

**KNOWLEDGE, UTILIZATION AND FACTORS AFFECTING THE USE OF MOBILE
TECHNOLOGY FOR KNOWLEDGE UPDATE AMONG NURSES IN A TERTIARY
HEALTH INSTITUTION EDO STATE**

BY

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OCTOBER, 2025

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**IN PARTIAL FULFILMENT OF THE AWARD OF THE DEGREE OF BACHELOR
OF NURSING SCIENCE, FACULTY OF NURSING SCIENCES, UNIVERSITY OF BENIN,
BENIN CITY**

OCTOBER, 2025

CERTIFICATION PAGE

This is to certify that this project was carried out by **AGUNLOYE EYITAYO FAVOUR** with matriculation number **BMS2009083**, Faculty of Nursing Sciences, University of Benin, Benin City.

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DEDICATION

This work is dedicated to GOD ALMIGHTY who is providing me with the strength to complete my academic journey.

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First and foremost, I give all glory and honor to God Almighty, the source of my strength, wisdom, and perseverance. His grace has been my anchor throughout this academic journey.

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ABSTRACT

This study investigated the knowledge, utilization, and factors affecting the use of mobile technology for knowledge update among nurses in selected secondary health care facilities in Benin Metropolis, Edo State. The study aimed to determine the level of nurses' knowledge of mobile technology, their extent of utilization, and the factors influencing its use for professional knowledge update. Three research questions were raised, and one hypothesis was tested at a 0.05 level of significance. A descriptive survey design was adopted for the study. The population comprised 202 registered nurses from two selected secondary health care institutions in Benin City, from which a sample size of 148 respondents was drawn using the Taro Yamane formula and convenience sampling method. A well-structured questionnaire was used for data collection and validated by experts in nursing and research methodology, while a pilot study yielded a reliability coefficient of 0.78. Data were analyzed using descriptive and inferential statistics, including frequency counts, percentages, means, and chi-square tests. The findings revealed that most respondents possessed an average level of knowledge of mobile technology and demonstrated moderate utilization, primarily for professional and general knowledge updates. Major factors influencing use included lack of appropriate mobile devices, unreliable network connectivity, long login times, and heavy workload. The study concluded that mobile technology plays a significant role in improving nurses' access to up-to-date knowledge but its utilization is hindered by infrastructural and institutional challenges. It was recommended that the Nursing and Midwifery Council of Nigeria integrate mobile technology into continuing education programs and that healthcare institutions improve technological access and support for nurses.

Keywords: Mobile Technology, Knowledge Update, Utilization, Nurses, Benin Metropolis.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Healthcare is increasingly technology-dependent with mobile technology devices connecting to national and international information. Many health professionals use mobile technology to guide clinical care and for continuing education. Health resources such as e-books, point of care guides, drug guidelines and search engines provide access to up-to-date research, guidelines and protocols that support the use of evidence-based practice. Additionally, these devices enable communication and networking with other health professionals. A benefit of mobile technology is that it can fit conveniently into a person's pocket. The number of health professionals using smartphones and other mobile devices in the clinical setting is increasing (Mosa, Yoo & Sheets, 2021). A systematic review of healthcare applications for smartphones found that smartphones make useful tools for evidence-based practice at the point of care, for mobile clinical communication and for remote monitoring of patients. Importantly, smartphones can play a very important role in patient education and self-management of disease (Mosa, Yoo & Sheets, 2021).

Since the introduction of mobile technologies in the early 1990s, it has become a valuable and important tool to be incorporated into various medical related fields used by multiple disciplines (Kim et al., 2021). Huge quantities of information can now be stored. The operating system allow applications that support advanced user interaction, the ability of their graphics offer an adaptable representation and their networked status means that they afford an effortless communication among the users. Moreover, many healthcare professionals (HCPs) will have acquired a degree of familiarity and confidence with such devices through their own personal

and recreational uses, so it is easy to argue that this use should be extended to support the education and practice of HCPs especially Nurses.

Various scoping studies (Tomesko et al., 2021) have identified a range of medical software applications available to HCPs. Most applications are information for points of reference, examination or a type of software application that test knowledge. However, proof of their impact on healthcare professionals is restricted. Several reviews showed that personal digital assistants (PDAs) were being increasingly integrated into clinical practice and medical education (Shen et al., 2021). A Personal Digital Assistant (PDA) is a general term for any mobile handheld device that is small. Examples are smartphones and tablets. These devices compute, provides, stores and retrieve information for personal or business use, often for schedule keeping calendars. However, none of these provided a comprehensive overview of the use of mobile technologies among nursing professionals with a focus on its use in improving education and clinical practice.

Nurses are highly flexible and pragmatic in responding to situations, finding workarounds for nursing practices that do not work as intended, become redundant or are viewed as onerous (Elgin & Bergero, 2021). This cognitive and behavioral capability leads nurses to reconfigure and normalize new practices into nursing work when the benefits outweigh non-use (Mather & Cummings, 2021). Historically, nurses have embraced the use of mobile technology in healthcare environments. However, as ‘tales from the profession’ emerged, the deployment of mobile technology to enhance learning opportunities at point of care stalled (Mather & Cummings, 2021). Use of mobile technology for learning has disrupted traditional workflow patterns. The advent of real-time access to information has led to a range of systems and organizational responses that initially included the prohibition of mobile technology’s use at the

workplace and at point of care. However, some healthcare organizations now ignore mobile technology use by particular health care profession groups at the place of work. Other groups, comprising nurses think they are still excluded from the benefits of legitimate use of mobile technology at work. If this assertion is true in developed countries, then it bothers to investigate the use of this technology among nurses in selected secondary health care settings in a developing economy where there is still ongoing reformation in the technology and its use. Hence, this study is set out to assess the level of utilization of mobile technology for knowledge update among nurses in selected secondary health care settings in Benin Metropolis.

1.2 Statement of the Problem

The transition towards a knowledge-based society triggers the need and pressure to learn continuously, yet the time available for learning is getting shorter and the knowledge gaps are widening. The rapid development of mobile knowledge supports robust contributions to the development of knowledgeable communities. Mobile and wireless technologies improve significantly the access to knowledge any time from any place through diverse and capable handheld devices. The continued education of nurses in the context of a rapidly changing healthcare system is a prime example of how the mobility of learners within a variety of real life learning environments has posed increasing challenges and where mobile technologies have the potential to supports and enhance teaching and learning. The high acuity and pace of practice in institutional environments, combined with an explosion of knowledge and technology, increasingly requires practitioners to access and process clinical data efficiently by drawing on current resources to support safe care and evidence informed practice at the point of care (Richard et al., 2021).

Various studies have been conducted on the use of mobile technology among nurses.

Wagner (2021) reported that evidence of the widespread adoption in North American Society of Mobile wireless technology such as cell phones, Personal Digital Assistants (PDAs), Laptop computers, and MP3 players, is inequitable. Current mobile technologies (especially wireless) – frequently refined to as third generation (3G) – provide an unprecedented opportunity for expensive and beneficial computing power for learners (Hill and Roldan 2021; Wagner 2021). Richard (2021) opined that the education of health care professionals in the context of a rapidly changing health care system is a prime example of how the mobility of learners within a variety of real live learning environments has posed increasing challenges and where mobile technologies have the potential to support and enhance teaching and learning. The high acuity and pace of practice in institutional environments, combined with an explosion of knowledge and technology, increasingly requires practitioners to access and process clinical data efficiently by drawing on current resources to support safe care and evidence informed practice at the point of care. Moreover, the shift of client care to the community requires that the education of health care professionals take place increasingly in this more autonomous and diverse practice environment where resources are not readily accessible, where client acuity is increasing, and where more traditional methods of directly observing and working with students are not as feasible. These shifts in practice, along with more limited education and practice resources to support students’ practice, raise concern for the quality of their education and the safety of their practice. This is particularly significant for rural practice education where resources are limited and geography poses additional challenges (Richard, 2018). Rosenthal (2022) outlines a number of useful functions identified by nurses using PDAs: address book, “to do” lists, date book, memo pad, expense tracking, “find” functions, diagnostic tools, clinical guidelines, medical

dictionaries, lab values, and patient, student, and staff management programs. She categorizes these as tools that enhance productivity, promote risk management/error reduction, and through their rapid access to critical information lead to stress reduction. Cahoon (2022) groups the functions into five categories: clinical services, calculators, data collection, medical record system, and content tools. Newbolt (2021) notes that if the PDA is also a wireless device, the use increase in both number and complexity. She lists potential applications such as: interdisciplinary consultations, electronic ordering and test results, patient histories, progress notes and assessments, references, protocols, and prescription information. Increased PDA wireless capacity to include phone and camera capabilities permits rapid chart access, improved workflow, increased time for patients, cost savings, enhanced productivity and, therefore, boosts professional satisfaction. The literature reviewed showed that there was high adoption of mobile technology particularly among nurses in western part of the world but in Nigeria little is documented about the extent to which nurses are knowledgeable and the extent to which they utilize mobile technology for knowledge update, hence the need for this study. The study assesses the utilization of mobile technology for meeting the needs of nurses for knowledge update in selected secondary health facilities in Benin Metropolis.

1.3 Aim and Objectives of the Study

The aim of this study was to assess the utilization of mobile technology for knowledge update among nurses in selected secondary healthcare settings in Benin Metropolis.

The objectives of this study are to:

1. examine the extent to which nurses are knowledgeable about the use of mobile technology for knowledge update;

2. determine the level of utilization of mobile technology among nurses; and
3. identify factors influencing the use of mobile technology among nurses

1.4 Research Questions

The following questions will be raised and answered in this study:

1. What is the extent to which nurses are knowledgeable about the use of mobile technology for knowledge update;
2. What is the level of utilization of mobile technology among nurses; and
3. Are there likely factors that influencing the use of mobile technology among nurses?

1.5 Hypothesis

The following hypotheses will be tested in this study:

1. There is no significant association between the level of utilization of Mobile Technology for Knowledge update among nurses and their age.

1.6 Significance of the Study

The study is intended to help raise the awareness among key decision makers in the public, private and civil society sectors about the potential importance of the use of low cost mobile devices in updating the knowledge of nurses working in our health facilities. By documenting the existing landscape of initiatives in this area and emerging good practice, it is also hoped that this work will serve as a common base for further analytical work in this area. Mobile technology devices such as mobile phones, laptop, PDA (Personal Digital Assistant) and modem have the potential to address some of the challenges faced by nurses by bringing the most relevant information directly to the point of care. Provision of information through electronic sources that

are easy to use may address some of the hurdles that stop access and clinical use of new and pertinent research by nurses. This study is significant in that currently there are few standardized policies issued by healthcare institutions to guide the use of mobile technology in the clinical setting. The results of this study may lead to policies and guidelines being reviewed by local healthcare agencies and may lead to review of current mobile technology integration into the undergraduate nursing curriculum. Mobile technology is relevant to bridge the knowledge gap among graduates and boost their confidence at point of care, which may result to better patient care. It is important to search through the complication of technology in nursing, as it is a major impact in healthcare results and experiences. Further evidence is required that addresses the relationship between nursing and technology by examining: its effects in the clinical setting; efficiencies; its relationships between nursing and caring; and the range of philosophical questions that may arise from the empowering of people in their healthcare choices.

1.7 Scope of the Study

This study is delimited to all registered nurses working in selected secondary healthcare settings in Benin City. This study is equally delimited to the topic and the objectives that guided this study.

1.8 Operational Definition

Utilization - the action of making practical and effective use of knowledge update

Mobile Technology -Mobile Technology is defined as any device with internet capability that is accessible by nurses for knowledge update from anywhere and at any time.

Knowledge Update– This is the act of getting modern and current information about a topic in Nursing.

Secondary Health Care -This is an urban/state government management approach to providing health care services to her residents.

CHAPTER TWO

LITERATURE REVIEW

This chapter will be presented into conceptual review of articles, empirical review and a theoretical framework.

2.1 Conceptual Review

2.1.1 Mobile Technology

The world is gradually becoming interconnected with modern technology. A necessary tool for this process is a communication system where telecommunication is central. Over the past decade, the expansion of mobile cellular networks and the popularization of mobile phones have been driving growth in information and communications technology (ICT) in Asia and the Pacific, and the world (Islam, 2021). The rapid growth of cell phone use in the impoverished South Asian nations has a significant impact on the economy, as well as on people's lifestyles. Bangladesh became the latest nation with at least 100 million active cell phone users – a milestone reached so far by only 12 countries in the world (Chowdhury, 2021). A total number of Mobile Phone subscribers now has reached 129.584 million at the end of February 2014 (BTRC, 2021). The use of mobile phones becomes an essential for success for every single person, group or organization for retrieval of information. The fabric of our lives has become interwoven with mobile technology as our day-to-day means of operating have, by necessity, become more mobile (Fox, 2021). In the year of 2009 for the first time ever, mobile phones were used more for accessing data than to make calls (Høivik, 2021).

Mobile technology is used for cellular communication. It is a form of communication technology that enables use of mobile phones. Mobile technology has progressed swiftly over the past few years. At the beginning of millennium, mobile device has gone from a two way pager to a mobile

phone, Global Positioning System (GPS) navigation device, a web browser and rapidly messaging client. Many professionals think that the future of computer technology lies in mobile computing with wireless networking. Tablet computers are popular mobile devices. Tablets are available on third generation of mobile technology (3G) and fourth generation of mobile technology (4G) networks. Mobile technology has diverse meanings in different facet. Examples of wireless devices are laptops, tablets, mobile phones,etc)

2.1.2 Mobile technology classification

Mobile technology, driven by the convergence of mobile communication technology and mobile computing technology, mainly includes four types of technologies.

1. radio-based two-way radio communication (professional or public mobile radio) or broadcast
2. mobile phone service based on cellular phones, SMS (Short Message Service), WAP (Wireless Application Protocol), GPRS (General Packet Radio Service), UMTS (3G, 3rd Generation Mobile Communication Network)
3. mobile-based, including laptops, tablets, PDAs (personal digital assistants), pagers, Bluetooth technology, RFID (radio frequency identification) and GPS (Global Positioning System)
4. Network-based WiFi or WAPI wireless LAN that China is developing.

2.1.3 Mobile Technology in Health care practice

Mobile technology in health is often called mHealth. mHealth (also written as m-health or mhealth) is an abbreviation for mobile health technology, a term used for the practice of medicine and public health supported by mobile devices (Adibi, 2021). The term is most commonly used in reference to using mobile communication devices, such as mobile

Phones, tablet computers and personal digital assistants (PDAs), and wearable devices such as smart watches, for health services, information, and data collection. It broadly encompasses the use of mobile telecommunication and multimedia technologies as they are integrated within increasingly mobile and wireless health care delivery systems. This field largely cover multimedia technology and mobile telecommunications use for the delivery of healthcare. Robert Istepanian coined the term mHealth as use of “emerging mobile communications and technologies network for healthcare “

MHealth has become more apparent as a sub division of eHealth, information and communication technology use (ICT). Examples are computers, patient monitors mobile phones and satellite communication etc. for health services and information. mHealth applications include the use of mobile devices in collecting community and clinical health data, delivery/sharing of healthcare information for practitioners, researchers and patients, real-time monitoring of patient vital signs, the direct provision of care (via mobile telemedicine) as well as training and collaboration of health workers (Pimmer, et al. 2021).

While mHealth has application for industrialized nations, the field has emerged in recent years as largely an application for developing countries, stemming from the rapid rise of mobile phone penetration in low-income nations. The field, then, largely emerges as a means of providing greater access to larger segments of a population in developing countries, as well as improving the capacity of health systems in such countries to provide quality healthcare. Within the mHealth space, projects operate with a variety of objectives, including increased access to healthcare and health-related information (particularly for hard-to-reach populations); improved ability to diagnose and track diseases; timelier, more actionable public health information; and expanded access to ongoing medical education and training for health workers.

2.1.4 Types of technologies used in healthcare education

Mobile technologies

Handheld, portable devices includes e-readers, tablets, iPads, smartphones. Between 2002 and 2012, personal digital assistants (PDAs) were one of the most commonly used mobile technologies within healthcare (Guo, 2021), but PDAs have now been largely superseded by smartphone technology. Mobile device can be used for a variety of reasons within healthcare education: information collection(for example; To obtain a reference guide of drugs, literature of the medical field);assisting in clinical decision making (e.g. the use of medical calculators or disease diagnosis aids); accessing patient records and recording or monitoring patient data; receiving alerts (similar to a pager device); time management through calendar applications; scanning documents; making notes and word processing; recording audio or dictating notes; and communicating with others through engaging with social media, phone calls, text or email (Ellaway and Masters, 2021; Wallace, 2022; Guo,2021). A range of medical software apps are now available for healthcare professionals to download onto the various handheld devices, for example: ICD10, Medscape, PubMed, British National Formulary, Pepid, Skyscape and Dynamed (Wallace, et al. 2022).

E-learning

E- learning is a prevalent approach to education which makes use of the internet as means of teaching and linking with learners. E-learning involves “a pedagogical approach that typically aspires to be flexible, engaging and learner–centered; one that encourages interaction (staff–staff, staff–student, and student–student), and collaboration and communication...” (Ellaway, et al. 2021). E-learning can be synchronous and asynchronous, and can provide access to a broad range of resources: course materials, multimedia tutorials/videos, educational websites, podcasts,

online simulations, and virtual learning environments that might contain discussion boards or assessment tools. Although some education programs can be provided entirely through e-learning, it is common for healthcare education to take the form of ‘blended learning’ with both online and face-to-face teaching and resources. However, there is often a lack of consistency with the technologies used within a blended learning approach (Rowe, 2021).

Simulation

Simulation provides a realistic scenario for learners to practice clinical skills in a “controlled environment” (Motola, 2021). Three types of simulation are typically used in healthcare education: low-fidelity, mid-fidelity and high-fidelity (Harder, 2021). Low-fidelity simulation includes role play, a task trainer or non-computerized technology which is used to teach basic technical skills. Mid-fidelity simulation can include computer games, technology which has some realistic feature (such as a pulse or breathing sounds) or the use of standardized diced patients. High-fidelity simulation tends to be the most realistic with computerized human patient manikins (Harder, 2021; Gough, 2021; Motola, 2021; Murdoch, 2021). Some programs also use fully equipped simulation environments e.g. operating theaters, dental simulation suites and simulation ambulances. In addition, virtual reality simulation “re-creates real life scenarios” in “a virtual clinical environment” (Duff, 2021) and can simulate a specific healthcare setting (e.g. a hospital) or enable users to interact in a virtual world, such as Second Life (Liaw, 2021). Augmented reality is a simulation technology which enables virtual objects to “be embedded in a real physical context” (Zhu, 2021).

2.1.5 Usage of Mobile technologies in Knowledge Update

Modern technology and tools use in the provision of library services is one of the hot topics in the present- day. Mobile devices can prove to be successful in countries that are developing. Diversified issues related to the use of mobile phones in library services is a topic of interest for many researchers (Chaputula & Mutula, 2021a;). With the increase of mobile technology availability and the demand for accessible mobile content, it is imperative that libraries examine how they can provide services to their patrons within this medium in order to continue to provide valuable services and make information retrieval easier for their clientele or users (Nowlan, 2021). For example, SMS has become a popular way of communicating. However, it is imperative that individual libraries consider the suitability of this technology for their client. By adding this new technology to the reference services, users are now able to send questions and receive answers from librarians by using the text messaging facility on their mobile phones (Herman, 2021). The unintended consequence of smaller and faster computing is the enabling of an anywhere and anytime learning. In the course of scientific discovery products are produced which have novel application that is wholly unintentional (Hahn, 2021). Because of the portability, popularity and pervasiveness of cell phones among our users, this service is a way for us to stay current (Maxymuk, 2021). Libraries are just starting to make their first steps into the world of mobile learning, in particular, learning through mobile phones (Walsh, 2021). The steps involved collection of mobile phone numbers, setting up a centralized SMS service centre, and sending group SMS via a network (Karim, Darus, & Hussin, 2021). In the educational context, factors such as the increasing role of distance education enhance the need for mobile technology. This phrase “mobile technology” not only refers to the hand-held devices themselves but to the infrastructure required to support such technology (Fox, 2021). A great number of respondents .

who owns a handheld device that is web-enabled point out that they would make use of small screen devices, such as Distributed Antenna System(DAS) or cell phones enabled with web to search a library Online Public Access Catalog(OPAC). The increasing prevalence of handheld mobile computing devices such as PDAs and web-enabled cell phones warrants investigation as to its impact on libraries (Cummings et al., 2021). Libraries have the opportunity to extend new types of services to users of mobile devices and to develop, license, or otherwise make available scholarly content that is configured for mobile devices. Ideally, libraries will become part of an institutional planning process for the development of services for mobile devices (Lippincott, 2021). By developing expertise in emerging technologies, libraries can foster partnerships with other groups on campus and play a leading role in providing relevant student-centered services (Wilson & McCarthy, 2021). The development and implementation of mobile services can range from work-intensive and expensive to scalable, inexpensive solutions (Murray, 2021). Regarding this, the professional concerned with information need to grasp the part of mobile phones in getting information from the libraries quickly. Chaputula and Mutula (2021b) findings show that attitude of the library students and staffs to providing and access to services through mobile devices were good. Palumbo (2021) opines that the librarians should adopt mobile phone technologies as an integral part of their service and employ them particularly in the areas of text reference, information literacy, and outreach.

2.2 Empirical Review

Gaturo (2021) conceived with the aim of investigating the availability and utilization of information and communication technology for accessing health information by medical professionals in Kenya. The study started from the premise that access to relevant information

and knowledge is critical to the delivery of effective healthcare services. The research design was semi-structured qualitative interview study. Data were collected on individual occurrences of the circumstances . The analytical tool used was grounded theory. The research was exploratory in nature and used Kenyatta National Hospital as a case study the result shows that the major themes that emerged from the data are highlighted. The basis of this findings of the study were that: healthcare professionals required information steadily during the course of their clinical work. Governance of the clinical area, patient care and renovation of the profession on the new medical practices were the foremost reasons for needing and seeking out information. When the medical professionals required clinical information, they turned to coworkers Sources of information that were often used were textbooks and journals . Nevertheless , there was a considerable preference for e-searching for information from the electronic journals and internet . The discovery revealed insufficient library and information services, not enough access and electronic information use resources and lack of ICT skills among the medical professionals. The study concluded that many critical information needs of the medical professionals were not being met adequately. Enhanced usage of ICT was viewed as the only strategy that was practical for improvement of information access and sharing of information among the health care professionals at the hospital.

Afolayan and Oyekunle (2019) explores the availability, accessibility and the extent of ICT usage by health professionals in Ilorin metropolis. Using a structured questionnaire, data was gathered using a sample size of 174 providers of healthcare services in 34 private and public hospitals. The discovery of the study shows that the information communications technology(ICT) that were accessible and used by healthcare professionals are the older information communications technology(ICTs). These include television sets, DSTV, fax

machines, photocopying machines and technologies that are concurrent like the phones and computer. Although, Internet driven facilities like video-conferencing, teleconferencing, web discussion forums and email among others, were not readily available to the health professionals, a comparative analysis reveals that there was superior availability and use of computers, projectors, e-mails and Internet by health professionals in private hospitals than those in public hospitals. This is as a result of the financial implications of procurement and installation of these facilities. Interestingly, the level of awareness of users on the numerous benefits of ICTs on their job and productivity is quite impressive. It is therefore, concluded that hospitals' regulatory agencies should collaborate with International agencies such as World Health Organization (WHO), United Nations Organization (UNO) and the European Union, among others, to aid in the successful implementation and funding for the procurement of sophisticated ICTs to facilitate the dissemination of up to date health information to public and private hospitals.

Balogun (2020) assessed the knowledge and attitudes of primary health care providers on the use of mobile technologies such as internet-enabled smart phones for maternal and child health services. It used data from a cross-sectional study of seven urban local government areas in Lagos, Nigeria. A sum total of 518 of primary health care professionals were reviewed for information on mobile technology use, the use of mobile technology for maternal and child health and the attitude. Analysis of data was done using t logistics regression models and descriptive multi variable linear. The study showed that smartphone ownership is not a predictor of high mHealth knowledge; however, having an internet-enabled smart phone was a strong predictor of higher knowledge of mHealth (regression coefficient, $\beta=1.20$, Interval of confidence=95%, $\beta=1.20$, CI=0.61-1.79) amid the primary health care professionals. Having a smartphone(95% of CI=0.12-1.89, $\beta=1.00$) and having phones enabled with the

internet($\beta=1.14, 95\% \text{ CI}=0.18-2.10$) were both predictors of good attitudes of mHealth. The primary health care providers with a higher score on mHealth knowledge were times 1.32 more likely to make use of mHealth for the services of maternal and child health. Those with a good attitude towards mHealth were times 1.15 more likely to make use of mobile technology for the services of maternal and child health services. The result proposes mHealth tools use by primary health care providers to give maternal and child health services is influenced by their attitude and knowledge towards mHealth. Interventions that center on increasing mobile technology with devices that are enabled like the smartphones are necessary to enhance attitudes, knowledge and mHealth use in the services of maternal and child health.

Adebara & Olaide (2021) assessed the knowledge, attitude and willingness to use mHealth technology in medical management and patient follow-up by doctors at the Federal Teaching Hospital, Ido-Ekiti. The study design was a descriptive cross sectional questionnaire based study. Proportionate sampling was used to select 220 doctors; data were obtained with a self-administered questionnaire. Ethical approval was obtained from LUTH HREC. Data analysis was performed using SPSS 21. The results showed that the mean age was 35.2 ± 7.3 years with a Male: Female ratio of 2.39:1. Knowledge of mHealth technology was high, with a mean score of 94.31 ± 11.26 , majority of respondents (97.6%) had positive attitude. A weak association was observed between respondents' attitude and the statistically significant variables with multiple correlation coefficient of determination of 0.022. Although 80% of respondents were willing to use mHealth, just about half were willing to expand the use of mHealth in bridging the digital divide even with higher fee charges. There was a significant association between the years of experience and willingness to use mHealth ($p=0.049$).

Koehler et al., (2021) enumerated the number of healthcare professionals that use mobile phones within clinical practice and their attitudes towards using them. Furthermore, given that the internet preceded smartphones, they also established healthcare professionals' attitudes towards internet use in clinical practice as a comparison. Forty-three healthcare professionals from a range of disciplines and specialties who were predominantly working in Australia completed an anonymous online survey. Health care professionals that owned a mobile phone was ninety one per cent which eighty seven per cent used it during clinical practice. The workplace which these healthcare professionals were in didn't supply them with a smartphone. As a result, they made use of their personally owned device. Ten out of eleven analogous statements healthcare professionals had a noteworthy good attitude towards the internet than mobile phone use in the clinical practice setting. The attitudes for eight out of ten statements relating to mobile devices use were good. As regards to confidentiality, mobile phones were perceived badly. Furthermore, health professionals perceived that patients may think they were using their mobile phones for reasons not related to their care. Their study concluded that mobiles, including smartphones, are commonly used within clinical practice and at present most healthcare professionals use their privately owned device. Despite the professionals in healthcare having more positive attitudes towards the use of the internet, their attitudes towards mobile use were greatly positive. Their results suggest that mobile phone use, in particular smartphone use, within clinical practice is likely to increase in the future.

Chester et al., (2022) focused on determining the use of mHealth and identifying and describing the opportunities and the challenges faced by the medical doctors in using mHealth at a specific health care facility in Zimbabwe. A quantitative, descriptive, cross-sectional and analytical design was used to determine the rate of utilization of selected mHealth "patient identification

and treatment activities” by medical doctors. For data collection, a well structured questionnaire was used from a hundred and four respondents. The number of questionnaires that were returned complete and usable were 42. There was no sampling technique adopted because the researcher was interested in the whole population, they were accessible and available during collection of data. The results show that Fifty percent (50%) of the respondents indicated, lack of knowledge and unawareness in using mHealth to support chronically ill patients.

A greater part of the respondents(83.3%) think that mHealth presented a chance to enhance the delivery of healthcare. A large number of respondents(95%) pointed out the possibility for its future technique was done because the researcher was interested in the entire population, they were accessible and available.

2.3 Theoretical Framework

There are a number of theoretical models that have been used to support studies especially in the part of perception, acceptance and electronic systems use. Technology Acceptance Model(TAM)(Davis et al, 1989) has been used widely. Based on this background and the constructs of the model which will help guide the study, the Technology Acceptance Model (TAM) was adopted. The Technology Acceptance Model (TAM) created by Davis, Bagozzi, and Warshaw (1989) focuses on the variables affecting users’ satisfaction in technology use. The technology Acceptance Model(TAM) and other forms of it , is focused to consider the factors that are underlying affecting users’ acceptance of technology systems such as Learning Management System(LMS). (Padilla-Meléndez, 2008). TAM is used to theorize that the behavioral intention of an individual to use a system is determined by two main factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEU) (Davis, 1993).

2.4 Application of TAM to this study

In the context of this study, the framework suggests that a user decides to access and use mobile technology because of their perceived usefulness. If successful in the search and retrieval, a user then makes use of the resources. Under Perceived Ease of Use, it is assumed that if a user's interaction with mobile technology is seamless, e-resources will be considered easy to use. Self-efficacy explains that the easier to use that a system is, the greater is the user's sense of efficacy. Moreover, a tool that is easy to use can make users feel that they are in control of what they are doing. Due to its ability to illustrate the direct link between perceived ease of use and attitude, Users' ICT competence is one of the underlying intrinsic motivational factors. Perceived ease of use can also contribute, in an instrumental way, to an improvement in mobile technology access and use.

2.5 Summary of Literature Review

Nurses have a professional obligation for safe practice supported by up-to-date knowledge which mobile technology has great potentials to provide. Wireless and mobile technologies boosts the accessibility to knowledge from any place at any time through the use of different and efficient handheld devices. The continued education of nurses in the context of a rapidly changing healthcare system is a prime example of how the mobility of learners within a variety of real life learning environments has posed increasing challenges and where mobile technologies have the potential to supports and enhance teaching and learning.

CHAPTER THREE

METHODOLOGY

This chapter discussed the method with which the necessary data relating to the problem was collected and analyses. It involves the research design, setting, target population, sample/sampling technique, instrument for data collection and ethical consideration.

3.1 Research design

A descriptive survey design was adapted to access the utilization of mobile technology for knowledge update among nurses in secondary healthcare settings. Descriptive survey design is a research design with the main objective of portraying characteristics of a person, phenomenon, situation, population or groups or the frequency with which certain phenomenon occur. Since the purpose of descriptive survey is to observe or describe the behaviour of a subject without influencing it in any way, it is considered appropriate for the phenomenon being investigated.

3.2 Study setting

Benin metropolis is made up of five Local Government Areas of Oredo, Egor, Ikpoba-Okha, Ovia North-East and Uhumwonde and it is the capital of Edo State, Nigeria. It lies between latitudes $6^{\circ} 16' N$ to $6^{\circ} 33' N$ and longitudes $5^{\circ} 31' E$ to $5^{\circ} 45' E$ (Nkeki, 2013). The indigenous people of Benin metropolis are the Edo people (The Benin People), and they speak the Edo language and other Edo languages. The people of the city have one of the richest dress cultures on the African continent and are known for their beads, body marks, bangles, anklets, raffia work and the subsistence farming of yam, plantain and cassava.

3.3 Target population

The target population constituted all the registered nurses working in Central Hospital Benin City, Edo Specialist Hospital, Benin City. This constituted 202 nurses.

S/N	Name of Health Centre	Number of Nurses
1.	Central Hospital, Benin City	113
2.	Edo Specialist Hospital, Benin City	89

(Source: Records Unit of each Hospital)

3.4 Sampling technique

The multi-stage sampling technique was used in this study. Stage one is the selection of two (2) health facilities in secondary health care centres each using random sampling, while stage two made use of the convenience sampling technique to select the number of nurses in each secondary health care centres. The third stage, a convenience sample of the sample size was used to sample nurses to fill the questionnaire.

Inclusion Criteria

- The nurse who was interested to participate
- The nurse working among the nurses in the selected health facilities

Exclusion criteria:

- Nurses who were on annual leave, maternity leave, unable to participate in the study due to illness at the time of data collection will be excluded.

3.5 Sample size

From the population size, the sample size was computed using Taro Yamane (1976)

This was estimated using the formula: $n = \frac{N}{1 + N(d)^2}$

Where n = sample size

N = population size

D = level of precision (confidence interval)

N =202

D = 0.05

Thus $n = \frac{202}{1 + 202(0.05)^2}$

$n = \frac{202}{1 + 202 \times 0.0025}$

n = 134.2

10% Attrition rate = 13.4

134.2+ 13.4=147.6

n = 148

Therefore, the sample size was 148 nurses in the primary and secondary health care settings.

Table 3.2 Sample size determination for nurses in each hospital

Hospital	Population	Number of nurses to be sampled	Approximate number of students to be sampled
Central Hospital, Benin City	113	$(113 \div 202) \times 148$	83
Edo Specialist Hospital, Benin City	89	$(89 \div 202) \times 148$	65
	202		148

3.6 Instrument for Data Collection

The instrument for data collection was a well-structured questionnaire. The items were formulated according to the research objectives stated. It had four sections:

SECTION A: Demographic data of the nurses

SECTION B -Knowledge about the use of mobile technology

SECTION C- level of utilization of mobile technology

SECTION D- factors influencing the use of mobile technology among nurses.

3.7 Reliability of the Instrument

This is the degree to which the questionnaire produces stable and consistent results. A pretest of the instrument was carried out among fifteen (15) nurses in Egor Health Centre, Benin City, Edo State, to ascertain the reliability of the instrument. The Cronbach alpha reliability technique was employed in this study and computed with the aid of the Statistical Package for Social Sciences (SPSS). A Cronbach alpha value of 0.78 was gotten which was considered reliable for each section of the questionnaire.

3.8 Validity of the Instrument

This refers to the credibility and or dependability of an instrument. It is the ability of test to measure exactly what it tends to measure. To determine for validity, face validity was checked by an experience nurse, biostatistician and supervisor and to ensure the required variable is used and can answer the research question. Content validity was employed to ensure clarity and validate the content of the questionnaire.

3.9 Method for Data Collection

Verbal and written consent were obtained from prospective research participants after explanation of what the research work was all about. They were informed of their right to

withdraw at will. Questionnaire was distributed to the respondents and the completed questionnaire was retrieved from the respondents immediately after filling and all irrelevant ones were dropped, reproduced, redistributed and retrieved to make up the sample for analysis.

3.10 Method of Data Analysis

On retrieving the questionnaires from the respondents, the data were coded, cleaned and analyzed using International Business Machine (IBM) Statistical Package for Social Sciences (SPSS) version 26.0. The statistical techniques employed in the data analysis were the descriptive statistics (frequency, percentages and means) as well as inferential statistics (chi-square statistical test and t-test) to test the research hypotheses. Further analysis using multivariate logistic regression was used to test significant demographic variables with perception. The level of significance will be set at $p < 0.05$.

3.11 Ethical Consideration

This research was governed by ethical principal and policies; this is to ensure the study has no harmful consequence on the participants. Therefore, this study was reviewed and approved by the ethical review committee of Edo state Ministry of Health, before data collection for the study.

Informed Consent - Informed consent implies that participants should be given all necessary information to make self-decision without inducement, or any form of force, fraud, duress or any other of threat (Nnamdi, 2015). For this study, written and verbal consent was voluntarily obtained from the study participants.

Privacy is when an individual activity is not interfered into by others. It is a fundamental right in a well-organized and democratic society (Nnamdi, 2015). Respondent's privacy must be

respected before, during and after the study. This study protected the privacy of all participants/ respondents by allowing participants to control information about them.

Confidentiality -This refers to the obligation of an individual, group, or organization to safeguard information (Nwachuchwu, 2014). In a research, this is as important as the study itself. All information made available by respondents in the process of a research and the information gotten from the study participant was kept confidential by avoiding the use of identifiers and storing the data collected away in pass worded laptops available to the researcher or any other authorized persons. This is important between the researcher and the respondents in other to maintain trust in relationship.

Autonomy - Autonomy implies that an individual should be given the freedom, willingness to involve in a study. Respondents must be given the freedom to choose to involve in the study or withdraw without any form of harm. This study maintained participant's autonomy by giving the participants the freedom to choose to participate or not.

Beneficence - Beneficence is another word for non-maleficent. It implies that a researcher give high consideration to the well-being of the participants. The benefits of the study must out weight the harm.

CHAPTER FOUR

RESULT

4.0 Introduction

The data analysis, hypothesis testing and answering of the research questions were done in this chapter using responses obtained from the questionnaires administered to nurses working in selected Hospital, Benin City, Edo State. A total of 148 questionnaires distributed to the respondents were duly filled and returned, this is 100% response rate.

4.1 Data Analysis

This data analysis is presented in this section such that the demographic variables were presented first before the research objectives were looked into, followed by the hypothesis testing.

4.1.1 Demography of Respondents

The demographic variables that pertained to this study and which the questionnaires assessed were age, level of education, marital status and years of experience. Table 4.1 show the demographic distribution of the respondents with respect to the afore-listed demographic variables.

Table 4.1: Demographic Information of Respondents

S/N	Variables	Attributes	Frequency	Percent (%)
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	Age	21-25 years	20	13.5
		26-30 years	20	13.5
		31-35 years	20	13.5
		36 – 40years	14	9.5
		41 – 45 years	15	10.1
		46 – 50 years	28	18.9
		51 years and above	31	21
		RN	36	24.3
	Academic	RN & RM	30	20.3
2	Qualification	Postbasic	60	40.5
		BNsc	22	14.9
		1 – 5 years	33	22.3
	Years of practice	6 – 10 years	23	15.5
5		11-15 years	19	27.2
		16-20 years	8	5.4
		20 years and above	65	40

The table above showed that high proportion of the respondents were within the 46-50 years (18.9%) and 51 years and above (21%) age range. Significant proportion (40.5%) possessed post-basic qualification in psychiatry, ophthalmic, perioperative, orthopedic, pediatric, and public health nursing and that the highest proportion of the respondents have worked for 21 years and above (40%). This indicates that most of the respondents are approaching their retirement

ANALYSIS OF STUDY OBJECTIVES

Level of Knowledge about the use of mobile technology for knowledge update

Table 4.2: Respondents Level of Knowledge about the use of mobile technology for knowledge update

Level of Knowledge	Frequency	%
Excellent (80-100%)	25	16.9
Good (60-79%)	43	29.1
Average (50-59%)	71	48.0
Poor (40-49%)	8	5.4
Very poor (0-39%)	1	0.6

Table 4.2 above shows that over 90% of the respondents have the level of knowledge on the use of mobile technology for knowledge update as average or better. This indicates that nurses in Edo State are knowledgeable about use of mobile technology for knowledge update.

Level of utilization of mobile technology among nurses

Table 4.3: Level of utilization of mobile technology among nurses

Variables	Frequency	%
A. TECHNOLOGY USED		
Mobile phone	148	100.0
Laptop PC	107	72.3
Internet	79	53.4
PDA	8	5.4
Modem	55	37.2
E-library	4	2.7

Table 4.3 shows that all the respondents indicated that they use mobile phone, followed by 72.3% who said that they use laptop PC. The usage level of laptop PC was highest among the male nurses (78.6%). Among nurses at different age groups, nurses within 21-25 years (68.7%)

demonstrated high level of laptop PC usage. Results also revealed that usage level of laptop PC was highest among nurses with higher qualification especially among those with BSc/B.N.Sc. (83.4%).

Driving Force For The Use Of Mobile Technology

Table 4.4: Driving Force for The Use Of Mobile Technology

Variables	Frequency	%
Professional knowledge update	55	37.2
General knowledge update	53	35.8
Communication	39	26.4
Storage of information	27	18.2
Nursing skills improvement	30	20.3
Game/Leisure	1	0.7
Income generation	3	2.1
Improvement on job performance	9	6.1
Patient/client care	2	1.4
Office administration	2	1.4

Table 4.4 above shows that high proportion of nurses (37.2%) stated that professional knowledge update was their main driving force for the use of mobile technology, followed by 35.8% of the respondents who indicated that general knowledge update was the main driving force for the use of mobile technology. Significant proportion of the respondents (26.4%) indicated that communication is their main driving force for the use of mobile technology.

Factors influencing the use of mobile technology among nurses

Table 4.5: Factors influencing the use of mobile technology among nurses

Factors restricting respondents	Never		Rarely		Sometimes		Very often		Always	
	%	Freq	Freq	%	Freq	%	Freq	%	Freq	%
Lack of appropriate Mobile tech.	28	18.9	31	20.9	46	31.1	13	8.8	30	20.3
Time to log on is too long	32	21.6	30	20.3	57	38.5	23	15.5	6	4.1
Unreliable connection to Network	32	21.6	24	16.2	47	31.8	20	13.5	25	16.9
Response time of the mobile tech.	46	31.1	42	28.4	40	27.0	14	9.5	6	4.1
Discouragement by others	69	46.6	45	30.4	20	13.5	12	8.1	2	1.4
Too many other work demands	22	15.1	18	12.3	63	43.2	35	24.0	8	5.5
My age	119	80.4	17	11.5	8	5.4	2	1.4	2	1.4
Lack of employers support	55	37.2	36	24.3	25	16.9	8	5.4	24	16.2
Lack of money	40	27.0	48	32.4	40	27.0	8	5.4	12	8.1
Lack of interest	110	75.3	26	17.8	8	5.5	0	0.0	2	1.4
Concern about my health	62	43.1	51	35.4	27	18.8	2	1.4	2	1.4
Erratic power supply	40	27.0	48	32.4	40	27.0	8	5.4	12	8.1

Table 4.5 presents the data results of the factors militating against effective use of mobile technology by the nurses. Significant proportion of respondents (31.1%) stated that lack of appropriate mobile technology sometimes restricts their use of mobile technology. Considerable proportion of the respondents (38.5%) opined that too long logging time sometimes restrict their

use of mobile technology. Considerable proportion of the respondents in Edo state (31.8%) stated that un reliable connection to the network sometimes restrict their use of mobile technology.

4.3 Test of Hypothesis

The researcher used analysis of Chi-square statistics to test the stated hypothesis at a significance level of 0.05. The decision rule was based on the p-value that is associated with the chi-square test. Thus, if the p-value is less than 0.05 (significance level), reject the null hypothesis (H_0) but if the p-value is greater than 0.05, accept H_0 .

The following hypothesis was tested using Chi-square statistics:

H_0 : There is no significant association between the knowledge of Mobile Technology among nurses and their age.

H_1 : There is a significant association between the knowledge of Mobile Technology among nurses and their age.

Table 4.6: Below contain the chi-square test used for the hypothesis testing:

		Level of Knowledge		Chi-square value (χ^2)	p-value
		High	Low		
1	Age				
	Less than 25 years	15	5	58.391	0.151
	25 years and above	108	20		

Result: $X^2(16) = 58.391$, $p = 0.151$. The chi-square test carried out in table 4.5 above showed that the p-value for the test is 0.151 which is more than 0.05; hence we reject the null hypothesis. The researcher thus concludes by stating the alternate hypothesis that there is a relationship between the level of knowledge of mobile knowledge and their age.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

This chapter provides the discussion of findings, implications for nursing, summary, conclusion, recommendation, and suggestion for further studies.

5.1 Discussion of findings

Objective One: Level of knowledge about the use of mobile technology for knowledge update among nurses.

Study findings in respect to objective one revealed that majority (90%) of the respondents have average level of knowledge on the use of mobile technology for knowledge update. The results of this study revealed high adoption of mobile technology particularly mobile phone and laptop PC. These findings were in agreement with the findings of similar studies among health personnel in Nigeria. Idowu (2021) reported that while ICT capabilities (personal computers, mobile phones and internet) were available in Nigerian hospitals, mobile phone were spreading fastest. As in this study also, various studies in developed countries demonstrated high adoption of mobile technology among nurses (Newbolt, 2021; Mucano, 2020; Jefe, 2021). However, earlier studies by Adeyemi and Ayegboyin (2021) have presented a contrasting results. In their surveys involving four general hospitals, 10 primary healthcare centres and 6 private hospitals in Nigeria, only 5% of the health workers possessed personal computers and just 65% had access to mobile phones but not necessarily their own.

Objective Two: Level of utilization of mobile technology for knowledge update among nurses

Study findings in respect to objective two revealed that the least used technology was PDA with very few number of the respondents who use the technology. This low adoption of PDA among nurses might be as result of the high cost of the technology. Nurses in Nigeria received meagre amount of money as salary, so affording a technology like PDA would be extremely difficult. The use of mobile technology across the different qualifications showed that nurse- respondents across the different qualifications level use mobile phone equally. The average usage level of laptop PC was higher among nurses with BNSc/BSc. This might be because of the encouragement at undergraduate level to make use of mobile technology such as laptop especially during presentations. Statistical analysis also showed that nurses' highest qualification in nursing had a significant relationship with their level of confidence in the use of mobile technology. The use of modem and PDA also followed a similar trend. Majority of the nurse-respondents used mobile phone for general communication and professional knowledge update. More than half of the respondents used laptop PC for general knowledge update and about half of the respondents also used it for professional knowledge update. Findings from this study are in contrast with findings from Rosenthal's work (2021). Rosenthal's findings showed that nurses used mobile technology for healthcare services as diagnostic tools, clinical guidelines, lab values etc. Similarly, Cahoon (2021) reported that nurses used mobile technologies mostly for clinical services. Lack of practical application of mobile technology in this study might be related to poor knowledge of the nurses on the clinical applications of these technologies. However, findings from this study are in agreement with results of Davenport's study. Davenport (2021) reported

that nurses identified 68 uses of mobile technology which include access to current information and improved team communication.

Objective Three: Factors influencing the use of mobile technology for knowledge update among nurses

With respect to the factors influencing the use of mobile technology among the nurse-respondents, various factors were identified as influencing their use of mobile technology. Professional knowledge update was the main driving force for the use of mobile technology followed by general knowledge update. Most of the nurse-respondents used mobile technology for knowledge update because their work require continues knowledge update. This study has demonstrated that the most important factors encouraging the use of mobile technology by the nurse respondents are knowledge update. Nursing is a knowledge intensive profession, therefore nurses considered it important to make use of mobile technology to update their knowledge continuously. On the factors restricting respondents from the use of mobile technology, significant numbers of nurse-respondents were restricted by lack of appropriate mobile technology, too long logging time, unreliable connection to the network, and too many work demands. Some of the identified restricting factors in this study has shown credence to the study conducted by Olatokun & Adeboyejo (2021). However, their study reported that erratic power supply is a major constraint to the effective use of the technology. Nigerians including nurses have adjusted themselves to counteract the effects of poor power supply. Many now have standby generators in their homes and places of work. This might be the reason why erratic power supply is not a major factor restricting nurse-respondents in this study.

Analysis of the hypothesized relationship using Chi-square statistics revealed that there is a significant relationship between the level of knowledge of the use of mobile technology for knowledge update among nurses and their age.

5.2 Summary

This study assessed Utilization of mobile technology for knowledge update among nurses in selected secondary health facilities in Benin Metropolis. A descriptive survey design was adopted in this study and the study's population comprised of 148 nurses across two secondary health facilities (Central hospital and Edo Specialist hospital) in Benin Metropolis. The sampling technique used was convenience technique. A self-structured questionnaire was used to get data from the respondents which was validated by the researcher's supervisor and yielded a reliability score of 0.81 during the pilot study. Descriptive statistics such as frequencies, percentage and means were used to analyze the data obtained while Chi-square statistics was used to test the stated hypotheses of the study. The major findings in this study are:

- There is average level of knowledge of the use of mobile technology for knowledge update among nurses in selected secondary health facilities.
- There is a low level of utilization of mobile technology for knowledge update among nurses in selected secondary health facilities.
- Factors such as lack of appropriate mobile technology, too long logging time, unreliable connection to the network, and too many work demands influence the use of mobile technology for knowledge update among nurses in selected secondary health facilities in Benin Metropolis.

5.3 Implications for Nursing

This study therefore has implications for nurses generally due to the influential role they play in the whole process of healthcare delivery. This will serve as an important indicator in various aspects in nurses' performance, attention and efforts to promote nurses' compliance with universal standard precaution as the largest group of health team. Therefore, to enhance the quality of services provided in health care system, results of this study have implications for nursing since it can increase nurses' knowledge on the use of mobile technology for knowledge update as regards the need for effective and efficient care delivery to patients. Interventions can then be designed to improve the quality of nursing services by offering basic information such as the ones provided in this study.

5.4 Conclusion

Distance learning, as a technology-mediated strategy, can play a vital role of bridging the educational gap that exists between the disadvantaged nurses working in hard to reach settings and their counterparts in urban settings. With high adoption of mobile phone and laptop PCs as demonstrated in this study, distance learning program in nursing can be promoted through the adoption of these technologies in nursing education.

5.5 Recommendations

The nursing and midwifery council of Nigeria should adopt the use of mobile technology in its MCPDP for nurses i.e. the program should be taken online in order to encourage nurses to make use of mobile technology for their professional knowledge update. In liaison with the mobile networks in the country, the Nursing and Midwifery Council of Nigeria should be updating nurses with current findings of research studies conducted in nursing. This can be achieved

through text messages or e-mail messages to all the nurses in the country. Therefore, the council should collect the mobile phone numbers and e-mail addresses of all the nurses in the country. The National Association of Nigerian Nurses and Midwives (NANNM) should produce and disseminate range of resource demonstrating ways that mobile technology can be used for the purpose of nursing care. This will facilitate the adoption of mobile technology by nurses for client's/patients care. The NANNM should also source for research grants for nurse researchers to investigate the impact of mobile technology on nursing care. This will give guide to areas that need adjustment with regard to use of mobile technology in nursing care.

5.6 Suggestion for Further Studies

It would be worthwhile to replicate this study using a larger sample including nurses from other hospitals in other state, particularly rural areas where there is limited availability of health institutions. This will broaden the overall understanding of the phenomena.

5.7 Limitation of the Study

The study was conducted in just few secondary health facilities in Benin metropolis and this is due to funds to finance the research,

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APPENDICES

APPENDIX I: INFORMED CONSENT FORM

TITLE OF STUDY: Utilization of Mobile Technology for Knowledge Update among Nurses in Primary and Secondary healthcare settings in Benin metropolis

INSTITUTION: Department of Nursing Science Faculty of Basic Medical Sciences, College of Medicine, University of Benin.

PRINCIPAL INVESTIGATOR:

PARTICIPATION: Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue your participation at any time without penalty or loss of benefits. The principal investigator may decide to withdraw you from the study if we are unable to obtain the necessary information.

INTRODUCTION: I'm interested in determining the utilization of mobile technology for knowledge update among nurses in primary and secondary healthcare settings in Benin metropolis

PROCEDURES TO BE FOLLOWED:

QUESTIONNAIRE: if you agree to participate, I will ask you questions about your age, marital status, sex, rank, years of experience, area of nursing specialty, academic qualifications, type of health facility and religion.

COMPENSATION: There is no compensation to volunteers for their participation.

DURATION OF PARTICIPATION: This study only requires the questionnaire. There is no follow-up or further information needed.

WHO CAN PARTICIPATE IN THIS STUDY: All men and women age 21 years old and above residing in Benin metropolis are eligible to participate, provided they agree to be part of the study.

ASSURANCE OF CONFIDENTIALITY OF VOLUNTEER'S IDENTIFY: Records relating to your participation in the study will remain confidential. Your name will not be used in any report resulting this study. All questionnaires, computerized records, and analyses of data will contain only a unique study number, not your name.

PERSONS AND PLACES FOR ANSWERS REGARDING YOUR RIGHTS AS A RESEARCH SUBJECT: If during the course of this study, you have questions concerning the nature of the research or you believe you have sustained a research – related injury, you should contact.

CONTACT INFORMATION

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ETHICS CONTACT

Director, Planning Research and Statistic

Ministry of Health.

Edo State.

IF THERE IS ANY PORTION OF THIS CONSENT AGREEMENT THAT YOU DO NOT UNDERSTAND, ASK THE FIELD WORKER OR INVESTIGATOR BEFORE SIGNING.

Please, sign below if you have agreed to participate in the study.

CERTIFICATION OF CONSENT

I, _____ (Name) having full capacity to consent for myself and having attained my _____ birthday, do thereby to my participation in the research study:

The methods and means by which the study will be conducted and the risks which may be reasonably expected have explained to me by _____. I have been given the opportunity to ask question concerning this investigational study, and any such questions have been answered to my full and complete satisfaction.

I understand that I may at any time during the course of this study revoke this consent and withdraw myself from the study without prejudice.

Subject’s Signature: _____ Date: _____

Permanent Address: _____

Witness’s Signature: _____ Date: _____

Study Number: _____

APPENDIX II: QUESTIONNAIRE

**DEPARTMENT OF NURSING SCIENCE
SCHOOL OF BASIC MEDICAL SCIENCES
UNIVERSITY OF BENIN
BENIN CITY.**

Dear Respondents,

I am a student of the above-named institution carrying out a research study on **UTILIZATION OF MOBILE TECHNOLOGY FOR KNOWLEDGE UPDATE AMONG NURSES IN PRIMARY AND SECONDARY HEALTHCARE SETTINGS IN BENIN METROPOLIS**. Please kindly assist me by ticking your choices or answers and suggest where necessary in the spaces provided at the end of the questions.

This study is strictly for academic purpose, and you are hereby assured that all information supplied will be treated with the utmost confidentiality.

Thank you for your cooperation.

Yours faithfully,

Researcher

Section A – Demographic characteristics

Please tick appropriate box provided to indicate your responses.

1. Gender: (a)Male[] (b) Female[]
2. Age: (a)21-25 years[], (b)26- 30 years[], (c) 31-35 years[], (d) 36-40 years[], (e) 41-45years [], (f) 46-50 years[], (g) 51 years and above
3. Rank: (a)NOII-NOI[], (b) SNO-PNO[], (c) ACNO-CNO[], (d) ADNS and above[]
4. Years of experience: (a)1-5 years[], (b) 6-10years[], (c) 11-15years[], (d) 16- 20 years[], (e) 20 years and above
5. Religion: (a)Christian[], (b) Muslim[], (c) traditionalist[], (d) others[]
6. Marital status: (a) Single[], (b) married[], (c) divorced[], (d) single parent[]
7. Area of nursing specialty: (a)Registered Nurse[], (b) Public Health Nurse[], (c) Midwifery[], (d) others[]
8. Academic qualification (a) RN [] (b) RN\RM [] (c) PostBasic [] (d) BNsc. []
9. Type of Health facility (a) Primary health care facility [] (b) Secondary health care facility []

SECTION B: LEVEL OF KNOWLEDGE ABOUT THE USE. OF MOBILE TECHNOLOGY FOR KNOWLEDGE UPDATE AMONG NURSES

10. Mobile technology is the technology used for _____. (a) Cellular transmutation [] (b) cellular communication [] (c) cellular technology [] (d) None of the above [] (e) All of the above []
11. A global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols is called _____. (a) Mobile Technology [] (b) ICT [] (c) Internet [] (d) None of the above
12. Which of the following is the fastest mobile technology for knowledge update? (a) 2G [] (b) 3G [] (c) 4G [] (d) 5G [] (e) None of the above, they operate same speed []
13. Which of the following is(are) considered as the type(s) of mobile devices? (a) [] Tablet (b) Smart-phone [] (b) Pager [] (d) E-book [] (e) Desktop PC [] (f) PDA []
14. What is (are) the benefit(s) of mobile technology? (a) Convenience [] (b) Efficiency [] (c) Accessibility [] (d) Good security []
15. Mobile technology is used for communicating over ____ distances _____. (a) short/wired [] (b) short/wireless [] (c) long/wired [] (d) long/wireless []
16. Which of the following are not used in mobile communication? (a) Wires [] (b) Cables [] (c) Wired antenna [] (d) All of the above [] (e) None of the above []
17. Mobile communication technology is built with _____. (a) Protocol [] (b) Speed [] (b) Services [] (c) None of the above [] (d) All of the above []
18. The process of copying (data) from one computer system to another, typically over the internet is called _____. (a) Firewall [] (b) Download [] (c) Bluetooth transfer [] (d) Internet copying [] (e) None of the above

SECTION C: LEVEL OF UTILIZATION OF MOBILE TECHNOLOGY FOR KNOWLEDGE UPDATE AMONG NURSES

19. Do you use Mobile Technology for Knowledge Update? (a) Yes [] (b) No []
20. If yes which of these do you use? (Tick as many as possible) (a) Technology Used [] (b) Mobile Phone [] (c) Laptop PC [] (d) PDA [] (d) Modem/mi-fi (e) [] E-library (f) [] Others []
21. How often do you use mobile technology for the following?

	Never	Sometimes	Often	Always
Professional knowledge update				
General knowledge update				
Communication				
Storage of information				
Improvement on job performance				
Game/Leisure				
Office administration				
Patient/client care				
Nursing skills improvement				
Income generation				

SECTION D: FACTORS INFLUENCING THE USE OF MOBILE TECHNOLOGY AMONG NURSES

For this section, kindly provide your level of agreement to the factors that influence the use of mobile technology among nurses

Never, Rarely, Sometimes, Very Often and Always

	Never	Rarely	Sometimes	Very Often	Always
Lack of appropriate Mobile technology					
Time to log on is too long					
Unreliable connection to Network					
Response time of the mobile technology					
Discouragement by other nurses and health workers					
My age					
Lack of employer's support for mobile technology					
Lack of Interest					
My age					
Concern about my health					
Erratic power supply					
Lack of money					
Too many other work demands					

APPENDIX III: RELIABILITY

CRONBACH ALPHA RESULT

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.810	.794	18

Cronbach's Alpha = 0.810