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Editors:



CONTENTS

VOL.2 NO.1 (AUGUST, 2024)

Knowledge, Accessibility and use of ICT among Students and Tutors of School of Post Basic Nursing Studies, University of Port-harcourt Teaching Hospital by **Dr. (Mrs) Gift, Cornelius Timighe**

PAGE 1

Knowledge and Practice of Cardiopulmonary Resuscitation Among Nurses in the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers State, Nigeria by **Dr. (Mrs) Gift, Cornelius Timighe and Miss Amagboruju Victoria.**

PAGE 17

KNOWLEDGE, ACCESSIBILITY AND USE OF ICT AMONG STUDENTS AND TUTORS OF SCHOOL OF POST BASIC NURSING STUDIES, UNIVERSITY OF PORT-HARCOURT TEACHING HOSPITAL

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Abstract

People over time, have devised various techniques for communicating their thoughts, needs and desires to others in every aspect of life. The emergence of ICT has affected all aspects of human life, including education at all levels. ICT knowledge, accessibility and use are linked with higher efficiency and higher productivity. Post Basic Nursing Students and their tutors occupy a central position in both educational and health care systems of any country. This study was carried out to investigate the knowledge, accessibility and use of ICT among students and tutors in Post Basic Nursing Students and their tutors. Method: A descriptive survey design was used. All 60 students in Post Basic Nursing Students and their tutors comprised the subjects for the study. A researcher developed questionnaire was the instrument for data collection. Results: Data were analyzed using percentage, table, columns and pie chart. 50(76.9%) have received any form of training on ICT while 15(23.1%) have not received any training. Students are very confident with Microsoft word 35(53.8%), confident with customizing desktop environment 35(53.8%) and non with windows installation 52(80%). 14(21.5%) respondents have access to computer, 10(15.4%) have access to E-mail, 28(43.1%) have access to internet, 13(20%) have access to data projector while none has access to electronic board and others. no respondent says that high cost of ICT affects access to ICT, 3(4.6%) said irregular power supply affects access to ICT, none said security challenge affects access to ICT, 22(33.8%) said long distance affects access to ICT, none said internet is a factor that affect ICT, 25(38.5%) said time factor affects access to ICT, while 23.1(15%) said computer illiteracy is a factors affecting access to ICT. 23(35.3 %) respondents' type with their computer, non-carry out data processing, 3(4%) carryout academic presentation, none carry out designing, 8(12.3%) assess academic information with their ICT, 5(7.8%) assess news, 16(24.6%) carry out researches, while 10(15.4%) carry out computing and calculation with their ICT gadgets. 12(18.5%) respondents lack expertise with ICT, 18(27.7%) lack of confidence in using ICT, 20(30.8%) insufficient knowledge of software, 10(15.4%) high cost of computer while 5(7.7%) respondents think irregular power supply is constraint to ICT. Conclusion: Based on the findings of this study, the following conclusions were made: Most students and tutors have knowledge of ICT; Majority of students and teachers encounter challenges in accessing ICT especially lack of expertise and high cost of ICT; ICT materials are not adequately utilized in the core teaching-learning in the post basic schools Recommendation: · In order to ensure better exploitation of ICT, the management of the School of Post Basic should invest in acquisition of ICT, both hardware and software in sufficient numbers to cover the ICT needs of both students and tutors. Investment in maintenance is also required. * The School of Post Basic Nursing administration should ensure that she sets up a monitoring team competent in ICT, to ensure ICT use during teaching and learning in the institution. * Both students and teachers need on-going ICT related training which will assist in significantly developing their ICT skills, improve access to needed information and enhance efficiency in their occupation (student or teachers). * Finally, the government, the hospital administration and stakeholders should provide adequate and current ICT equipment, services and related materials in the education industry with a view toward increasing availability and access to ICT in particular and improving teaching and learning in general in the school.

Key words: Information Communication Technology (ICT), knowledge, Accessibility, use, and students.

Introduction

Background of Study: Information and communications technology or technologies (ICT) is an umbrella term that includes any communication device or application, encompassing; radio, television, cellular phones, computer and network hardware and software, projectors, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries (Margaret, 2016). People over time have devised various techniques

for communicating their thoughts, needs and desires to others. In early civilized times, people achieved adequate communication through speech and written messages. Communication in teaching and learning situation were mainly done using a teacher-centered education system in the past few years (Adeyinka, Adedeji, Majekodunmi, Adika & Adeyinka, 2011) when the conventional way of teaching was the order of the day. The teacher was seen as the sole source of knowledge and the students were "mere recipients" of his/her information. Chalk and talk methods were used in delivering lectures to students and pupils in schools.

According to Education Scotland, (2016), we are living in a constantly evolving digital World. ICT has an impact on nearly every aspect of our lives - from working to socializing, learning to playing. The digital age has transformed the way young people communicate, network, seek help, access information and learn. As technology becomes more and more embedded in our culture, we must provide our learners with relevant and contemporary experience that allow them to successfully engage with technology and prepare them for life even after school. It is widely recognized that learners are motivated and purposefully engaged in the learning process when concepts and skills are underpinned with technology and sound pedagogy. Information and communications technologies education is basically our society's efforts to teach its current and emerging citizens valuable knowledge and skills around computing and communications devices, software that operates them, applications that run on them and systems that are built with them.

The knowledge, access and use of ICT are becoming integral part of education in many parts of the globe. To Danner (2013) education is the first and best key area for ICT application. Use of different ICT has become inevitable for students in learning. By using modern ICT, students and teachers can retrieve required information within a short time. Use of ICT has the potential to become cost-effective as it offers greater flexibility regarding time and location of teaching and learning. ICT also provides greater flexibility to adapt teaching and learning to meet the learners' cognitive and learning styles. ICT offers the learners the opportunity to work at their own pace. Betts (2011) affirmed that ICT can enhance the quality of learning where its use is tailored to lesson objectives and the needs of the learners. The use of ICT in teaching is a relevant and functional way of providing education to learners that will assist in imbuing in them the required capacity for the world of work. Very few jobs today do not require the use of skills in technology, collaboration, teamwork and information, all these can be acquired through teaching and learning with technology. ICT fundamentally changes the way we live, learn and work.

On the other hand, there are documented hindrances to using ICT in spite of its numerous benefits to both tutors and students. The factors hindering both tutors' and students' readiness and confidence in using ICT include tutor's lack of expertise with ICT, lack of confidence in using ICT by both tutors and students. Other factors include; insufficient knowledge of appropriate software and insufficient knowledge and skills on how to use ICT equipment, lack of knowledge of how to evaluate the use and the role played by ICT in teaching and learning is also another factor hindering use of ICT by both tutors and students (UNESCO, 2012).

ICT tools used by both teachers and students to include; computers specifically; internet, telephone, digital camera, and overhead projector. Other ICT materials include; compact disc-read only memory (CD-ROM), teleconferencing, audio-cassette tapes and video tapes, interactive television, electronic board, optical fibres, electronic notice board, slides, radio among others.

The knowledge, access and use of ICT during teaching and learning of nursing sciences are unknown. Tutors and nursing students have the obligation to know, access and use various instructional aids including modern ICT tools during their course of teaching and learning. There may be lack of general information, access or misinformation about ICT used by both teachers and students during teaching and learning.

Statement of Problem

Teachers and students live in a rapidly changing technological world. Information and communications technology including hardware and personal digital devices, software, and systems that manage, store, process, create, produce and communicate information, has become an important part of everyday life. The integration of ICT capabilities in teaching, learning and assessment can lead to enhanced outcomes for both teachers and students and support the interactive process of teaching, learning and assessment in schools. This will also develop the knowledge, skill, understanding, attitudes and behaviors to assist students to live and work successfully in this 21st Century. Integration of ICT can support a range of teaching, learning and assessment approaches that:

- Enhance learning opportunities through access to a range of resources, stimulus materials and learning tools.
- Provide increased opportunities for student engagement and motivation.
- Make ICT easily accessible.
- Equip students with the necessary knowledge and skills to use ICT to support 21st century learning.
- Support the development of effective student research and evaluation skills.
- Promote critical and creative thinking skills
- Increase teacher and student efficiency
- Develop awareness of the public nature of online activity and related responsibilities.
- Increase opportunities to work collaboratively, locally nationally and globally.

Students and teachers have the opportunity to become competent, discriminating and creative users of ICT as they learn to use ICT effectively and appropriately when investigating, creating and communicating ideas and information. Students and teachers will learn about the ethics of nursing and teaching through technology. Irrespective of all the above perceived gains of using ICT in teaching and learning, many studies have demonstrated very low usage of ICT in institutions of learning where such is being used at all especially in some developing countries. In school of post basic Nursing, Port Harcourt, it was observed by the researcher during her primary clinical posting of the West African Postgraduate College of Nurses and Midwives, and Advanced Nurse Practitioner (MSc) in Nursing internship, that many teachers and students were not making use of ICT in teaching and learning thus hindering their ability to have faster access to recent clinical researches and methods of teaching which in turn is capable of enhancing evidence based practice which is the current clinical acceptable practice. This has prompted the researcher to go into investigation into knowledge and use of ICT in teaching and learning

among teacher and students of School of post basic Nursing in Port Harcourt.

Research Objectives

Main Objective: The aim of this research is to investigate knowledge, accessibility and use of ICT among students and tutors of School of Post Basic Nursing studies of University of Port Harcourt Teaching Hospital.

Specific Objectives

- i. Ascertain students' and tutors' knowledge of ICT in School of post basic Nursing, University of Port Harcourt Teaching Hospital.
- ii. Determine accessibility to ICT among nursing students and tutors of School of post basic Nursing, University of Port Harcourt Teaching Hospital .
- iii. Investigate students' and tutors' use of ICT in School of post basic Nursing, University of Port Harcourt Teaching Hospital.
- iv. To determine the constraining factors to use of ICT as perceived by students and tutors.

Research Questions

- i. What is the knowledge of ICT between students and tutors?
- ii. How accessible is ICT use between students and tutors?
- iii. How often is ICT used between students and tutors?
- iv. What are the constraints associated with ICT use between the students and the tutors?

Significance of the Study

The findings revealed that both tutors and students actually understand what ICT means, whether they have access to ICT and also to what use they put ICT tools. This will help in academic decisions and review of teaching and learning process where necessary. Tutors will utilize the information from the study to plan teaching-learning activities to include softwares, hardwares and programmes to make teaching and learning easier, faster and learner centered. The findings will as well provide data for student's and tutor's individual decision making.

To the profession; especially School of post basic Nursing, the findings will serve as a guide to design appropriate in-service training programmes to update tutor's skills in ICT; to enhance their knowledge and use of ICT in relation to tutoring and learning. To health providers, it will give them insight on the activities of the Department in terms of ICT in the Department and plan programmes according to determined needs. To the society, it educates the on the importance and proper use of ICT. The findings of the present study is hoped to provide base line knowledge in this area and also fill the gap in the literature.

Literature review

Concept of Information Communication Technology (ICT)

Margaret Rouse (2019) defined ICT, or information and communications technology (or technologies), as the

infrastructure and components that enable modern computing. Although there is no single, universal definition of ICT, the term is generally accepted to mean all devices, networking components, applications and systems that combined allow people and organizations (i.e., businesses, nonprofit agencies, governments and criminal enterprises) to interact in the digital world. ICT refers to technologies that provide access to information through [telecommunications](#). Christensson, (2010).

It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication mediums.

In the past few decades, information and communication technologies have provided society with a vast array of new communication capabilities. For example, people can communicate in real-time with others in different countries using technologies such as instant messaging, voice over IP (VoIP), and video-conferencing. Social networking websites like Facebook allow users from all over the world to remain in contact and communicate on a regular basis.

Modern information and communication technologies have created a "global village," in which people can communicate with others across the world as if they were living next door. For this reason, ICT is often studied in the context of how modern communication technologies affect society.

Types of ICT Application in Use in Education

Computer applications: Computer Applications also called computer programs or software that instructs the hardware to perform certain tasks. The most commonly used software programs are word processors, databases, spreadsheet and presentation graphic programs.

- **Word Processing:** The ability to save and manipulate words is probably the most used computer application. The word processing Program has numerous options to permit the user to specify the typeface, spacing and page layout. Documents can be automatically checked for spelling and grammar. Documents can also be individualized by merging them with name and address lists and can include pictures, tables and charts and graphical designs.
- **Databases:** Database programs are also used to manage detailed information. Within a database file are individual records that represent the person, product, or area information. The record contains fields that are characteristics of the record. Database Program has the ability to quickly search extremely large numbers of records and fields for commonalities and then help the user generate detailed and complete report.
- **Spreadsheets:** Electronic spreadsheets are programs that manipulate words and numbers. The data are arranged in cells formatted into columns and rows. The Program can perform many complicated manipulations on the data using formulas and directions that are entered or built into the software. Spreadsheets are used extensively for managing budgets: database programs scheduling, invoicing and research.

- **Communications:** Communication devices require software to guide the computer in connecting to a remote device and knowing what data to send or receive. Communication programmes use one or more standard protocol depending on the form of communication such as file transfer, in order to communicate effectively with the distant site. An important type of communications software is electronic mail (e-mail). E-mail has become a standard method of communication world-wide.
- **Presentation Graphics Programs:** Presentation Graphics Programs are software programs used to create charts, graphs, tables, pictures, videos, audio and other non-text files. Users of this Program can create so-called slide shows for use in teaching and research presentations.

Application Of ICT To Teaching And Learning Process

The field of education has been affected by ICT, which has undoubtedly affected teaching, learning and research. ICT has the potential to accelerate, enrich, and deepen teaching and learning skills. ICT equally motivates and engages students to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthen teaching. In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. Conventional teaching has emphasized content. In the past, the conventional process of teaching has revolved around teachers planning and leading students through a series of instructional sequences to achieve a desired learning outcome. Typically, these forms of teaching have revolved around the planned transmission of a body of knowledge followed by some forms of interaction with the content as a means to consolidate the knowledge acquisition. Within the conventional method of teaching; courses are written around textbooks. Teachers teach through lectures and presentations are interspersed with tutorials and learning activities designed to consolidate and rehearse the content.

Conversely, the contemporary settings are now favoring curricula that promote competency and performance. Curricula are starting to emphasize capabilities and are more concerned with how the information will be used rather than with what the information is. Contemporary ICT use in teaching and learning is able to provide strong support for all these requirements. The integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas. To achieve these objectives, teachers need to be involved in collaborative projects and development of intervention, change strategies, which would include teaching partnerships with ICT as a tool.

Syed (2012) stated three conditions which are necessary for teachers to introduce ICT into their classrooms: teachers should believe in the effectiveness of technology, teachers should believe that the use of technology will not cause any disturbances, and finally teachers should believe that they have control over technology. However, research studies show that most

teachers do not make use of the potential of ICT to contribute to the quality of learning environments, although they value this potential quite significantly. Benefits of ICT will be gained when confident teachers are willing to explore new opportunities for changing their classroom practices by using ICT. The use of ICT enhances learning environments but also prepares next generation for future lives and careers. Other benefits of ICT use in teaching and learning include: changed pool of teachers will come with changed responsibilities and skills, teaching will become more facilitative than didactic. Integration of ICT into teaching and learning processes contributes to increase in the interaction and reception of information. Individual and collaborative learning are enhanced in the ICT models. The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. ICTs by their very nature are tools that encourage and support independent learning. Students using ICT for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools.

Benefits of using ICT in education

ICT provides students with tools they need to discover and own knowledge. ICT give students the hooks and templates they need to fasten information to the long-term memory. There are benefits of using ICT. in education as revealed by Blog, (2010):

- **Motivating benefits:** ICT can act as a motivating tool for many students. Young people are very captivated with technology. Educators must capitalize on this interest, excitement, and enthusiasm about the Internet for the purpose of enhancing learning. For already enthusiastic learners, ICT allows the teacher to provide students with additional learning activities not readily available in the classroom.
- **Fast Communication:** ICT promotes fast communication across geographical barriers. Students can join collaborative projects that involve students from different states, countries or continents. This type of learning experience was not possible before the ICT. This is a unique learning experience very essential for each student as the world is becoming one big community.
- **Cooperative Learning:** ICT facilitates cooperative learning, encourages dialogue, and creates a more engaging classroom. For example, an internet Program in one class may allow other students to get involved in class discussions through e-mails in a way not possible within the four walls of the classroom.
- **Locating Research materials:** Apart from communication, research is what takes many people to the Internet. There are many more resources on the Internet than the school library can provide.
- **Acquiring Varied Writing Skills:** If students are required to publish their work on the Internet, they have to develop hypertext skills. These skills help students gain experience in non-sequential writings. Moreover, and since the Internet is open to all with access, students publishing their work on the Internet are forced to be mindful of their language and to write to non-expert audience.

Disadvantages Of Using ICT In Education

The use of the ICT for education is not without problems. Therefore, one should expect the problems to be encountered in using the ICT in teaching in education to be evolving as well. There are some disadvantages of using ICT in education according to Blog, (2010):

- **Plagiarism:** Apart from Web sites that claim to help students write term papers, there are numerous cases of students downloading information from the Net and turning them in for grades. Students' privacy may be compromised: Criminals, marketers, and other persons can easily get information from students when they are online. These could pose danger to students' lives or may even lead to litigation against the school.
- **Low Income Groups:** According to the US Department of Education, over 50% of public schools with a high minority enrollment had a lower rate of Internet access than public schools with a low minority enrollment in 1997. The same was true of instructional rooms in those schools. In addition, students from low-income families may not have computers at home or may have computers at home with no access to the Internet. Consequently, students in low-income communities may be disadvantaged. To reduce the effect that social or economic status may have, we should give Internet assignments that students can easily complete while in school. If necessary, schools may need to keep computer labs open for longer and/or odd hours. The use of computers at public libraries should also be encouraged.
- **Long preparation Time:** It takes a lot of preparation time to effectively use the internet for education. In addition to designing Internet based lesson plans, one may have to surf the Internet to download lesson plans and adapt them to support the curriculum objectives or visit sites to select those appropriate for classes. Preparing lesson notes in order to help students become responsible users of the Internet may take a long time to achieve.

Problems Militating Against Effective Use Of ICT In Education

There are certain factors which hinder nursing training institutions in Nigeria in providing quality ICTs knowledge and skills for nursing education as well as their use by both teachers and students. Some of these include lack of technically experienced lecturers, limited ICTs facilities and infrastructure, inadequate course content for ICTs trainings, lack of clear directions in the Nigeria National policy for Information Technology (NNDIT) on nursing education, lack of leadership by professional organizations, and problem of electricity. These factors are:

- **Inconsistent Electric Power Supply:** Nigeria as a country that finds it difficult to provide uninterrupted power supply (UPS) to its citizens which will definitely be a problem with deployment of good ICT services. It's observed also that a lot of damages have been caused to both research institutes and computer laboratory equipment as computer components such as hard disks and mother board can be destroyed by interrupted and unreliable power supply. ICT equipment was made

to function with other infrastructure such as electricity. Most internet facilities in Nigeria suffer frequent downtime due to power interruption and equipment damages due to incessant power interruption.

- **Limited Technology Infrastructure:** (Especially internet access, bandwidth, hardware and software provision). The attitudes of various managements in and outside institutions towards the development of ICT related facilities such as the internet and procurement of computers is rather slow in some instances, and in others there are no aids or support by the government at all.
- **High Cost of ICT Tools:** The price of computer hardware and software; which are major ICT tools in Nigeria is very high compared with the income of an average Nigerian. The high cost of these materials prohibits for most people, and even government establishment to buy.
- **Lack of qualified ICT Personnel:** Most institutions lack computer literate teachers and ICT experts that would support and manage the internet connectivity and or for application of computing in the teaching learning process.
- **Non-Inclusion of ICT Programs in Teacher's education:** Non-Inclusion of ICT Program in Teacher's Training curricula and or at the basic levels of education. There seems to be no clear and definite policy and or curriculum for all levels of the Nigerian education system.
- **Lack of Maintenance Culture:** Lack of maintenance culture is another factor that is able to pose hindrances to effective ICT use in Nigeria higher institutions. Idowu et al (2011) notes that government agencies in Nigeria have no financial plans for maintenance of ICT equipment and allowances for depreciation in value for such ICT materials.
- **Lack of time to experiment ICT:** Lack of time is a factor that may hinder ICT use in education as noted in (Mojgan, Kamariah, Wong, Bahaman & Foo, 2011). The authors revealed that barrier to time to experiment manifest in two ways: (a) released time and (b) scheduled time. Lack of released time due to regularly scheduled classes for teachers may prevent teachers from using ICT in their classes as well as prepare materials for use with their classes. Lack of time scheduled on the time table to use ICT with student may pose a barrier to using ICT in classes.

Theoretical Framework

The Novice to Expert Theory a Nursing theory by Patricia Benner (1982)

The Novice to Expert Theory, a construct theory first proposed by Hubert and Stuart Dreyfus (1980) as the Dreyfus Model of Skill Acquisition, and later applied and modified to nursing by Patricia Benner (1984) provides a very useful and important theory that clearly applies to nursing informatics. The Dreyfus brothers developed the model while working with scholars interested in comparing artificial intelligence development and expert computer system programming to the human



Fig 1. The Novice to Expert Theory a Nursing theory by Patricia Benner (1982) will be applied in this research.

mind and the development of expertise. Within the field of nursing informatics, this theory can be applied to:

The development of nursing informatics skills, competencies, knowledge and expertise in nursing informatics specialists; The development of technological system competencies in practicing nurses working in an institution; The education of nursing students, from first year to graduation and; The transition from graduate nurse to expert nurse.

The currently accepted five levels of development within the Novice to Expert theoretical model are illustrated in the image above, as presented by Benner (1984). They start from the bottom rung at the Novice level and move upward through Advanced Beginner, Competent, Proficient, and Expert levels. Dreyfus and Dreyfus (1980) initially proposed the stages of: Novice, Competent, Proficient, Expertise and Mastery. In both configurations, each level builds on the level before it as the learner advances from a neophyte level then gains knowledge, skills, perceptions, intuition, wisdom and most important of all, experience in their given field of practice.

Distinguishing Traits

Both Dreyfus and Dreyfus and Benner estimated that it takes approximately five years to move through the five stages from novice to expert but also elaborated that not all novices become experts. Some people get 'stuck' at the competent or proficient stages. Two personal characteristics that distinguish the successful evolution to the expert level seem to be: Deliberate practice; The willingness to take risks, to go beyond the norm.

- Deliberate practice** - This is a trait shown by people who use a personal, goal-oriented approach to skill and knowledge development - they devote themselves to engage in progressively higher, and ultimately expert performance. This requires years of sustained effort to continually improve the quality of their practice and performance within the skill in this case, in nursing informatics skills. They

feel personal satisfaction in confronting challenges to achieve a high standard of excellence within their field. They are not content to acquire merely functional and rudimentary skill levels - they want to shine, and join the ranks of the experts in the field.

- Taking Risks** - This continuous climb to the expert level is not without perceived 'risks', it requires people to move beyond the status quo of mere competence through the levels of Proficiency, then Expertise. This is a quality often seen in Super Users and Champions within the nursing informatics arena. To move to this level, many different perspectives

must be digested and the zone of comfort can become threatening. Many people do not like to stand out from the rest, so do not risk the possibility of being perceived as different or peculiar - nor do they want to be regarded as thinking that they excel above their peers. Yet, the true expert must take this risk and continue to move up the ladder of skill and knowledge acquisition despite potential conflict within the nursing workplace.

Some common themes are evident as a person successfully progresses through the novice to expert levels: As progression occurs, the person tends to move away from relying on rules and explicit knowledge to learning to trust and follow their intuition and pattern matching. Better cognitive filtering occurs, where problems are no longer a huge confusing collection of data but instead become a complete and unique whole where some bits are much more relevant than others. The person also moves from being a detached observer of a problem to an involved part of the system itself, accepting responsibility for results, not just for carrying out tasks.

Application of the theory

Novice to Expert Levels. Each of the five levels of skill acquisition has distinguishing behaviors and traits (Frisoli, 2010). They include:

- Novice:** A novice does not know anything of the subject he/she is approaching and has to memorize its context-free features. The novice is then given rules for determining an action on the basis of these features. To improve, the novice needs monitoring, either by self-observation or instructional feedback. For example, a nurse learning to use a new hospital information system needs explicit instruction and 'rules' to learn to use the computer interface and manipulate the software.
- Advanced Beginner:** An advanced beginner is still dependent on rules, but as he/she gains more experience with real life situations, he/she begins to notice additional aspects that can be applied to related conditions.

- iii. **Competent:** At this stage, the competent person grasps all the relevant rules and facts of the field and is, for the first time, able to bring his/her own judgment to each case. This is the stage of learning that is often characterized by the term "problem solving." A competent level nurse would be able to use a hospital information system with ease, and know how to problem solve technical difficulties or interpret conflicting data.
- iv. **Proficient:** The fourth stage is called fluency and is characterized by the progress of the learner from the step-by-step analysis and solving of the situation to the holistic perception of the entirety of the situation. The proficient hospital information system learner would know how to interpret data from all departmental information and provide guidance to other disciplinary members as needed.
- v. **Expert:** An expert's repertoire of experienced situations is so vast that normally each specific situation immediately dictates an intuitively appropriate action. After a great deal of experience actually using a system in everyday situations, the expert nurse discovers that without his consciously using any rules, situations simply elicit from him or her appropriate responses. The proficient performer, immersed in the world of his skillful activity, sees what needs to be done, and decides how to do it. The expert not only knows what needs to be achieved, thanks to the well refined ability to exercise situational discrimination, s/he knows how to achieve his or her goal.

Empirical Review

Knowledge level assessment, accessibility and use of ICT among teachers and students are interesting areas that require research work. In developed countries, research on knowledge level, access and use of ICT among teachers and students are quite available.

Solomon, Yigzaw & Desalegn (2013) conducted a cross-sectional study at the College of Medicine and Health Sciences, University of Gondar, Ethiopia. Data regarding socio-demographic characteristics of the students, level of knowledge and utilization of ICT were collected by means of a self-administered questionnaire. Data was analyzed using SPSS version 13. A total of 1096 students responded giving a response rate of 97.8%. The mean age of the study participants was 20.3 (± 1.3) years. Females constitute only 26% of the respondents. The majority (79%) were fulltime students. Only half of the respondents (51%) had ICT knowledge and only 46% students utilized ICT while 47% of the respondents never used electronic communication (e.g. email or chat room) and 39% of the respondents never used Microsoft office (e.g. word W or WordPerfect W). ICT knowledge [AOR = 2.5, 95% CI: 1.7-3.5], family educational background [AOR = 4.36, 95% CI: 2.16-8.80], and perceived quality of training [AOR = 1.9, 95% CI: 1.3-2.8] showed strong and positive associations with ICT utilization. Students from urban areas were more likely to utilize ICT compared with those from rural areas [AOR = 2.7, 95% CI: 2.097, 3.497], and information technology training was found to be positively associated with ICT utilization [AOR = 2.07, 95% CI: 1.18, 3.62].

The result showed that students' knowledge was inadequate and utilization of ICT was poor. Therefore, the university should sustain professional development to improve teaching, to raise student performance and equip the college with student centered ICT computer labs to increase students' ICT utilization.

Umar, et al., (2017) in their study: pattern and utilization of Information and Communication Technology among undergraduate Nursing students in Tanta University, Egypt. A descriptive cross sectional design was used for the study where 504 fourth year students enrolled in the 2015/2016 session participated in the study. A validated structured questionnaire was used for data collection. The data collected were analyzed using Statistical Package for Social Science (SPSS) version 20. The results indicated that 80% of the surveyed students utilized ICT in performing their study assignments and research. Majority of the female students (79.0%) self-reported themselves as good in computer skills while only one fifth (21.0%) of the male students rated themselves as good in computer skills. Students whose parents had secondary education and above had their total score in self-rating of computer operation skills as significantly higher than those whose parents had below secondary education. The study concluded that majority of the students had good ICT utilization with variation to residence and family income. It is therefore recommended that the university should ensure strict compliance with the rules of e-learning courses for the students and ensure proper application by each student.

Khan, Bhatti & Khan, (2011) in a descriptive study in Bahawalpur used 200 students which was the sample for the study to measure students' use of ICT. Questionnaire was the instrument they used for data collection while SPSS software was the statistical measure used. The study revealed that 23(19.5%) were male and 132 (80.5%) respondents were female. The study also revealed that internet use varies according to the different information needs of the users: a vast number of respondents use Google search engine:126 (76.8%), 43 (26.2%) respondents were found Yahoo users, while 5 (3.0%) respondents use MSN, 3 (1.8%) respondents use Alta Vista, 2 (1.2%) respondents Hot Boot, 3 (1.8%) respondents Lycos and 2 (1.2%) respondents use Netscape .80 (48.8%) access ICT at their departmental computer lab, 52 (31.7%) respondents use at their class room,15 (9.1%) respondents use library, 5 respondents (3.0%) avail it at their university hostel, 6 (3.7%) respondents access at net café while 4 (2.4%) respondents use it at their friend's homes.

Adetimirin (2012), in her work on ICT literacy among undergraduates in Nigerian universities reveals that computer, telephone and the Internet were the three ICT mostly used by the undergraduates, although more on an occasional basis. The undergraduates in the state universities xx and Imo State University(BSU and IMSU) were found to have poor ICT literacy skills in the use of the three ICT with over 25%, while those with average ICT literacy skills were in the federal universities (ABU and UNIMAID). Three major factors affecting the ICT literacy of the undergraduates were identified as

irregular power supply, inadequate ICT and limited duration of the use of the ICT.

Adeyinka, Adedeji, Majekodunmi, Adika & Adeyinka, (2011) studied: An Assessment of Secondary School Teachers Use of ICT: Implication for Further Development of ICT Use in Nigeria Secondary Schools. This study employed a descriptive survey method. Their sample consists of 700 teachers of Nigeria Secondary Schools. Questionnaire was used. Their findings include: On the issue of access to ICT in the respondents various schools, the result generally showed that aside of other identified ICT; it's only the Internet and e-mail facilities that respondents did not have access to. The study also showed that ICT technical support and Internet facility are lacking in all the respondents schools, while other facilities like hardware, software, computer consumables and other ICT equipment like digital camera and data projector were adequate and available. Their findings also showed that teacher's expertise and lack of knowledge to evaluate the use and role of ICT in teaching are the two prominent factors hindering teacher's readiness and confidence in using ICT.

Woreta, Kebede & Zegeye (2013) conducted a cross-sectional study at the College of Medicine and Health Sciences, University of Gondar, Ethiopia. Data regarding socio-demographic characteristics of the students, level of knowledge and utilization of ICT were collected by means of a self-administered questionnaire. Data was analyzed using SPSS version 13. A total of 1096 students responded giving a response rate of 97.8%. The mean age of the study participants was 20.3 (± 1.3) years. Females constitute only 26% of the respondents. The majority (79%) were fulltime students. Only half of the respondents (51%) had ICT knowledge and only 46% students utilized ICT while 47% of the respondents never used electronic communication (e.g. email or chat room) and 39% of the respondents never used Microsoft office (e.g. word ® or WordPerfect ®). ICT knowledge [AOR = 2.5, 95% CI: 1.7-3.5], family educational background [AOR = 4.36, 95% CI: 2.16-8.80], and perceived quality of training [AOR = 1.9, 95% CI: 1.3-2.8] showed strong and positive associations with ICT utilization. Students from urban areas were more likely to utilize ICT compared with those from rural areas [AOR = 2.7, 95% CI: 2.097, 3.497], and information technology training was found to be positively associated with ICT utilization [AOR = 2.07, 95% CI: 1.18, 3.62]. The result showed that students' knowledge was inadequate and utilization of ICT was poor. Therefore, the university should sustain professional development to improve teaching, to raise student performance and equip the college with student centered ICT computer labs to increase students' ICT utilization.

Okwudili (2015) carried out a study to investigate the knowledge, accessibility and use of ICT among students and teachers in the Department of Nursing Sciences, University of Nigeria, Enugu Campus. A descriptive cross sectional survey design was used. All the 454 undergraduate students in the Department of Nursing and 23 teachers comprised the subjects for the study. A

researcher-developed questionnaire was the instrument for data collection. Data were subjected to descriptive statistics and analyzed using student's t-test and Chi square. Probability value less than 0.05 was considered statistically significant.

Majority of the students 346 (80.5%) and majority of the teachers 20(90.9%) had knowledge of ICT. Respondents had access to the following ICT: computer; students 314(73.0%), teachers 20 (90.9%), Internet; students 343(79.8%), teachers 22(100%) and e-mail; students 248(57.7%) and teachers 17(77.3%). The Internet activities mostly performed by the students were: browsing 386(89.8%), chatting with friends 274(63.7%) and e-mailing 262(60.9%). The Internet activities mostly performed by teachers were: browsing 22(100%), e-mailing 20(90.9%) and downloading articles 18(81.8%). Google is the most common search engine used by students 393(91.4%) and teachers 20(90.9%). High cost of ICT 281(62.2%) and irregular power supply 258(57.1%) were major factors that affect accessibility to and use of ICT negatively.

There was no significant difference ($p > 0.05$) in the access to ICT types among teachers and students. There was no significant difference ($p > 0.05$) in the constraints associated with ICT use among students and teachers. There was significant difference ($p < 0.05$) in the use of ICT between students and teachers. Findings of this study revealed that there is still need to provide ICT materials and training at subsidized rate in order to encourage use in university education.

Summary of the Reviewed Literature

For several years the educational institutions of many African nations have witnessed poor knowledge, access and use of ICT. Nigeria has set a wide array of ambitious goals of several global and national frame works that seek to promote the fundamental rights of her citizens to quality education. A significant challenge for Nigeria is that, despite all her efforts, Nigeria is one of the only two countries that were at the risk of not meeting the target of EFA because of the quality of teaching and learning in our schools. It has been discovered that ICT promotes learner-centered learning and provides effective and efficient framework for the world of work, study and play. Various ICT types, benefits, activities, and constraints were highlighted. Novice to expert theory by Patricia Benner used to assess the knowledge and competency level was used to explain the theoretical review while various empirical reviews were used to explain practical works done by other researchers as regards; knowledge, access and use of ICT. Constraints encountered by the students and teachers in accessing and using ICT were discussed in line with the literature review.

Research Methodology

This chapter discussed the research methods used for the study under: research design, area of study, population of the study, subject for the study, instrument for data collection, validity of instrument, reliability of instrument, ethical consideration, procedure for data collection and method of data analysis.

Research Design

Descriptive survey design was used for this study to ascertain the students and tutor's information communication technology knowledge, access and use.

Research Setting

The study was carried out in school of Post Basic Nursing, University of Port Harcourt Teaching Hospital, Rivers State. The school of Post Basic Nursing runs both Accident and Emergency and Pediatrics Nursing program. School of Post Basic Nursing, University of Port Harcourt Teaching Hospital, Rivers State is in the South-South geopolitical zone of Nigeria. The hospital is bordered in the East by Alakahia Community, In the West by Emohua Community, in the North by Rumualogu Community and in the South by Aluu community. The hospital is situated in the sub Urban of the city of Port Harcourt, which is a metropolis as well as metropolitan city of Rivers State.

Target Population

The population of this study includes all the students of school of post basic Nursing 2020/2021 section and 5 tutors (lecturers) that were available. According to the School Office (Record, 2021), the Post Basic Nursing students comprised of: 30 from Accident and Emergency program and 30 from Pediatrics. Thus, a total population of 60 post basic Nursing students and their tutors (18). A total of 78 respondents constituted the population of the study.

Sample size and formula determination

A sample size of (65) emergency nurses was used for the study while convenient sampling techniques was used for the study. Therefore, the sample size comprise of 60 student Nurses and 5 tutors that were available at the time of study.

Sampling Technique

A convenience sampling technique which is a non-probability sample technique was used. This technique was used because of an easy way of getting the data from the respondents.

Inclusion Criteria

- Willingness to participate in the study.
- Availability at the time of data collection.
- Students must be students of school of post basic Nursing.
- Tutors must be academic staff of school of post basic Nursing, University of Port Harcourt Teaching Hospital irrespective of cadre, gender and age.

Instrument for Data Collection

Data will be collected using a questionnaire developed by the researcher titled: Students' and Tutors' Information Communication Technology Knowledge, Access and Use (SAT-ICT-KAUS) . The instrument consists of two sections A and B. Section A contains 5 items on the respondents' socio-demographic characteristics. Section B consists of closed ended questions. There was 4 subscales namely: knowledge about ICT, access/ availability to ICT ,use of ICT and factors affecting access and use of ICT. The questions were designed to generate

data to address the research objectives and research questions.

Validity Of Instrument

The face and content validity of the researcher-developed questionnaire was carried out by giving the instrument to the ICT Experts validators in the ICT centre UPTH and BMU respectively. They examined the purpose and research objectives of the study in line with the specific items in the instrument. They made necessary modifications in the instrument which was effective. The final draft was submitted to the ICT validators and was approved, due corrections were made.

Reliability Of The Instrument

The reliability of the instrument was done using the test retest method. 10 questionnaires (10% of sample size) that was administered to nursing student in University of Port Harcourt which were retrieved and after 2weeks; the same questionnaire was administered to the some nursing students. The response was correlated using person movement correction co-efficient.

Method of Data Collection

The data was collected by administering the questionnaire to the respondents in the classroom and online using goggle form. An offline and online questionnaire was created which was easily assessed by all the students and tutors needed for the study. A link was sent to students and tutors who are not within reach to fill the offline questionnaires.

Method of Data Analysis

Data generated for the study was collated, tallied, organized and analyzed descriptively using frequencies and percentages, and results were presented in tables, columns and pie charts.

Ethical Consideration

An acceptance letter was obtained after approval from the Research Ethical Committee of the School of Post Basic Nursing, University of Port Harcourt Teaching Hospital, Rivers State. Both administrative permission and the letter of introduction was obtained from the Head of Department of School of Post Basic Nursing Sciences to collect data from students and tutors.

Data Analysis

This chapter deals with data presentation and analysis of results with respect to the research questions in this study. A total of 65 copies of the questionnaire were distributed among respondents in School of Post Basic Nursing, UPTH and the 65 copies were retrieved successfully.

Personal data of respondents

Table 1: Frequency and percentage showing distribution of respondents by age

Age	Frequency	Percentage (%)
20-30	38	58
31-40	20	31
41 and above	7	11
Total	65	100

Table 1 shows that 38(58%) are within the age range of 20 - 30years, 20(31%) are within the age range of 31 - 40years and 7(11%) are with the age range of 41 and above.

Table 2: Frequency and percentage showing distribution of respondents by gender

Gender	Frequency	Percentage (%)
Female	55	85
Male	10	15
Total	65	100

Table 2 shows that 55 respondents representing 85% are females while 10 respondents representing 15% are males.

Table 3: Frequency and percentage showing distribution of respondents by marital status

Marital status	Frequency	Percentage(%)
Married	53	82
Single	10	15
Widowed	2	3
Divorced	-	-
Total	65	100

Table 3 shows that 53(82%) respondents are married, 10(15%) are single, 2(3%) are widowed while non is divorced.

Table 4: Frequency and percentage showing distribution of respondents by religious inclination.

Religion	Frequency	Percentage(%)
Christianity	64	98.4
Islam	1	1.5
Traditional African religion	-	-
Others	-	-
Total	65	100

Source: Research data

Table 4 shows that 64(98.4%) respondents are Christians, 1(1.5%) is a Muslim while non was either traditionalist or others.

Table 5: Frequency and percentage showing distribution of respondents by program.

Program	Frequency	Percentage(%)
Accident and emergency	30	50
Pediatrics	30	50
Total	60	100

Table 5 shows that 30(50%) are in accident and emergency program while 30(50%) are in pediatrics programme.

Section B: Answering research questions - Knowledge about ICT

Question One: Have you received any form of training on ICT?

Table 6: Frequency and percentage showing forms of ICT training

Have you received any form of training on ICT?	Frequency	Percentage(%)
Yes	50	76.9
No	15	23.1
Total	65	100

Table 6 shows that 50(76.9%) have received any form of training on ICT while 15(23.1%) have not received any training.

Question two: What type of Computer training did you receive?

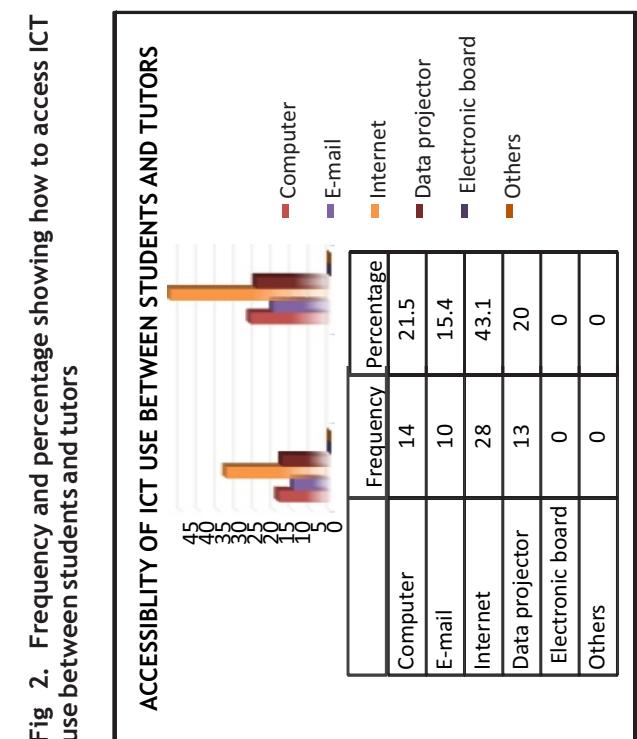
Table 7: Frequency and percentage showing what type of computer training that was received

What type of Computer training did you receive?	Frequency	Percentage(%)
Formal	35	53.8
Non-formal	25	38.5
Non	5	7.7
Total	65	100

Table 7 shows the 35(53.8%) persons have received formal computer training, 25(38.5%) received non-formal while 5(7.7%) received no training on computer use.

See Question Three next page

Question four: How accessible is ICT use between students and tutors?



From figure 2, 14(21.5%) respondents have access to computer, 10(15.4%) have access to E-mail, 28(43.1%) have access to internet, 13(20%) have access to data projector while none has access to electronic board and others.

Question three: indicating knowledge of confidence in using the computer

Table 8: Frequency and percentage showing knowledge of confidence in using computer

Item	Very confident	Quite confident	Confident	Not confident	Total
Customizing Desktop Environment	8 (12.3%)	10 (15.4%)	35 (53.8%)	12 (18.5%)	65 (100%)
Window installation	3 (4.6%)	5 (7.7%)	5 (7.7%)	52 (80%)	65 (100%)
Microsoft word Processing	35 (53.8%)	12 (18.5%)	10 (15.4%)	8 (12.3%)	65 (100%)
Microsoft Excel	5 (7.7%)	8 (12.3%)	2 (3.1%)	50 (76.9%)	65 (100%)
Microsoft Power point	20 (31%)	15 (23%)	15 (23%)	15 (23%)	65 (100%)
Zoom app	58 (89.2%)	5 (7.7%)	2 (3.1%)	-	65 (100%)

Table 8 shows that students are very confident with Microsoft word 35(53.8%), confident with customizing desktop environment 35(53.8%) and non with windows installation 52(80%). Access/availability of ICT

Question five: Where else do you access ICT services?

Fig 3. Frequency and percentage showing where else to access ICT services

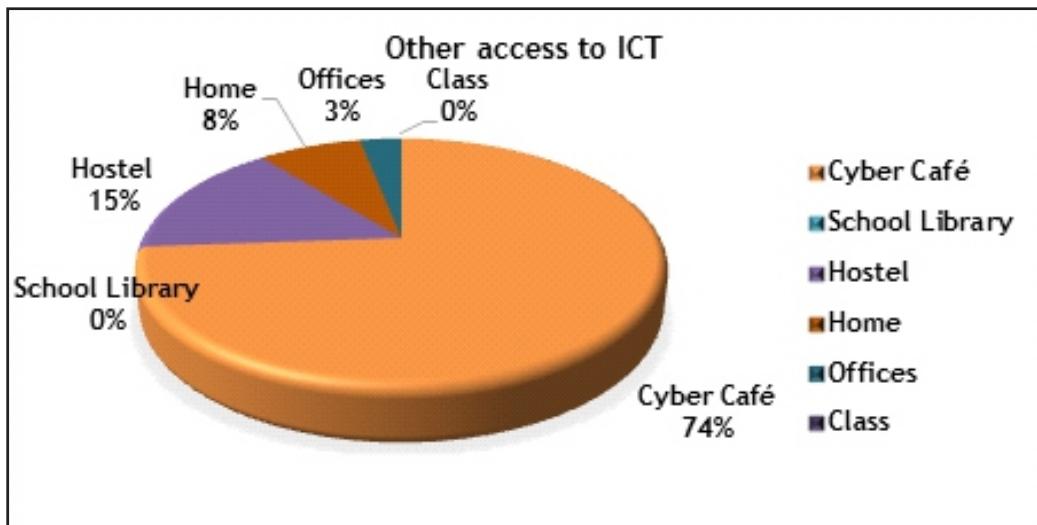


Fig 3. shows that 48(74%) have access to cyber café, none have access to ICT in the school library, 10(15%) have access to ICT in the hostel, 5(8%) have access to ICT at home, 2(3%) have access to ICT at offices while none has access to ICT in class.

Question 6: Are computers available to students in your institutions?

Table 9: Frequency and percentage showing computers available to students in their institution

Are computers available to students in your institutions	Frequency	Percentage(%)
Yes	65	100
No	0	0
Total	65	100

Table 9 shows that 65 (100%) said “yes” computers are available to students in our institution while none said there is no computers.

Research Question Seven: what factors do you think affects access to ICT in your institution?

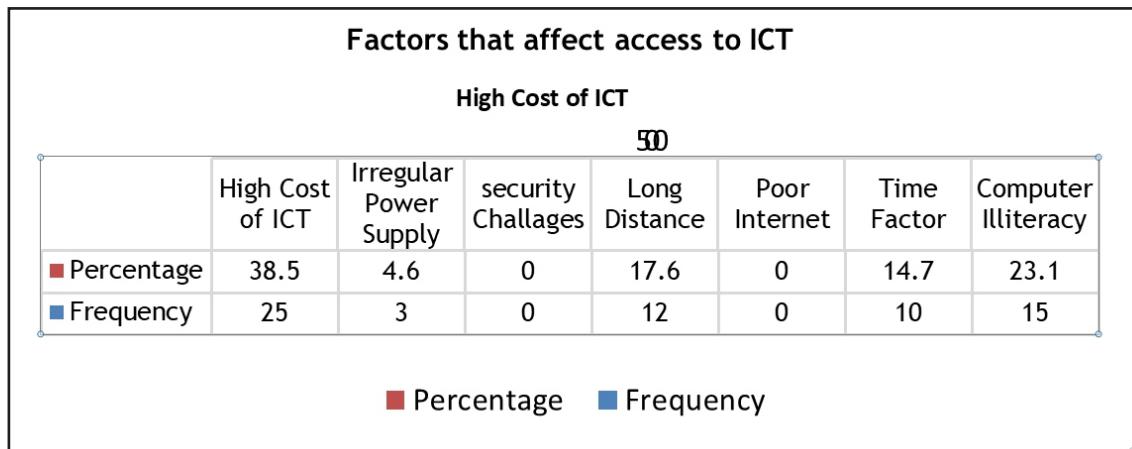
Fig 4. Frequency and percentage showing what factors that affect ICT in their institution

Figure 4. shows that no respondent says that high cost of ICT affects access to ICT, 3(4.6%) said irregular power supply affects access to ICT, none said security challenge affects access to ICT, 22(33.8%) said long distance affects access to ICT, none said internet is a factor that affects ICT, 25(38.5%) said time factor affects access to ICT, while 23.1(15%) said computer illiteracy is a factor affecting access to ICT.

Use of ICT

Research Question Eight: What activity (ies) do you perform with ICT/Computer?

Table 10: Frequency and percentage showing what activities performed with ICT/computer

What activity (ies) do you perform with ICT/Computer?	Frequency	Percentage(%)
Typing	23	35.4
Data Processing	0	0
Academic Presentation	3	4.6
Designing	0	0
Assessing Academic information	8	12.3
News	5	7.8
Research	16	24.6
Computation/Calculation	10	15.4
Total	65	100

Table 10 shows that 23(35.4%) respondents type with their computer, none carry out data processing, 3(4.6%) carry out academic presentation, none carry out designing, 8(12.3%) assess academic information with their ICT, 5(7.8%) assess news, 16(24.6%) carry out researches, while 10(15.4%) carry out computing and calculation with their ICT gadgets.

Question Nine: How often do you use ICT/Computer?

Table 11: Frequency and percentage showing how often ICT/ computer is used

How often do you use ICT/Computer	Frequency	Percentage(%)
Daily	41	63
Several days in a week	10	15.4
Once a week	9	13.8
Rarely	5	7.8
Not at all	0	0
Total	65	100

This table shows that 41(63%) respondents use ICT daily, 10(15.4%) several days in a week, 9(13.8%) once a week, 5(7.8%) rarely while none never used ICT.

Question Ten: What type of Computer software do you often use?

Table 12: Frequency and percentage showing computer software often used

What type of Computer software do you often use?	Frequency	Percentage(%)
Microsoft Word	40	61.5
Microsoft Access	0	0
Microsoft Power point	22	33.8
Microsoft Excel	3	4.6
Corel Draw	0	0
Games/Education software	0	0
Others	0	0
Total	65	100

Table 12 shows that 40(61.5%) uses Microsoftword often, non make use of microword access, 22(33.8%) uses microsoftword powerpoint, 3(4.6%)uses microsoftword excel while non use coral draw,games and education software and others.

Question Eleven: How often do you use computer/ICT for academic purpose?

Table 13: show how often ICT is used for academic purposes

How often do you use computer/ICT for academic purpose?	Frequency	Percentage(%)
Daily	32	49.2
Several days in a week	13	20
Once a week	12	18.4
Several days in a month	5	7.7
Rarely	3	4.6
Never	0	0

Table 13 shows that 32(49.2%)uses ICT for academic purpose daily,13(20%) uses it several days in a week, 12(18.4%) uses it once a week, 5(7.7%) uses it several days a month,3(4.6%) uses it rarely while none never used ICT for academic purpose.

Question Twelve: What is your difficulty level in using a computer?

Table 14: Frequency and percentage showing difficulty level using a computer

What is your difficulty level in using a computer?	Frequency	Percentage(%)
Very easy	38	58.5
Easy	12	18.5
Difficult	10	15.4
Very difficult	5	7.7
Total	65	100

Table 14 shows that 38(58.5%) respondents use ICT very easily, 12(18.5%) use ICT easily,10(15.4%) find it difficult to use ICT while 5(7.7%) find it very difficult to use ICT.

Question Thirteen: Do you require assistance when using the computer?

Table 15: Frequency and percentage showing required assistance when using the computer

Do you require assistance when using the computer?	Frequency	Percentage(%)
Yes	17	26.1
No	48	73.8

Table 15 shows that 17(26.1%) respondents don't require assistance while 48(73.8%) need assistance in using ICT.

Question Fourteen: How competent are you in the following ICT applications?

Table 16: Frequency and percentage showing competency level in the use of ICT application

Item	Excellent	Good	Fair	Low capability	No capability	Total
Word processing	11 (16.9%)	14 (21.5%)	18 (27.7%)	12 (18.5%)	12 (18.5%)	65 (100%)

File Navigation	0 0	0 0	0 0	0 0	65 (100%)	65 (100%)
Internet Browsing	60 (92.3%)	5 (7.7%)	0 0	0 0	0 0	65 (100%)
E-mailing	27 (41.5%)	24 (36.9%)	7 (10.8%)	4 (6.2%)	3 (4.6%)	65 (100%)
Presentation Tools	5 (7.7%)	12 (18.4%)	14 (21.5%)	10 (15.4%)	24 (36.9%)	65 (100%)

Table 16 shows that 18(27.7%) respondents are competent in word processing, 65(100%) have no capability, 60(92.3%) are competent in internet browsing, 27(41.5%) are competent in E-mailing while 24(36.9%) have no capability in presentation of tools.

Factors affecting access and use of ICT

Question Fifteen: What factor (s) do you think that constrain ICT access and use

Table 17: What factor (s) do you think that constrain ICT access and use

What factor (s) do you think that constrain ICT access and use	Frequency	Percentage(%)
Lack of expertise with ICT	12	18.5
Lack of confidence in using ICT	18	27.7
Insufficient knowledge of appropriate software	20	30.8
High cost of computer	10	15.4
Irregular power supply	5	7.7
Total	65	100

Table 17 shows that 12(18.5%) respondents lack expertise with ICT, 18(27.7%) lack of confidence in using ICT, 20(30.8%) insufficient knowledge of software, 10(15.4%) high cost of computer while 5(7.7%) respondents think irregular power supply is constraint to ICT.

Discussions

Identification of Key Findings

The major findings of this study are discussed in line with the research objectives that were formulated to guide the study.

Students and tutor's knowledge of ICT

Knowledge about ICT depends on if the student and teacher had any form of information received before the study. In this study, majority of the respondents had information about ICT. The respondents' major types of information were formal. The reason adduced to this may be that most of them might have been a beneficiary of the multiples of trainings often organized by the Governments, NGOs, Development Partners and Corporate Organizations.

The findings on the kind of ICT training received or exposed to revealed that "Microsoft word"; "Microsoft Powerpoint" and "Zoom" attracted the highest responses. The high response rate may be associated with the respondents' needs to improve their teaching and learning needs which the above packages often as observed by (Khan et al, 2011), in their study on the use of ICT by the students.

Students' and Tutor's access to ICT

On the issue of access to ICT, majority of the respondents indicated that mostly "internet", "e-mail" "data projector" and "computer" are accessible in their institution. This finding disagrees with that of (Adeyinka et al, 2011) in their study: An Assessment of Secondary

School Teacher's use of ICT, that it is only internet and email services that teachers did not have access to. This result indicates that ICT are available for access and that respondents have skills to access them. Concerning the factors that affect ICT access, the study showed that high cost of ICT was a major factor affecting ICT access negatively. Other factors that attracted high response rates are "time factor" and "computer illiteracy" "distance". "High cost" attracted the highest score. "Irregular power supply also attracted a high response as a factor that affects ICT access. Ajayi et, al, (2010) noted that irregular or in ability to provide minimum acceptable standards of electricity services affect ICT access negatively since ICT needs other infrastructure like electricity to function. "Computer illiteracy" as a factor that affects ICT access also revealed a high response rate as well. This finding agrees with that of (Ajayi et al., 2010) that students and teachers were to a little extent exposed to ICT, hence they have poor access to ICT. The findings of this study also revealed that a substantial proportion of the respondents possess a computer. As regards the type of computer they possess; majority had laptops and most of them are linked to internet quite unlike the result by (Ajayi et al., 2010) that in the Schools computer and internet were not accessible to teachers.

Students' and Tutors' use of ICT.

Findings indicated that the respondents use ICT/ Computer: "daily" (63%) and "several days in a week" (15.4%). The findings emphasize that less than half the respondents use ICT regularly. This is in line with the view of (Ajayi et al., 2010), who observed that there was

a low level of ICT application in Schools. Findings also showed that it is only Microsoft word 40(61.5%) that the respondents make reasonable use. Findings also revealed that ICT/computer were minimally used for academic purposes. This agrees with the findings of (Ajayi et al 2010) that there was a low level of ICT application in teaching and learning in schools. The implication is that most of the teachers may still be using the old method of chalk or pen and talk, the practice which will make them lag behind on the world of ICT.

As regards, the respondents' difficulty level in using a computer, "easy" attracted the highest score, 38(58.5%). The result showed that the respondents are confident in the use of computer. As regards with ICT skills, respondents perceived themselves confident in the 3 highest score items which are "Internet browsing" "Word Processing" and "Email" The result suggests that respondents' information retrieval skills were good. This agrees with the findings made by (Khan et al, 2011) on their study, use of ICT by students; that students information retrieval skills were good such as goggling of materials.

Students and teachers perceived constraints associated with ICT

Table 4.20 indicated that the 4 highest scored items on respondents' factors constraining the use of ICT are, "Insufficient knowledge of appropriate software" 20(30.8%) "Lack of confidence in using ICT 18(27.7%)" "Lack of expertise with ICT" 12(18.5%) High cost of computer 10(15.4%). The findings clearly show that greater number of respondents perceive ICT knowledge as a vital tool to its use. The finding is in line with that of (Khan et al, 2011) that Nigerian teachers possess a very low knowledge of computer. This is a pointer to the low level of ICT use in teaching and learning in schools as indicated by the finding of (Ajayi et al., 2010) in their study, application of ICT in schools.

Implications of the Findings To Nursing

The findings of this study have some implications as follows:

- Sufficient ICT materials are very essential for effective and efficient use of ICT materials, as lack of these will obviously affect the use.
- If the students and tutors are adequately trained for the use of ICT, teaching and learning will be adequately conducted with ease.
- ICT materials are not adequately utilized in the core of teaching and learning in nursing. ICT provides efficient and current information services. Once the staff and students are able to use these technologies effectively, the teaching, learning and research activities in Nursing will be made easier for the Nursing community.
- ICT usage will facilitate development since there will be free flow of information.

Limitations of the study

The conclusions and generalizations that can be made from the findings of this study are subject to some limitations. Firstly, it was difficult to gain co-operation

from some of the respondents. Some of the respondents were reluctant in co-operating with the researcher because some of them felt that the researcher was interrupting their schedule. Furthermore, the researcher also encountered huge financial expenses in carrying out this research.

Suggestion for Further Studies

The present study has provided empirical information about knowledge, access and use of ICT among students and tutors in school of post basic nursing. This study opens up avenue to some other areas that could be investigated in order to improve ICT knowledge, access and use in nursing education. However, it is not all that appropriate to make definite conclusion on only a single study of this kind, putting into consideration the possible shortcomings of this study. There is therefore the need to replicate this study in order to provide empirical support for the findings of the present study.

- This study should be replicated using university students and teachers in departments of Nursing sciences in South South Zone of Nigeria.
- A study could be carried out to investigate the factors that militate against knowledge, access and use of ICT as they affect students' academic performance or achievement.

Summary

This study was carried out to investigate the knowledge, access and use of ICT among students and tutors in School of Post Basic Nursing, Port Harcourt. Four objectives guided the study. The objective were to: (i) ascertain what students and tutors know about ICT,(ii) determine students and teachers access to ICT, (iii) determine students and teachers use of ICT and (iv) find out the constraining factors to the use of ICT. Literatures were reviewed to cover the objectives of the study. A descriptive survey design was used. 68 comprised the subjects for the study. A researcher-developed questionnaire was the instrument for data collection. Data were analyzed using table and frequencies. Findings of this study revealed that there is still need to provide ICT materials at subsidized rate in order to encourage use in Nursing education. There is need also to organize ICT training in universities in order to make tutors and students acquainted with various ICT tools. The research design was the descriptive survey.

Conclusion

Based on the findings of this study, the following conclusions were made:

- Most students and tutors have knowledge of ICT
- Majority of students and teachers encounter challenges in accessing ICT especially lack of expertise and high cost of ICT.
- ICT materials are not adequately utilized in the core teaching-learning in the post basic school.

Recommendations

The following recommendations are made in view of the findings and educational implication of the study.

- The problem of high cost of ICT, needs to be addressed especially for students in order for them to better access and use the ICT

- materials. Correcting the problem of no or little access of students to ICT requires a holistic approach on the part of the government and the university authority.
- In order to ensure better exploitation of ICT, the management of the School of Post Basic should invest in acquisition of ICT, both hardware and software in sufficient numbers to cover the ICT needs of both students and tutors. Investment in maintenance is also required.
 - The School of Post Basic Nursing administration should ensure that she sets up a monitoring team competent in ICT, to ensure ICT use during teaching and learning in the institution.
 - Both students and teachers need on-going ICT related training which will assist in significantly developing their ICT skills, improve access to needed information and enhance efficiency in their occupation (student or teachers).
 - Finally, the government, the hospital administration and stakeholders should provide adequate and current ICT equipment, services and related materials in the education industry with a view toward increasing availability and access to ICT in particular and improving teaching and learning in general in the school.

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KNOWLEDGE AND PRACTICE OF CARDIOPULMONARY RESUSCITATION AMONG NURSES IN THE UNIVERSITY OF PORT HARCOURT TEACHING HOSPITAL, PORT HARCOURT, RIVERS STATE, NIGERIA.

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Abstract

This study was carried out to assess the knowledge and practice of cardiopulmonary resuscitation (CPR) among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt (UPTH, PH). CPR is a fundamental life-saving procedure that combines chest compressions and rescue breaths to restore blood circulation and oxygenation in individuals experiencing cardiac arrest. Prompt and effective CPR significantly improves survival rates for patients in cardiac arrest. Despite the importance of CPR skills, studies have indicated disparities in the level of knowledge and practice of CPR globally. Three objectives: to assess the level of knowledge of CPR, to assess the level of practice of CPR among Nurses of UPTH, P.H. and to determine the barriers influencing the effective CPR among Nurses of UPTH.PH., and responding three research questions were formulated to guide the study. A descriptive research design was used. The population of the study consisted of Nurses at UPTH, P.H., and the sample consisted of 98 Nurses. A Non-probability convenience sampling technique was used. A self-structured questionnaire was used to obtain data after ethical clearance and Results revealed that 85.71 percentage of Nurses have good knowledge of CPR and 14.29 % of Nurses have poor knowledge of CPR. 75% of the respondents have good level of practice of CPR and 25% of respondents have poor level of practice of cardiopulmonary resuscitation skills. Also, lack of training and knowledge of CPR, bystander's hesitation to initiate CPR, CPR equipment availability and accessibility and lack of communication and coordination among team members can affect the effective practice of cardiopulmonary resuscitation. In conclusion, the study revealed varying levels of knowledge and practice among nurses of the UPTH, PH, indicating a need for targeted training programs and continuous education to enhance skills and ensure consistent adherence to CPR protocols by all Nurses.

Keywords: Knowledge, Practice, Cardiopulmonary Resuscitation, Nurses, University of Port Harcourt Teaching Hospital, Port Harcourt.

Introduction

Background to the Study: Cardiac arrest is the most prevalent cause of death for millions of people worldwide annually, (Ozbilgin et al., 2015). More than 550,000 individuals experience cardiac arrest every year, each year more than 400,000 Americans succumb to sudden cardiac death with China having the most cardiac arrest incidence in the world (Patel, et al, 2023). Cardiopulmonary resuscitation (CPR) is a fundamental life-saving procedure that combines chest compressions and rescue breaths to restore blood circulation and oxygenation in individuals experiencing cardiac arrest. Prompt and effective CPR significantly improves survival rates and neurological outcomes for patients in cardiac emergencies. Nurses, as integral members of the healthcare team, play a pivotal role in the initial response to cardiac arrests and other critical situations, underscoring the importance of their proficiency in performing CPR (Segaye et al., 2020).

Despite the importance of CPR skills among nurses, studies have indicated disparities in the level of knowledge and practice of CPR globally. Research by Tsegaye et al. (2020) in Ethiopia revealed insufficient CPR knowledge among nurses, and a study conducted by Jiang et al. (2019) in China highlighted discrepancies between CPR training and actual practice. In Nigeria, a country burdened by a high prevalence of cardiovascular

diseases and limited healthcare resources, the competence of healthcare professionals in CPR holds even greater significance (Jiang et al., 2019). The University of Port Harcourt Teaching Hospital, located in Port Harcourt, Rivers State, serves as a major healthcare facility in the region. The knowledge and practice of CPR among nurses in this hospital are crucial factors in patient care and outcomes within the context of cardiac emergencies. Studies on CPR knowledge in Nigeria are limited, particularly within the specific context of the University of Port Harcourt Teaching Hospital.

Adequate Knowledge and awareness about Basic life support and Cardiopulmonary Resuscitation (CPR) are mandatory for the healthcare worker working in a hospital. It is considered a criminal offense if a health worker does not help in situations of crisis like in giving CPR in Europe and several other countries (Chaudhary et al, 2023; Sah et al., 2023). Therefore, the need for health care professionals especially Nurses to be trained in Basic Life support to enable them have the basic knowledge and skills on how to perform cardiopulmonary resuscitation as they often encounter situations requiring these skills in their practice.

Factors influencing nurses' CPR competency include the availability of regular training opportunities (Oermann et al., 2018), Nurses' exposure to real-life CPR scenarios

and clinical experience (Cooper et al. (2016), work environment (Cho et al. (2019), access to updated guidelines and familiarity (Yeung et al. (2019), institutional leadership/support, and individual attitudes toward skill retention (Tobase et al.,2017). Adequate training in CPR is not only essential for nurses' confidence but also for ensuring the quality of patient care during emergencies. This study aims to bridge the existing knowledge gap regarding the level of knowledge of cardiopulmonary resuscitation, the level of practice of cardiopulmonary resuscitation among the Nurses working in the University of Port Harcourt, Teaching Hospital, Port Harcourt, Rivers state and to determine the factors and barriers influencing the effective cardiopulmonary resuscitation among Nurses of the University of Port Harcourt teaching Hospital, shedding light on potential gaps and areas for improvement. Also, by conducting a thorough assessment of the current state of CPR training, knowledge, and practice among nurses, this study seeks to provide evidence-based insights that could drive policy changes, curriculum enhancements, and training program modifications. Again, identifying barriers that impede effective CPR performance will also help to propose strategies to address these obstacles.

In conclusion, this research addresses a critical gap in understanding the CPR knowledge and practice of nurses at the University of Port Harcourt Teaching Hospital. The findings have the potential to inform hospital administrators, nursing educators, and policymakers about the current status of CPR competency among nurses, ultimately contributing to improved patient care and outcomes during cardiac emergencies.

Statement of Problem

The University of Port Harcourt Teaching Hospital, Port Harcourt (UPTH) is a tertiary health care facility and offers wide range of health care services to all types of health problems presented in the hospital by individuals in Rivers state where it is located, even to the neighbouring states like Bayelsa and Akwa Ibom states. Some of these patients where rushed into the hospital in critical conditions and in cardiac arrest state and some other patients went into cardiac arrest even on admission. in the course of hospitalization.

The hospital also had a lot of health care professionals among whom are Nurses that makes a greater number of the employees. Nurses are most often the first to witness cases of cardiac arrest while at work and sometimes when they are off duties and their immediate responses could help to save the life of the victims. But there have been reported number of deaths from sudden cardiac arrest due to poor level of knowledge of cardiopulmonary resuscitation/basic life support among health care professionals regarding the importance of immediate response to cardiac arrest victims (Perkins et al, 2017; Ozbilgin et al, 2015), the researcher's son was also a victim. Again, there is still paucity of published data on cardiopulmonary resuscitation (CPR) and health care professionals in the hospital with little or no study done in the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state, Nigeria. These among others are the major drive aimed at assessing the

knowledge and practice of cardiopulmonary resuscitation among health care professionals especially Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state, Nigeria. This makes the study setting and the target population for the study ideal for carrying out the research.

Aim of the study

The broad objective of this study is to assess the knowledge and practice of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state.

Specific objectives: To achieve the above aim, the study specifically sought to answer the following specific objectives:

1. To assess the level of knowledge of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state.
2. To assess the level of practice of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state.
3. To determine the factors and barriers influencing the effective cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state.

Research Questions

1. What is the level of knowledge of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state?
2. What is the level of practice of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state?
3. What are the factors and barriers influencing the effective cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state?

Significance of the Study

The project titled the knowledge and practice of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, are of immense benefit to nurse practitioners, other health care providers, individuals, the general public, government, scholars/ researchers, to mention but a few. CPR is a critical life-saving skill that can make a difference between life and death for patients experiencing cardiac arrest. Nurses are often at the forefront of patients' care, so having a high level of knowledge and skill on cardiopulmonary resuscitation is crucial for ensuring patients safety.

Ultimately, by improving nurses' knowledge and practice of CPR, patient outcomes in emergency situations can be enhanced as timely and effective CPR can significantly increase the chances of survival and decrease the risk of long-term complications. To the nurses, the study created awareness on the intricacies of cardiac arrest, as well as providing skilful and timely intervention thereby reducing the rising rate of sudden deaths.

The study helped to identify specific areas where nurses lack sufficient knowledge or practical skills in CPR. Addressing these knowledge gaps can lead to better outcomes for patients and improve overall healthcare quality.

The findings from this study would help nurses that are deficient in the knowledge and practice of cardiopulmonary resuscitation understand the need to undergo further training on basic life support and advanced life support in order to be very proficient in giving care to patients with sudden cardiac arrest, as they are now trained to become life savers in times of giving emergency cares to patients with cardiac arrests that could even occur in and outside the hospital environment. This would help to boost the status of the nursing profession.

By understanding the level of knowledge and practice, healthcare institutions can identify areas that need improvement and implement targeted training programs to ensure that necessary skills in cardiopulmonary resuscitation are acquired in order to enhance the quality of care provided.

CPR guidelines are regularly updated based on the latest scientific evidence. Studying nurses' knowledge and practice helped to evaluate Nurses adherence to these guidelines and ensures that they are providing care in line with the best practices.

The study's findings can be used as a reference for other healthcare settings and professionals, helping to improve CPR knowledge and practice beyond the specific study population. Besides, the findings would help doctors and other health workers to appreciate the problems related to lack of knowledge and the non-practice of cardiopulmonary resuscitation on cardiac arrest victims in order to reduce sudden deaths in the society.

The research findings can also help the hospital management in planning programs and interventions that will be aimed at improving the knowledge of medical and non-medical personnel working in the health care facility, that are deficient in knowledge and practice of cardiopulmonary resuscitation as no one knows the next victim of cardiac arrest in the hospital settings. Proper training will enable the employees to know what actions to take when a colleague is found to have a cardiac arrest.

To policy makers, it will help in the formulation of appropriate policies and laws on life saving first aid measures and policies/protocols related to CPR training and ongoing competency assessment for Nurses. Moreover, it will help the government to come out with health measures aimed at providing the necessary facilities and materials for nurse practitioners and lay rescuers to enable them practice cardiopulmonary resuscitation.

To the public, the result will serve as a source of information on the appropriate strategies and management of cardiac arrest which help to reduce sudden deaths. The community at large can use the

present piece of work as a material to understand the basic knowledge and theoretical skills that a lay person can use to rescue cardiac arrest victims especially when it occurs outside the hospital. Thus helping to save the lives of individuals in the society from cardiac arrest.

To researchers, findings from this study will serve as a source of knowledge and reference to other researches in this area, that is, the study will contribute to the existing body of knowledge in Nursing and allied health discipline.

In summary, the significance of the study lies in its potential to improve patient care, healthcare quality, and overall patient outcomes by addressing knowledge gaps and enhancing CPR skills among nurses.

Scope of the study

The scope of the study is on the following variables: The study focuses on assessing the knowledge and practice of cardiopulmonary resuscitation among Nurses in the University of Port Harcourt Teaching Hospital, Port Harcourt. In terms of content and scope, the study examined variables which include the following: the knowledge and practice of cardiopulmonary resuscitation among Nurses, the factors and barriers influencing cardiopulmonary resuscitation among nurses in the University of Port Harcourt Teaching Hospital, Port Harcourt. The geographical scope of the study was the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state, while the unit of analysis were the Nurses working in the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state, made up the population for the study.

Operational Definition of Terms

Code/Cardiac Arrest. Cardiac arrest is the abrupt loss of heart function resulting to loss of consciousness and unresponsiveness. The time and mode of death are unexpected and occur instantly after symptoms appear (ACLS, 2016).

Resuscitation. For the purpose of the study, resuscitation refers to an emergency procedure wherein the patient's heart has stopped beating and has become unresponsive, and the patient must be immediately revived in order to be alive, prevent neurological deficits and death (Clarke et al., 2016).

Cardiopulmonary Resuscitation: Also known as CPR for short, is an attempt to restore cardiac or pulmonary functioning after cessation of normal heart activity, often accompanied by chest compression, artificial respiration, or medication administration (ACLS, 2016). In this study, the term resuscitation is synonymous with cardiopulmonary resuscitation.

Knowledge: A state of awareness or understanding of Cardiopulmonary Resuscitation. In this study the investigator wants to assess the knowledge of cardiopulmonary resuscitation guidelines among Nurses of the university of Port Harcourt Teaching Hospital, Port Harcourt, to know if the proper guidelines are followed and if not, to know what the factors and barriers are that hinder the effective cardiopulmonary resuscitation.

Practice: The customary way of operation regarding the performance of cardiopulmonary resuscitation on victims with sudden cardiac arrest. In this study, the researcher also wants to assess the level of practice of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state.

Nurses: These are qualified and licensed health care professionals that have undergone specialty training within the field of professional nursing, focused on the care of patients that are sick, require prompt medical and surgical attention and can give cardiopulmonary resuscitation to victims with sudden cardiac arrest. Nurses employment titles (formal) in the University of Port Harcourt Teaching Hospital include: Nursing officers 1 & 11, Senior Nursing Officer, Principal Nursing Officer, Assistant Chief Nursing Officer, Chief Nursing Officer and Assistant Director of Nursing (other organizational leadership positions like the Deputy Directors of Nursing are specifically excluded from participation)

Literature review

Abundant literatures exist in the area of cardiopulmonary resuscitation but scares in the knowledge and practice of cardiopulmonary resuscitation among Nurses in the University of Port Harcourt Teaching Hospital. This chapter therefore focuses on the review of related literature and it is discussed under the following subheadings; Conceptual review, Empirical studies, theoretical framework and Summary of literature.

Conceptual Review on Cardiopulmonary Resuscitation (CPR)

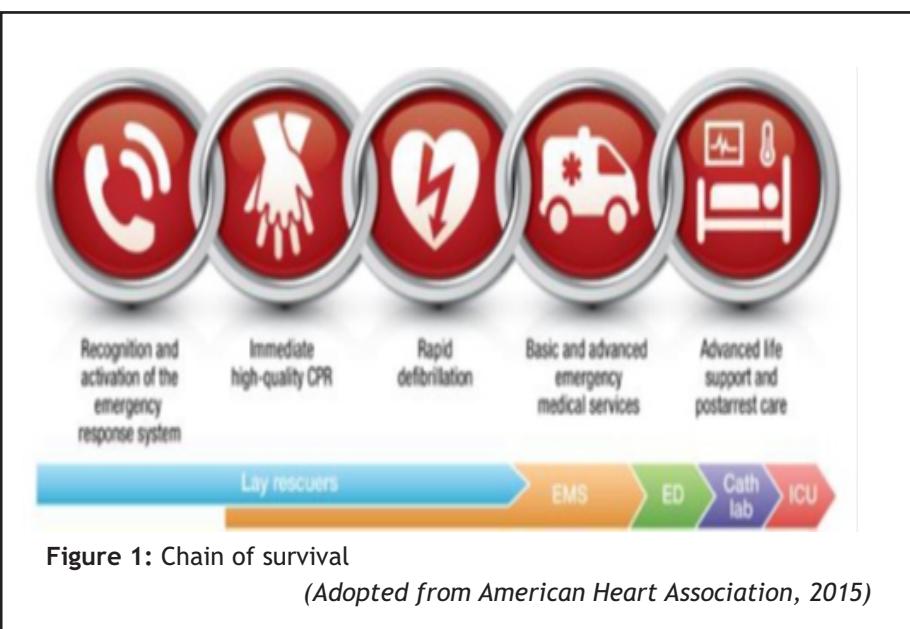
Cardiac arrest as defined by the American Heart Association and the American college of Cardiology, "is the sudden cessation of cardiac activity so that the victim becomes unresponsive, with no normal breathing and no signs of circulation. Cardiac arrest is a sudden cessation of functional cardiac activity and is capable of causing irreparable brain damage and death within few minutes if corrective measures (cardiopulmonary resuscitation) are not initiated rapidly, this condition progresses to sudden death (Patel et al., 2023).

Cardiopulmonary resuscitation is a series of life-saving actions that improves the chances of survival of victims following cardiac arrest (Homlberg & Herlitz, 2013). The cause of cardiac arrest varies by population and age, most commonly occurring in those with a previous diagnosis of heart disease. There are also many non-cardiac etiologies of cardiac arrest including intracranial haemorrhage, drug overdose, electrolyte abnormalities, severe infection (sepsis), hypothermia or

trauma (Patel, et al, 2023).

The history of cardiopulmonary resuscitation (CPR) can be traced as far back as the [literary works of ancient Egypt](#) (c. 2686 - c. 2181 BCE), however, it was not until the 18th century that credible reports of [cardiopulmonary resuscitation](#) began to appear in the medical literature. The most important signs and symptoms of cardiac arrest include: sudden collapse or loss of consciousness, absence of pulse, abnormal or absence of breathing. Some individuals may experience chest pain, shortness of breath, or nausea preceding cardiac arrest. If not treated within minutes, it typically leads to death (Schenone et al, 2016).

CPR has the potential to save lives in other life threatening emergencies such as stroke, respiratory arrest, trauma, drowning and airway obstruction (American Heart Association, 2016). Early cardiopulmonary resuscitation (CPR) is essential to surviving cardiac arrest with good neurological function (Field, 2019). Successful resuscitation following cardiac arrest requires an integrated set of coordinated actions represented by the links in the chain of survival. The links include immediate recognition of cardiac arrest and the activation of emergency response system, early cardiopulmonary resuscitation with an emphasis on chest compressions, rapid defibrillation, effective advanced life support and integrated post-cardiac arrest care (American Heart Association).



According to Kleinman et al., (2015), the main components of adult's basic life support are as follow: Immediate recognition of respiratory distress and cardiac arrest, activation of the emergency response system, getting help and equipment, early cardiopulmonary resuscitation (CPR), rapid defibrillation with an automated external defibrillator (AED) especially if it occurs in the hospital environment where all these gadgets are supposed to be handy.

When an adult suddenly collapses, checking for response is the first step in emergency situations as continuing

with other forceful methods of Basic Life Support at this stage could exacerbate the patient's condition and can be seen as assault. Alert, Verbal, Pain, Unconscious (AVPU) is the commonly used acronym for quickly assessing the level of consciousness in a patient by the health care provider. The Rescuer sends for help as to allow much more assistance to be rendered on the patients and increase the patients chances of receiving Advanced Life Support. Next is to assess the airway via the Jaw Thrust maneuver which is the preferred method as the head-tilt maneuver is thought to be more risky for people with suspected spinal injury. Once the airway has been opened, checking for breathing should begin, if the respiratory rate is below 12-20 breaths per minute (gasping respiration) and there is no pulse after being checked for 2 minutes, then CPR should begin. Cardiopulmonary Resuscitation (CPR) involves a rescuer or bystander providing chest compressions to a patient in a supine position while also giving rescue breaths. The rescuer or bystander can also choose not to provide breaths and provide compression-only CPR. The Chest compressions performed in cardiopulmonary resuscitation should be of adequate rate, adequate depth, allowing full chest recoil between compressions and minimizing interruptions in chest compressions (Atkins et al., 2015). In delivering of the chest compressions, the hands must be overlapped placing it on the center (or lower half) of the sternum (breastbone), with the rescuer's arms extended for adult victims. 2 fingers or the heel of one hand can be used depending on the size of the infant to a depth of one third to one half of the anteroposterior chest diameter. Chest compressions are to be delivered at a rate of 30 compressions to 2 breaths and a depth of 2 inches, at a rate of 100 to 120 per minute for adults. 15 compressions to 2 breaths and 1.5 inches deep for children, at a rate of 100-120 compressions per minute (Atkins et al., 2015).

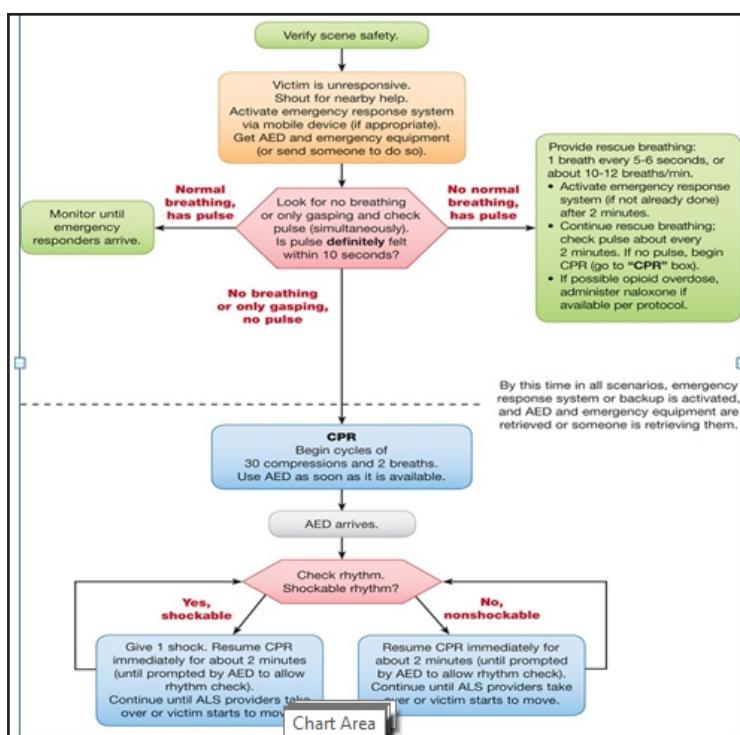


Figure 2: The algorithm for adult's basic life support:
adopted from American Heart Association, 2015

Conceptual review on Knowledge about Cardiopulmonary Resuscitation among Nurses

Cardiopulmonary resuscitation is the foundational technique for the emergency treatment of cardiac arrest and the standardized training of it has been emphasized more than ever. Competence of the nurses in this lifesaving procedure is a critical factor in patient's outcome from cardiac arrest and can largely prevent sudden death (Shrestha et al., 2020). Cardiopulmonary resuscitation (CPR) is a very critical practise in the healthcare setting and it should be initiated within the first three (3) minutes of cardiac arrest (Manono et al., 2015).

The advocacy therefore, is for every health care professional especially Nurses (since they are mostly close to the patients) to be in a better position to know when a patient goes into cardiac arrest and be equipped with the necessary knowledge and skills in performing cardiopulmonary resuscitation (Clarke et al., 2016; Grover et al., 2017). Nurses should be mandated to continue to improve in these technical clinical skills as they frequently get immersed in the care of critical ill patients as patient's conditions might deteriorate into sudden cardiac arrest. This is necessary because, critical emergency moments in patients' lives take shape in many forms and nurses must not only be prepared to only be able to recognize the signs and symptoms of cardiac arrest but should also be ready to respond rapidly, with high level of clinical knowledge and competence (Druwe et al., 2021).

Cardiopulmonary resuscitation (CPR) as the fundamental technique for the emergency treatment of cardiac arrest (CA), which has been receiving great attention, especially by the World Health Organization

that has over the years emphasized on standardized training of healthcare professionals to acquire knowledge and skills on cardiopulmonary resuscitation. In developed countries and regions like Britain and the United States of America for example, it is mandatory for health professionals to receive training on various cardiopulmonary resuscitation programmes. These are the reasons; they have many different algorithms for different types of emergency resuscitations.

Conceptual review on Practice of cardiopulmonary resuscitation among nurses

Grover et al., (2017) suggested that specific attributes of nurses create deviation in team dynamics during critical situations, the most serious of these scenarios being the emergency resuscitation of a patient during cardiac arrest. Cardiac arrest management requires interdisciplinary team where members of the team will need to demonstrate high level of competence and skills through specialized clinical algorithm training (Advanced Cardiac Life Support [ACLS], 2016).

The ability of a nurse to contribute to a critical resuscitation scenario varies with the nurse's experience, the setting, and personal attributes of the nurse (Grover et al., 2017). Taylor, (2017) suggested that the recognition of alteration in team dynamics when faced with high-stress resuscitation scenarios such as code arrest is integral to the successful resuscitation of patients presenting with hemodynamic instability in inpatient hospital settings. Based on their research, Grover et al. (2017); Taylor (2017) stated that the current poor outcomes for patients during cardiopulmonary resuscitation and lack of qualitative investigation into nurses' perceptions and practice of resuscitation leaves room for further study. Very limited research exists on how nurses translate previously developed perceptions and practice of teamwork during resuscitation in the Emergency Department (Grover et al., 2017; Lauridsen et al., 2021; Taylor, 2017).

Despite important advances in prevention, cardiac arrest remains a substantial public health problem and a leading cause of death in many parts of the world. Cardiac arrest occurs both in and out of the hospital (Meena. Et al., 2014). Factors influencing nurses' CPR competency include the availability of regular training opportunities (Oermann et al., 2018), Nurses' exposure to real-life CPR scenarios and clinical experience (Cooper et al., (2016), work environment (Cho et al., (2019), access to updated guidelines and familiarity (Yeung et al., (2019), institutional leadership/support, and individual attitudes toward skill retention (Tobase et al., 2017). Adequate training in CPR is not only essential for nurses' confidence but also for ensuring the quality of patient care during emergencies.

Barriers and factors influencing the effective cardiopulmonary resuscitation

Inadequate training and education can impact CPR performance. A study by McNeill et al. (2016) emphasized the importance of regular training and identified gaps in healthcare providers' knowledge and skills. Again, resuscitation teams often deviate from algorithms of CPR. Emerging evidence suggests that in addition to technical skills of individual rescuers, human factors such as teamwork and leadership affect adherence to algorithms and hence the outcome of CPR (Hunziker, 2014). Again, staying updated with CPR guidelines is essential (Aung et al., (2020). Staffing levels and fatigue can impact CPR quality (Carayon et al., (2015). Also, communication and teamwork are critical during resuscitation. A study by Marsch et al. (2013) emphasized the importance of clear communication for successful CPR.

The psychological factors of fear and anxiety can hinder healthcare providers' performance during emergencies (Lee et al., 2015) Limited access to CPR equipment can impede effective resuscitation efforts. Limited access to CPR equipment can indeed impede effective resuscitation efforts and can significantly impact patient outcomes during cardiac emergencies. Having the necessary equipment readily available is essential for healthcare providers to initiate prompt and effective cardiopulmonary resuscitation (CPR) interventions (Blewett et al. (2019)).

Workplace culture and support play a crucial role in influencing healthcare providers' readiness to perform effective cardiopulmonary resuscitation (CPR) during emergencies. A positive workplace culture that emphasizes the importance of CPR, provides adequate training, and offers support to healthcare providers can greatly enhance their confidence and preparedness to respond to cardiac arrest situations (Tobase et al., (2017) emphasized the role of leadership and organizational culture in supporting effective CPR performance.

Cultural beliefs about death, dying, and medical interventions can influence CPR decisions. In some cultures, death is viewed as a natural part of life, and aggressive medical interventions may be seen as futile or even disrespectful to the natural course of events. Conversely, some cultures prioritize the preservation of life through all available means. These beliefs can impact patients' and families' choices regarding CPR (Cao et al., (2016)). Again, religious beliefs often play a significant role in end-of-life decisions. Some religions advocate for aggressive life-saving measures, while others emphasize acceptance of natural processes. For instance, certain religious groups may have specific teachings about the sanctity of life, the afterlife, and the importance of minimizing suffering.

Many factors determine outcome after cardiac arrest and implementation is the crucial part of changing attitudes and behaviour to ensure that high quality of cardiopulmonary resuscitation are carried out, publishing clinical practice guidelines is insufficient. Changing clinical practice and maintaining high quality resuscitation practice is often as demanding as the work required to generate the medical science behind the suggested change. Therefore, ensuring that the guidelines are translated into high quality clinical practice is essential (Soreide et al., 2018). However, regardless of high levels of quality technical skills, poor team dynamics during resuscitation may contribute to decreased patient outcomes (Clarke et al., 2016). Critical stress incidences may significantly alter the performance of the cardiopulmonary resuscitation team as postulated in the Shared Mental Framework (Lowe et al., 2016). Identifying these characteristics of teamwork during critical stress incidences such as code arrests and how they alter the psychosocial dynamic of the nursing team also may provide the opportunity to improve patient survival (Ehrler et al., 2021).

Cardiopulmonary resuscitation may be withheld in some circumstances. One is if the patient has a do not resuscitate ("no code") order, such as in a living will. Another is if the patient, family member, individual with power of attorney privileges over the patient, or other surrogate decision maker for the patient, makes such a request of the medical staff. Surrogate decision makers are considered in a hierarchy: legal guardians with health care authority, individual with power of attorney for health decisions, spouse, adult children, parents, and adult siblings (Do not resuscitate Wikipedia, 2023). Savoie., (2019) stated that cardiopulmonary resuscitation can help someone's life. One crucial

element that a person suffering from cardiac arrest needs to survive is someone who will perform cardiopulmonary resuscitation on them. Yet, there are still a lot who are afraid to perform CPR. Even when an emergency is taking place, they may hesitate to carry out the techniques, they will rather wait for someone else to do it. This is because they are afraid that they might be doing it wrongly and also because they lack self-confidence. The author further explained that other reasons include; afraid of hurting the victim, afraid of being sued for inappropriate touching and afraid that they might catch a disease.

Theoretical review

Health Belief Model is a health behavior change and psychological model developed by Irwin, M. Rosenstock in 1966 for studying and promoting the uptake of health services. The model was subsequently amended by Becker and colleagues in the 1970's and 1988 to accommodate evolving evidence generated within the community about the role that knowledge and perceptions play in personal responsibility. Originally the model was diagnosed to predict behavioral response to the treatment received by acutely or chronically ill patients, but in more recent years the model has been used to predict more general health behaviors. The model includes:

- Perceived threat (whether the danger imposed by not undertaking a certain health action recommended is great).
- Perceived susceptibility (an individual's assessment of their risk of getting the condition).
- Perceived severity (an individual's assessment of the seriousness of the condition, and its potential consequences).
- Perceived barriers (an individual's assessment of the influences that facilities or discourage adoption of the promoted behavior)
- Cues to action (external influences promoting the desired behavior, may include information provided or sought, reminders by powerful others, persuasive communication and personal experiences).
- Demographic variables (such as age, gender, ethnicity, occupation)
- Perceived efficacy (an individual's self-assessment of ability to successfully adopt the derived behavior).

According to this model, it is believed that individuals will take action to prevent, screen for or control an ill-health condition or situation if they regard themselves as being susceptible to a condition that may have serious consequences, or that will affect their lifestyles, as well as believing that a course of action on their part would benefit them by reducing either their susceptibility to the condition or its severity, and that the barrier to taking actions, in terms of costs are outweighed by the benefits of actions. These beliefs are influenced by the conviction that the disease can be modified or prevented by implementing the recommended behaviour and the belief that it will be cheaper and less unpleasant to take the recommended action.

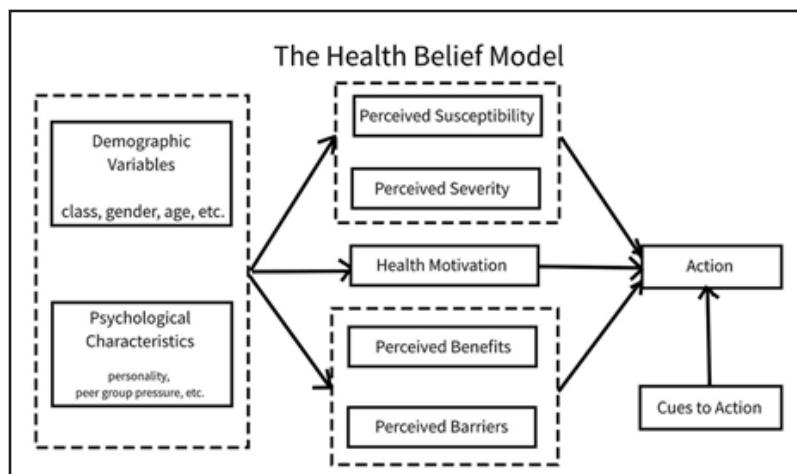


Figure 3: Schematic representation of the health belief model: adapted from *Health belief model - Wikipedia*

Application of the Health Belief theory to the Study

Applying the Health Belief Model (HBM) to the study of knowledge and practice of cardiopulmonary resuscitation (CPR) among nurses in the University of Port Harcourt Teaching Hospital involves examining how the different components of the HBM influence nurses' decisions and behaviors regarding CPR. The HBM is a theoretical framework that seeks to explain and predict health-related behaviors by considering individuals' perceptions of health threats and the benefits and barriers of taking action.

Perceived Susceptibility: This component focuses on an individual's perception of their susceptibility to a health condition. In the context of CPR, nurses' perception of their susceptibility to encountering a cardiac arrest situation and the likelihood of needing to perform CPR would be relevant. This can be assessed in the Nurses' beliefs about the likelihood of encountering such scenarios and how it influences their willingness to learn and practice CPR.

Perceived Severity: This component pertains to an individual's perception of the seriousness of a health condition. This can be investigated on how nurses perceive the severity of cardiac arrest situations and whether they believe that prompt and effective CPR is crucial for saving lives. Nurses who recognize the seriousness of cardiac arrest are more likely to prioritize learning and practicing CPR.

Perceived Benefits: This aspect refers to an individual's assessment of the benefits of taking a particular health action. Nurses can be observed to perceive their benefits of learning and practicing CPR, such as the potential to save lives, increase patient survival rates, and improve patient outcomes. Nurses who understand and value the benefits of CPR are more likely to engage in it.

Perceived Barriers: Barriers are obstacles that may hinder an individual's ability to take a health-related action. The perceived barriers that nurses face in learning and practicing CPR can be identified. These could include factors such as lack of time, lack of access to training, fear of making mistakes, or concerns about

legal implications. Addressing and mitigating these barriers could increase nurses' motivation to learn and perform CPR.

Cues to Action: Cues to action are triggers that prompt an individual to take a specific health action. Factors that serve as cues for nurses to initiate CPR can be identified. This could include factors like witnessing a cardiac arrest, participating in regular CPR training sessions, or having supportive colleagues and supervisors who encourage CPR practice.

Self-Efficacy: Self-efficacy refers to an individual's belief in their ability to successfully perform a health-related behavior. Nurses' confidence in their CPR skills and their perception of their ability to perform effective CPR in a high-stress situation can be assessed. Higher self-efficacy is likely to result in more proactive engagement in CPR-related training and practice.

By examining these components of the Health Belief Model in relation to nurses' knowledge and practice of CPR, valuable insights can be gained into Nurses motivations and barriers towards the practice of cardiopulmonary resuscitation. This information can guide interventions to improve CPR training programs, enhance nurses' skills and confidence, and ultimately contribute to better patient outcomes in cardiac arrest situations.

In this study the model suggests that Nurses in the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state, Nigeria require a health behaviour change which should be based on a rational approval of the balance between the barrier to and benefits of action. In other words, their knowledge and practice of cardiopulmonary resuscitation should be more rational and beneficial to them towards the saving of life of patients who may suffer from cardiac arrest and heart diseases. Their level of knowledge of cardiopulmonary resuscitation could be found to predict the level of their practices, hence the health belief model suggests that training nurse on cardiopulmonary resuscitation and motivating them to towards practicing it as the occasion demands will go a long way in preventing untimely deaths resulting from sudden cardiac arrest and inappropriate cardiopulmonary resuscitation among adults and children in the society. The model further adduced that Nurses in the university of Port Harcourt Teaching Hospital, Port Harcourt Rivers state, Nigeria should be encouraged to take responsibility for their patients' health by knowing and practicing cardiopulmonary resuscitation when the need arises.

Empirical Review

Empirical review on the Knowledge and practice of cardiopulmonary resuscitation

Chandrasekaran et al., (2016) conducted a study on the awareness of basic life support among medical, dental, nursing students and doctors in India in the continent of Asia. It was a cross-sectional study conducted by assessing responses to 20 selected basic questions regarding BLS among students, doctors and nurses of medical, dental, homeopathy and nursing colleges. The

outcome of the study revealed that two out of 1054 (0.19%) secured 80 - 89% marks, 10 out of 1054 (0.95%) secured 70 - 79% marks, 40 of 1054 (4.08%) secured 60 - 69% marks and 105 of 1054 (9.96%) secured 50 - 59% marks. A majority of them, that is, 894 (84.82%) secured less than 50% marks. Awareness of BLS among students, doctors and nurses of medical, dental, homeopathy and nursing colleges is very poor. Thirty-one per cent of the responders did not know the abbreviation of BLS as Basic life support. Fifty-nine failed to insist on looking for safety as the first step in BLS. Eighty-nine per cent failed to insist on activating EMS immediately after confirming the unresponsiveness in an adult. It was concluded that awareness of BLS among students, doctors and nurses of medical, dental, homeopathy and nursing colleges is very poor

Sabir, (2017) conducted a study on the knowledge of basic cardiac life support among nursing students in Pakistan in the continent of Asia. The study was a quantitative experimental study. The knowledge was analysed by using questionnaires prepared from Basic Life Support (BLS) manual of American Heart Association (AHA). The findings of the study revealed that out of 62 participants only 3.2% (n=2) of the participants got high scores in pre-test. The rest of the participants (93.5%) (n=58) had moderate knowledge level and 3.2% (n=2) had low knowledge level. Post-test assessment done with the same question paper showed that 96.8% (n=60) secured high score and the remaining 3.2% (n=2) passed with moderate score. Mean difference was -9.4 and P value 0.000 showed that the workshop was highly effective and improved knowledge level in post-test. Hence BCLS workshop is essential to improve knowledge and skills of cardiopulmonary resuscitation (CPR).

It was also observed in the study by Bajracharya & Nagarkoti, (2016) on knowledge regarding basic life support among nurses of a tertiary level hospital of Nepal located in the continent of Asia that majority (46%) of the respondents were between 20 to 25 years of age. 52% of respondents were of Proficiency Certificate Level (PCL), 36 % of bachelor of nursing (BN) and 12% Bachelor of Science in Nursing (B.Sc. Nursing). 36% respondents had working experience of 5-10 years and 6% of 10-15 years. All respondents had heard about BLS but 86% of them had never attended any BLS training. Most of the respondents (86%) had seen CPR being done and more than half of the respondents (58%) had done CPR. 62% stated circulation, airway and breathing as the latest CPR sequence. 90% of the respondents said cardiac arrest is the indication of CPR. 66% had inadequate knowledge, 32% had moderate knowledge while minority 2% had adequate knowledge on Basic Life Support.

In another study on the knowledge on American Heart Association Guidelines Update for Cardiopulmonary Resuscitation among the Nurses Working at University Hospital, Kavre in South Asia, conducted by Shretha et al, (2015), explained that Cardiopulmonary resuscitation is the foundational technique for the emergency treatment of cardiac arrest and the standardized training of it has been emphasized more than ever and competence of the nurses in this lifesaving

procedure is a critical factor in patient outcome from cardiac arrest and can largely prevent sudden death. Many evidences suggest lack of knowledge on proper cardiopulmonary resuscitation among nurses and the aim of the study was to assess the knowledge on 2015 American Heart Association guidelines update for cardiopulmonary resuscitation among nurses working at University hospital and to identify the relationship between the level of knowledge and selected variables. Two hundred and sixty nurses working in Dhulikhel hospital participated in the study. A cross-sectional descriptive study was conducted using a predesigned questionnaire based on 2015 guidelines updates for cardiopulmonary resuscitation that incorporated a total of 20 questions. Results revealed that a total of 260 participated in the study and all were female. Only one third of the nurses had good knowledge regarding 2015 guidelines update for cardiopulmonary resuscitation. No significant results existed between the knowledge score and age of the nurses, duration of work experience. However, significant results existed between the knowledge score and qualification, designation of the nurses and previous training on cardiopulmonary resuscitation. The study concluded that One third of the nurses had good knowledge regarding 2015 guidelines update for cardiopulmonary resuscitation in this study. Thus, knowledge and practical approach has to be updated with current guidelines in cardiopulmonary resuscitation in order to improve the safety and effectiveness of patient care.

In a study carried out by Mayanlambam & Devi, (2016) on knowledge and practice regarding basic life support among nursing students in Greater Noida in the continent of Asia. It adopted a quasi-experimental research design. A total of 40 subjects were chosen for the study. The instrument used to generate necessary data was structured questionnaire for knowledge assessment and observation (checklist for practice assessment). The outcome of the study revealed that 26.4% of respondents had good knowledge about BLS/CPR while 73.6% had poor knowledge about BLS/CPR. Most of the respondents that had never practiced CPR before (93.2%) while 6.8% had performed CPR on a patient before. The study therefore concluded that there is need to intensify review of the training curriculum for nursing students and the need to incorporate cardiopulmonary resuscitation training into their programs.

In a study titled factors influencing the level of knowledge of cardiopulmonary resuscitation in hospitals in Peru (South America), conducted by Aranzabal-Alegria et al., (2017), as part of introduction explains that worldwide, the incidence of cardiopulmonary arrest is 20-140 per 100,000 people, with an alarmingly low survival rate of approximately 2-11%. Effective cardiopulmonary resuscitation (CPR) is required in order to improve this situation. And the objective of the study was to determine the association between social and education factors and the level of knowledge of CPR among healthcare staff in hospitals in Peru. The methodology employed was a multi-centre, cross-sectional analytical study which was based on convenience sampling among healthcare workers in 25

hospitals in Peru, using questionnaires validated for the local population. Bi-variate and multi-variate statistics were calculated using generalised linear models. Results revealed that, out of the 1075 people surveyed, 52% were females, the mean age was 33, 77% were physicians, 61% had attended national universities, and 62% had taken a first aid course/workshop. Of them, 59% failed the CPR test. Having spent a longer number of hours in the emergency service (OR: 1.003; 95% CI: 1.002-1.004; p < 0.001), being a physician (OR: 1.51; 95% CI: 1.13-2.03; p: 0.027) or being a nurse (OR: 1.45; 95% CI: 1.10-1.93; p: 0.001), was associated with good knowledge of CPR, adjusted for prior attendance to a CPR course, and for the place of work of the individual respondent. The study was concluded that, the level of knowledge was low and this is something that needs to be considered when developing continuing education policies in order to ensure that the healthcare staff has updated knowledge, and is prepared, in theory and in practice, to avoid complications and fatal outcomes.

In another study conducted by Kelkay et al., (2018) on the title: A cross sectional study on knowledge, practice and associated factors towards basic life support among nurses working in Amhara region referral hospitals, northwest Ethiopia, 2016. Sudden cardiac arrest is one of the most frequent causes of death in the world; however, timely provision of basic life support (BLS) by knowledgeable and skilful health professionals will make an important contribution to reduce avoidable death and disability. An institution based cross-sectional study was carried out in April 2016 among 397 nurses working in Gondar University Hospital and Bahirdar Referral Hospitals. Multivariate analysis using logistic regression model was used to analyse the association between knowledge and practice of basic life support with potential predictor variables. AOR and 95% CI were computed to identify predictor variables. Results revealed that a total of 388 nurses participated in the study with a response rate of 97.7 among the study participants, 38.6% and 28.4% had good knowledge and good practice of BLS, respectively. Educational status, assigned place, training, and previous exposure were significantly associated with knowledge of BLS. With regard to practice of BLS: training, previous exposure, confidence and knowledge were factors associated with practice of BLS at (p≤0.05). The study states that, in conclusion, in general, the knowledge and practice of BLS among nurses were low. Thus subsequent training and education is mandatory to achieve the desired outcome.

In another study conducted by Andrell et al., (2020) on the Knowledge and attitudes to cardiopulmonary resuscitation (CPR)- a cross-sectional population survey in Sweden (Northern Europe). The authors explained that rates of bystander's CPR are increasing, yet mortality after out-of-hospital cardiac arrest (OHCA) remains high in OHCAs with agonal breathing. The aim of the survey was to explore public knowledge and attitudes to CPR and the hypotheses were that recent CPR training (< 5 years) would be associated with a high-quality response in a case vignette of OHCA with agonal breathing, and associated with an interest to become a smartphone app responder in suspected OHCA. The

method used was collection of data through a web survey. Respondents (≥ 18 years) in Skåne County, Sweden were members of a panel created by a market research company. Data were weighted with respect to gender, age, municipalities and level of education to increase generalisability to the general population. Results revealed that a total of 1060 eligible answers were analysed. Seventy-six percent of non-healthcare professionals ($n = 912$) had participated in a CPR course at some time in life, 58 percent during the previous five years. The recommended CPR algorithm was known by 57 percent, whereas knowledge of the location of the nearest automated external defibrillator (AED) in a home environment was poor. The study concluded that, CPR training should highlight methods improving retention of theoretical knowledge and possible areas of improvement in CPR training, which might improve OHCA identification and facilitate knowledge retention.

In another study conducted by Rajeswaran et al., (2018) titled "Assessment of nurses' cardiopulmonary resuscitation knowledge and skills within three district hospitals in Botswana "in the continent of Africa. The study revealed that, Nurses are usually the first to identify the need for and initiate cardiopulmonary resuscitation (CPR) on patients with cardiopulmonary arrest in the hospital setting. Cardiopulmonary resuscitation has been shown to reduce in-hospital deaths when received from adequately trained health care professionals. The study employed a non-probability quantitative, quasi-experimental study which was conducted at three hospitals in Botswana. A pre-test, intervention, post-test, and a re-test after 6 months were utilised to determine the retention of CPR knowledge and skills. Non-probability, convenience sampling technique was used to select 154 nurses. Results showed markedly deficient CPR knowledge and skills among registered nurses in the three district hospitals. The pre-test knowledge average score (48%) indicated that the nurses did not know the majority of the BLS steps. Only 85 nurses participated in the re-evaluation test at 6 months. While a 26.4% increase was observed in the immediate post-test score compared with the pre-test, the performance of the available participants dropped by 14.5% in the re-test 6 months after the post-test. The study concluded by stating that Cardiopulmonary resuscitation has been practiced for over 50 years and many studies have shown that knowledge and skills decline within 6 months after initial training in CPR and performance improves when all nurses are certified and practicing the relevant life support training courses. The quality of CPR performed by rescuers depends on learners integrating, retaining and applying the cognitive, behavioural and psychomotor skills required to successfully perform resuscitation.

Aliyu et al., (2019) in a study on practice of cardiopulmonary resuscitation among health care providers in a tertiary health centre in a semi-urban setting in Nigeria, observed that one hundred and two respondents were recruited (40 doctors and 62 nurses). There were 50 males (49%) and 52 females (51%). Their age ranged from 23 to 54 years with mean of (34.9 ± 7.4) years. Only 20% of the respondents were aware of

circulation, airway and breathing in adult resuscitation; however, 61.0% of all respondents were aware of airway, breathing and circulation of resuscitation in children. Furthermore, only 10% of the respondents were aware of the correct steps of single rescuer resuscitation. Their knowledge was poor about chest compression and ventilation for both adult and children resuscitation. The overall knowledge score ranged from 0.0% to 100% with mean knowledge score of (21.2 ± 18.6). Knowledge score of the respondents was generally poor, majority (98%) of them scoring below 84%. The cadre of the respondents (doctors and nurses) had no relationship with their knowledge score ($x^2=0.100$, $P=0.633$ for doctors and nurses; $x^2=7.074$, $P=0.225$ for doctors' cadre; $x^2=3.868$, $P=0.677$ for nurses' cadre) respectively.

In a study conducted by Ihunanya et al., (2021) on Relationship between knowledge and practice of cardiopulmonary resuscitation among nurses in Babcock University Teaching Hospital, Nigeria in Africa: Cross tabulation of knowledge and practice of cardiopulmonary resuscitation showed that 79.2% of the respondents who had good knowledge of cardiopulmonary resuscitation practiced cardiopulmonary resuscitation, and 76.5% of those who had poor knowledge did not practice CPR. The test of this relationship had a chi-square value of 97.54 at $p=0.001$. The p-value was less than the 0.05 significant level which revealed that a significant relationship exists between knowledge and practice of cardiopulmonary resuscitation among nurses in Babcock University Teaching Hospital.

In another study conducted by Ihunanya et al., (2021) on Attitude and Practice of Cardiopulmonary Resuscitation Among Nurses in Babcock University Teaching Hospital in Ilisan-Remo, Ogun State, Nigeria, Africa. It was explained that Cardiac arrest is a substantial health problem estimated to account for 15-20% of all death. A timely performed cardiopulmonary resuscitation (CPR) can largely prevent sudden death as cardiopulmonary resuscitation is a critical component of basic life support. The study adopted a descriptive design which enabled the researcher in finding answers to the set research questions. A set of 135 structured questionnaires were administered to the respondents, which were filled and returned. SPSS version 22.0 was used for the data analysis. The results showed that whereas 74.9% of the respondents had good knowledge of cardiopulmonary resuscitation, 65.2% of the respondents had practiced cardiopulmonary resuscitation on patients and 56.3% of the respondents had negative attitude towards it. Further analysis showed that knowledge of cardiopulmonary resuscitation had significant influence on its practice. The study concluded that majority of Nurses have good knowledge of cardiopulmonary resuscitation but only few of them had positive attitude towards its practice. Good knowledge influenced practice. The study showed that nurses have negative attitude towards CPR, it was recommended that the prevailing notion among nurses about cardiopulmonary resuscitation being a complex and time consuming process should be addressed through an intervention programme, to improve their

attitude towards cardiopulmonary resuscitation.

Another study conducted by Olateju & Amoran, (2014) on the knowledge and attitudes towards Basic cardiopulmonary resuscitation (CPR) among Community Nurses in Remo Area of Ogun State, Nigeria in Africa. It was a questionnaire-based cross-sectional study that involved 70 nurses with mean age of 40.2 ± 7.7 years were studied. None of the respondents who were unwilling to do mouth-to-mouth rescue breathing knew that compression alone could be life saving for a stranger or relative. Conclusively, knowledge of basic CPR amongst nurses at primary health care level is generally poor. This suggests the need for regular CPR training and re-training.

In a study conducted by Offiong et al., (2017) titled 'knowledge and practice of cardiopulmonary resuscitation among public health Nurses of Cross River state, Nigeria, in Africa'. Cardio- Pulmonary Resuscitation (CPR) is a lifesaving technique useful in many emergencies, and nurses' competence in this lifesaving procedure is a critical factor in patient outcome from cardiac arrest. However, studies reveal compelling evidences that suggest lack of competence in the performance of proper CPR among registered nurses. This study assessed the knowledge and practice of cardiopulmonary resuscitation among public health nurse practitioners in Calabar metropolis. The study employed a questionnaire-based cross sectional descriptive design. Purposive sampling technique was used to elicit information from 57 respondents. Findings revealed good knowledge of CPR but generally, very few nurses actually practise CPR. No significant relationship existed between knowledge and practice of cardiopulmonary resuscitation (cal. $r=0.090.05$). The need for training and retraining of Public Health Nurse Practitioners with the ultimate aim of equipping them with the requisite skills, methods or techniques of practicing cardiopulmonary resuscitation becomes imperative. More so, government should provide the necessary incentives, facilities and other enabling environment that will facilitates appropriate practice of cardiopulmonary resuscitation.

The study by Okonta & Okoh, (2015) on theoretical knowledge of cardiopulmonary resuscitation among clinical medical students in the University of Port Harcourt, Nigeria, in Africa was a cross-sectional study and the data collected were analysed using the Epi info version 7 statistical packages and Chi-square test was used to compare proportions with $P < 0.05$ considered significant. Results from the analysis revealed that two hundred and forty-five questionnaires were distributed with 177 (72.2%) duly filled. The male to female ratio was 1.5:1, the age range was 19-40 years with a mean of 24.50 ± 2.79 years. The 6th year class had 109 (61.6%) respondents, 5th year had 49 (27.7%) and 4th year had 19 (10.7%). Forty-six (26.0%) of students had some form of CPR training and 11 (6.2%) admitted having performed CPR. Of the 46 students that had CPR training, 39 (84.8%) did so because it was given to them at some point in their medical training, while 7 (15.5%) acquired the training due to personal interest. One hundred and two (74.6%) students scored <50%, while 45 (25.4%) scored >50%. The

number of students scoring >50% increased with increasing class level ($P < 0.001$). Students with some prior training in CPR (50.0%) scored above average compared to the students without CPR training (16.8%) ($P < 0.001$). It was however concluded that there is a need to periodically and constantly organize CPR for the medical students and incorporating the training in their medical curriculum to enhance better understanding of the procedure.

In a study conducted by Hirose et al., (2014) on the "effectiveness of a simplified cardiopulmonary resuscitation training program for non-medical staff of a university hospital' the authors explained that the 2010 Consensus on Science and Treatment Recommendations Statement recommended that short video/computer self-instruction courses, with minimal or no instructor coaching, combined with hands-on practice can be considered an effective alternative to instructor-led basic life support courses. The purpose of this study was to examine the effectiveness of a simplified cardiopulmonary resuscitation (CPR) training program for non-medical staff working at a university hospital. The method employed was that, before and immediately after a 45-min CPR training program consisting of instruction on chest compression and automated external defibrillator (AED) use with a personal training manikin, CPR skills were automatically recorded and evaluated. Participants' attitudes towards CPR were evaluated by a questionnaire survey. Results revealed that from September 2011 through March 2013, 161 participants attended the program. The researchers evaluated chest compression technique in 109 of these participants. The number of chest compressions delivered after the program versus that before was significantly greater ($110.8 \pm 13.0/\text{min}$ vs $94.2 \pm 27.4/\text{min}$, $p < 0.0001$), interruption of chest compressions was significantly shorter ($0.05 \pm 0.34 \text{ sec}/30 \text{ sec}$ vs $0.89 \pm 3.52 \text{ sec}/30 \text{ sec}$, $p < 0.05$), mean depth of chest compressions was significantly greater ($57.6 \pm 6.8 \text{ mm}$ vs $52.2 \pm 9.4 \text{ mm}$, $p < 0.0001$), and the proportion of incomplete chest compressions of <5 cm among all chest compressions was significantly decreased ($8.9 \pm 23.2\%$ vs $38.6 \pm 42.9\%$, $p < 0.0001$). Of the 159 participants who responded to the questionnaire survey after the program, the proportion of participants who answered 'I can check for a response,' 'I can perform chest compressions,' and 'I can absolutely or I think I can use an AED' increased versus that before the program (81.8% vs 19.5%, 77.4% vs 10.1%, 84.3% vs 23.3%, respectively). The study concluded that a 45-min simplified CPR training program on chest compression and AED use improved CPR quality and the attitude towards CPR and AED use of non-medical staff of a university hospital.

Empirical review on the Barriers to effective cardiopulmonary resuscitation

In a study conducted on the barriers to the success of cardiopulmonary resuscitation from the perspective of Iranian nurses: A qualitative content analysis (2021) conducted by Janatolmakan et al., (2021) explained that the survival rate following Cardiopulmonary Resuscitation (CPR) has been reported to be 7-26.7%. Various studies have shown that CPR failure is high in

many countries. This study was aimed to explore the barriers to the success of CPR from the perspective of Iranian nurses. The study employed 14 Iranian nurses as participants, recruited through purposive sampling. In-depth semi-structured interviews were used to collect data. Data were analyzed using qualitative content analysis. Results revealed that the barriers to successful CPR were developed in three main categories and nine subcategories. Some of the barriers to CPR success were: "delayed attendance of the CPR team and start of CPR", "inadequate experience and skill of the CPR team", "poor access to special units", "insufficient and deficient CPR equipment", "poor CPR location", "critical clinical conditions of the patient", and "interference of the patient's family members. The study concluded that human and environmental factors can result in CPR failure. These barriers can be minimized by measures such as empowerment of the CPR team, and providing the necessary facilities and equipment.

In a study conducted by Guteta, (2021) on the "Factors Affecting Cardiopulmonary Resuscitation Practice Among Nurses in Mizan Tepi University Teaching Hospital, Tepi General Hospital, and Gebretsadik Shawo Hospital, Southwest Ethiopia". It was explained that Cardiopulmonary resuscitation is one of the basic lifesaving medical procedures which is performed for a patient with an emergency such as cardiac arrest, suffocation, near-dying, or circumstance that results in cardiac or pulmonary failure or both. The objective of the study was to assess factors affecting the practice of cardiopulmonary resuscitation among nurses at Mizan Tepi University Teaching Hospital, Tepi General Hospital, and Gebretsadik Shawo, Hospital. The method employed was an Institution-based cross-sectional study which was supported by qualitative data conducted from March 20 to April 20, 2021. Nurses who answered ≥ 7 CPR practice questions correctly were considered to have good practice. Data were entered into EpiData version 4.4 and exported to SPSS version 23 for data analysis. A multivariable logistic regression model was fitted, adjusted odds ratio (AOR) at 95% confidence interval and p-value < 0.05 were estimated to determine the statistically significant association between predictors and outcome variable. Qualitative data were analyzed based on thematic content. Results revealed that, the prevalence of good practice towards CPR was 31.8% (95% CI: 27.5- 36.3) in the study area. Experience of 6- 10 years (AOR = 2.27, 95% CI: 1.25- 4.13) and > 10 years (AOR= 1.81, 95% CI: 1.10- 2.98), rarely (AOR = 3.77, 95% CI: 1.26- 11.30) or actively (AOR = 4.60, 95% CI: 1.51- 13.98) involved in CPR practice, assigned to emergency department (AOR = 1.02, 95% CI: 0.55- 1.90), having CPR good knowledge (AOR = 1.37, 95% CI: 0.28- 2.14) and having a nursing degree (AOR = 1.54, 95% CI: 0.93- 2.54) were predictors of CPR good practice. The study concluded that, Nurses' good practice towards cardiopulmonary resuscitation was low. Therefore, efforts should be taken to enhance nurses' practice towards cardiopulmonary resuscitation.

In a study conducted by Manono et al., (2015), titled institutional factors associated with effective cardiopulmonary resuscitation among health workers at

a County Referral Hospital in Kenya, Africa. A descriptive cross-sectional design was adopted with permission from the Institution to collect data. A total of 175 health care providers aged between 18-39 years that had served at the Nakuru County Referral Hospital for more than 6 months participated in the study while Students and staff on internship were excluded. Self-administered questionnaires were used. Which was pre-tested at Thika Level 5 hospital since it shared the same characteristics. Ambiguous questions were rephrased. Data analysis was done using SPSS computer software, version 24 while demographic data were analysed by descriptive statistics. The study reported inadequate staffing. The response was 92.5% with a majority 69.1% (n=112) being females. Basically (89.5%) of them were nurses, a profession where females are the majority. Respondents 18-29 years were 36.4% (n=59) while those aged between 30 and 39 years accounted for 32.1% (n=52). The mean age was 32 years. The vast majority of respondents were young (<40 years). Some respondents (51.9% (N=81), indicated that, they did not have all the necessary resources for CPR. Having a BLS/ACLS certificate (p=0.042), a refresher courses in the last 2 years (p=0.029) and necessary resources (p=0.034) was significant. All respondents had the minimum required level of education for their profession, i.e., 52.8% (n=85) had acquired a diploma in nursing while 31.7% (n=51) had a bachelor's degree. All cadres of health workers participated spreading out across the various departments at the study site. The medical ward had 25.9% (n=42) while 24.7% (n=40) worked in the surgical ward. In conclusion, the study confirmed that, institutional factors influence effective Cardiopulmonary Resuscitation. Effective CPR improves the patients' outcomes reducing mortality related to cardiac arrest (CA). Early detection of cardiopulmonary arrest and initiation of CPR greatly influence the outcomes of CPR. Lack of debriefing following CPR among Health workers contribute to ineffective and repeated mistakes when conducting CPR. Understaffing in the hospital setting limits the number of personnel who assist in the practice. The fatigue experienced by the rescuer prevents optimal chest compression. The sub-Saharan region lacks documented information to enlighten the public about the problem. It was however, recommended that, Hospital administrators should guarantee the provision of both human and material resources. Policy makers ought come up with policies to ensure that, all staff members are trained on CPR protocols.

In another study conducted by Akbani et al., (2021) titled 'Barriers to the successes of Cardiopulmonary resuscitation from the perspective of emergency medical providers in Iran'. The study was aimed to identify the barriers to successful CPR from the perspective of Emergency Medical Service (EMS) providers as Cardiopulmonary resuscitation (CPR) is an integral part of prehospital emergency care. The study employed a cross-sectional analytical study which was used in conducting the study from May 2015 to Jan 2016. One hundred and sixty EMS providers who were employed at EMS affiliated to Birjand University of Medical Sciences (Iran) were selected through simple random sampling. The data were collected using a

researcher-made questionnaire (60 questions) categorized in six subscales. Study data were analyzed by SPSS and descriptive (frequency, mean, and standard deviation), and inferential statistics (t-test and ANOVA). Results revealed that, among the subscales of barriers to successful CPR from the perspective of EMS providers, the EMS structure subscale was the most important (3.06 ± 0.38 , out of a 0 - 4 range). In this subscale, public inaccessibility automated external defibrillator (AED) (3.59 ± 0.49) and Lack of telephone-CPR advice by the dispatcher (3.58 ± 0.55) were the most important barriers, respectively. There was a significant difference between the mean score of barriers to successful CPR and educational status, which increased in EMS providers with BS degree ($P = 0.003$). There was no significant difference between the mean score of barriers to successful CPR compared to the other demographic characteristics of EMS providers ($P > 0.05$). The research concluded that EMS providers perceived public inaccessibility of AED and Lack of telephone-CPR training as the most important barriers to successful CPR in prehospital emergency care. Therefore, public access to AED must be emphasized to promote immediate response and improve CPR's outcome in EMS. Moreover, telephone-CPR training by dispatchers should be recommended to help increase the success of CPR.

In a study conducted by Amoako-Mensah et al., (2023) on the "Perceptions of Nurses regarding quality of adult cardiopulmonary resuscitation in Ghana: a qualitative study. The study explained that Cardiopulmonary resuscitation (CPR) is a necessary life-saving emergency intervention for patients with cardiac arrest and other medical conditions. The study's primary objective was to qualitatively explore nurses' perceptions of the quality of adult cardiopulmonary resuscitation in Ghana. The method employed was an exploratory descriptive qualitative study was conducted among 13 purposively sampled nurses in Ghana. Thirteen face-to-face and telephone interviews were conducted using a semi-structured interview guide. Data were transcribed verbatim and analyzed using the thematic analysis approach recommended by Braun and Clarke. Results revealed that, nurses were filled with positive emotions when patients regained consciousness following resuscitation. When the otherwise happens, they tend to become tortured psychologically and filled with negative emotions. Besides, environmental factors such as the time of initiating CPR following a cardiac arrest, the availability and appropriateness of equipment and medications, workplace ergonomics, and institutional regulations affected the quality of resuscitation practices of nurses. Participants perceived that attitudes of condemnation, prejudice, apathy and skills deficiency also impacted the quality of resuscitation practices. Significant aspects of self-reported behavioural competence that affected resuscitation were knowledge and skills of CPR, confidence in initiating CPR, and the need for effort maximization. The study concluded that, several non-medical factors that influenced the resuscitation practices of nurses from their perspective. Nurses need to maximize their effort toward seeking further education in specialty areas such as emergency nursing and critical care nursing to guide their CPR practices and

other newly emerging evidence-based protocols.

In another study conducted by Aina et al., (2022) on Cardiopulmonary Resuscitation among Nursing Staff at a Tertiary Health Facility in Nigeria: A Cross- Sectional Study. They explained that Cardiopulmonary Resuscitation (CPR) is an emergency life-saving care to restore blood circulation following cardiac arrest. Nurses are often the closest when cardiac arrest occurs, thus their competence and initiation of CPR could be life-saving. The aim of the study was to evaluate nurse practitioners' knowledge, attitude, and willingness to initiate CPR. A cross-sectional study was conducted; participants were nursing staff at the University of Ilorin Teaching Hospital, Ilorin, Nigeria. Nursing students and other healthcare workers were excluded from the study. Multistage sampling method was used and all participants completed a self-administered questionnaire after informed consent. Data analysis was with SPSS version 21.0 and $p < 0.05$ was significant. Results revealed that among the 220 participants, 35(15.9%) were ≤ 5 years post-qualification, 100(45.5%) had sub-specialty training, awareness about CPR, 100%, 66(30%) showed good knowledge on the practice of CPR, 154(70%) had formal training on CPR, 112 (50.9%) of the training were during schooling while 182(82.7%) showed good attitude towards initiating CPR when indicated. Hindrances to initiation of CPR included lack of training (56.2%), heavy workload (47.3%), inadequate knowledge (42.8%), lack of equipment (41.8 %,) and difficulty establishing a diagnosis of cardiac arrest (13.9%). Competence grading for CPR was 48.4% for participants with surgical, 40.0% for medical subspecialty training, and 44.2% for non-subspecialists. There was a statistically significant relationship between competence in CPR and knowledge about it ($p=0.026$). The study was concluded that Knowledge and practice of CPR among nurses were low; health institutions and the mandatory nursing professional development programs should prioritize post-qualification training of nurses in the life-saving skills of CPR.

Mersha et al., (2020), Factors associated with knowledge and attitude towards adult cardiopulmonary resuscitation among healthcare professionals at the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia: an institutional-based cross-sectional study. The objective of the study was to assess the factors associated with knowledge and attitude towards adult cardiopulmonary resuscitation (CPR) among health professionals at the University of Gondar Hospital, Northwest Ethiopia. An institutional-based cross-sectional study was conducted from 15 February to 15 March 2018. Both bivariable and multivariable logistic regression analyses were used to identify factors associated with knowledge and attitude level of health professionals towards CPR. Variables with a p value less than <0.2 in the bivariable analysis was fitted into the multivariable analysis. In the multivariable analysis, variables with a p value <0.05 were considered statistically significant. A total of 406 health professionals (physicians, nurses, anaesthetists, health officers and midwives) were included. Results revealed that among the study participants, 25.1% (95% CI 21.2 to 29.3) had good knowledge and 60.8% (95% CI

55.9 to 65.5) had good attitude towards adult CPR. Work experience (adjusted OR (AOR): 5.02, 95%CI 1.25 to 20.20), number of work settings (AOR: 6.52, 95%CI 2.76 to 15.41), taking CPR training (AOR: 2.76, 95%CI 1.40 to 5.42), exposure to cardiac arrest case (AOR: 2.16, 95%CI 1.14 to 4.07) and reading CPR guidelines (AOR: 5.57, 95%CI 2.76 to 11.20) were positively associated with good knowledge. Similarly, taking CPR training (AOR: 1.74, 95%CI 1.42 to 1.53) and reading CPR guidelines (AOR: 2.74, 95%CI 1.55 to 4.85) were positively associated with good attitude. The study concluded that the level of knowledge and attitude of health professionals towards adult CPR was suboptimal. Health professionals who were taking CPR training and reading CPR guidelines had good knowledge and attitude towards CPR. In addition, work experience, number of work settings and exposure to cardiac arrest case had a positive association with CPR knowledge. Thus, providing regular CPR training and work setting rotations is highly crucial.

Dobbie et al., (2020), 'Barriers to bystander CPR in deprived communities: Findings from a qualitative study'. The aim of the study was to examine the barriers to administering BCPR in deprived communities. The study employed a mixed method qualitative study with ten single sex focus groups (n=61) conducted in deprived communities across central Scotland and 18 semi-structured interviews with stakeholders from the UK, Europe and the USA. The results obtained revealed that two key themes related to confidence and environmental factors were identified to summarize the perceived barriers to administering BCPR in deprived communities. Barriers related to confidence included: self-efficacy; knowledge and awareness of how, and when, to administer CPR; accessing CPR training; having previous experience of administering BCPR; who required CPR; and whether the bystander was physically fit to give CPR. Environmental barriers focused on the safety of the physical environment in which people lived, and fear of reprisal from gangs or the police. The study conducted that barriers to administering BCPR identified in the general population are relevant to people living in deprived communities but are exacerbated by a range of contextual, individual and environmental factors. A one-size-fits-all approach is not sufficient to promote 'CPR readiness' in deprived communities. Future approaches to working with disadvantaged communities should be tailored to the local community.

In another study conducted by Sasson et al., (2014) with the title of the study 'Barriers to Calling 911 and Learning and Performing Cardiopulmonary Resuscitation for Residents, Latino, High-Risk Neighborhoods in Denver, Colorado'. Individuals in neighborhoods composed of minority and lower socioeconomic status populations are more likely to have an out-of-hospital cardiac arrest event, less likely to have bystander cardiopulmonary resuscitation (CPR) performed, and less likely to survive. Latino cardiac arrest victims are 30% less likely than whites to have bystander CPR performed. Six focus groups and 9 key informant interviews were conducted in Denver during the summer of 2012. Purposeful and snowball sampling was used, conducted by community

liaisons, to recruit participants. Two reviewers analyzed the data to identify recurrent and unifying themes. A qualitative content analysis was used with a 5-stage iterative process to analyze each transcript. Six key barriers to calling 911 were identified: fear of becoming involved because of distrust of law enforcement, financial, immigration status, lack of recognition of cardiac arrest event, language, and violence. Seven cultural barriers were identified that may preclude performance of bystander CPR: age, sex, immigration status, language, racism, strangers, and fear of touching someone. Participants suggested that increasing availability of tailored education in Spanish, increasing the number of bilingual 911 dispatchers, and policy-level changes, including CPR as a requirement for graduation and strengthening Good Samaritan laws, may serve as potential facilitators in increasing the provision of bystander CPR. Distrust of law enforcement, language concerns, lack of recognition of cardiac arrest, and financial issues must be addressed when community-based CPR educational programs for Latinos are implemented.

Summary of the Review

Cardiopulmonary resuscitation (CPR) is a very critical practise in the healthcare setting. It is a medical procedure involving repeated cycles of compression of the chest and artificial respiration performed to maintain blood circulation and oxygenation in a person who has suffered cardiac arrest. And cardiac arrest is a sudden cessation of the normal circulation of blood due to failure of the heart to pump effectively. World Health Organization (WHO) recommends CPR to be initiated within the first three (3) minutes of an arrest. Many health care professionals lack the basic knowledge of cardiopulmonary resuscitation and sometimes the practice of cardiopulmonary resuscitation is also not effectively carried out which contributes to the increased rate of death among patients with sudden cardiac arrest. It makes the family to suffer great loss and financial implications if the victim is the bread winner. It increases mortality rate and also brings bad image to the hospital,

Relevant literatures were reviewed in this study on cardiopulmonary resuscitation and the importance of acquiring the basic knowledge among Nurses and practicing it as first respondents in cases of patient's cardiac arrest which is critical in patient's survival rate. The review of literature supported the current study and established a foundation that permitted the construction of the research.

The theoretical framework of the study employed Becker & Rosenstock model which was used as an explanatory model for the study. Becker & Roseenstock model explained its objective principle in training of nurses on cardiopulmonary resuscitation and motivating them to practicing it as the occasion demands, which will go a long way in preventing untimely death arrest among adults and children in the society. The model further adduced that Nurses in the university of Port Harcourt Teaching Hospital, Port Harcourt Rivers state, Nigeria should be encouraged to take responsibility for their patients' health by knowing and practicing

cardiopulmonary resuscitation when the need arises. In every healthcare setting, nurses have a common vision to protect and promote patients' health, no matter what the patient's nationality. Thus, it is required that nurses are competent enough to provide high-quality services that meet international standards. Adaptation or implementation of these theories will be of great importance to Nurses.

Relevant empirical reviews were also reviewed in line with the study which exposes the lack of the knowledge and practice of cardiopulmonary resuscitation among nurses for patients with cardiac arrest. From the literatures reviewed above, it can be observed that there is little or study conducted in the same topic or setting as the current study, even the only study in literature conducted by Okonta & Okoh (2015) was on the theoretical knowledge of cardiopulmonary resuscitation among clinical medical students in the University of Port Harcourt, this therefore proves that there is a gap in knowledge. Thus the need for this study; knowledge and practice of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state, Nigeria. Overall, the research aimed to provide insights into the gap between nurses' knowledge of CPR and their actual practice, while considering the influence of the Health Belief Model. The findings of this study could inform strategies to bridge this gap by addressing knowledge deficits, enhancing nurses' self-efficacy and confidence in CPR skills, and mitigating perceived barriers. Ultimately, improving nurses' knowledge and practice of CPR has the potential to enhance patient care and outcomes during cardiac arrest events in the University of Port Harcourt Teaching Hospital.

Research Methodology

Research Design: The study will adopt a descriptive survey to assess the knowledge and practice of cardiopulmonary resuscitation among Nurses in the University of Port Harcourt Teaching Hospital, Port Harcourt. Descriptive research design describes the characteristics of the population or phenomenon that is being studied, focuses more on the "what" of the research subject rather than the "why" of the research Subject (Shields & Rangarajan, 2013).

Study setting:

The setting of the study was the university of Port Harcourt Teaching Hospital, Port Harcourt. The University of Port Harcourt Teaching Hospital (UPTH) is located along the East West Road. It is a major tertiary-health care teaching and research facility in Rivers state, South of Nigeria. University of Port Harcourt Teaching Hospital originally commenced its operations in 1980 and was officially commissioned by the federal government in 1985. When it started, there were only 60 beds in use. After relocating to its permanent site in 2006, the hospital's capacity later expanded to 891 beds as at the time of carrying out this research study.

University of Port Harcourt Teaching Hospital is managed through a three-tier managerial system consisting - the Board of Management, Hospital Management Committee

(HMC) and the Head of Departments. More than 200,000 patients are seen annually in both the outpatient and inpatient settings, as well as over 3000 surgical operations carried out annually. The average bed occupancy rate per annum is at above 80%. Besides offering medical services, the hospital also provides clinical education and training to students, nurses, and other healthcare professionals.

Nursing department consist of the highest employee of staff in the hospital and they work in various wards of the hospital where they attend to cardiac arrest victims almost on daily basis like the Accident and Emergency department, Intensive Care unit, Medical wards, urology ward, orthopaedic wards, Obstetrics and Gynaecological wards, surgical wards, theatre, just to mention but a few. There are also other health care professionals like the Doctors with diverse specialties, laboratory scientist, just to mention but a few.

Target Population:

The target Population consisted of all Nurses that were currently employed and working in the university of Port Harcourt Teaching Hospital, Port Harcourt as at the time of the study. According to the Nursing Audit statistics (2023), there were 776 (seven hundred and seventy-six) Nurses working in the hospital.

Sampling (size and formula)

According to the University of Port Harcourt Teaching Hospital Nursing statistics (2023), total number of Nurses were seven hundred and seventy-six (776). The sample from the population was derived using Taro Yamane's (1973) simplified formula to determine the sample size which was stated as follows;

$$n = N/(1+N(e)^2)$$

Where n = the sample size for a population less than 10,000
 N = population size for the study
 e = the margin of error or level of significance which is constant at 10%, 5% or 1% i.e. 0.1, 0.05 or 0.01 respectively

Thus using a level of margin of 10% and population of 450

$$n = \frac{776}{1 + 776(0.1)^2}$$

$$n = 88.5$$

$$n \text{ is approximately } 89$$

Applying a 10% non-respondent level (10% of 89 = 8.9), therefore the sample size will be appropriately 98 Nursing staff, working at the University of Port Harcourt Teaching Hospital, Port Harcourt.

Sampling Technique

Non-probability convenience sampling technique was employed for the study, which was the easiest method of sampling in the study as the participants were simply selected based on fact that, they are work in the university of Port Harcourt Teaching Hospital. i.e. only those nursing staffs on duty during the field work and

were willing to participate in the study were selected.

Instrument for data collection

A self-structured questionnaire titled “Knowledge and Practice of Cardiopulmonary Resuscitation Questionnaire (KPCRQ)” was used for data collection in this study. It was divided into 4 sections, Sections A, B, C and D.

The first section (section A) has 5 (five) items which was used to obtain information on the demographic data of the respondents.

Sections B consist of 7 (seven) response items regarding the knowledge of the respondents regarding cardiopulmonary resuscitation.

Section C consist 12 (twelve) of response items regarding the practice of respondents on cardiopulmonary resuscitation,

Section D consist of 9 (nine) response items regarding the factors and barriers that can influence cardiopulmonary resuscitation.

Validity of the Instrument

The instrument was validated by matching its content with the research objectives and research questions to ensure congruency. The researchers, then scrutinized it and made necessary corrections after which it was submitted to two experts' cardiac nurses and accident/Emergency nurses, and a cardiologist in the hospital of study for scrutiny to make sure it measures what it is meant to measure. This is to ensure face and content validity and to remove any question that is ambiguous.

Also, the face validity of the instruments was further validated and the instrument was checked for the appropriateness of each item in terms of language use as well as the suitability of the questions for inclusion in the instrument. Corrections was made as it was deemed fit. The corrections or suggestions by the experts were incorporated into producing the final version of the instrument.

Reliability of the Research Instrument

The reliability of the instrument was carried out using a pilot study on 20 nurses working in another tertiary hospital in Rivers state (the Rivers State University Teaching Hospital- RSUTH). Data was collated and analysed and relevant adjustments made before being administered to the actual research samples.

Method of data collection

Nurses that were working in the University of Port Harcourt Teaching Hospital, Port Harcourt during the period of study provided the responses that was used for the study. Questionnaires were administered to the respondents after ethical clearance was obtained and time was given for the respondents to fill the questionnaire, same retrieved on the spot after filling to ensure 100% return of questionnaire.

Method of Data Analysis

Data collected in the study was analysed using Statistical

Package for Social Sciences (SPSS) version 24 and findings were presented using percentages, frequency distribution tables, charts and graphs.

Ethical consideration

A letter of introduction was then presented to the Research and Ethical committee of the University of Port Harcourt Teaching Hospital, Port Harcourt to enable me obtain ethical clearance which enabled me during the fieldwork; to administer my questionnaire after explanation of the purpose of the research to the Respondents, while ensuring that confidentiality and anonymity was maintained throughout the period of the study. The respondents were given 2 hours to fill the questionnaires before retrieving the questionnaire from them, to ensure that hundred (100) percent of the questionnaire were returned.

Results and Presentations

This chapter dealt with data analysis and presentation obtained from specific questions in the questionnaire which seek to provide answers to the objectives and research questions of the study. For orderliness and more understanding, data presentation and analysis are done simultaneously.

Results

Respondents Demographic Data

Table 1: Showing Respondents Demographic Data Based On Gender

S/NO	Sex	Frequency	Percentage (%)
1	Male	1	1.0
	Female	97	99.0
	Total	98	100

Source: Author Field survey (Sept., 2023).

The above table shows that out of the 98 respondents, only 1 (1.0%) is a male while the majority 97 (99.0%) are female.

Figure 1: Showing Respondents Demographic Data Based On Gender

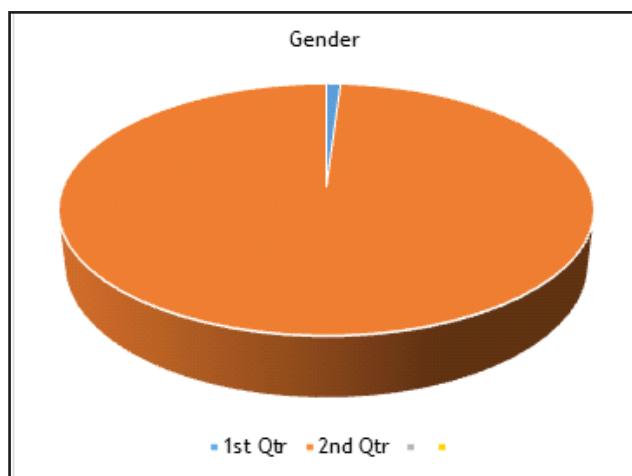


Table 2 Demographic Data showing the age group of the respondents

S/NO	Age-Groups	Frequency	Percentage (%)
2	20-30years	20	20.4
	31-40years	45	45.9
	41-50years	20	20.4
	51-60years	13	13.3
	Total	98	100%

Source: Author Field survey (Sept., 2023).

The above table indicates that out of the 98 respondents, majority were within the age range of 31-40years 45 (45.9%), 20 (20.4%) were between ages 20-30years, 20 (20.4%) of them were between ages 41-50years and 13 (13.3%) of the respondents are between the ages of 51-60years.

Figure 2: showing the age group of Respondents

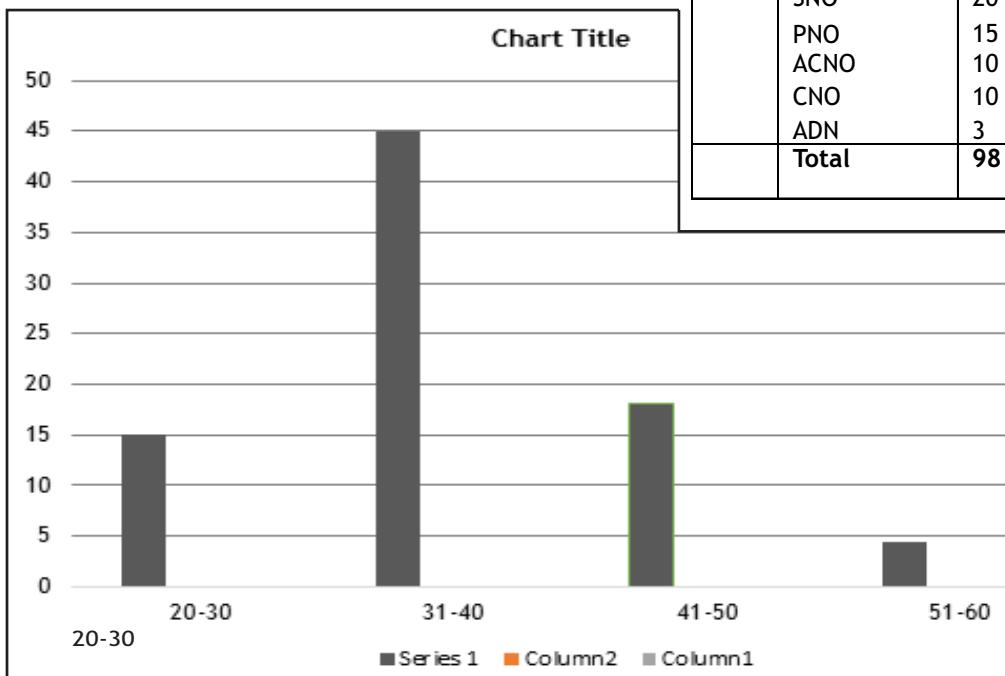


Table 3: Demographic Data showing the Years of experience of the respondents

S/NO	Years of experience	Frequency	Percentage (%)
3.	1-10years	15	15.3
	11-20years	55	56.1
	21 and above	28	28.6
	Total	98	100%

Source: Author Field survey (Sept., 2023).

The table above on the years of working experiences of respondents shows that, 15 (15.3%) had 1–10yrs representing, 56.1% had 11-20years working experience, and 28 (28.6%) had 21 and above years of working experience.

Figure 3: showing the years of working experiences of the respondents

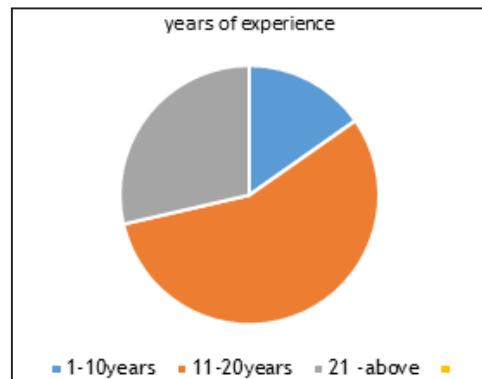


Table 4: Demographic Data showing the cadre of the respondents

S/NO	cadre of respondents	Frequency	Percentage (%)
4	N011	15	15.3
	N01	25	25.5
	SNO	20	20.4
	PNO	15	15.3
	ACNO	10	10.2
	CNO	10	10.2
	ADN	3	3.1
	Total	98	100

Source: Author Field survey (Sept., 2023).

Cadre of Nurses shows that, majority of the nurses were N011- 30 representing (30.6%), N01 -25 (25.5%), SNO 13 (13.3%), PNO 5 (5.1%), ACNO 5 (5.1%), CNO 10 (10.2%), ADN 10(10.2%)

Figure 4: Distribution of respondents according to Nurses Cadre

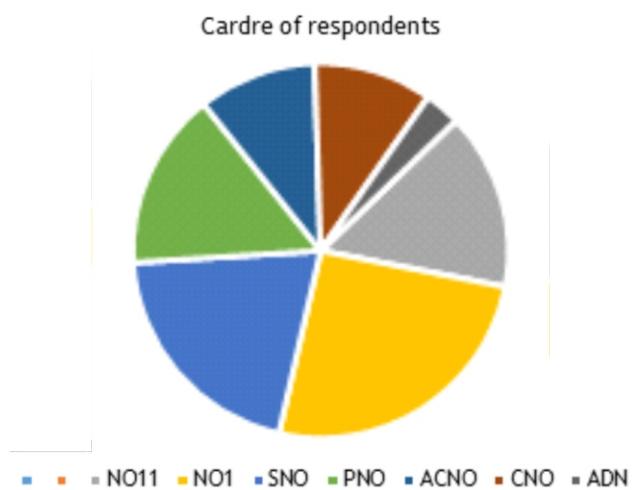


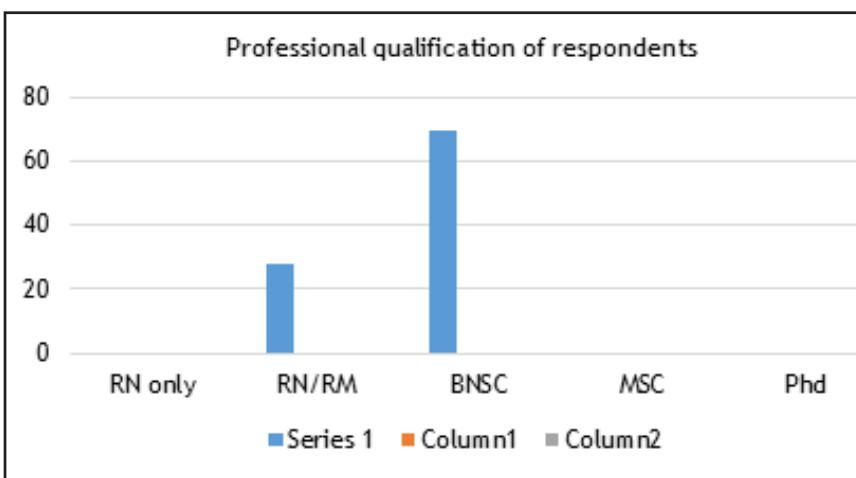
Table 5 showing the educational qualification of the respondents

S/NO	Educational qualification of the respondents	Frequency	Percentage (%)
5	RN only	nil	0
	Nurse/ Midwife	28	28.57
	B.NSC	70	71.43
	M.Sc.	Nil	0
	Ph.D.	Nil	0
	Total	100	

Source: Author's field survey (Sept., 2023)

From table 6 above educational Qualifications of the respondents shows that the majority are B. NSC holders 70 representing (71.43%), MSc (0%) and Ph.D. 0 (0%), RN only 0 (0%) and RN/RM -28 (28.57%)

Figure 5: showing the educational qualification of the respondents



Analysis of Research Questions

Research Question One: What is the level of knowledge of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state?

Table 7: showing the participants responses and analysis on the level of knowledge of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state.

S/No	Variables	Parameters	Frequency	Percentages (%)
7	Have you been trained on CPR before?	Yes	25	25.5
		No	73	74.5
		Total	98	100%
8	Is Cardiopulmonary resuscitation applied to patients with cardiac arrest?	yes	98	100
		No	0	0
		Total	98	100%
9	Is Cardiopulmonary resuscitation applied on a victim with pulse?	yes	78	79.6
		No	20	20.4
		Total	98	100

Table 7 showed that only 25(25.5%) of respondents had received training on CPR. 98(98%) of respondents correctly said that Cardiopulmonary resuscitation is carried out on victims with cardiac arrest.

78 (79.6 %) said that, cardiopulmonary resuscitation is not carried out on patients with pulse. 58 (59.18) agreed that they would check if a collapsed person is conscious or not by calling out on the patient and tapping on the victim's shoulder to find out if a person that collapsed is conscious or not. 51 (52.04) respondents said they will place their hand on the neck of a person who collapsed to see if there is a pulse. Also, 88 (89. 8%) of the respondents correctly said critical lifesaving steps of cardiopulmonary resuscitation are immediate recognition of danger signs and activation of the emergency response system, and early CPR and rapid defibrillation for shockable rhythms are the key steps in saving the lives of cardiac arrest victims.

And 72 (73.47%) agreed that they will begin chest compression and send someone to call for help if they confirm that a collapsed victim is unconscious, not breathing and has no pulse.

Summary

85.71 percentage of Nurses have good knowledge of cardiopulmonary resuscitation and 14.29 % of Nurses have poor knowledge of cardiopulmonary resuscitation.

In order to answer research question one, what is the level of knowledge of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state?

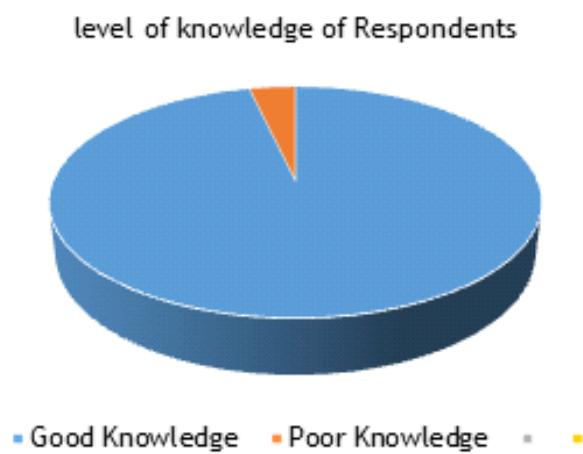
It can be said from the above results that most participants have the knowledge of cardiopulmonary resuscitation but some Nurses still lack the knowledge of cardiopulmonary resuscitation.

Therefore, there is still some level of suboptimal knowledge of Cardiopulmonary Resuscitation (CPR) protocols techniques and guidelines among some Nurses working in the University of Port Harcourt Teaching Hospital, Port Harcourt.

10	To check for consciousness in a collapsed victim, is it right to shake the person and shout loudly, Are you Okay?	Yes No	58 40	59.18 40.82
		Total	98	100%
11	Is 10seconds enough time to check for breathing in an unresponsive victim in cardiac arrest?	Yes	51	52.04
		No	47	47.96
		Total	98	100
12	Critical lifesaving steps of cardiopulmonary resuscitation are immediate recognition of danger signs and activation of the emergency response system, early CPR and rapid defibrillation for shockable rhythms	Yes No	88 10	89.8 10.2
		Total	98	100%
13	Will you begin chest compression and send someone to call for help if you confirm that a collapsed victim is unconscious, not breathing and has no pulse?	Yes No	72 26	73.47 26.53
		Total	98	100

Source: Author's field survey (Sept., 2023)

Figure 6 shows the overall level of knowledge of Respondents



Research Question Two: What is the level of practice of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state?

Table 7 showed that 50(51.02%) respondents agreed that they have practiced CPR on a cardiac arrest victim before. 38 (38.78%) accepted that lack of practice of CPR is as a result of lack of knowledge about CPR procedure.

50 (51.02%) accepted that they are very confidence in performing high-quality CPR., 50 (51.02%) agreed that they can perform CPR on any cardiac arrest victim because the training has become part of them since they have the formal training and experience in CPR

75 (76.55%) accepted that they can perform CPR on any cardiac arrest victim because the training has become part of them since they have the formal training in CPR.

70 (71.43%) correctly identified that during CPR, the victim's head should be positioned by applying the 'head tilt-chin lift' technique to open the airway. 63 (64.29%) responded yes to that the correct rate of cardiopulmonary resuscitation in adults is 100-120 compressions per minute.

78 (79.59%) of the respondents correctly identified that the correct rate of cardiopulmonary resuscitation in children is 100-120 compressions per minute. 65(66.33%) correctly identified that the recommended CPR compression depth for adult Victim in cardiac arrest as per current guidelines is 2-2.4 inches (5-6 cm).

60 (61.22%) correctly identified that the recommended compression-to-ventilation ratio for adult CPR when there are two rescuers are 15:2. 63 (64.29%) correctly identified that the correct ratio of cardiopulmonary resuscitation (Compression: Ventilation Ratio) for an adult when there is a single rescuer is 30:2.

60 (61.22%) correctly identified that the correct rate of cardiopulmonary resuscitation in children is 100-120 compressions per minute. 63 (64.29%) correctly identified that the correct ratio of cardiopulmonary resuscitation (Compression: Ventilation Ratio) for an adult when there is a single rescuer is 30:2. 60 (61.22) correctly identified that the correct method of chest compression for a child is the use of the heel of the hand and giving compressions at the rate of 100 -120 compressions per minute.

Table 7: showing the participant responses and analysis of the level of practice of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state. Source: Author's field survey (Sept., 2023)

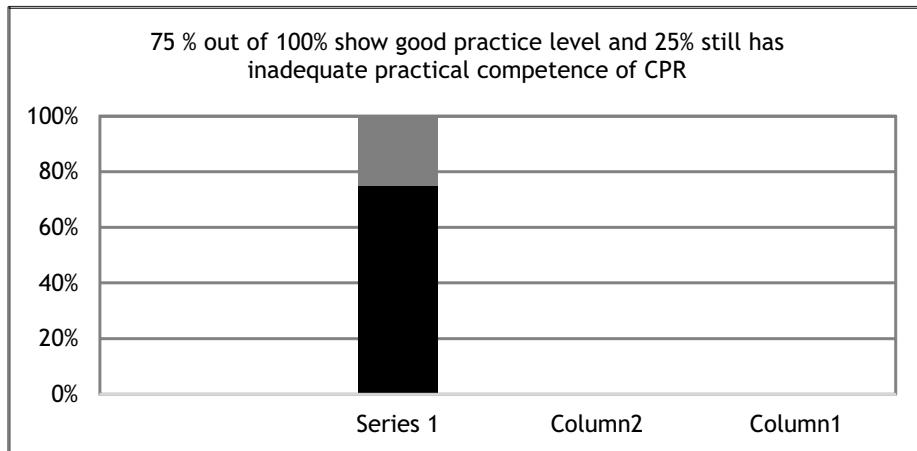
S/No	Variables	Parameters	Frequency	Percentages (%)
14	Have you practiced CPR on a cardiac arrest victim before	Yes No	50 48	51.02 48.98
		Total	98	100%
15	Is lack of practice of CPR as a result of lack of knowledge about CPR procedure?	yes No	38 60	38.78 61.22
			98	100
16	Are you very confident in performing high -quality CPR?	Yes No	50 48	51.02 48.98
			98	100
17	Can you perform CPR on any cardiac arrest victim?	Yes No	50 48	51.02 48.98
			98	100
18	When performing Chest compressions, are the hands of the rescuer supposed to be placed over the upper part of the sternum (breastbone) in an adult victim?	Yes No	75 23	76.53 23.47
		Total	98	100
19	During CPR, to open the airway, is the victim to be positioned on a flat surface and the mouth opened by applying the "head tilt -chin lift" technique?	yes No	70 28	71.43 28.57
		Total	98	100
20	The correct rate of cardiopulmonary resuscitation in adults is 100-120 compressions per minute	Yes No	63 35	64.29 35.71
		Total	98	100
21	Is the correct rate of cardiopulmonary resuscitation in children 100 -120 compressions per minute?	Yes No	78 20	79.59 20.41
		Total	98	100
22	Is the recommended CPR compression depth for adult Victim in cardiac arrest as per current guidelines 2-2.4 inches (5-6 cm)	No Yes	65 23	66.33 23.47
		Total	98	100
23	Is the recommended compression -to-ventilation ratio for adult CPR when there are two rescuers 15:2?	Yes No	60 38	61.22 38.78
		Total	98	100
24	Is the correct ratio of cardiopulmonary resuscitation (Compression: Ventilation Ratio) for an adult when there is a single rescuer 30:2?	Yes No	63 25	64.29 25.51
		Total	98	100
25	Does the correct method of chest compression for a child make use of the heel of the hand with a compression rate of 100 -120 compressions per minute?	No Yes	60 38	61.22 38.78
		Total	98	100

Source: Researcher's Field survey (September, 2023)

And 60 (61.22%) correctly identified that the correct method of chest compression for a child is the use of the heel of the hand and giving compressions at the rate of 100 -120 compressions per minute

Summary

75% of the respondents have good level of practice of cardiopulmonary resuscitation and 25% of respondents have poor level of practice of cardiopulmonary resuscitation skills

Figure 7 showing the overall level of practice of the respondents

In order to answer research question two, what is the level of practice of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state? It can be said that, there is still some level of inadequate proficiency or insufficient practical competence in implementing Cardiopulmonary (CPR) techniques and protocols among Nurses working in the University of Port Harcourt Teaching Hospital, Port Harcourt, Port Harcourt.

Research Question 3: What are the factors and barriers influencing the effective cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state?

S/No	Variables	Parameters	Frequency	Percentages (%)
26	CPR training and knowledge of Cardiopulmonary Resuscitation are key factors to the practice of CPR	Yes No	98 0	100 0
		Total	98	100%
27	Bystander hesitation to initiate CPR is a factor that affect the outcome of CPR	Yes No	80 18	81.63 18.37
		Total	98	100
28	Discomfort with mouth to mouth resuscitation is a reason why some rescuers do not engage in the practice of CPR	Yes No	80 18	81.63 18.37
		Total	98	100
29	CPR is time consuming and this is the reason why rescuers do not engage in it.	Yes No	78 20	79.60 20.40
		Total	98	100
30	CPR causes fatigue and there is perceived difficulty in carrying out CPR	Yes No	28 70	20.40 79.60
		Total	98	100
31	Carrying out CPR on victims that are rushed into the hospital is against the hospital policy	Yes No	40 58	40.82 59.18
		Total	98	100
32	CPR equipment availability and accessibility can discourage Healthcare workers from practicing CPR	Yes No	78 20	79.59 20.41
		Total	98	100
33	Legal concerns and liability can affect the ability of a nurse to perform CPR	Yes No	60 38	
		Total	98	100
34	Communication and coordination among team members can affect the effective practice of Cardiopulmonary resuscitation	Yes No	75 23	76.53 23.47
		Total	98	100

Source: Author's field survey (Sept., 2023)

From the above table, the following are factors that act as barriers to the cardiopulmonary resuscitations as correctly identified by the respondents: Lack of training and knowledge of Cardiopulmonary Resuscitation are key factors to the practice of CPR with acceptable level

of 98 (100%). 80 (81.63%) identified that Bystander hesitation to initiate CPR is a factor that affect the outcome of CPR. 80 (81.63%) identified that discomfort with mouth to mouth resuscitation is a reason why I do not engage in the practice of CPR.

78 (79.59%) identified that CPR equipment availability and accessibility can discourage me from practicing CPR. 60 (61.22%) Legal concerns and liability can affect the ability of a nurse to perform CPR and 75 (76.5 %) identified that communication and coordination among team members can affect the effective practice of Cardiopulmonary resuscitation.

In order to answer research question 3: What are the factors and barriers influencing the effective cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state? It can be said that, lack of training and knowledge of cardiopulmonary resuscitation, bystander's hesitation to initiate CPR can affect the practice and outcome of CPR, discomfort with mouth to mouth resuscitation is a reason why some participants do not engage in the practice of CPR. Again, CPR equipment availability and accessibility can discourage health care providers from practicing CPR and lack communication and coordination among team members can affect the effective practice of cardiopulmonary resuscitation.

Discussion of findings

Discussion of Major Key Findings:

Out of the 98 respondents, only 1 (1.0%) is a male while the majority 97 (99.0%) are female. Out of the 98 respondents, majority were within the age range of 31-40years 45 (45.9%), 20 (20.4%) were between ages 20-30years, 20 (20.4%) of them were between ages 41-50years and 13 (13.3%) of the respondents are between the ages of 51-60years. 15 (15.3%) had 1-10yrs representing, 56.1% had 11-20years working experience, and 28 (28.6%) had 21 and above years of working experience.

Majority of the nurses were N011- 30 representing (30.6%), N01 -25 (25.5%), SNO 13 (13.3%), PNO 5 (5.1%), ACNO 5 (5.1%), CNO 10 (10.2%), ADN 10(10. 2%). The educational Qualifications of the respondents showed that the majority are B.N. Sc holders (70 representing 71.43%), RN/RM -28 (28.57%), MSc (0%) and Ph.D. 0 (0%), and also RN only 0 (0%). 73(74.49%) of the respondents have not received formal training on cardiopulmonary Resuscitation (CPR) whereas 25 representing 25.51% have received formal training on CPR and also have been certified.

85.71 percentage of Nurses have good knowledge of cardiopulmonary resuscitation, while 14.29 % of Nurses have poor knowledge of cardiopulmonary resuscitation. 75% of the respondents have good level of practice of cardiopulmonary resuscitation and 25% of respondents have poor level of practice of cardiopulmonary resuscitation skills.

Also, the following factors were identified as barriers to the cardiopulmonary resuscitations: Lack of training and knowledge of Cardiopulmonary Resuscitation are key factors to the practice of CPR with acceptable level of 98 (100%). 80 (81.63%) identified that Bystander hesitation to initiate CPR is a factor that affect the outcome of CPR. 80 (81.63%) identified that discomfort with mouth to

mouth resuscitation is a reason why they do not engage in the practice of CPR. 78 (79.59%) identified that CPR equipment availability and accessibility can discourage them from practicing CPR. 60 (61.22%) of the respondents feels that there is legal concerns and liability that can affect the ability of a nurse to perform CPR and 75 (76.5 %) identified that communication and coordination among team members can affect the effective practice of Cardiopulmonary resuscitation.

Implication of Findings with Literature Support

Findings from the study showed that 85.71 percentage of Nurses have good knowledge of cardiopulmonary resuscitation, while 14.29 % of them have poor knowledge of cardiopulmonary resuscitation. This implies that, continuing education policies and seminar needs to be considered in order to ensure that the healthcare staff has updated and consistent knowledge, and prepared, in theory and in practice at all times, which will be essential for reduced mortality following cardiac arrest (Aranzabal-Alegria et al., 2017). This is because knowledgeable and skilful health professionals will make an important contribution to reduce avoidable death and disability. Therefore, subsequent training and retraining is mandatory to achieve the desired outcome.

Secondly, 75% of the respondents have good level of practice of cardiopulmonary resuscitation and 25% of respondents have poor level of practice of cardiopulmonary resuscitation skills. This implies that good training, practice of cardiopulmonary resuscitation with hands on use of manikin on chest compression and ventilation ratio will lead to good practice level of the remaining nurses that have inadequate competent practice level of chest compression and ventilation ratio during CPR. A 45-minutes simplified CPR training program on chest compression and ventilation ratio can improve knowledge and attitude towards CPR by staff of a university hospital (Hirose & Taku, 2014).

Thirdly, following factors were identified as barriers to the cardiopulmonary resuscitations:

Lack of training and knowledge of Cardiopulmonary Resuscitation are key factors to the practice of CPR with acceptable level of 98 (100%). 80 (81.63%) identified that Bystander hesitation to initiate CPR is a factor that affect the outcome of CPR.

80 (81.63%) identified that discomfort with mouth to mouth resuscitation is a reason why they do not engage in the practice of CPR. 78 (79.59%) identified that CPR equipment availability and accessibility can discourage them from practicing CPR.

60 (61.22%) of the respondents feels that there is legal concerns and liability that can affect the ability of a nurse to perform CPR and 75 (76.5 %) identified that communication and coordination among team members can affect the effective practice of Cardiopulmonary resuscitation.

Aligning Findings with Findings of Previous Study Sited
In the study, majority of respondents were of ages majority were within the age range of 31-40years 45 (45.9%), 20 (20.4%) were between ages 20-30years, 20

(20.4%) of them were between ages 41-50 years and 13 (13.3%) of the respondents are between the ages of 51-60 years. This finding was expected because this age group represents the peak working age group in most typical civil /Public service setting within and outside the country. All respondents had the minimum requirement level of education for their profession and (70 representing 71.43%) had Bnsc. But not all have the necessary resources for CPR: having a BLS/ACLS certificate, a refresher courses in the last 2 years as only 25 respondents representing 25.51% have received formal training on CPR and also have been certified, which was very significant in order to practice cardiopulmonary resuscitation effectively.

This is in agreement with the findings of Manono et al., (2015) study where the mean age was 32 years. The vast majority of respondents were young (<40 years). Some respondents (51.9% (N=81), indicated that, they did not have all the necessary resources for CPR. Having a BLS/ACLS certificate ($p=0.042$), a refresher courses in the last 2 years ($p=0.029$) and necessary resources ($p=0.034$) was significant. All respondents had the minimum required level of education for their profession, i.e., 52.8% (n=85) had acquired a diploma in nursing while 31.7% (n=51) had a bachelor's degree. Also, Guteta, (2021) in his findings explained that having CPR good knowledge ($AOR = 1.37$, 95% CI: 0.28- 2.14) and having a nursing degree ($AOR = 1.54$, 95% CI: 0.93- 2.54) were predictors of CPR good practice.

Out of the 98 respondents, only 1 (1.0%) is a male while the majority 97 (99.0%) are female. This is in agreement with the findings of the Manono et al., (2015), in which Basically (89.5%) of of the study population was female, it was concluded that nursing is a profession that is dominated with females.

85.71 percentage of Nurses have good knowledge of cardiopulmonary resuscitation, while 14.29 % of Nurses have poor knowledge of cardiopulmonary resuscitation. 75% of the respondents have good level of practice of cardiopulmonary resuscitation and 25% of respondents have poor level of practice of cardiopulmonary resuscitation skills. In congruence with this finding was that observed in a study by Oteir et al, (2019) on cardiopulmonary resuscitation level of knowledge among allied health university students in Jordan where 39.0% of respondent had good knowledge about CPR, 46.4% had fair knowledge while 14.6% had poor knowledge about it. A contrasting observation was, however, seen in the study by Bajracharya & Nagarkoti (2016) in Nepal where 66% of the respondents had inadequate knowledge, 32% had moderate knowledge while minority 2% had adequate knowledge on Basic Life Support.

Another parallel observation was seen in the study by Olajumoke et al. (2012) on knowledge, attitude & practices towards cardiopulmonary resuscitation in Osun state, Nigeria where 64% of respondents had good knowledge about BLS/CPR while 36.0% had poor knowledge about BLS/CPR. The differences in the findings of this study can be attributed to the dissimilarities in the respondents of the various studies.

Rajeswaran et al., (2018) in their findings shows that knowledge and skills of cardiopulmonary resuscitation decline within 6 months after initial training in CPR and performance improves when all nurses are certified and practicing the relevant life support training courses. And the quality of CPR performed by rescuers depends on learners integrating, retaining and applying the cognitive, behavioural and psychomotor skills required to successfully perform resuscitation. Therefore, the findings that 25 respondents representing 25.51% only have received formal training on CPR which will definitely affect the level of practice of the Nurses. Also, Ihunanya et al., (2021) findings showed that knowledge of cardiopulmonary resuscitation had significant influence on its practice. Good knowledge influenced practice.

Okonta & Okoh, (2015) in their findings explained that Students with some prior training in CPR (50.0%) scored above average compared to the students without CPR training (16.8%) ($P < 0.001$). It was however concluded that there is a need to periodically and constantly organize CPR for the medical students and incorporating the training in their medical curriculum to enhance better understanding of the procedure. Again, the findings were in agreement with Mersha et al., (2020), study which concluded that the level of knowledge and attitude of health professionals towards adult CPR was suboptimal. Health professionals who were taking CPR training and reading CPR guidelines had good knowledge and attitude towards CPR. In addition, work experience, number of work settings and exposure to cardiac arrest case had a positive association with CPR knowledge. Thus, providing regular CPR training and work setting rotations is highly crucial.

Also, the following factors were identified as barriers to the cardiopulmonary resuscitations:

Lack of training and knowledge of Cardiopulmonary Resuscitation are key factors to the practice of CPR with acceptable level of 98 (100%). 80 (81.63%) identified that Bystander hesitation to initiate CPR is a factor that affect the outcome of CPR. 80 (81.63%) identified that discomfort with mouth to mouth resuscitation is a reason why they do not engage in the practice of CPR. 78 (79.59%) identified that CPR equipment availability and accessibility can discourage them from practicing CPR. 60 (61.22%) of the respondents feels that there is legal concerns and liability that can affect the ability of a nurse to perform CPR and 75 (76.5 %) identified that communication and coordination among team members can affect the effective practice of Cardiopulmonary resuscitation.

Marsch et al. (2013) emphasized the importance of clear communication for successful CPR, which can affect the effective practice of Cardiopulmonary resuscitation. The findings were also in agreement with Blewer et al., (2019), that, having the necessary equipment readily available is essential for healthcare providers to initiate prompt and effective cardiopulmonary resuscitation (CPR) interventions. Also, for rescuers that do not want to carry out CPR due to discomfort of using mouth to mouth rescue breaths, Olateju & Amoran, (2014)

findings explained that none of the respondents who were unwilling to do mouth-to-mouth rescue breathing knew that compression alone could be life saving for a stranger or relative.

Implication of findings to nursing

Based on the findings of the study, nurses should make out time to be educated on critical emergency responses and what they can do while waiting for support from other nurses and doctors. Nurses should also from time to time participate in life saving measures such as CPR in order to encourage learning and be empowered to take responsibility when the need arises. Also they should try to remain abreast with the latest version of the American Heart Association guidelines on Cardiopulmonary resuscitation for infants, children and adults.

Limitation of the Study

The study was faced with the following limitations:

- Time constraint to carry out the research on all the Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt to really identify the knowledge and practice gap.
- Financial constraint to carry out the study on all the Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state and limited access to material are the limitations of the study.

Summary of the study

This study was carried out to assess the knowledge and practice of cardiopulmonary resuscitation (CPR) among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt (UPTH, PH). CPR is a fundamental life-saving procedure that combines chest compressions and rescue breaths to restore blood circulation and oxygenation in individuals experiencing cardiac arrest. Prompt and effective CPR significantly improves survival rates for patients in cardiac arrest. Despite the importance of CPR skills, studies have indicated disparities in the level of knowledge and practice of CPR globally. The project focused on evaluating the proficiency of nurses in tertiary hospitals regarding cardiopulmonary resuscitation (CPR). It aimed to assess their knowledge and actual application of CPR techniques in emergency situations. Key findings highlighted the current level of CPR competency, identified knowledge gaps, and suggested targeted strategies to enhance training and improve CPR performance. Ultimately, the project aimed to contribute to better patient outcomes during critical cardiac and respiratory events within tertiary hospital settings.

About 92% of out-of-hospital cardiac arrest subjects lose their lives due to the unavailability of immediate CPR by persons who are knowledgeable in the art of administering of BLS (Cayley, 2017). 30% of cardiac arrest occurs within the hospital and evidence shows that approximately 70% of all cases of cardiac arrest occur out of hospital, often in the victim's home (AHA, 2015); therefore, early intervention would avert effects of sudden death that occur worldwide. This is a major challenge to the developing nations of the world like Nigeria as the burden from Cardiac arrest has continued

to linger because of lack of adequate knowledge about it. The objective of this study therefore, was to assess the knowledge and practice of cardiopulmonary resuscitation among Nurses of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state and to identify to the factors that influence the effective cardiopulmonary resuscitation. This study was a descriptive study with a non-experimental research design was used. The population of the study consisted of Nurses at the University of Port Harcourt Teaching Hospital, Port Harcourt., and the sample consisted of 98 Nurses selected using convenient sampling technique. A self- structured questionnaire The questionnaire comprised of four sections: A, B, C, and D. Section A has five items which was used to obtain information on the demographic data of the respondents. Sections B consisted of seven response items regarding the knowledge of the respondents regarding cardiopulmonary resuscitation. Section C consist twelve response items regarding the practice of respondents on cardiopulmonary resuscitation and section D consist of nine response items regarding the factors and barriers that can influence cardiopulmonary resuscitation.

All response items consist of yes and no response pattern. The instrument developed by the researcher was validated by the researchers' supervisor and other research experts, the reliability of the research instrument was determined using a pilot study which was carried out on 20 nurses who are not selected for the main study were used for data collection after ethical clearance was obtained and same analysed using Statistical Package for Social Sciences (SPSS) version 24. Results revealed that 85.71 percentage of Nurses have good knowledge of CPR and 14.29 % of Nurses have poor knowledge of CPR. 75% of the respondents have good level of practice of CPR and 25% of respondents have poor level of practice of cardiopulmonary resuscitation skills. Also, lack of training and knowledge of CPR, bystander's hesitation to initiate CPR, CPR equipment availability and accessibility and lack of communication and coordination among team members can affect the effective practice of cardiopulmonary resuscitation. In conclusion, the study revealed varying levels of knowledge and practice among nurses of the UPTH, PH, indicating a need for targeted training programs and continuous education to enhance skills and ensure consistent adherence to CPR protocols by all Nurses.

Conclusion

In conclusion, the study on the knowledge and practice of cardiopulmonary resuscitation (CPR) among nurses working in University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers State, Nigeria sheds light on a critical aspect of healthcare. The findings underscore the importance of assessing healthcare professionals' proficiency in CPR, which is fundamental in saving lives during cardiac and respiratory emergencies. The study revealed varying levels of knowledge and practice among nurses, indicating a need for targeted training programs and continuous education to enhance skills and ensure consistent adherence to CPR protocols.

Efforts should be directed towards implementing regular CPR training, simulation exercises, and refresher

courses tailored to the specific needs and challenges faced by nurses in tertiary hospital settings. Such initiatives will contribute to maintaining high standards of CPR competency, ultimately leading to improved patient outcomes and increased survival rates in emergency situations. Additionally, fostering a culture of accountability, continuous learning, and interdisciplinary collaboration within healthcare teams will be pivotal in optimizing CPR practices and fostering a safer healthcare environment for all.

Recommendations

Based on the findings of the study on the knowledge and practice of cardiopulmonary resuscitation (CPR) among nurses in the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers state, Nigeria, several recommendations can be made to enhance CPR proficiency and, consequently, improve patient outcomes in emergency situations:

Mandatory Regular CPR Training and Certification: Implement a mandatory and regular CPR training program for all nurses, ensuring they receive updated and evidence-based training at least annually. Recertification should also be enforced to validate competency and keep skills up-to-date. Even Non-clinical staff should be encouraged to learn certain basic emergency protocols so they can apply it in or outside the hospital when the need arises

Stimulation-based Training: Integrate simulation-based training, including high-fidelity mannequins and scenario-based exercises, to provide a realistic CPR learning experience. This approach helps nurses apply theoretical knowledge in a controlled environment, enhancing their confidence and skills.

Incorporate Advanced CPR Courses: Advanced CPR courses, such as Advanced Cardiovascular Life Support (ACLS) and Pediatric Advanced Life Support (PALS) should also be offered, to nurses working in critical care areas. These specialized courses equip nurses with advanced CPR skills tailored to specific patient populations.

Interdisciplinary Training and collaboration: Facilitate interdisciplinary training sessions involving nurses, physicians, respiratory therapists, and other relevant healthcare professionals. Collaboration and communication between team members should be improved, which in turn will improve the efficiency and effectiveness of CPR delivery during emergencies.

Regular Skills Competency Assessment: Head of nursing Services and the Management of Head care facilities to establish a system for regular skills competency assessments to identify gaps and areas for improvement in CPR knowledge and practice. Feedback from assessments should inform targeted training interventions and individualized development plans.

Accessible Educational Resources: Easy access to up-to-date CPR guidelines, educational materials, and resources within healthcare facilities should be ensured. Ensuring nurses can readily access credible information will support continuous learning and knowledge enhancement.

CPR Champions and Mentoring: Experienced nurses or CPR champions should be designated to mentor and guide less-experienced nurses in CPR best practices. Creating a culture of mentorship encourages continuous learning and fosters a supportive environment for skill development.

Quality Assurance and Audit Mechanisms: Regular audits and quality assurance measures should be implemented to monitor adherence to CPR protocols and guidelines. Any deviations through corrective actions should be provided in order to ensure constructive feedback to promote continuous improvement.

Engagement in Research and Evidence-based Practice: Nurses should be ensured to engage in research related to CPR, its best practices, and outcomes. Promote the integration of evidence-based CPR protocols into daily practice to ensure the highest standard of care.

Feedback Channels and Reporting Systems: Anonymous reporting systems or feedback channels should be established for nurses to report challenges, concerns, or incidents related to CPR practices. Encouraging open communication allows for the identification of systemic issues and the implementation of appropriate solutions.

By implementing these recommendations, healthcare institutions can significantly enhance the knowledge and practice of CPR among nurses in tertiary hospitals, ultimately leading to improved patient survival rates and better overall healthcare outcomes.

Suggestions for further studies

Exploring the knowledge and practice of cardiopulmonary resuscitation (CPR) among nurses in tertiary hospitals is a crucial area of research with ongoing relevance and potential for further study. Here are suggestions for future research on this topic:

Studies can still be carried out on the knowledge and practice of cardiopulmonary resuscitation in the University of Port Harcourt Teaching Hospital, Port Harcourt using the entire population of Nurses as to identify the actual knowledge and practice gap.

Longitudinal Studies: Conduct longitudinal studies to track changes in CPR knowledge and practice among nurses over an extended period. Understanding how knowledge and skills evolve with experience and further training can inform targeted interventions for sustained improvement.

Comparative Analysis: Compare CPR knowledge and practice among nurses across different tertiary hospitals, regions, or countries. This comparative approach can identify variations and potential factors influencing CPR competence, enabling the development of tailored interventions based on contextual differences.

Effectiveness of Training Modalities: Investigate the effectiveness of various CPR training modalities, including traditional classroom-based training, simulation-based training, e-learning, or blended approaches. Assessing the impact of different training

methods on knowledge retention and practical application can guide the selection of the most effective training approach.

Integration of Technology: Explore the integration of technology, such as mobile applications, virtual reality, or augmented reality, in CPR training for nurses. Assess how technology-enhanced training influences knowledge acquisition, skill retention, and confidence in performing CPR.

Qualitative studies on Barriers and Facilitators: Conduct qualitative studies to explore the barriers and facilitators that affect CPR knowledge and practice among nurses. Understanding organizational, cultural, or individual factors that influence CPR competency can guide the development of targeted strategies to overcome challenges and enhance practice.

Patient Outcomes and CPR Performance: Investigate the correlation between nurses' CPR performance and patient outcomes in real-life clinical settings. Analysing how the quality of CPR impacts patient survival and recovery can underscore the importance of maintaining high CPR standards.

Influence of work environment: Examine the influence of the work environment, including staffing levels, workload, and resource availability, on CPR knowledge and practice. Understanding how organizational factors affect CPR performance can inform policies and practices that optimize CPR delivery.

By pursuing these suggestions for further research, the understanding of CPR knowledge and practice among nurses in tertiary hospitals can be deepened, ultimately leading to enhanced training programs, better patient care, and increased survival rates during emergencies.

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