

Is smartphone a necessity or luxury among orthopedic specialty?

Kamran Hafeez,¹ Ghulam Mustafa Kaim Khani,² Muhammad Bux,³ Masood Jawaid⁴

Abstract

Objective: To assess the utilisation pattern of smart phones by residents and consultants with respect to their clinical work and academics.

Methods: The cross-sectional study was carried out in orthopaedic departments of various hospitals in Karachi in July 2014. Orthopaedic residents and consultants were asked to fill a questionnaire containing various questions, including utilisation of their smart phones for professional applications, books, internet and emails; and sharing of clinical data.

Results: A total of 98 residents and consultants were approached and 83(84.7%) of them filled up the questionnaire. Of them, 70(84.3%) owned a smart phone and represented the study sample. Of them, 60(85.7%) were using applications on their mobile phone; and 27(38.6%) were using them for sharing clinical data with colleagues. The use of smart phone applications was more among residents than consultants ($p=0.010$) and the same applied to data sharing ($p=0.028$). AO Surgery reference was the most utilised application in 43(61.4%). Besides, 46(65.7%) respondents were using smart phones to read text books; 60(85.7%) were using internet on their smart phones for browsing web pages and to check emails; and 62(88.6%) wanted to have more applications available related to orthopaedic practice. Only 1(1.4%) respondent was willing to pay for these applications.

Conclusion: Majority of orthopaedic caregivers owned a smart phone, but their clinical use was limited which may be enhanced to improve patient care.

Keywords: Smart phones, Orthopaedic, Mobile applications. (JPMA 64: S-27 (Suppl. 2); 2014)

Introduction

Cellular phones are the mainstay of communication in the present era. Advances in cellular technology led to the development of smart phone which is becoming an important aspect of our lives. In recent years the use of smart phones has been increasing rapidly in our society. Smart phones are a newer generation of cellular phones with integrated computer related functions capable of performing various tasks based on number of applications.¹ One can use internet and surf to view desired medical information.² Smart phones have been utilised for communication between physicians.³ Clinical pictures and x-rays can be captured for record-keeping and shared with colleagues or seniors for opinion. Various text books can be downloaded and available for clinical referencing. Clinical and surgical videos can be viewed online or downloaded for learning purpose.⁴ In addition, there are number of applications that can be utilised for sharing information; updating knowledge through current reference guidelines; drug referencing and dose calculators; and for getting informed about upcoming conferences and events.^{5,6} These are easily downloadable

through online stores either free or by paying a small amount. Cellular phones have been utilised in transferring clinical data, including images, to enhance patient management by improvement in decision making in late hours as well as from remote areas and transferring them to the desired institution.^{7,8} It was our observation that most orthopaedic residents and consultants working in different institutions in Karachi owned a smart phone. The current study was planned to assess the utilisation of smart phones by residents and consultants with respect to their clinical work and academics.

Subjects and Methods

The cross-sectional study was carried out in orthopaedic departments of various tertiary care teaching hospitals and secondary care hospitals in Karachi in July 2014. Orthopaedic residents and consultants working in these facilities were approached and the nature of study was explained to them in detail. The specific questionnaire was handed to them after their consent to participate. Those who were not contacted personally were interviewed on telephone. They were assured that their identity will be kept confidential.

The questionnaire was designed containing various questions regarding basic demographics, working level (resident/consultant), possession of a smart phone, operating system on smart phone, utilisation of their

.....
^{1,2,4}Dow International Medical College, ³Dow University Hospital, Ojha Campus, Karachi, Pakistan.

Correspondence: Ghulam Mustafa Kaim Khani. Email: drkk58@hotmail.com

smart phones for orthopaedic applications, books, internet and emails; categories of applications or web pages they found useful in their clinical practice. They were also asked about the need of further useful orthopaedic applications, their categories and their willingness to pay for these applications.

The responses were evaluated and data was analysed using SPSS version 16. Data was mainly presented as descriptive statistics. Chi square and Fischer's exact tests were used to compare some variables among groups (residents/consultants). $P < 0.05$ was considered statistically significant.

Results

A total of 98 residents and consultants were approached and 83 (84.7%) of them filled up the questionnaire. Of them, 70 (84.3%) owned a smart phone; 46 (65.7%) residents and 24 (34.3%) consultants. The remaining 13 (15.7%) were excluded. Android operating system was the most commonly found system in 62 (88.6%) cases, followed by iPhone operating system 7 (10%) and 1 (1.4%) had windows-based phone. Overall, 60 (85.7%) were using applications on their mobile phone; and 27 (38.6%) were using them for sharing clinical data with colleagues (Table). The use of smart phone applications was more

Table: Comparison of smart phone use among residents and consultants (n=70).

		Residents (n=46)	Consultants (n=24)	P-value
Share clinical data	Yes	22 (31.4%)	5 (7.1%)	0.028*
	No	24 (34.3%)	19 (27.1%)	
Use applications	Yes	43 (61.4%)	17 (24.3%)	0.010*
	No	3 (4.3%)	7 (10%)	
Use internet	Yes	41 (58.6%)	19 (27.1%)	0.258*
	No	5 (7.1%)	5 (7.1%)	

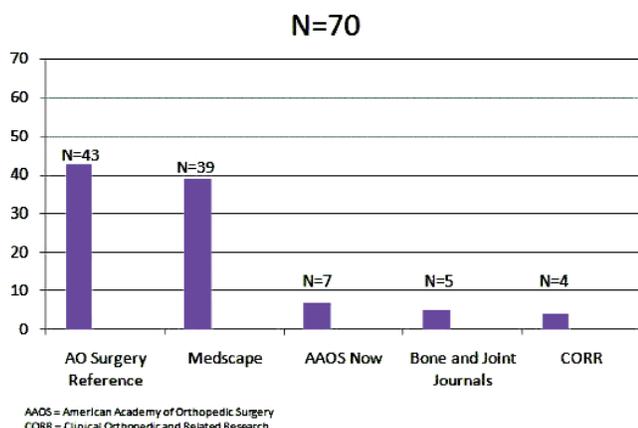


Figure-1: Smart phone applications used by orthopaedic residents and consultants.

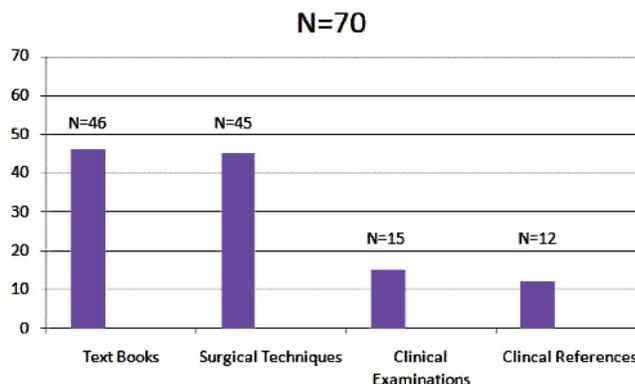


Figure-2: Categories of knowledge resources found useful while using smart phones.

among residents than consultants ($p=0.010$) and the same applied to data sharing ($p=0.028$).

AO Surgery reference was the most utilised application in 43 (61.4%) followed by Medscape 39 (55.7%) (Figure-1). Besides, 46 (65.7%) respondents were using smart phones to read text books; 60 (85.7%) were using internet on their smart phones for browsing web pages and to check emails (Figure-2).

Overall, 62 (88.6%) wanted to have more applications available related to orthopaedic practice. Only 1 (1.4%) respondent was willing to pay for these applications.

Discussion

Smart phones available now are fully equipped with high-resolution cameras, good storage capacities, are Wi-Fi-enabled and allow easy internet access. These make them useful handheld pocket devices enabling physicians to use them in their daily clinical routine effectively to update their knowledge, communicate with peers around the world and to utilise various specialty related applications. Alone study¹⁰ assessed the use of blackberry smart phone within a hospital among residents and nurses to improve communication related to patient care. Adoption of smart phone use showed improved efficiency over the traditional use of pagers. In our study, we also observed that a good proportion of respondents (38.6%) were using smart phones for sharing clinical data with peers and seniors.

There are number of smart phone applications available for medical community. According to a study¹¹ there are approximately 10,275 applications on various online stores available ranging from medical calculators, flash cards, general reference, lab tests, terminology and news. There are also a number of specialty-specific applications. One study¹² published in 2011 reported 61 specific orthopaedic applications for iPhone users and 13 for

Android users. These must have increased in numbers in the following years. In that study survey, 53% orthopaedic students and caregivers were found using smart phone applications in clinical practice. In our study, 85.7% respondents reported using smart phone applications. AO Surgery reference was the most common application used by the respondents. According to a study,¹² most of these orthopaedic applications were available for iPhone users but in our study Android operating system was mostly used by the respondents. This may be the reason that the variety of applications used was low. This gave us the impression that our orthopaedic personnel owned a smart phone, but they were not aware of different useful applications available online. Additionally, most of our respondents wanted to have more applications, but they were not willing to pay for them.

One study¹³ conducted a survey among orthopaedic trainees and surgeons in Australia. Majority (97.7%) were using smart phones. Professional contact (78%), viewing online educational resources (68.3%) and radiology (46.3%) were the frequent uses of smart phones in clinical practice. In conclusion, the study was of the opinion that smart phones helped in improvement of patient care and they will continue to use in the future. In our study, some of the respondents (38.6%) were involved in sharing of clinical data, but it was utilised effectively for reading text books (65.7%) and internet access (85.7%). Reading text books and browsing surgical techniques were the educational resources found most useful by the respondents. There is a need to increase awareness of the use of smart phones. As radiology is the major component in the assessment of emergency trauma patients, by sharing X-rays and clinical pictures with senior colleagues and getting their opinion, junior residents will definitely contribute better towards patient care.

Smart phones have been utilised in long distance communication by sharing clinical data and thereby help in shifting the injured patient to the desired trauma unit.¹⁴ In addition, it will also give an insight to the recipient clinical team to make necessary arrangements in the meantime like arranging operation theatre and skilled personnel. This is especially important for developing countries where advanced trauma services are not available in remote areas. Effective use of smart phones which are now widely available with almost every physician/surgeon will help in making decision for remote

patients and transferring them for urgent care.

Our study had some limitations. Results based on the small number of orthopaedic caregivers approached cannot be generalised. In addition, as it is a questionnaire-based study, there may be a response bias.

Conclusion

Majority of orthopaedic caregivers owned a smart phone. Most of them used applications, but the variety of applications utilised was low. Additionally, there was limited use of smart phone in sharing of clinical data which may be enhanced to improve patient care.

References

1. Ballagas R, Borchers J, Rohs M, Sheridan JG. The smart phone: a ubiquitous input device. *Pervasive Computing* 2006; 5: 70-7.
2. Leon SA, Fontelo P, Green L, Ackerman M, Liu F. Evidence-based medicine among internal medicine residents in a community hospital program using smart phones. *BMC Med Inform Decis Mak* 2007; 7: 5.
3. Wu RC, Morra D, Quan S, Lai S, Zanjani S, Abrams H, et al. The use of smart phones for clinical communication on internal medicine wards. *J Hosp Med* 2010; 5: 553-9.
4. Mutter D, Rubino F, Temporal MS, Marescaux J. Surgical education and Internet-based simulation: The World Virtual University. *Minim Invasive Ther Allied Technol* 2005; 14: 267-74.
5. Franko OI. Useful apps for orthopedic surgeons. *Am J Orthop (Belle Mead NJ)* 2012; 41: 526-7.
6. Ozdalga E, Ozdalga A, Ahuja N. The smartphone in medicine: a review of current and potential use among physicians and students. *J Med Internet Res* 2012; 14: e128.
7. Archbold HA, Guha AR, Shyamsundar S, McBride SJ, Charlwood P, Wray R. The use of multi-media messaging in the referral of musculoskeletal limb injuries to a tertiary trauma unit using: a 1-month evaluation. *Injury* 2005; 36: 560-6
8. Chandhanayingyong C, Tangtrakulwanich B, Kiriratnikom T. Teleconsultation for emergency orthopaedic patients using the multimedia messaging service via mobile phones. *J Telemed Telecare* 2007; 13: 193-6.
9. Burdette SD, Herchline TE, Oehler R. Surfing the web: practicing medicine in a technological age: using smartphones in clinical practice. *Clin Infect Dis* 2008; 47: 117-22.
10. Wu R, Rossos P, Quan S, Reeves S, Lo V, Wong B, et al. An evaluation of the use of smartphones to communicate between clinicians: a mixed-methods study. *J Med Internet Res* 2011; 13: e59.
11. Yadalla HK, Shankar VM. Professional usage of smart phone applications in medical practice. *Int J Health Allied Sci* 2012; 1: 44-6.
12. Franko OI. Smartphone apps for orthopaedic surgeons. *Clin Orthop Relat Res* 2011; 469: 2042-8.
13. Churchill J. Mobile Technology Usage by Orthopaedic Surgeons and Trainees in Australia. *JMTM* 2012; 1: 11-5.
14. Elkaim M, Rogier A, Langlois J, Thevenin-Lemoine C, Abelin-Genevois K, Vialle R. Teleconsultation using multimedia messaging service for management plan in pediatric orthopaedics: a pilot study. *J Pediatr Orthop* 2010; 30: 296-300.