



# PERCEPTION & USES OF MEDICAL APPS AMONG POST-GRADUATES OF A TERTIARY CARE TEACHING HOSPITAL, D.K, KARNATAKA

**Dr. Prakash kumar**<sup>1</sup>

<sup>1</sup>Postgraduate,  
Department of Community Medicine,  
KVG Medical College & Hospital,  
Sullia

**Dr. A. Nagarajachari**<sup>2</sup>

<sup>2</sup>Professor and HOD,  
Department of Community Medicine,  
KVG Medical College & Hospital,  
Sullia

## ABSTRACT

### **Background:**

The widespread use of medical applications (Apps) is opening new and innovative ways to improve health and health care delivery. These Software applications (apps) are providing evidence-based decisional tools to reduce medical errors and enhancing educational and workplace activities among healthcare workers, with the potential to improve overall patient care.

### **Objective:**

To explore the perception, purpose of installation and impact of medical apps on the clinical training/practice among the Post-graduates of a tertiary care teaching hospital in Sullia, D.K, Karnataka.

### **Materials and Methods:**

A cross-sectional study was done in November 2020 among 50 Post-graduates, who were selected by simple random sampling method. Data was collected using a semi-structured questionnaire about the perception and uses of medical apps.

### **Results:**

Among 50 respondents, 26(52%) males and 24(48%) females had smart-devices. 47(94%) using smart phones and 3(6%) using tablets, majority of which was android-based 45(91.86%). Almost all participants 49(98%) were aware of availability of medical apps and 46(92%) had installed it. 27(54%) participants had installed 1 to 5 apps in their devices and 19(38%) were spending 40 to 60 minutes per day on healthcare apps. Of all respondents, number and percentage of using various healthcare apps was

medical education/textbooks 36(72%), procedure & case documentation 32(64%), disease diagnosis/management

43(86%), clinical score calculation 14(28%) & drug reference 41(82%). Regarding perception of healthcare apps, most participants found it useful in medical education & patient care & were interested in recommending to peer group. Regarding impact of medical apps most participants found it useful in clinical decision making, assisting in differential diagnosis, allowing faster access to evidence-based medical practice and saving time. Respondents recommended use of medical apps to improve healthcare, to access medical education and improve their clinical skills.

### **Conclusions:**

Medical apps are used by the majority of Post-graduates on a daily basis in order to perform their job. Evidence-based, affordable and credible medical apps are needed to provide a platform for better patient care, continuing medical education and improving clinical skills of the healthcare professionals.

**KEYWORDS:** Smart phone, Medical app, Mobile health, Mobile apps, Post-graduates

## INTRODUCTION

India has 502.2 million smart phone users as of December 2019 and 77% of Indians are accessing internet through smart phones.[1] Use of smart devices & hence use of medical apps among healthcare professionals has become widespread & will continue to grow in coming years. Due to their

functionality and potential, Smartphone are gaining importance in healthcare and attract the attention of researchers and developers of healthcare related apps.

The role of mobiles in health care professions is becoming very strong and effective by providing tailor made access and provision of information to valuable advice in almost each specialty [2]. This has



produced a very positive effect on the decision-making in difficult situations, resulting in an obvious reduction in a number of medical errors because of better understanding among health care professionals resulting in improved and effective patient care [3].

Currently, mobile phones serve an important role in public health initiatives through mobile-health (m Health or e Health). mHealth helps in overcoming resource limitations on supply side of health care as well as structural barriers and behavioral limitations on the demand side. This increase can further enhance the prospects of using mobile phones for delivering various health care services.[4]

According to an estimate, more than 13,000 mobile Apps relating to health are available from different Apps stores [5]. These Apps are quite helpful in the training of health care workers and provide an easy approach to multiple activities such as appointment reminders, reference ranges, physician or hospital locator, calorie counter, body surface area calculator and many others. This provides tremendous help in day-to-day decisions pertaining to diagnosis, treatment and in the healing process [6]. Medical Apps, which can be easily downloaded onto mobiles, have an increased popularity among medical students and young clinicians [7].

Based on the present trends, one can speculate that use of smart phone Apps would groom medical students for their future professional clinical life. For this reason, a number of medical institutes have started using this new technology for teaching purposes to provide an effective guide to the budding clinicians for their upcoming professional demands[8].

Medical apps provide convenient, portable & rapid access to medical resources for healthcare professionals.

## METHODOLOGY

A cross-sectional study was done in November 2020 among 50 Post-graduates of KVG Medical college of Sullia taluk in Dakshin Kannada district of Karnataka selected by simple random

sampling method, who were in their 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> year of their residency training. There were no inclusion or exclusion criteria based on specialty, or gender. All data was collected during a 1 month time period and subjects were given two reminders to complete the survey. Data was collected using a semi-structured questionnaire about the perception and uses of medical apps. Questions were derived from previous literature [9,10], and the apps named in the survey were derived from a list of the most popular medical apps on Google play store, and other websites [11,12]. After data collection was complete, univariate analysis was performed and all numerical data were reported as simple statistical data (e.g., frequency, percentage).

## RESULTS

Over the one month period, a total of 50 responses were received, with a response rate of 66.66% (50/75). Among 50 respondents, 26(52%) males and 24(48%) females had smart- devices. 47(94%) using smart phones and 3(6%) using tablets, majority of which was android-based 45(91.86%). Almost all participants 49(98%) were aware of availability of medical apps and 46(92%) had installed it. 27(54%) participants had installed 1 to 5 apps in their devices and 19(38%) were spending 40 to 60 minutes per day on healthcare apps. Of all respondents, number and percentage of using various medical apps was medical education/textbooks 36(72%), procedure & case documentation 32(64%), disease diagnosis/management 43(86%), clinical score calculation 14(28%) & drug reference 41(82%).

Regarding perception of medical apps, most participants found it useful in medical education & patient care & were interested in recommending to peer group. Regarding impact of medical apps most participants found it useful in clinical decision making, assisting in differential diagnosis, allowing faster access to evidence-based medical practice and saving time. Respondents recommended use of medical apps to improve healthcare, to access medical education and improve their clinical skills.

**Table1. Medical applications are being used by the participants (participants had the choice to select more than one Medical Apps).**

Name of Medical Apps	N	%
Medscape	29	58
WebMD	18	36
MedCalc	17	34
UpToDate	15	30
PubMed Mobile	25	50
Epocrates	11	22
Skyscape	14	28
Oxford Clinical Handbooks	29	58
Student BMJ	13	26
Differential Diagnosis BMJ	16	32



NEJM	16	32
Prognosis	21	42
Pocket Lab Values	24	48
ECG Guide	21	42
iStethoscope	10	20
Eponyms	05	10
Diagnosaurus DDx	17	34
Practo	27	54
Curofy	30	60

Table 1 reveals that popular apps included Curofy (60%), Medscape(58%), Oxford handbooks (58%)Practo (54%)Pubmed mobile (50%).

**Table 2.Perceptions of medical app reliability amongst participants (N = 50).**

Application name	Do not trust % (total)	Indifferent % (total)	Trust % (total)	Total (N)
Medscape	4.25(2)	6.38(3)	89.36(42)	47
WebMD	9.30(4)	25.58(11)	65.11(28)	43
MedCalc	8.16(4)	12.24(6)	79.59(39)	49
UpToDate	9.09(3)	18.18(6)	72.7(24)	33
PubMed Mobile	5.71(2)	20.00(7)	74.28(26)	35
Epocrates	7.40(2)	18.51(5)	74.07(20)	27
Skyscape	7.31(3)	17.07(7)	75.60(31)	41
Oxford Clinical Handbooks	0(0)	17.94(7)	82.05(32)	39
Student BMJ	3.12(1)	18.75(6)	78.12(25)	32
Differential Diagnosis BMJ	4.16(1)	12.50(3)	83.33(20)	24
NEJM	0(0)	28.57(8)	71.42(20)	28
Prognosis	3.70(1)	7.40(2)	88.89(24)	27
Pocket Lab Values	12.50(4)	12.50(4)	75.00(24)	32
ECG Guide	2.56(1)	17.94(7)	79.48(31)	39
iStethoscope	13.63(6)	11.36(5)	75.00(33)	44
Eponyms	4.76(1)	47.61(10)	47.61(10)	21
Diagnosaurus DDx	23.07(6)	23.07(6)	53.84(14)	26
Practo	8.16(4)	20.40(10)	71.42(35)	49
Curofy	2.17(1)	6.52(3)	91.30(42)	46

Table 2 reveals the five apps perceived to be the most trustworthy by participants were Curofy(91.3%),Medscape(89.36%),Prognosis(88.89%),Differential diagnosis(83.33%) and Oxford clinical handbooks(82.05%).

**Table 3. Perceptions of medical app use amongst participants (N = 50).**

Answers	Do not trust % (total)	Indifferent % (total)	Trust % (total)	Total (N)
Save you time	2(1)	6(3)	92(46)	50
Improve the care of my patients	4(2)	6(3)	90(45)	50
Increase diagnostic accuracy	2(1)	2(1)	96(48)	50

Table 3 reveals that 92% of participants who responded said medical app use saves time, 90% reported that it improves patient care, and 96% believed it increases diagnostic accuracy .



## DISCUSSION

Now a days clinicians are increasingly using medical apps in the clinical setting .Our cross-sectional study found that Curofy, Medscape and Oxford handbooks and are the most commonly used and trusted apps amongst post graduates. The majority of participants thought that medical apps save time, improve care of their patients, and improve diagnostic accuracy. However, participants also felt that mobile device use in the clinical setting makes them appear less engaged. These findings are similar to the few of the previously available literature.[9,13]The majority of the participants were aware that mobile phones can be utilized for health education, to spread awareness about common diseases, counseling for cessation of addictions, adherence to medication. The point-of-care access to medical information has led to improved decision-making, enhanced telemedicine capabilities, and decreased hospital stays [14]. Some medical schools and residency programs have encouraged app use by requiring all medical students to have certain apps on their phones and often provide free mobile subscriptions to these apps [15].Use of medical apps can revolutionize the healthcare industry.

## CONCLUSION

Evidence-based, affordable and credible medical apps are needed to provide a platform for better patient care, continuing medical education and improving clinical skills of the healthcare professionals. If health systems want to reap these rewards associated with app use, the culture of medicine must embrace technology.

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