

# Attitudes about the Use of Smartphones in Medical Education and Practice in Emergency Department of Tertiary Care Hospital

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## Abstract

**Background:** Smartphone has emerged common place within the medical field. Most health care experts desire current clinical facts and decisions that support at the point of Patients™ care. The study was carried out to ascertain the use of smartphones in medical education and practice in Emergency Department of BP Koirala institute of Health Sciences (BPKIHS), Nepal.

**Method:** A cross-sectional study was done in all the medical officers, residents and faculties working in emergency department of BPKIHS.

**Result:** Ninety-nine percent (99%) of participants reported using smartphones and 89% of participants used smartphones over more than two years. 55% bought smartphone to use in medical education and 98% of participants found using medical apps in clinical practice. 99% believed that smartphone apps were supportive to learning especially in clinical exam tests and findings 75%. Ninety-six (96%) of the participants believed the concept of smartphones was useful. 66% of respondents expressed their views regarding smartphone use in medical education.

**Conclusion:** The study confirms that smartphones are ubiquitously adopted by residents, medical officers and faculties which enhance both learning and continuing Patients™ care. It is advisable to understand its need and maximize its benefits in field of medical education.

**Keywords:** Attitudes; Medical education, Smart phone; Patients™ care

## Introduction

Smartphone has become common place within the medical field as both a personal and professional tool. It's simply not possible for doctors to memorize every piece of medical information needed to treat patients. That's especially true in the emergency department, where we care for everything from cases of heart attacks, trauma and burns and everything in between, as well as other conditions that just can't wait for a doctor's visit in the morning. Most health care professionals desire current clinical information and decision support at the point of care. Smartphones can provide both by accessing traditional medical textbooks, professional society guidelines, drug references, and institution-specific therapy standards. Smartphones provide numerous benefits to physicians, including rapid access to medical references, research applications, and patient information [1,2].

Healthcare market research had predicted that over 80% of physicians have used smartphones in 2012. These devices have been used for teleconsultation and patient education, and applications have been developed for numerous clinical specialties. Smartphones have also provided fast and clear access to electronically mailed digital images and allowed the oral/maxillofacial surgeon free mobility in turn allows for improved efficiency of the specialty consultation and improved triaging [3].

Double-check recommendations with medical apps and additional research may be the patients' greatest satisfaction. It is comforting to them to know that there is additional evidence supporting medical decisions besides an emergency-department doctor they've never met before telling them they are OK or that they need additional treatment. These kinds of studies are very new and there is limited evidence regarding smartphones in medical education and practice in Nepal. We, therefore, like to explore such kind of study in Emergency department of BP Koirala institute of Health Sciences (BPKIHS), Nepal.

## Aims and Objectives

- To ascertain the use of smartphones in medical education and practice among medical officers, residents and faculties of BPKIHS
- To assess participants' attitudes about the use of such devices in medical education and practice.

## Method

A cross sectional study was done in all the medical officers, residents and faculties working in emergency ward and general practice OPD of department of general practice and emergency medicine at BPKIHS in year 2018. All the medical officers, residents and faculties working in department of general practice and emergency medicine were included in the study. The study considered 95% confidence interval and power 80% to estimate the sample size. For this purpose, the study considered 50% prevalence of using smartphones for medical practice and education [4].

Now using the following formula for calculating sample size by applying  $N = Z^2 pq/L^2$  where  $Z = 1.96 \sim 2$  at 95% Confidence Interval.  $P = 50\%$ ;  $q = (100 - 50)\%$ . Therefore,  $L = 20\%$  of  $p$  at 80% power = 10; Hence,  $n = 100$ . Percentage of smartphone users among medical officers, residents and faculties were measured for medical education and practice.

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Semi-structured interviews were conducted with medical officers, residents and faculties working in Emergency ward and general outpatient department of BPKIHS. All the participants were invited voluntarily in the survey. Questionnaires were used for the interview. A convenient sampling method was used by using non-probability sampling i.e. purposive sampling methods. Collected data were entered at MS Excel 2007 and converted it into SPSS 11.5 for statistical analysis. Percentage, mean, SD, median, were calculated along with graphical and tabular presentation. Chi square test were used as difference in proportion for descriptive analysis. Qualitative data were analyzed by using thematic analysis. Ethical clearance was obtained from Institutional Review Committee, BPKIHS ref. no 06-075-076-IRC (Proforma in Appendix).

## Results

Interviews were conducted with 100 participants (51 residents, 33 medical officers and 16 faculty members). 99% of participants reported using smartphones where 89% of participants used it more than two years as shown in Table 1 and Figure 1.

An android smartphone device was more prevalent among medical officer 23%, resident 46% and medical faculty 13% shown in Table 2.

67% of the participants' were from department of General, 11% from Internal Medicine, 9% from Surgery, 3% from Orthopaedics, 2% from Dental and 1% from Radiology, Psychiatry, Physiology, Community Medicine and Ear Nose Throat (ENT) respectively as shown in Figure 2. 55% of the participants considered buying smartphones specifically to use in medical education as shown in Table 3.

98% of the participants found using medical apps especially for medical education (p=0.37) as shown in Table 4. 42% of the participants valued at least 5 medical apps in their clinical practice followed by 4 apps in 11%, 3 apps in 20%, 2 apps in 16% and 1 app in 10% of the participants respectively. Only 1 participant found not using any app for medical education as shown in Figure 3.

67% of participants were using these medical apps more than once a day, 13% used at least once a day. 5% reported once a week, 1% reported less than once a week. Erratically only 2% of stated of not

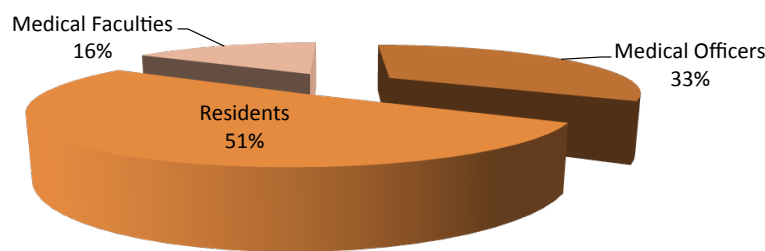


Figure 1: Level of training.

Level of training	Distribution of duration participants owing Smartphone		P value
	Less than 2 years	More than 2 years	
Medical Officer	4	29	0.15
Resident	5	46	
Medical Faculty	2	14	

Table 1: Distribution of smartphone owned at different level of training.

Level of training	Distribution participants owing types of Smartphone		P value
	iOS	Android	
Medical Officer	10	23	0.88 (CI=0.52-0.77)
Resident	12	39	
Medical Faculty	3	13	

Table 2: Distribution participants owing types of Smartphone.

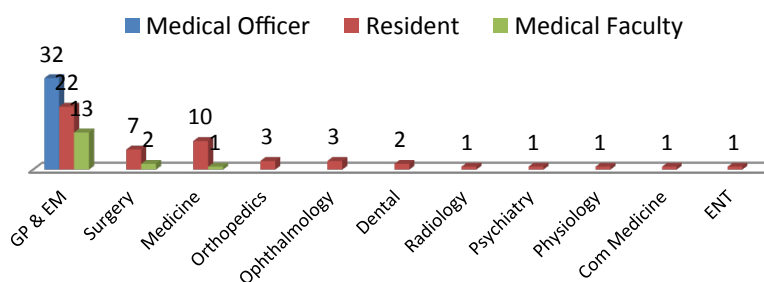


Figure 2: Distribution of participants from various departments.

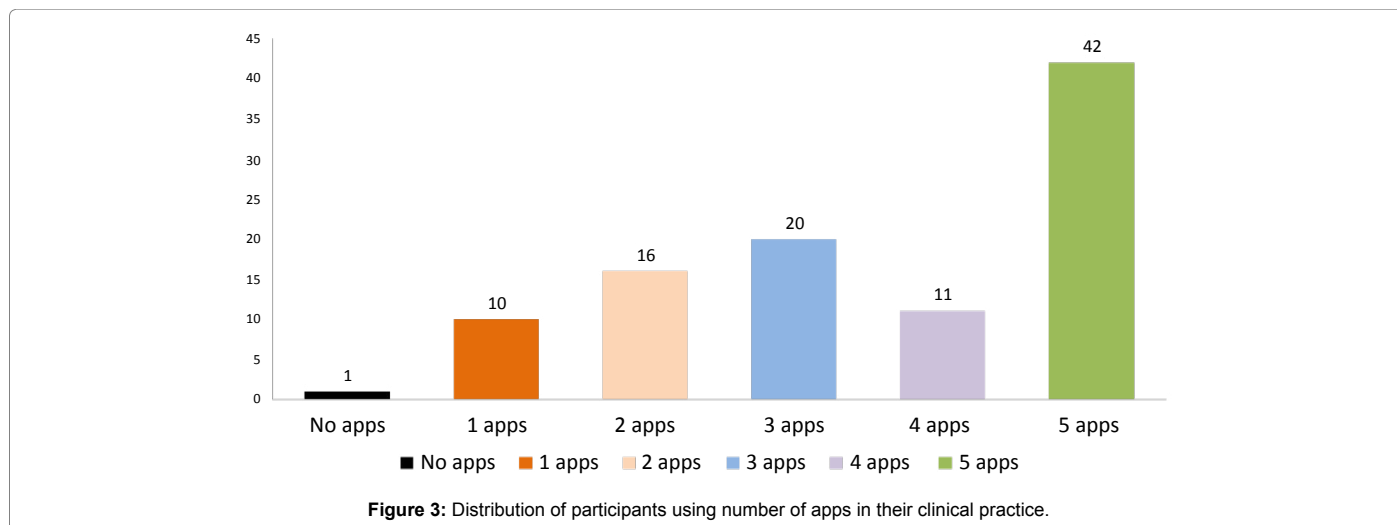


Figure 3: Distribution of participants using number of apps in their clinical practice.

Level of training	Participants for considering to buy smartphone used specifically in medical education		P value
	Yes	No	
Medical Officer	16	17	0.64
Resident	30	21	
Medical Faculty	9	7	

Table 3: Distribution of participants for considering buying smartphone specifically in medical education.

Level of training	Distribution of participants using medical apps specifically in medical education		P value
	Yes	No	
Medical Officer	33	0	0.37
Resident	49	2	
Medical Faculty	16	0	

Table 4: Distribution of participants using medical apps specifically in medical education.

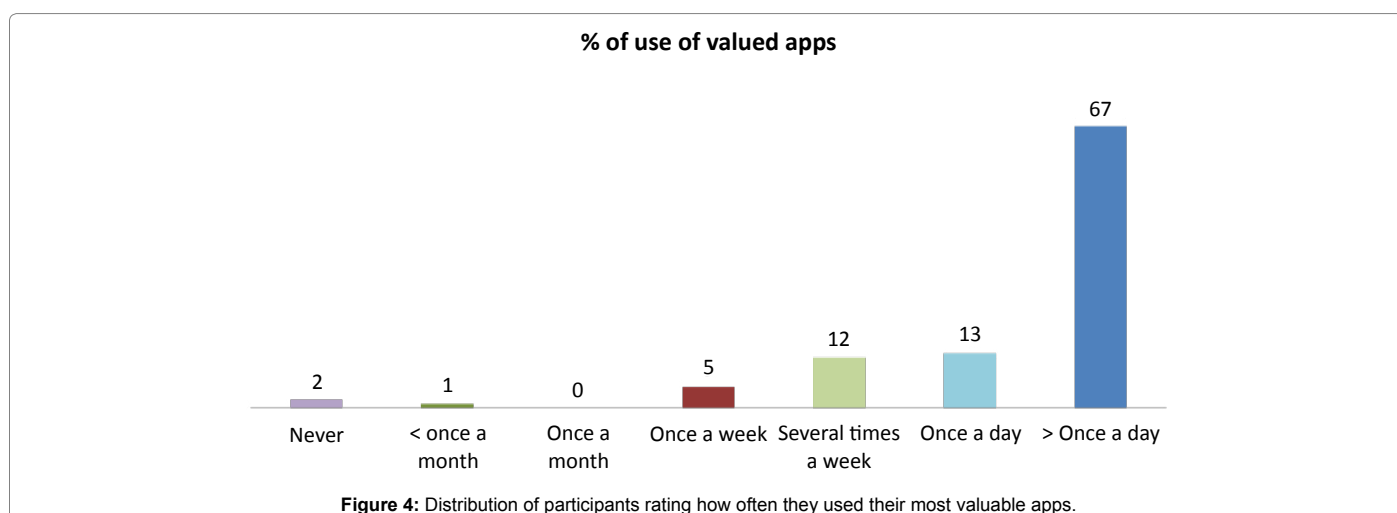


Figure 4: Distribution of participants rating how often they used their most valuable apps.

using any medical apps in their clinical practice as shown in Figure 4. Among the medical apps Medscape were used in 58% of case, up to date 28% as shown in Table 5. 75% of the participants responded to clinical exam tests and findings especially in managing tasks (to do list in medical care); taking medical related notes and communicating with medical (students/staffs)/ looking unfamiliar terms/ as clinical log/ as a cameras to take picture/access clinical data/medical calculator/read

medical news/read medical research/read medical text books. 25% of participants specified to textbook and reference material shown in Figure 5. 99% accepted that those apps were supportive to learning.

50% stated that they use smartphone more than once a day, 15% more than once an hour, 18% once a day and 13% several times a week during their medical or clinical education as shown in Figure 6. 36%

Ranking	Apps Name	% of respondents
1	Medscape	58
2	Uptodate	28
3	Dimsnepal	5
4	Pes apps	1
5	Orthobullets	1
6	Wikipedia	1

Table 5: Most commonly used smartphone apps.

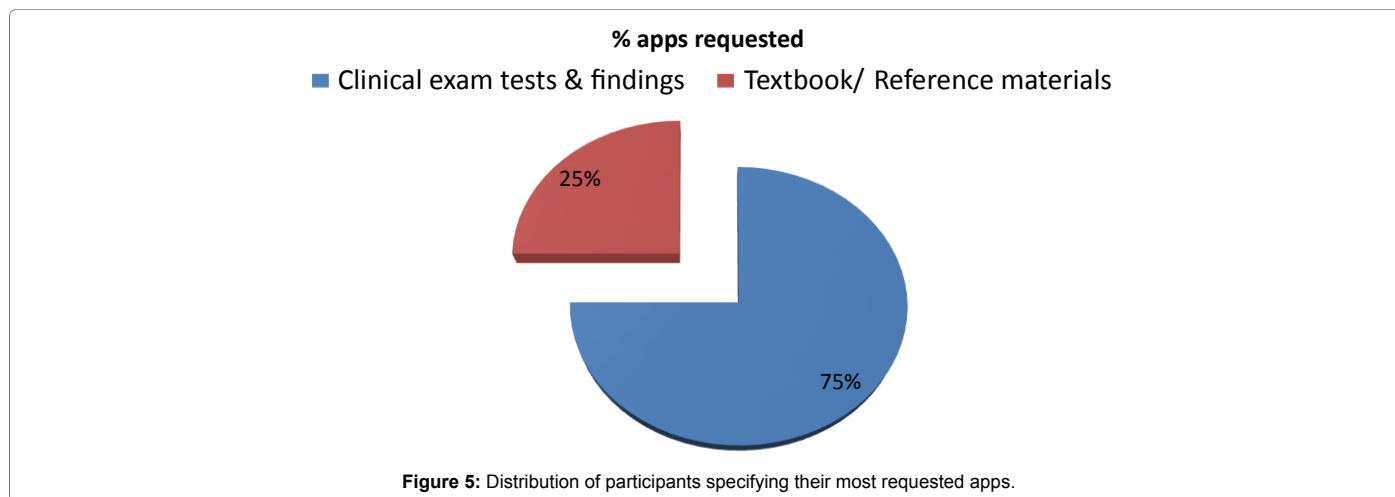


Figure 5: Distribution of participants specifying their most requested apps.

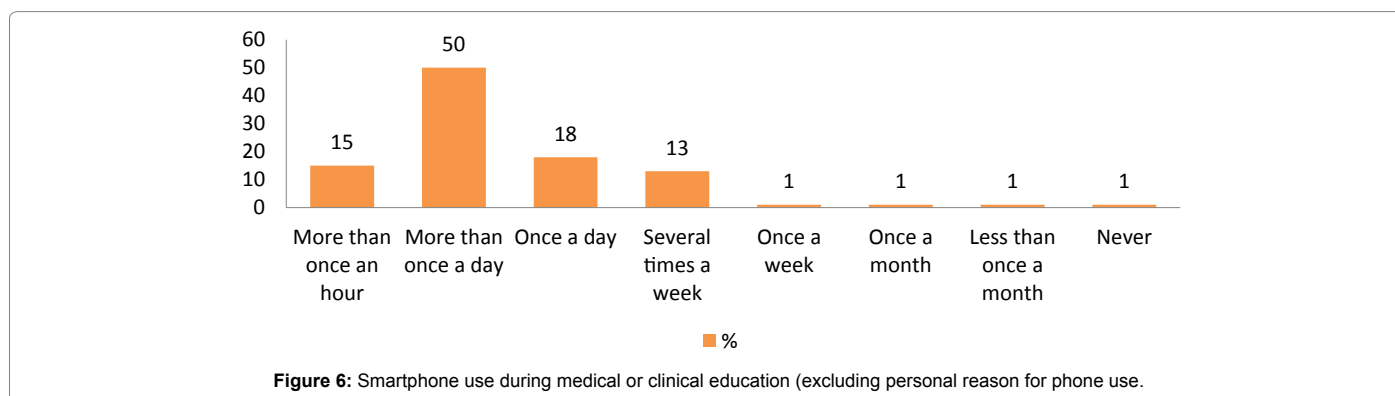


Figure 6: Smartphone use during medical or clinical education (excluding personal reason for phone use).

strongly agreed, 56% agreed to smartphone use during medical or clinical education (excluding personal reason for phone use in Figure 7. 11% strongly disagreed, 24% disagreed, 32% were uncertain and 32% agreed regarding smartphone limitations in medical education to the extent as shown in Figure 8. 50% believed that concept of smartphones are very useful, 46% as useful as future educational aids. Only 4% believed as unusual concept as shown in Figure 9. The various statements regarding smartphone use, university policy regarding smartphone utility and the prospect of smartphone becoming more prevalent are described in Figures 10-12 respectively.

### Discussion

The purpose of the study was to ascertain the use of smartphone and use of such devices in medical education and practice at BP Koirala Institute of Health Sciences.

The results demonstrated that smartphones either android or iOS operating system are widely used by medical officers 23%, residents 46% and faculties of BPKIHS 14% (P=0.88, CI=0.52-0.77) which are

quite consistent with study done by Franko, et al. where over greater than 85% of respondent specialty used a smartphones, of which the iPhone was the most popular (56%) [5].

The growing trends of smartphones such as iPhone or Samsung provide medical practitioners access to relevant information at the right time and from a relevant sources. In our study 99% of respondents use smartphones which are quite consistent with another study by Franko, where 84% of respondents (n=476) have a smartphone [6], the majority (55%) have an iPhone, and that 53% of people with smartphones already use apps in clinical practice [7,8].

In our study, more than half of the participants specified their most requested apps types were textbook/reference materials 75% and clinical exam test findings 25% which were similar to the study done by Franko, et al. reported that the most commonly used app types were drug guides (79%) [5], medical calculators (18%). The most frequently requested app types were textbook/reference materials (average response: 55%), classification/treatment algorithms (46%) and general medical knowledge (43%).

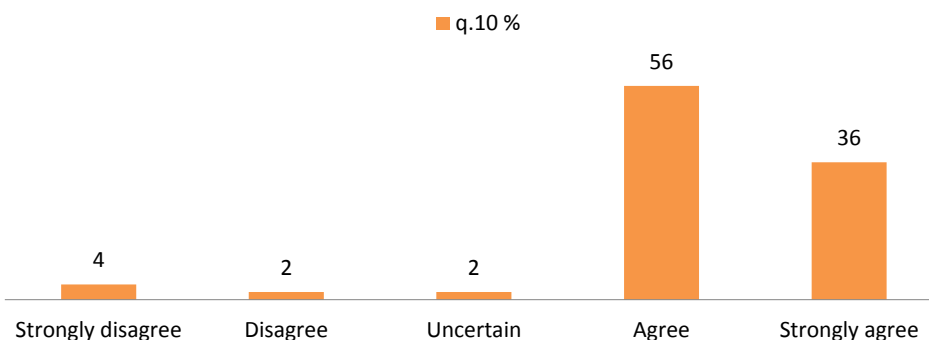


Figure 7: Smartphone use during medical or clinical education (excluding personal reason for phone use).

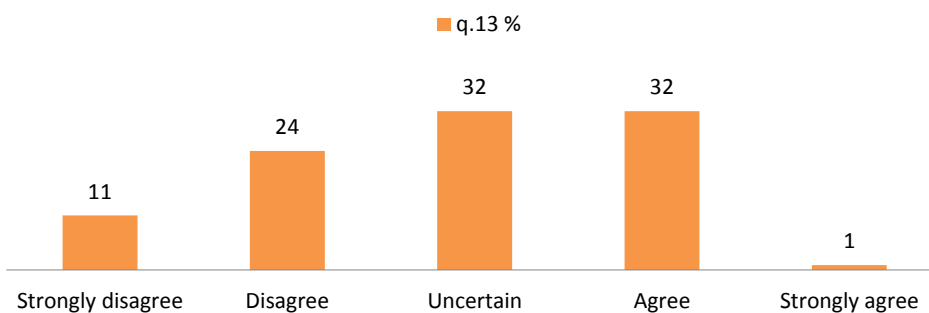


Figure 8: The concept of smartphones as future educational aids.

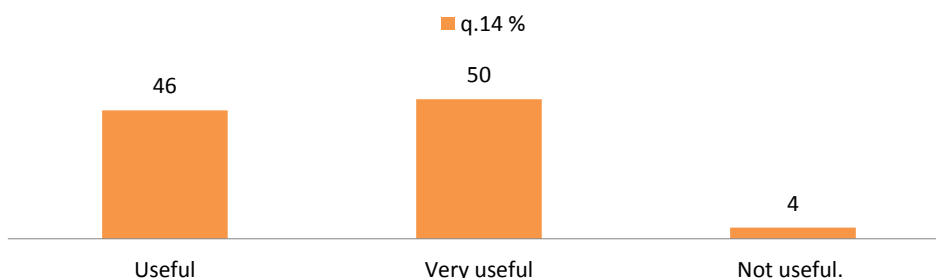


Figure 9: Statements regarding the concept of smartphones as future educational aids.

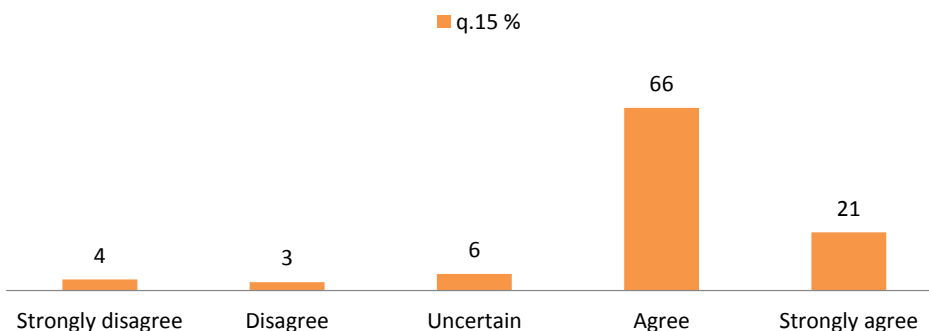


Figure 10: Statements regarding smartphone use in medical education in the future to the extent that you agree with them.

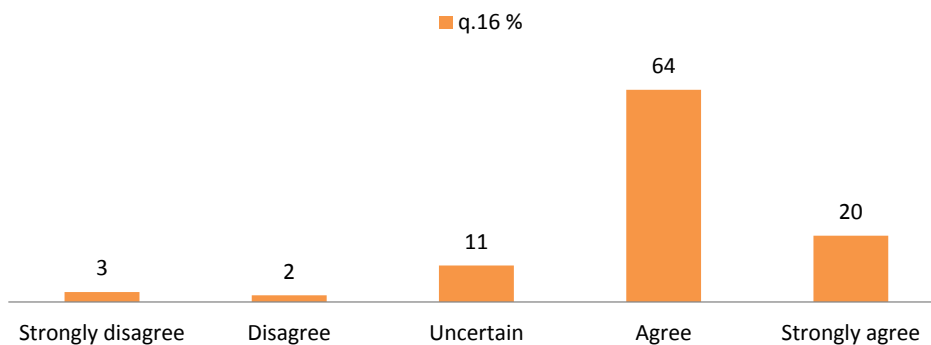


Figure 11: University policy regarding smartphone usage in medical education would be beneficial.

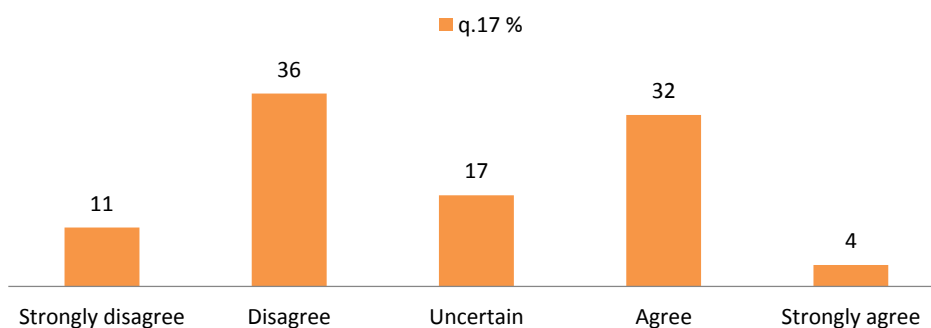


Figure 12: Are you worried at the prospect of smartphone becoming more prevalent in medical education?

The study found that app use was supportive of learning in 50% of residents, medical officer 33% and faculty member 16% which are similar to another study done by Michael Fralick, et al. found that app use was associated with a 1.1 point (95% CI: 0.10, 2.1) [ $\beta=1.08$ ,  $t(1)=2.08$ ,  $p=0.04$ ] higher change in knowledge score compared to the change in knowledge scores in the control group. 88% found it easy to navigate, 85% found it useful, and about one-quarter used it daily [9].

### Limitation

The limitation of the study was that this study only assessed the use of smartphones and apps at single ward of BPKIHs and may not reflect the trends among other residents and medical faculty at large. A larger study is needed which may accurately focus the prevalence of smartphone as well medical apps among practitioners from various specialties regarding the validity of apps.

### Conclusion

The study confirms that smartphones are ubiquitously adopted by residents and medical officers and faculty members in medical education and practice at our institute. Though smartphones offers to enhance both learning and continuing patients' care it is advisable to understand its need and maximize its benefits in field of medical education.

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