

# Smartphone use and acceptability amongst undergraduate pharmacy students

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## Abstract

**Background:** Smartphones offer unique resources useful for practicing pharmacists; however their acceptance among students within pharmacy educational institutions as learning tools remains unclear.

**Method:** A 30-point questionnaire was administered to pharmacy students, with descriptive statistics used to calculate frequencies and percentages.

**Results:** Data were obtained from 81 pharmacy students. All responding students owned a smartphone; 56.1% of respondents reported using their smartphone for educational purposes at least twice weekly. Ninety-five point eight per cent of students believed that resources offered on the smartphone were more easily accessible compared to traditional textbooks. However, 87.5% believed that faculty might think students are using non-medical applications if these devices should be allowed in the classroom setting.

**Conclusion:** This report highlighted that smartphone usage is prominent among pharmacy students and indicates agreement on benefits and barriers should these devices be allowed in the educational setting.

**Keywords:** *Mobile Medical Applications, Mobile Technology, Pharmacy Student Perceptions, Smartphones*

## Introduction

Mobile technology is advancing rapidly and becoming increasingly common practice for both personal and professional use. Smartphones, described as mobile phones with capability of functioning as handheld computers, are becoming more common in a wide variety of professions. In the healthcare sector, smartphones have been used for a broad range of functions including but not limited to accessing information on different diseases and medications (Prgomet, Georgiou & Westbrook, 2009), downloading tertiary references (Franko & Tirrell, 2012; Mosa & Yoo, 2012), and viewing images related to anatomy (Trelease, 2008). In the field of pharmacy practice, mobile medical applications accessed on smartphone devices have been found to allow pharmacists to have mobile access to information for point-of-care treatment, organise and manage the users' personal files, and help with productivity and time management (Aungst, 2013). Smartphones are also beginning to represent an educational medium for students studying in pharmacy (Richard, Hastings & Bryant, 2015). The objective of this report was to investigate pharmacy students' current use of smartphone technology in an educational setting while describing their perceptions towards incorporation of smartphone technology into pharmacy education and assessments.

## Methods

A cross-sectional descriptive survey was conducted amongst undergraduate pharmacy students. Ninety-nine students currently enrolled first, second, third or fourth professional years of the undergraduate pharmacy programme were eligible to take part in this survey. The author developed a 30-point questionnaire designed to elicit and describe smartphone ownership (four items), current use of smartphone technology by students and how these devices were used for educational purposes (six items), perceived facilitators and barriers for smartphone use in the current educational environment (17 items), and future use of smartphone technology in the pharmacy education environment (three items). The first draft of the questionnaire underwent content validity by faculty members of the College of Pharmacy with expertise in questionnaire development. The questionnaire was then piloted by three pharmacy graduates for ease of understanding and completion time. The final version of the questionnaire was reviewed by both investigators. The questionnaire was distributed to students via an emailed link to the self-administered SurveyMonkey (SurveyMonkey Inc., Palo Alto, CA) online web-based survey. This study was approved by the University Institutional Review Board. Frequencies and percentages were used to summarise the responses generated.

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## Results

Demographic characteristics of participants are shown in Table I.

**Table I: Participant demographics**

Characteristic	Total N=81	Prof.* Year 1 N=24	Prof.* Year 2 N=20	Prof.* Year 3 N=24	Prof.* Year 4 N=13
	n (%)	n (%)	n (%)	n (%)	n (%)
Female	81 (100)	13 (100)	24 (100)	20 (100)	24 (100)
Ownership of smartphone	81 (100)	13 (100)	24 (100)	20 (100)	24 (100)
Brand of smartphone					
Apple/iPhone	44 (54.3)	5 (38.5)	10 (41.7)	14 (70)	11 (45.8)
Android	37 (45.7)	8 (61.5)	14 (58.3)	6 (30)	13 (54.2)
Ownership of smartphone medical applications	66 (81.5)	9 (69.2)	18 (75)	15 (75)	24 (100)
Frequency of using smartphone medical applications if owned					
Daily	17 (25.8)	2 (22.2)	4 (22.2)	3 (20)	8 (33.3)
2-3 times per week	20 (30.3)	2 (22.2)	8 (44.4)	2 (13.3)	8 (33.3)
Once weekly	19 (28.8)	4 (44.4)	5 (27.8)	4 (26.7)	6 (25)
Once monthly to never	10 (15.2)	1 (11.1)	1 (5.6)	6 (40)	2 (8.3)

\*Prof. = Professional

Eighty-two percent of students reported having a medical application on their smartphone with Medscape reported as the most frequently used application. Few participants received training on how to use medical applications (15.8%) while a majority of those that did receive training indicated that a faculty member at the College of Pharmacy had provided this training.

The majority of participants (95.8%) believed that smartphone technology for education is a more easily accessible resource compared to textbooks. Eighty-eight point nine per cent believed that smartphone medical applications are a useful reference when searching for specific information about medications while 77.5% suggested that smartphone technology saves time compared to using textbooks for medically relevant information. Use of medical applications available on the smartphone were viewed as a useful resource for completing in-class assignments (53%) while many participants also agreed that smartphone technology could replace textbook resources in practical assessments (51.5%). The pharmacy professional skills and integrated case-based learning courses were suggested as course series for incorporation of smartphone technology.

Size of a smartphone screen was cited as a factor which hinders its ability as a useful resource (43%). A significant number of participants agreed that the

temptation to cheat through the smartphone internet access was a barrier to its use (45.5%). Some participants suggested that allowing smartphones to be used in class may decrease the students' attention (40.8%). A majority agreed that faculty might think students are using other non-medical applications (e.g., Facebook<sup>®</sup>) rather than medical applications during classes (87.5%).

## Discussion

The results from a relatively small sample of students in this report demonstrate that smartphone technology has been embraced by pharmacy students in that device ownership was 100% and that a majority are already incorporating the technology to further their learning. A recent study examining smartphone use and perceptions among medical students and physicians found that 92.5% of practicing physicians and 95.2% of medical students owned a smartphone (Buchholz *et al.*, 2016). This highlights the rapidly changing environment on smartphone technology and the growing availability of these devices amongst both healthcare students and practitioners. Prior suggestions that students in healthcare studies may not be able to acquire a smartphone if required by their institution of study (Robinson *et al.*, 2013) may no longer be valid as all students already appear to own a smartphone, based on this study's results.

Overall, student participants in this study perceived smartphones as useful, readily available resources for educational purposes. A similar outcome was found amongst third and fourth year medical students who were positive towards the concept of smartphones as educational devices with 84% of survey respondents believing that these devices would be useful or very useful (Robinson *et al.*, 2013). Many of these respondents also thought smartphones would be useful or very useful as tools to access information (72%). With the constantly changing and progressing field of healthcare sciences, the availability of a resource that has the potential to provide up to date information in a timely fashion appears to be very appealing to students studying within this field.

A major barrier to smartphone use in the educational setting was the misconception of faculty members that students would be using non-medical applications (e.g., social media) rather than designated medical applications in the learning environment. This drawback was also noted by medical students who believed that there were potential perceptions of unprofessionalism associated with using a smartphone device in the learning and clinical environments (Robinson *et al.*, 2013).

## Conclusion

Pharmacy students across all years of study are positive towards the idea of incorporating smartphones in their

education. Smartphones were seen as an important resource that could potentially replace other references, such as textbooks, currently used.

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