**Research Article**

**Use of medically-related smartphone apps for health care information among health care professionals**

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**ABSTRACT**

**Background of the study:** Smartphones medically related applications are quickly becoming one of the main tools for accessing clinical information among health care professionals.

 **Aim of Study:** This study investigated the level of awareness and usage of medically-related smartphone apps by healthcare professionals in Nigeria tertiary health institution.

**Methodology:** The study recruited 150 health care professionals from Federal Medical Centre, Owo, Ondo-state, Nigeria. Data on demographic characteristics, knowledge and usage of medically-related smartphone applications were obtained using a self-administered questionnaire. Data were summarized using a descriptive statistics of percentage and frequency distribution.

**Results:** 85 (56.7%) males and 65 (43.3%) females participated in the study. 96.7% of the respondents own a smartphone, 94.0% have android phones while 6.0% have tablet phones. Majority (96.7%) of the respondents were aware that smartphones can be helpful in patient’s care similarly, 93.3% were aware, there are various smartphone apps that can be used for health care information in patient care. 73.3% of the respondents have medically-related smartphone apps. 59 (39.3%) of the respondents claimed to use their professional- related apps daily while 53 (35.3%) twice weekly.

**Conclusion:** Majority of Nigerian health care professionals are aware of medically-related smartphone apps and have at least one professionally-related smartphone app which serve as a quick reference materials in patients’ care and clinical decision making. Further, greater proportion of the health care professionals recounted to have discussed the usage of professional-related apps in clinical education and practice with their colleagues, and are advocating for development of more relevant apps.

**Keywords:** Smartphones, Medical-app, Health care professionals

**Introduction:**

Medical practise has grown beyond the use of text-based information in the care of the sick. The global advancement in Information and Technology have continue to play a vital role in health care services.(1) The past decade has witnessed the advent of smartphone, a hand-held device armed with computing power and various downloadable “apps”. Since then mobile devices such as smartphones and tablet computers have been widely adopted by health care professionals.(2,3)

The rapid proliferation of mobile communications and phone applications has significant global consequences for health care. 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.(4) Smartphones medically-related apps are quickly becoming one of the main tools for accessing clinical information, especially for younger health professionals and trainees. Many medical resources of varying quality are available for these devices and for clinical use.(5)

The clinically relevant set of apps are a good example of evidence based clinical answers and skills that can be accessed by various health professionals to aid their effectiveness and efficiency in patients ‘care, furthermore, clinicians in less resourced working environments that lack access to text based information are able to function maximally using the clinically related smartphone apps available at their fingertip.(4) Majority of Nigerian health care professionals own a smartphone and are at various time search for information on health therefore, they are likely to know of the potentials of their use in medical education. Previous researchers in other part of the world have investigated the use of smartphones among medical students and doctor populations to enhance educational and improve patients care. However, there seems to be paucity of such studies that investigated the use of medically–related smartphone application among health care professionals in Nigeria.This study therefore is aimed at investigating the level of awareness of medically--related smartphone applications and the level of its usage for health information among Nigerian Doctors, Physiotherapist, Radiographers, Nurses, Medical laboratory Scientist and Pharmacists.

**Methodology:**

The cross-sectional study recruited 150 health care professionals: House Officers, Junior Doctors, Medical officers, Physiotherapists, Nurses, Pharmacists, Radiographers, Medical Laboratory Scientists in Federal Medical Centre, Owo. Ondo- state, South-western Nigeria. The study protocol was approved by the Health Research Ethics Committee of Federal Medical Centre, Owo (FMC/OW/380/LXX1/174). The survey instrument for the study was a three parts, self-administered questionnaire. Part A consisted of the demographic data of participants. Part B sought information on knowledge of medically-related smartphone applications while part C was on usage of medically-related smartphone applications. Data obtained were summarized using Statistical Package for Social Science (SPSS) version 20.0 software. Descriptive statistics of percentages and frequency table was used to present the results.

**Results:**

A total of 150 health care professionals participated in this study. 85 (56.7%) were males while 65 (43.3%) were females. 98 (65.3%) of the participants were single while 52(34.7%) were married. The age group 26-30 had the highest frequency (38.7%) followed by age group 20-25 (28.7%) while age group 51-55 had the least frequency (0.7%). 27 (18.0%) of the participants are on National Youth Service Scheme, 75(50.0%) are on internship training while 48(32.0%) are on permanent appointment. Participants professional distribution shows that Medical doctors were in the majority (29.3%), followed by Nurses (24.0%), Medical Laboratory Scientists (18.7%), Pharmacists (13.3%), Physiotherapists (8.7%) while Radiographers were the least (6.0%). The demographic characteristics is presented in table 1.

**Table 1: Demographic Characteristics of participants**

|  |  |  |
| --- | --- | --- |
| Characteristics (N=150) | n |  % |
| GenderMaleFemale | 8565 | 56.743.3 |
| Marital statusSingleMarried | 9852 | 65.334.7 |
| Age group 20-25 26-30 31-35 36-40 41-45 46-50 51-55 56-60  | 435822117612 | 28.738.714.77.34.74.00.71.3 |
| Qualification  B.Sc  MBBS Others  | 100446 | 66.729.34.0 |
| Staff Category  NYSC  Intern  Permanent staff | 277548 | 8.050.032.0 |
| Profession Medical doctor PhysiotherapistNursePharmacistRadiographerMedical lab scientist | 44133620928 | 29.38.724.013.36.018.7 |

Table 2 shows respondents knowledge of medically-related smartphone apps. The result shows that 96.7% of the respondents own a smartphone, 94.0% have android phones while 6.0% have tablet phones. Majority (96.7%) of the respondents were aware that smartphones can be helpful in patient’s care similarly, 93.3% were aware, there are various smartphone apps that can be used for health care information in patient care. 73.3% of the respondents reported to have both medical and their professional- related apps on their smartphones.

Table 2: Respondents’ knowledge of medically-related smartphone apps

|  |  |  |
| --- | --- | --- |
| Knowledge (N=150) | n | % |
| Own a smartphones Yes No | 1455 | 96.73.3 |
| Type of Device Android Tablet | 1419 | 94.06.0 |
| Smartphones can be helpful in patients’ care Yes No | 1455 | 96.73.3 |
| Know of Smartphone health-related apps Yes No | 14010 | 93.96.7 |
| Have Medically-related apps Yes No | 11040 | 73.326.7 |
| Have your Professionally-related apps Yes No | 11040 | 73.326.7 |

Table 3 shows the respondents’ level of utilization of medically-related smartphone apps. From the result, 6 (3.3%) respondents reported to have six different types of professionally-related apps on their smartphones, 14 (9.3%) have four, 43 (28.7%) have two while 28 (18.7%) did not have. Out of 112 participants that have professionally-related apps on their smartphones, only112 (91.8%) are using the apps while 10(8.2%) had never use it. The result also shows that 59 (39.3%) of the respondents claimed to use their professional- related apps daily while 53 (35.3%) twice weekly. More than half of the respondents (65.3%) recounted to have discussed the availability and the use of their professional-related apps in clinical education and practice with their colleagues, 58.7% had shared their professional-related apps with colleagues while 74.0% of the respondents agreed to endorse the development of more apps for health care professional usage. From the result of this study, 44.7% of the respondents stated more than five reasons for using professional-related smartphone apps among which are: to enhance education on patient care, to assist in patient management, to update their knowledge, to assist in providing suitable answers to their patients questions/concerns similarly, 48.0 % of the respondents stated three patient care- related benefits derived from the use of professional-related smartphone apps: update on the most recent approach to treating some medical conditions, increase knowledge on adverse effects of some drugs to be prescribed and making diagnosis easier and faster.

Table 3. Respondents’ level of utilization of medically-related smartphone apps

|  |  |  |
| --- | --- | --- |
| Characteristics (N=150) | n | % |
| No of professional apps None 1 2 3 4 5 6 | 282543331425 | 18.716.728.722.09.31.33.3 |
| Use professional- related app(n=122) Use it Never use it | 11210 | 91.88.2 |
| Usage frequency I never use them Daily Twice weekly | 385953 | 25.339.335.3 |
| Have discussed it with colleagues Yes No | 9862 | 65.334.7 |
| Have share it with colleagues Yes No | 8862 | 58.741.3 |
| Endorse development of more apps Yes No | 11139 | 74.026.0 |

**Discussion:**

This study investigated the level of awareness and utilization of medically-related smartphone apps for medical information among health care professionals a Nigeria tertiary health institution. The selected health care professionals include Medical doctors, Pharmacists, Physiotherapists, Nurses, Radiographers and Medical Lab Scientists. A total number of 150 respondents participated in this study within the age range from 20 to 60 years.

From the present study, majority of the health care professionals own smartphones. This is comparable to the findings of Mohammad et al, (6) where 98.9% of doctors and 95.1% of nurses own a smartphone and that of Nicole et al, (7) which reported that majority (84%) of their participants i.e. the healthcare professionals own a smartphone. The results of this study also revealed that many health professionals (96.7%) were aware that smartphones can be helpful in patient’s care. This result can be related to a study conducted in Nigeria by Olufunmilayo et al, (8) where almost all the respondents had knowledge about the use of mobile technology and its benefits to healthcare. However, the present result is in contrast with the findings in Ethiopia where only 18.7% of respondents had good knowledge about mobile health apps.(9)

From the results of this study, 73.3% of the respondents have their professional- related apps. About 39.3% of the healthcare professionals who partook in this study reported to be using the apps on daily basis while 35.3% used the apps twice weekly, this shows that about 74.6% used the apps regularly. This result is in line with findings from the studies of Murfin M.,(10) and Wallace et al, (11) where they observed that 70% of medical school health practitioners reported using at least one medical app regularly, with 50% using their favorite app daily.

In this study, 44.7 % of the respondents identified more than 5 reasons for using their professional related app and some include: to enhance education on patient care, to assist in patient management, to update their knowledge, to assist in providing suitable answers to their patients’ questions/concerns. The respondents also mentioned some of the patient care- related benefits derived from the usage of their professional- related apps which include: update on the most recent approach to treating some medical conditions, increase knowledge on the adverse effects of some drugs to be prescribed, makes diagnosis easier and faster. These results are similar to the benefits provided by mobile devices and apps for health care professionals which are: allowance for making more rapid decisions with a lower error rate, increasing the quality of data management, accessibility to best practices, improving practice efficiency and knowledge. (11-13) These benefits have been shown to have a positive effect on patient care outcomes, as evidenced by reduction in adverse events and hospital length of stay (14,15)

**Conclusion:**

The development of medically-related smartphone apps has created a wide range of medical resources for health care professionals. Majority of Nigerian health care professionals are aware of medically-related smartphone apps and have at least one professionally-related smartphone app which are employed on regular basis as a quick reference materials in patients’ care and clinical decision making. Majority of the health care professionals recounted to have discussed the availability and the use of their professional related apps in clinical education and practice with their colleagues; and are advocating for development of more relevant apps.

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