behavior the academic performance of the students gets deteriorates. With this in background, this study was conducted to compare the use of smartphones with the student's academic performances.

Methods: This prospective cross-sectional study was conducted among the undergraduate medical students of Sri Venkateshwara medical college hospital and research institute, Puducherry, a tertiary care teaching hospital during the January 2019 to July 2019. A total of 370 students were included in this study. All were assessed for the demographic profile and questions related to usage of smart phones using a questionnaire. Data was analyzed using SPSS.

Results: Sharing documents, assessing drug information, taking notes and reading journals articles and books was the academic reasons reported by 94.6%, 72.7%, 58.1% and 35.7% of participants, respectively. Among non-academic reasons games, social media and entertainments was recorded in 82.4% 75.4% and 33% of participants, respectively. Mean duration of smart phone usage in a day was 3.5 hours. However, there was no significant difference noted between the academic performance and use of smartphones.

Conclusions: Though smartphone use has no significant impact on academic performance of medical students, with the view of steady increase in smartphone usage, there is a necessary for further monitoring, in order to prevent smartphone related complications like addiction.

Keywords: Smartphones, Academic performance, Addiction

INTRODUCTION

Smartphones are gaining popularity in both the personal and professional realms.[1] Many aspects of our culture, commerce, communication and education have been transformed by the introduction of new technology in the last decade. Smartphones have been widely adopted in many countries, allowing for easy access to information in previously unattainable ways.[2]

For a variety of reasons, smartphones are thought to be an especially effective tool for advancing education in developing countries. Mobile phones are most common in developing countries and their penetration rate is rapidly increasing. With the growing impact of mobile phones in the educational sector in developing countries, more research is needed.[3]

Smartphones have a variety of features and applications that can be used to benefit health care. The potential of a smartphone as an educational tool is becoming more widely recognized.[3] We believe that these devices enable access to information, which has the potential to change how medicine is learned and practiced.[4]

According to a recent study, faculty, students and residents frequently use mobile devices as reference and information management tools in clinical practise and medical training, with a trend toward higher use among newer professionals and trainees.[5] Learning across multiple contexts, through social and content interactions, using personal electronic devices is what m-learning or mobile learning is defined as.[6] M-learners, a type of e-learning distance education, can use educational technology on their mobile device in a variety of locations at their leisure.7

Literature says that mobile and wireless device technology aids teaching and learning.[8,9] A growing number of physicians, residents and medical students are using mobile devices like smartphones, ipads and tablets for education and clinical use.[10,11] During their studies, medical students must assimilate a lot of new information, especially with the need for evidence-based practise and they must develop skills for lifelong learning to keep their knowledge up to date.[12] Motivation and problem-solving skills relevant to the clinical situation are required for lifelong learning, particularly in medicine.[13] Though there are several advantages with the use of smartphones, there is another school of thought is that, due to excessive use of smartphones and addiction behavior the academic performance of the students gets deteriorates. With this in background, this study was conducted to compare the use of smartphones with the student's academic performances.

Objectives

The objective of this study was to compare the use of smartphones with the student's academic performances.

METHODS

This prospective cross-sectional study was conducted among the undergraduate medical students of Sri Venkateshwara medical college hospital and research institute, Puducherry, a tertiary care teaching hospital during the January 2019 to July 2019. Students from all academic years were included in the study. Students who were not willing to participate and reachable during three consequent attempts were excluded from this study. A total of 370 students were included in this study.

Statistical analysis

After taking the written informed consent, all the students were assessed for the demographic profile and questions related to usage of smartphones using a questionnaire. Following which the principal investigator entered the details in a Microsoft excel sheet and analyzed using SPSS (version 17). Descriptive statistics with mean, standard deviation and proportions (%) were calculated for quantitative variables. To test the hypothesis independent sample t test was used. $P<0.05$ was considered as statistically significant.

RESULTS

The mean age of the students were found to be 20.1 years in this study, among the study subjects 55.4% were females and 44.6% of the students were males. 26.5% of the students were in I MBBS, 24.6% of the students were from II MBBS and 25.4% and 23.5% of the students were from III and final MBBS respectively.

Table 1: Background characteristics of the study participants.

Parameters	Frequency	Percentage
Gender		
Male	165	44.6
Female	205	55.4
Academic year		
I	98	26.5
II	91	24.6
Pre final	94	25.4
Final	87	23.5

Table 2: Purpose of smart phone use among medical college students.

Parameters	Frequency	Percentage
Type of smart phones		
Android phones	317	85.7
Iphone	49	13.2
Others	04	1.1
Purpose of using smart phones#		
Academic use		
Drug information	269	72.7
Reading journals articles and books	132	35.7
Taking notes	215	58.1
Sharing documents	350	94.6
Non-academic use		
Social media	279	75.4
Games	305	82.4
Other entertainments	122	33.0

#Multiple responses.

Table 3: Academic performance of the students who use smart phone.

Academic performances	Frequency	Percentage
Average and above	289	78.1
Below average	81	21.9
Total	370	100

The mean years of smartphone usage among the medical students was found to be 5.3 years, most of the students (85.7%) were using Android phones followed by 13.2% who were using Iphones and remaining 1.1% of the students were using other type of phones in our study. The

reason for smartphone use was noted for two purposes one wass academic and other non-academic.

In academic, sharing documents, to gather drug information, taking notes and reading journals articles and books was the reasons in order among 94.6%, 72.7%, 58.1% and 35.7% respectively. Among non-academic reasons games, social media, other kind of entertainments was recorded in 82.4% 75.4% and 33% of the medical students. The mean duration of smart phone usage in a day was 3.5±1.6 hours.

Based on the smart phone usage and the academic performance 78.1% of the students were average and above average performers while 21.9% of the students were below average performers.

The mean duration of smart phone use in a day was found to be 2.9±1.1 hours among average and above average performers whereas among below average academic performers the mean duration of smart phone usage was 3.1±0.8 hours, but the difference in academic performance among below average and above average students based on the duration of phone use was statistically insignificant in this study (p=0.1278).

Table 4: Difference between academic performance and mean duration of mobile phone usage.

Parameters	Academic performance		P value
	Average and above	Below average	
Mean duration of smart phone usage in a day (in hours)	2.9±1.1	3.1±0.8	0.1278

DISCUSSION

Findings of the present study were comparable with the findings of Nasser et al who conducted a study and reported that 60.7% of students had problematic smartphone use.[14] Students used smartphones predominantly to access social media. In their study they stated that longer duration on the smartphone per day more than 9 hours, age at first using a smartphone and depression carried higher risk of developing problematic smart phone use.

In contrast with the findings of this study, previous studies conducted on medical students who perceived that their smartphone usage was negatively affecting their academics. However, no comment was made on the objective performance of these students.[15] Lepp et al reported that when measured against hours of cellphone use, undergraduate students who used the phone for longer duration showed a poorer performance in examinations after taking into account the variations caused by demographic factors, inherent abilities and motivation of the students giving a more holistic picture of the situation.[16] However, the major difference between this study and ours was that it was conducted on university students taking different courses.

In another study, Khan et al conducted among medical students of Pakistan and reported that they used smartphones to browse the internet to find medical information (100%), to share educational material (90%) and to take notes (79%).[17] Easy and speedy access to information and improvement in study skills were the major benefits, while limited wireless access, small screen and lack of awareness about medical resources were the main barriers. The students had a positive attitude towards smartphone as an academic tool. Smartphones use was likely to increase with the emergence of new developments in terms of design, medical apps and educational resources. Subhash et al in their study reported that smartphone users were 83.6%, in their study.[18] They used smartphone for academic purposes (56.41%) and entertainment purposes (20.83%). In their study they reported that there was a significant gender difference in terms of smartphone availability and daily internet use for educational purposes, with females using the internet more frequently than males.

However, Ithnain et al reported that medical students in Malaysia were prone to becoming smartphone addicts and were subjected to anxiety and depression.[19] Gavali et al conducted a study and reported that 96% of medical students owned a smartphone which were Android based (72.4%), Iphone (13.0%), Windows based (7%) and Blackberry (3.6%).[20] More than 90% of students said they could use smartphones for medical education, communication and instant access while teaching at the bedside. Inadvertently, 37.2 percent of students believed that using smartphones for clinical purposes would require them to spend less time with patients. Smartphones should be included in the MBBS curriculum, according to nearly 79.4% of respondents.

Ibrahim et al in their study reported that 63 percent of students only use their smartphones for basic functions like receiving and making calls, sending and receiving SMS and e-mails, scheduling/calendaring/planning and using a dictionary.[21] In addition, 41% of students used the internet to access and take lecture notes, medical videos, electronic textbooks and medical research. They were rarely used as patient management tools, course evaluation tools or log books. The main barriers to mobile learning were battery life, small screen size, slow speed, limited memory and cost, while the biggest benefits were device mobility, ease of use, access to current information and ease of access to resources. Also Oswal et al performed a study and reported

that smartphone addiction affected 22.2 percent of students, with addicted students more likely to change their phones frequently, use them for longer periods of time, and in restricted areas.[22] Gender, age, years of use and academic performance had no correlation.

In the study conducted by Payne et al among medical students and doctors, they found that the majority of students and doctors had 1-5 medical-related apps, with only a few having more than ten, and that Iphone owners were significantly more likely to have apps.[23] Both groups had similar patterns of using apps multiple times per day. Apps were used for 1-30 minutes by students and 1-20 minutes by doctors over the course of 24 hours. Students used disease diagnosis/management and drug reference apps, while doctors preferred clinical score/calculator apps. Robinson et al in their study conducted in UK reported that 59 percent of students had a smartphone and 37 percent of those who did said they used it to help them learn.[24] The concept of smartphones as future educational aids was generally well received by students, with 84 percent believing the devices would be useful or very useful. However, 64 percent of respondents believed that implementing smartphones would be too expensive and 62 percent believed that such technology was not in the medical school's best interests.

Karki et al conducted a study and reported that Smartphone addiction was estimated to be around 36.8% among medical students, with a higher percentage of male smartphone addicts.[25] Phubbing was reported by 37.6% of participants, with over 60% reporting excessive use. There was a statistically significant link between smartphone addiction, gender and overuse. Self-awareness of addiction was discovered to be the most important predictor of smartphone addiction.

Limitation of this study was that it was conducted in only one medical college however in order to get a better picture about the impact of mobile phone use on academic performance of medical students, a multi-centric study could be the much appropriate option.

CONCLUSION

We conclude that there was no significant difference noted between the academic performance and use of smartphones. However, the use of smartphones is steadily increasing, which shows that further monitoring is much needed, in order to prevent smartphone related complications like addiction.

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