



### Research Article

## A Survey on Usage of Mobile Health Apps among Medical Undergraduates

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### Abstract

**Introduction:** The widespread adoption and use of mobile technologies is opening new and innovative ways to improve health and health care delivery using various health apps. The Health Apps could be beneficial and effective in planning, monitoring and achieving personal health goals.

**Objective:** To explore the awareness, attitude, and trend among medical students of Rajarajeshwari Medical College and Hospital, Bangalore, Karnataka, India.

**Methodology:** The cross-sectional study was conducted among all the 2nd and 3rd year medical students of Rajarajeshwari Medical College and Hospital, Bangalore, Karnataka, India.

**Results:** Out of 140 students, who were studied, 41.4% were males and 58.6% were females. Out of 140 students, 127 (91) % were aware of Health apps. 75 (59%) of the students were using Health apps on their smart phones of which majority were females (56%). Out of various health apps, Samsung Health, Fit bit and healthily me were common Apps used. 58.7% users are motivated of being fit as main reason while 76.9% non-users feel that either no need of using these Apps or they just don't trust these Apps. Around 80% students are using the Apps from within last 12 months. Almost every 3rd student is using the Apps throughout the day.

**Conclusion:** The present study reveals that many students were aware of the apps and using it regularly to track their physical activity and calorie intake. It also motivates them to maintain a healthy lifestyle. Users are taking these Apps quite seriously and update the

credentials regularly so that output can be appropriately tracked. Accordingly, they are not only finding the tips and suggestions useful but also using these Apps in different ways like tracking calories, weight and monitoring sleep quality. Also, they are reviewing the data on monthly/ weekly basis to change the fitness activities or food intake.

**Keywords:** Awareness; Bangalore; Health apps; Medical students

### Introduction

Over the last two decades, Smartphone have been evolving rapidly in functionality and propagation. The Smartphone has gained increasing importance in our everyday life. Due to their functionality and potential, Smartphone are gaining importance in healthcare and attract the attention of researchers and developers of healthcare related apps. Recent research has majorly focused on reviewing, testing and developing Smartphone apps for topics such as physical activity tracking, patient monitoring, diagnosis and measurement [1-4].

Smartphone combine a mobile phone with other features of personal digital assistance such as Internet browsing, email access, global positioning system navigation, touch screen, motion sensor, wireless Internet for frequent interface/fourth generation (mobile telecommunications technology) connectivity, desktop synchronization, voice recognition, high-quality camera, large displays, as well as third party applications, commonly referred to as "apps" [5]. These functions turn the smart phone into a portable computer. They have great potential for medical education, as they allow health care providers and students to access resources efficiently at the right time at the point-of-care to support better decision making in patient care [6-10]. Faster processors, improved memory, and long-life batteries in concert with highly efficient operating systems capable of advanced functions have paved the way for apps that are beneficial for both personal and work environments.

A mobile application is a type of application software designed to run on a mobile device like a Smartphone or a tablet (Tables 1 and 2). Smartphone usage has spread too many settings including that of healthcare with numerous potentials and real-life benefits [11]. The number of college students using their cell phones during class has increased over the last few years [12].

Medical Applications, which can be easily downloaded onto mobiles, have an increased popularity among medical students and young clinicians [13]. Studies report that over 85% of health professionals and medical students use a Smartphone, and 30-50% use medical applications for learning and information purposes. The use of mobile technology can significantly enhance blended learning but can have a major role in supporting on-campus teaching.

Smartphone have been used in educational activities to access course content, acquire information related to student's performance, and to encourage discussion and sharing between students and

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teachers. It is therefore apparent that mobile devices, such as Smartphone can have a significant contribution to modern health care education since these devices might offer possibilities to enhanced teaching and learning [14].

AGE (in complete years)	NUMBER	%	Male	Female
17	1	0.7%		1
18	4	2.9%	1	3
19	25	17.9%	10	15
20	65	46.4%	28	37
21	28	20.0%	9	19
22	14	10.0%	8	6
23	3	2.1%	2	1
TOTAL	140	100%	58 (41.4%)	82 (58.6%)

**Table 1:** Distribution of students according to their age (N=140).

	Male	Female	Total
Mean Age	20.3	20.1	20.2
Mean Height (cm)	172.3	161.2	165.7
Mean Weight	71.0	61.2	65.1
Mean BMI	23.9	23.5	23.7

**Table 2:** Basic characteristics of participants.

According to a new report, there are now more than 165,000 mobile health applications on the market, more than doubling over the past two years [15]. Medical mobile applications provide rapid and smart access to knowledge and enable medical students to have a firm grip over their understanding and comprehension of curriculum [16].

The charm of mobile phone is more among young generation and the increasing use can lead to various harmful effects and may result in dependence. Smartphone usage has spread too many settings including that of healthcare with numerous potential and realized benefits. The ability to download custom-built software applications (apps) has created a new wealth of clinical resources available to healthcare staff, providing evidence-based decisional tools to reduce medical errors. One of the study in Iran states that the most commonly used apps among medical students were medical dictionary, drug apps, medical calculators and anatomical atlases and among nursing students were medical dictionary, anatomical atlases and nursing care guides [17].

A literature review indicated that there is a lack of research regarding the use of smart-phones Medical Apps among medical students and their perception of the impact of Medical Apps on their health in India. Therefore, the objectives in planning this study were to explore the awareness, attitude, and trend among medical students of Rajarajeshwari Medical College and Hospital, Bangalore, Karnataka, India.

## Methodology

Descriptive study was conducted at Rajarajeshwari Medical College and Hospital, Bangalore in month of Sep 2018. All second and third year medical undergraduate students who were willing to participate and present on the day of study were included. Permission for carrying out the study and Institutional ethical clearance was

obtained. Written Informed consent was taken from the students and the information was collected by using a self-administered questionnaire to students.

Out of total 240 students (180 and 60 respectively in second and third year), only 140 students (110 and 30 respectively in second and third year) participated in the study and completed the questionnaire and rest were not willing to take part even after 4 attempts being made. Data was entered and analyzed through Microsoft excel work sheet

## Results

In the present survey, out of 240 students, only 140 participants returned the filled questionnaire, giving a response rate of (58%). 58 (41.4 %) were males and 82 (58.6%) were females and the mean age of the participants was 20.2 years. Mean Height was 165.7 cm, Mean Weight was 65.1 kg and Mean BMI was 23.7 which are in normal limits.

As shown in table 3, about 90.7% (127) of the participants were aware of different Health Apps for smart devices and considerably good number of people 59.1% (75) had installed different medical apps on their smart devices and is using different Apps.

Table 4 tells that out of 127 people who are aware of Health Apps, 88 (69.3%) people believe that these Apps are useful. It is interesting to note that it also includes the number of people who are not actually using these Apps.

Everyone may have different reasons for using or not using the health Apps. Table 5 depicts that most of the users (58.7%) are motivated of being fit as main reason while 76.9% non-users feel that either no need of using these Apps or they just don't trust these Apps. Table 6 enlists all different Apps used by students.

The duration of use plays an important role as it keeps the users motivated. Around 80% students are using the Apps from within last 12 months. Almost every 3rd student is using the Apps throughout the day. Tables 7 and 8 tell that students are quite motivated for using these Apps and aligning these to achieve their health targets.

Taking further the usage pattern, table 9 tells that users are taking these Apps quite seriously and update the credentials regularly so that output can be appropriately tracked. Accordingly, they are not only finding the tips and suggestions useful but also using these Apps in different ways like tracking calories, weight and monitoring sleep quality. Also, they are reviewing the data on monthly/ weekly basis to change the fitness activities or food intake.

## Discussion

Every participant of our study owned a smart device, mostly a Smartphone. Furthermore, 89.1% had already installed one or more Medical Apps on their devices. This finding is consistent with the previously carried out studies at Monash University, Canadian study and King Abdulaziz University, Jeddah in which 79%, 89% and 99% of the participants respectively had installed any mobile Apps on their Smartphone [18-20].

It may also suggest that now owning a Smartphone is a global trend and that medical students are not an exception.

Sex	Number		Aware of Health Apps			Uses Apps on Mobile		
			Yes	No		Yes	No	No Ans
Male	58	41.4%	Yes	51	87.9%	Yes	33	64.7%
			No	7	12.1%	No	18	35.3%
Female	82	58.6%	Yes	76	92.7%	Yes	42	55.3%
			No	6	7.3%	No	31	40.8%
						No Ans	3	3.9%
Total	140		Yes	127	90.7%	Yes	75	59.1%
			No	13	9.3%	No	49	38.5%
						No Ans	3	2.4%

**Table 3:** Summary of awareness and use of Health Apps.

	Yes	No	Total
Male	40	14	54
Female	48	25	73
Total	88	39	127

**Table 4:** Mobile Health Apps are useful.

		Number	
Users	For Fitness/To be Fit	44	58.7%
	Weight Loss/Weight Gain	19	25.3%
	No Reason Given	7	9.3%
	Other Reasons	5	6.7%
		75	
Non Users	Don't know how to obtain them	4	6.2%
	I don't trust them	24	36.9%
	No Need to use Health Apps	26	40.0%
	No reason given	11	16.9%
		65	

**Table 5:** Reasons for using and not using Mobile Apps.

Generally, the medical students using medical apps believed they could easily download the apps, and they could rely on the contents and all were easy to use. Moreover, they showed their willingness to obtain more apps mentioned installing the apps without any guidance from their medical educator. Overall, this trend reflected the positive attitudes toward the utility of Health Apps for personal health and fitness.

There is an increasing recognition that smart-phones are mainly being used for unprofessional purposes. It would be beneficial if medical colleges would arrange sessions to convince and guide the students to work online with the help of various Health Apps relevant to their health and fitness needs.

There are certain limitations in our study. Firstly, this was a sample for one site, so our results can-not be generalized. It is quite possible that the use of Health Apps on smart devices may be better in other

colleges as well as other regions of the country. Secondly, it was a cross-sectional and questionnaire-based study. Thirdly, as the answers to the questionnaires remained anonymous, the participants may have answered the questions in a casual manner, a problem observed in most of the survey questionnaires.

Name of Mobile Health App	No. of users	%
Samsung Health	8	13.3%
Fit bit	5	8.3%
Healthily me	5	8.3%
Fitness Challenge	6	10.0%
Nike Fitness App	4	6.7%
Health Tracker	4	6.7%
Apple Health	3	5.0%
Gym Trainer	2	3.3%
Home Workout	3	5.0%
Yoga and Meditation App	3	5.0%
Google Fit	2	3.3%
MI Fit	2	3.3%
Pedometer	2	3.3%
Calorie Counter	2	3.3%
Down Dog	9	15.0%
7 Minutes		
Water Reminder		
Fastrack reflex		
Stomach exercise		
30 days fitness challenge		
Pulse monitoring apps		
Freeletics		
Fit Girls		

**Table 6:** Usage of various Health Apps (n=60) \*Multiple responses.

	Male	Female	Total
0-3 months	8	16	24
4-6 months	6	3	9
7-12 months	10	16	26
1-5 years	9	7	16
	33	42	75

**Table 7:** Duration of use for Health Apps (N= 75).

	Male	Female	Total
After having food to track the calories	2	6	8
During workout only, which may be gym exercises, walking, running, cycling, etc	21	19	40
Throughout the day	10	17	27
	33	42	75

**Table 8:** Time of use (N= 75).

	Yes	No	Sometimes
Do you update the details in it promptly like your height, weight, calorie intake, physical activity etc. in a day?	45	6	24
Do you find information tips and suggestions regarding food intake or physical activities useful?	66	9	
Do you track the number of calories you consume with the help of it?	24	28	23
Do you track your weight with the help of your app?	37	26	12
Do you monitor your sleep quality in it?	26	36	13
Does your app motivate your physical activity?	65	8	2
Does the app notification about your calorie intake alter what you eat/ drink?	41	31	3
Does looking at your apps data at the end of day / weekly/monthly summary change your fitness activities or food intake?	58	12	5

**Table 9:** Active usage of Health Apps (N=75).

## Conclusion

The regular use of medical apps on mobile devices is quite common among medical students of Rajarajeshwari Medical College and Hospital, Bangalore, Karnataka, India. The increasing usage of medical apps on smart devices is an established reality. The present study reveals that majority of students were aware of the Health apps and many were using it to track their physical activity and calorie intake. Many of them were willing to continue using it as it motivates them to do their physical activity regularly. Health apps are useful to track the physical activity and calorie intake.

## Recommendations

1. It is recommended for medical students as it helps and motivates them for maintaining healthy lifestyle.
2. It must be stressed that more attention should be focused by the faculty of medical colleges to guide and educate the students on appropriate use of smart phones and health Apps in maintaining their personal health and hygiene.
3. The use of Health Apps for improving health parameters can be institutionalized through guided monitoring of pre-set milestones and targets in relation to individual health.
4. Similar studies involving different populations and larger sample size can be conducted to know the utility and usefulness of various Health apps.

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## Competing Interests

The authors declare that they have no competing interests.

## Ethical Approval

We have received ethical approval.

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