DETERMINANTS OF COMPUTER TECHNOLOGY UTILIZATION IN NURSING PRACTICE AMONG NURSE - MIDWIVES IN KWALE COUNTY, KENYA

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DECLARATION AND APPROVAL

Declaration by the Student

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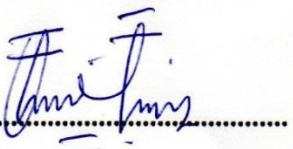
Signature.....  **Date**.....9TH JULY 2019

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Approval by the Supervisors

As Supervisors of the above signed student we do here by concur that the candidate, with his own creativity managed to come up with the work as presented in this Thesis document.

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DEDICATION

My heartily dedication is directed to my family members and all the Nurse Practitioners and Scholars for their consistent support throughout the whole process.

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ABSTRACT

Globally all nurses are expected to be abreast with information, communication and technology (ICT) for their empowerment when it comes to making the right interventions in the provision of nursing care to patients or clients (Newbold, et al 2015). The purpose of the study was to investigate the determinants of computer utilization among nurse-midwives in Kwale County. Method: was institution based cross-sectional design which was done in Kwale County and the targeted population were the nurse-midwives in Kwale County with a sample size of 141 Results: revealed that on the social demographic characteristics Ages of respondents significantly influenced utilization of computer technology (χ^2 (1, N=141) =7.453, p=0.006). Qualification significantly influenced utilization of computer technology (χ^2 (1, N=141) =5.083, p=0.024). Nursing job significantly influence utilization of computer technology (χ^2 (1, N=141) =4.499, p=0.034). Number of years worked as a nurse significantly affected utilization of computer technology (χ^2 (1, N=141) =9.131, p=0.003). Previous computer training significantly affected utilization of computer technology (χ^2 (1, N=141) =23561, p=<0.001).Concerning nurse- midwife related factors, showed that self-rated computer knowledge significantly affected utilization of computer technology (χ^2 (1, N=141) =26.338, p=<0.001). Attitude significantly influenced utilization of computer technology (χ^2 (1, N=141) =4.098, p=0.043). Concerning institutional related factors revealed that availability of policies, guidelines, regulations did not influence utilization of computer technology (χ^2 (1, N=141) =0.047, p=0.828), (χ^2 (1, N=141) =0.047, p=0.828), (χ^2 (1, N=0.000), p=0.986) respectively. Conclusion majority of the nurse-midwives demonstrated basic knowledge in computer operational skills Gender, marital status, and residence did not have significant association with utilization of computer technology in nursing practice. More than a half of the nurse-midwives had negative attitude towards utilization of computer technology. There are no guidelines, regulations, or policies governing the utilization of computer technology. Recommendation: On the determinants of social-demographic characteristics the researcher recommends the County training committee to encourage and support the nurse-midwives to upgrade to Diploma level and above and also come up with modalities of assisting the nurses to acquire literacy in computer applications and operation skills. On determining nurse-midwives related factors the County health committee in conjunction with Nurse Managers and supervisors should take an initiative of formulating logical strategies of transforming analogical practice of nursing to digital forms of nursing practice by embracing computer technology utilization in the health institutions in the County. The Kwale County health committee should advise the CEC health through MCAs to come up with policies that will govern the utilization of information technology in the county. The same committee should take the initiative to capacity build the nurses and health institutions by equipping them with infrastructural and technical support in form of computers, trainings and free WI-FI.

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LIST OF ABBREVIATIONS AND ACRONYMS

AMIA	American medical informatics association
CEC	County executive committee member (County minister)
CEO	Chief executive officer
DHIS	District Health information system
ECG	Electrocardiogram
E-Health	is a relatively recent health practice supported by electronic processes and communication.
EMR	Electronic medical records
EHR	Electronic Health records
GOK	Government of Kenya
ICT	Information and communication technology
ICU	Intensive care unit
IT	Information Technology
IV	Intravenous
HI	Health informatics
HIS	Health information system
MCA	Member of county assembly
MEWS	Modified early warning system
PEOU	Perceived ease - of use
PU	Perceived usefulness
RFID	Radio frequency identification

CHAPTER ONE

INTRODUCTION

1.1 Background information

According to free dictionary by Farlex, (2012) the definition of computer technology is the activity of designing, constructing and programming computers. However for the purpose of this research the operational definition will be a scientific strategy put in place through the use of a computer to simply work or activities by designing, manipulating and programming a computer to meet the desired objectives of a person or a certain entity.

Nurses-midwives' adequate knowledge on utilization of computer technology will readily assist them promote standardised and well informed patient care delivery; and this will actively encourage proficient practice and secured care. (Newbold, Klein & Douglas J. V. 2015).

Globally all nurses are expected to be abreast with information, communication and technology (ICT) for their empowerment when it comes to making the right interventions in the provision of nursing care to patients or clients (Newbold, et al 2015). Thus utilization of computer technology is the way to go.

Provision of health services is confronted by prominent disease condition every other time and the only way out to cab this menace is indulging in utilization of computer technology which is in cooperated in information, communication and technology. It is a fact that nursing plays a major role in any healthcare delivery system, and therefore it should be appreciated that nursing profession is faced by all the challenges that come together with all the disease conditions (Smedley, 2015).

It should be noted that bringing change to any professional discipline will always be met by both positive and negative responses which are necessary to consider before the

introduction of the change as positivity or negativity will dictate the success of that change. Introduction of ICT can be followed by actively utilization of the service if there is positive response as opposed to negative perception where users may shy away from using the technology (Bond, 2013).

During 1990s any health system in Japan that was eager to adopt electronic medical records (EMRs) was given incentives by the Japanese government to encourage the efforts; this is according to a study which was conducted by Kuroda and others (Kuroda, Kashiwagi, Hayashi, Nakayama, Oda, Yamase, Nakaki, 2017).

In a study which was done by USA department of health and human services it was realised that to boost the morale of the health workers; USA had to give rewards to health facilities that practiced EHRs (USA Department of Health and Human Services 2013).

In order to ensure uptake of computer utilization the national and state government in Australia allocated a lot of money in health information systems; this is according to a study done by Eley, Soar, Buikstra, Fallon, & Hegney (2013).

All these efforts by these governments were aimed at bringing uniformity and compatibility of health service delivery and all nurses should be able to embrace this development for them to stay relevant in the healthy delivery systems.

In Kenya utilization of computers is not a common practice in the nursing activities especially in the public health institutions though there is some evidence of utilization of computers in private (non- governmental) and few GOK facilities.

The use of computer technology and to a further extent nursing informatics in healthcare service delivery gives opportunity to the nurse-midwives to determine and do away with nursing practices that are not maximising on productivity and better patient care. Electronic records can be adopted from the normal paper recordings to

coming up with clinical decision support systems, thus promoting health service to the recipient of care, leading to standardised care, acceleration of decision-making, which further promotes harmonization of actions (Blatz, Jennings, La Rocca, 2015).

In a study conducted in Canadian hospitals, where triangulation paradigm methodology was applied it was shown that the use of IT, by means of palmtops, enhanced quality of life in Job places and care of patients, enabling the application of scientific evidence in patient care and nursing practice (Health Metrics Network, 2015).

1.2 Problem statement

Currently Nursing is becoming more and more technical as well as hands on discipline. The nurses of the current era are exposed to a lot of technology at their disposal unlike the founders of nursing in the past years (Eley et al, 2016).

Worldwide studies have shown that **Keeping track of equipment and supplies** has been a very big challenge**;** however countries like United States of America has demonstrated that through utilization of computer technology applications, nurse-midwives are able to trace extremely important logistics such as patient monitoring devices with just a click of a baton (Spyros Kitsiou, 2018).

In Africa a study which was done Synowiec, Lagomarsino, Schweitzer demonstrated that **Recurrent Medication Errors** during manual nursing documentation and drug administration is increased which can easily be reversed by addition of computer technology in the provision of patients care Lewis, Synowiec, Lagomarsino, Schweitzer, (2014).

In Kenya **Cumbersome Documentation and tedious time Management;** A recent study done in Kenya revealed that turnaround time was too much for the nurse-midwives and that made them to spare very little time to provide nursing care to their

patients Ragneskog, Gerdner, (2016) however this study demonstrated that computers are now used in a wide range and not just confined in hospitals, currently they are found in nursing home and other Mission and Private Hospitals.

In Kwale County like any other nurses-midwives around the globe, the professionals are ever confronted with changing and challenging practice situations like making prompt clinical decisions, having quicker access to patient information, improving overall efficiency of their work performance, reducing operational costs, improving Coordination of Care, improvement of documentation and seeing a reduction in potential medical errors. Despite the fact that these problems can be best addressed through utilization of computer technology, most of the nurse-midwives in Kwale County have no adequate training on the same. (Training up dates for nurses summary sheet 2016/2017).

1.3 Justification of the study

Currently utilization of computer technology in the health provision has become the order of the day and these calls for all nurse-midwife to be literate in computer technology for them to be relevant in the field of health service provision. In countries like USA policies were put in place to high light the importance of computer utilization in health care provision (World Health Organization, 2016).

There is very little literature about utilization of computer technology in nursing practice in Kenya and the study was expected to generate new knowledge which would be referred to by other researchers, nurse educators, nurse administrators/managers, nurse practitioners and other scholars globally.

It should be appreciated that ICT users' knowledge and attitudes towards utilization of computer technology affects their willingness to apply the technology and hence an

organization's ability to detach from analogy systems to digital world; understanding the determinants of computer utilization among the nurse – midwives will give prior focus on how the technology can be adopted for the betterment of the service giver and the recipient of the service. (Burger and Blignaut, 2014).

According to the Kwale public service board, out of the 1560 health workers in Kwale county 441 are nurses which translates to over 28% of the total health work force, thus nursing staff is the largest part of the health workforce in the County (Kwale public service board staff returns summary 2016/2017). Therefore their positive uptake of ICT will be feasible for the implementation of utilization of computer technology in their nursing practice for the betterment of the overall patient care in Kwale County and beyond

In order to come up with training needs and the likely challenges which are affecting the nurse-midwives, it is necessary to carry out studies in developing countries such as Kenya, where the infrastructure is wanting and by so doing these studies will give a really picture of the determinants of computer utilization among nurse - midwives in these under developed areas.

In Kwale County there are three sub county Hospitals and One County referral hospital of which have computers in departments like accounts, pharmacy and in the administration departments while the clinical departments like nursing departments are not having this essential component despite the fact that it is in these departments where patient care is provided.

The aim of this research was to find out whether the Kwale county Nurse-midwives' social-demographic characteristics had any influence in utilization of computer technology and also determine the nurse-midwives related factors towards utilization of the same with a view of coming up with recommendations on whether they could

embrace and adopt the technology in their nursing practice to improve nursing practice in Kwale County and beyond. The researcher was seeking to determine institutional related factors on utilization of computer technology by Nurse-midwives of Kwale County more so in the maternity units.

1.4 Objectives of the Study

1.4.1 Broad objective

The main objective was to assess the determinants of computer technology utilization among nurse-midwives in nursing practice in Kwale County, Kenya.

1.4.2 Specific objectives

1. To determine the influence of social-demographic characteristics on computer technology utilization among nurse-midwives in Kwale County, Kenya
2. To assess the determinants of nurse-midwives related factors in utilization of computer technology in Kwale County, Kenya.
3. To identify institutional related factors in utilization of computer technology among nurse-midwives in Kwale County, Kenya.

1.5 Research questions

1. What influence do social-demographic characteristics have on utilization of computer technology among nurse-midwives in Kwale County, Kenya?
2. What are the nurse-midwives related factors in the utilization of computer technology in Kwale County, Kenya?
3. What are the institutional related factors in the utilization of computer technology among Nurse-midwives in Kwale County, Kenya?

1.6 Significance of the study

It stands as a fact that from the various definitions of computer technology from deferent scholars they all highlight the significance of this field. It goes without saying that nurse-midwives are co-opted in the global field of ICT naturally. It is high time therefore for the nurse-midwives to embrace this technology to improve the quality nursing care provision.

Computer technology brings benefit in the following areas:

In Nursing Practice: (Nurse Practioner) nursing practice is made easy when using Computer technology, for instance the nursing process which is the scientific backing of all the nursing care being given to patients can be easily presented in a form of an application (software) leading to easy access to patient documentation and making timely interventions with minimal movements and reducing the turnaround time.

Benefits to patients and clients: Computer technology utilization enables the required coordination of patients and clients care to be possible and efficient. Computer technology is crucial as far as it enhances outcomes of the interventions that are put in place in any situation. Electronic medical records result in higher quality care and safer care as coordinated teams provide better diagnoses and decrease the chance for errors by a click of a button

Nurse Administrator Utilization of computer technology will definitely enable the nurse-midwives managers and administrators to create applications that will enable them monitor their staff well, present and disseminate quality report in an efficient manner as opposed to the current situation where a nurse will have to do a lot of leg work in the name of sending reports to deferent departments. The manual preparation of a duty roster will also be addressed.

Benefits to police makers: This study aims at unveiling most obstacles associated with utilization of computer technology and this will enable County government CECs and MCAs to come up with policies, guidelines, and regulations in relation to utilization of computer technology in nursing practice in Kwale County and beyond.

Nurse Educator Computer technology is capable of applying applications that are able to do away with the distance when it comes to learning, a good example is teleconferencing. Power point presentation helps Nurse Educators to pass information with easy

Benefits to scholars: A study of this nature will act as base line for other scholars to do more research on this subject.

Nurse Researcher Computer technology has made it easy for researchers to explore all the information they want at any time due the richness of the technology in internet access (Baker, 2014).

The study findings have a capacity of generalization and therefore it can be used for inference for the whole County. The study is to demonstrate the knowledge and attitudes of the Nurse - Midwives towards the utilization of computer technology in the provision of nursing services in the maternity units.

The study is also expected to determine the role of social-demographic characteristics on computer technology utilization among nurse-midwives in Kwale County and also unveil the nurse – midwives related factors as well as institutional related factors on the utilization of computer technology in nursing practice.

1.7 Delimitation and limitation of the study

1.7.1 Delimitation of the study

The research findings from the study were delimited to nurse-midwives providing services in the three Public Health Hospitals of Kwale County that was Kinango Sub-county hospital, Kwale Sub-county hospital and Msambweni County referral hospital and did not include the nurse-midwives who were working in the periphery facilities like the Dispensaries. The study was delimited to nurse-midwives only and did to include general nurses who did not do midwifery in their pre or in-service training. The study focused on the modalities of determining nurse-midwives' related factors as well as institutional related factors in the utilization of computer technology in nursing practice more so in the maternity units.

1.7.2 Limitation of the study

Utilization of computer technology in Kwale County in nursing practice among nurse-midwives has not yet been documented; hence finding literature materials for review in the County was a major limitation of the study. Kwale County has very unique characteristics compared to other Counties in the country a good example is poor terrain and it is a Simi-arid region. That acted as another source of limitation of the study as moving around was compromised. Another limitation was on the part of self-rating of the participants on the knowledge of computer use there was no any other source to verify how precise they rated themselves. The other limitation was on the part of the methodology that I used. I used quantitative method only and may be application triangulation paradigm methodology would have been broad enough to capture more data as I could have used more than one data collection tool for example I used a questionnaire and I could have also used focused group discussion to collect a more comprehensive data. However the findings of the study may be inferred

elsewhere in the world provided that similar characteristics like those in Kwale County hospitals in Kenya prevail.

1.8 Operational Definitions of Key Terms

Attitude is a settled way of thinking or feeling about something.

Computer is an electronic device that has an ability to handle or control data and information according to the users' specifications.

Computer Skills are learned or acquired skills applied to utilize the computer to assist the user meet his desired objectives either through browsing the web and creating application to aid patient documentation in a safer and acceptable manner.

Computer technology: is a scientific strategy put in place through the use of a computer to simplify work or activities by designing, manipulating and programming a computer to meet the desired objectives of a person or certain entity.

Determinants: factors which decisively affects the nature or outcome of something**.**

Informatics Is the study of information and communication display by application of computational, cognition and social aspects.

Informatics Knowledge Is a communication strategy in nursing practice to put in place to allow an easy flow and access of patient data to promote better patient care.

Informatics Skills are learned or acquired skills applied to utilize the computer to assist a person or a certain entity strategize on how they can enhance easier and organized flow of patient data and information for better patient care.

Knowledge is having a good perception of something or being in possession of certain facts about something.

Nursing: Is the provision of care to all human beings whether sick or well in form of preventive, curative, rehabilitative and promotive care in all aspects of life.

Nurse: An individual who has qualified through a laid down nursing education programme which is recognised by the nursing regulatory body in a country and has been empowered to provide nursing services.

Nurse-midwife; is an individual who has qualified through a laid down nursing education programme which incorporates midwifery and is recognised by the nursing-midwifery regulatory body to provide nursing and midwifery services.

Technology is perceptions put into practical use to address certain issues by coming up with devices like computers and use of the web

Utilization: the action of making practical and effective use of something

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter critically analyzed by objectives an assessment of utilization of computer technology in nursing practice by Nurse-Midwives in Kwale County, through a review of the available and relevant literature in line with the study objectives.

2.1. The influence of social-demographic characteristics on utilization of computer Technology

2.1.1 Work experience in relation to utilization of computer technology by nurse-midwives

Globally nursing practice has been subjected to change which has led to nurse-midwives to be abreast with emerging medical diseases and conditions. Long term experience in nursing practice dictates better uptake of ICT application. (Spyros Kitsiou, 2018). Nurses offer their services around the clock, seven days a week thus the effects and quality of nursing care provision is readily realised by them earlier enough than any other health professional. Good experience in nursing practice acts as a corner stone in application of the same via computer technology which will do away with the challenges confronting nurses in every other day. (Spyros Kitsiou, 2018) Computer technology is also able to do away with those cumbersome practices of documentation through paper work which reduces the turnaround time (Spyros Kitsiou, 2018)

In Africa a famous study which was done under the umbrella of the QUALMAT (Quality of Maternal and Prenatal Care: Bridging the Know-do Gap) project introduced an electronic clinical decision support system (CDSS) for pre-natal and maternal care services in rural primary health facilities in Burkina Faso, Ghana, and Tanzania. It was

found that due to nurse-midwives richness in work experience in nursing service provision; their uptake of computer technology utilization was good. (Mehdi Kahouei, Mohhamed, Hasamedin Askari majdadi, 2016)

In Kenyan application of computer technology is being utilized in some hospitals in the country according to Ragneskog and Gerdner, (2016) computers are no longer just being used hospitals but also they have been introduced in nursing homes and in most of the Mission Hospitals.

In Kwale County there are three sub-county Hospitals and One County referral hospital of which has health informatics being practised in departments like accounts, pharmacy and in the administration - the clinical departments like nursing are not having that in place and that is where care is being provided.

2.1.2 The influence of education level on utilization of computer technology by nurse-midwives.

Globally, since time in memorial nurses were and even today are the major collectors of patients' information for use and they rely primarily on labour-intensive methods to record, retrieve and manipulate information (Kathleen, Hunter and Carol, Bickford, 2015). Nurses being the majority in the health work force they remain most users of health information technology thus their level of education will determine how fast they are able to master the utilization of computer technology (HIT) (Seon, Yoon and Nancy Staggers, (2014).

In a study done by Kaya in 2014 he found out that the use of computer technology in nursing practice enhances nurse-midwives decision-making and competencies which end up offering standardized and quality care to the patients; however this study also revealed that nurse-midwives who reside in urban areas were more exposed and use

computers more frequently than those nurse-midwives who were practicing in the rural areas and this highlights the importance of addressing the impact of nurse-midwives social-demographic characteristics in relation to computer technology utilization. The study revealed that young nurses were more interested in applying computer technology than their older fellows. The gender and age of the nursing staff's therefore, cannot be underestimated, given that many HIT initiatives fail because of limited user acceptance among nursing personnel (Kaya N. 2014).

Nurses-midwives at their entirely are subjected to the use of computer technology related skills to handle compound patient data and information for better health service delivery (Kathleen et al, 2015) and all this require good education for better competency.

In Africa a study to establish the attitudes of nurse-midwives on the application of computer technology for possible adoption in Ghana and Tanzania by Abdrbo AA, Hudak CA, Anthony MK, Douglas SL they revealed that the current advance in utilization of computer technology has managed to cab all the short comings in the handling of the bulky health data generated on daily basis in the health care delivery systems (Abdrbo, Hudak, Anthony, Douglas, 2013).

In Kenya very few studies have been done but with no significant conclusions as there are a lot of contradicting findings as far as utilization of computer technology is concerned (Ragneskog, 2016). There are very few studies on the influence of social-demographic characteristics on the use of computer technology.

2.2 Nurse-midwives related factors on utilization of computer technology

2.2.1 The resistance to change-attitude of nurse-midwives towards utilization of computer technology.

Worldwide studies have shown that Nurse-midwives' resistance to change to new information technology is expected; that was revealed in study done by Mehdi, Iahouei, Hassan Baba Mohhame on Nurses' attitudes towards the benefits of utilizing computer technology in Iran (Mehdi Kahouei, Hassan Baba Mohhamed, Hasamedin Askari majdadi 2014).

A Module of Electronic Medical Record for Patient Care in Two University Hospitals of Iran they revealed that resistance to upcoming technology among Nurse-midwives is seen as a normal response. Determining the likely obstacles early enough can be utilized in coming up with methods that help in developing computer programme on Nurses' willingness to change (Mehdi et al, 2014). They concluded that to adopt a new technology, involvement of the users in the initial stages in order to get their opinions was of paramount importance. (Mehdi et al, 2014).

Nursing informatics which is embedded in computer technology essentially dates back to the days of Florence Nightingale, who realised not only the importance of data and its relationship to patient outcomes and quality nursing care, but also how data could promote innovation in health service delivery (McBride, 2016). In the late 1980s it came into its own as a discipline of nursing that intended to address the better use of data and information for the improvement of patient care. (Weaver, Delaney, Weber and Carr RL Eds 2016).

The Australian nursing body revealed that by 2017 more than 85% nurse-midwives utilized computer technology in their nursing practice (Australian Nursing Federation, 2017). Utilization of computer technology is not solely the province of informatics

specialists, it is high time that all nurses embrace computer technology for better health care delivery and be relevant to the current trends in healthcare demands. (Cooper, Hamer 2014). Evidence-based practice will become the order of the day in nursing practice and will replace the routine ways of doing things.

In Africa a study which was done in Ebonyi state in Nigeria revealed that the introduction of new technology is affected by the response of the user of the technology which may be positive or negative. Many Nurse-midwives in Ebonyi state, like every other citizens, resists the introduction of new technological developments because they felt it would jeopardise their job or profession (Wachter, 2016). It should be appreciated that new innovations and know how should be in line with imparting the right skills to the workers to apply the new innovations. Service providers believe that introduction of new technology is accompanied by new ways of doing things and added reward and in the other hand any system that is bringing the new technology on board has high hopes that some staff will be rendered redundant which will lead to decreased operational costs. To reverse this trend therefore, there is need to train the nurse-midwives to cope with the change rather than declaring them redundant.

2.2.2 Lack of Maintenance Culture and Cost of ICT Equipment's

In Africa a study which done by Fergus and Igwe in Ebonyi state university in Nigeria demonstrated that inadequate maintenance culture can be a challenge in computer technology utilization; even government agencies find it difficult to maintain ICT equipment in Nigeria (Fergus, igwe, 2017).

In the same study it was revealed that the cost of computer hardware and software in Nigeria is very high compared with the income of an average Nigerian.

2.2.3 Lack of time and inadequate computer technology

In a study done in UK by Gerrish found that inadequate time and ICT knowhow have been identified as limiting. Gerrish, (2016) . They identified a number of factors influencing the use of IT, including lack of time during a working day and poor access to facilities within practice settings, supporting the findings.

2.2.4 Lack of exposure to computer technology, and Information technology infrastructure

Globally in countries like India a study was conducted in the rural areas to determine factors on the utilization of computer technology by Felix Sukum and others and it was revealed that, despite the fact that, the utilization of computer technology enhanced patient visits, the bulky documentation which was accompanied by the practice did not go well with health workers attitudes.

They cited that lack of exposure to computer technology, and IT infrastructure coupled with inadequate computer training are the well-known reasons for negative attitudes (Felix Sukums, Nathan mensah, Rose mpembeni, 2014)

In Africa a study which was done in Uganda showed that the successful adoption of computer technology in nursing practice is obstructed by insufficient technical infrastructure Felix Sukums et al. (2014). Computer literacy remains the only way to go in order to scale up better nursing service provision to patients.

2.2.5 Inadequate Trained Nurse-midwives on Computer technology

All around the globe it has been found that the best way to motivate nurse-midwives to embrace utilization of computer technology is by imparting the right knowledge to the service provider through the formal channels and putting the knowledge acquired into

practice (Lee, 2015). Studies have revealed that empowering nurse-midwives by providing the necessary logistics at their disposal enables them to put their knowledge in practice. (Tennet, Becker, & Kehoe. 2015).

In a study by Tennent and others (2015), they found that, there is need for nursing educators to be literate in utilization of computer technology for them to pass the same to their learners and instil confidence in them. (Tennent, Becker & Kehoe, 2015; Warren & Connors, 2017).

In Africa it is believed that literate work force in computer technology is very crucial in ensuring attainment of the required progress as far as computer technology is concerned. Currently the trained nursing informaticians are few and they are sporadically distributed (Hersh, Margolis, Quiros, Otero, 2013). In an e-Capacity meeting which was conducted in Bellagio in 2008 it was concluded that there was need to come up with a general model of empowering nurse-midwives in computer technology application to increase the number of trained workforce in computer technology. (The Rockefeller Foundation, 2013).

2.2.6 Nurse-midwives managers are not aware about the benefits of computer technology.

In a study conducted McGonigle, Mastrian, (2015) the results showed that the biggest challenge for the current nurse manager is to persuade higher level managers to come up with the appropriate ICT that will be able to solve thorny problems and deliver standardized care and which is easy to operate. They conclude that there is need for all the nursing managers to be literate in computer technology and set the direction for nursing informatics in the profession (McGonigle et al, 2015).

Nurse Managers who are literate in computer technology are better in managing and monitoring their patient and human resource management as pertaining to the nursing staff in general. (Wachter, 2016.) For instance, specialised nurse-midwives are able to design software to in their line of specialization to enable them come up with remedies that will helt patient from any exposure to adverse events (McFadden KL, Stock GN, Gowen CR, 2014).

It is only through researched evidence based practice that computer technology literate managers can convince executives by demonstrating more and more advantages of utilization of computer technology and how it can uplift the standard of nursing care to the patient (Westra, 2016).

It was through nurses' Leadership effort that applications like ***Modified Early Warning System,*** or MEWS, were developed in a form of a "scorecard" which by a click of button nurse-midwives are able to get alerts on patients' conditions and are able to make the right intervention in the right time (Spyros Kitsiou, 2018).

2.3 Institutional related factors on utilization of computer technology by Nurse-midwives

Worldwide, studies have demonstrated that accessing computer technology is not the same in the different parts of the globe and this is due to the difference in economic status in these countries this was revealed in a study by Loh, Flicker, & Horner, (2013) which was to determine the status of the introduction of computer technology, in order to address the new innovation in any health system (Lol eet al, 2013)

2.3.1 Resource and Technical Infrastructure Limitations by most of the government health facilities

Worldwide it has been reported that the major obstacles that affect implementation of computer related programs are inadequate financial and technical infrastructure. (Fraser HS, Biondich P, Moodley D, et al 2015). Most of the health institutions in the developing countries like Kenya are faced by these common problems.

In Africa, it is worthy to note that it is difficult to obtain the required computer systems as most of the African countries are struggling to become developed and as such they may have conflicting demands in place due to compromised resources as such computer technology utilization may not be in the priorities. (Fraser HS, et al 2015).

In Kenya there are no known agendas or policies in place which indicate that there is a plan to adopt nursing informatics in the health systems in the near future especially in the public hospitals (Ragneskog, 2016).

2.3.2 Inability of the health institutions to in co-operate nurse-midwives in development of computer technology system Agendas

Globally in countries like Australia it has been shown that all the institutions investing in computer technology should involve nurse-midwives in coming up with the required software design for better and collaborative decision (Remus, 2016). Being the largest group in the health workforce nurses may find themselves using systems that may not work to their expectations simple because they were never involved in the initial stages. (Bowles, Dykes, Demiris, 2015).

2.3.3 Lack of health institutions to put up Policy, ethics and Legal framework to support computer technology operations in the institutions.

Globally Nurses are not well represented institutionally and at the governmental level when it comes to crucial decision making on computer technology application (Nagle Lynn, Sermeus, Junger, 2017). Inclusion of nurse-midwives during deliberations on policies and guidelines governing computer technology adoption in nursing practice is paramount. (Nagle et al, 2017). Also inclusion Informaticians who are well versed on how to initiate and adopt computer related programs to their successful end is also of paramount importance.

In the African region it has been advocated that there is some importance to have a legal backing and well developed policies and guidelines regarding computer technology utilization to overcome any obstacles during the implementation process (Ajami, Arab-Chadegani. 2013).

In Kenya there is no tangible legal frame work on the adoption of computer technology utilization in public health institutions as the number of initiatives is lower than expected when compared to developed countries. (Meslin, 2016)

2.3.4 Inability to utilize Common Interoperability Standards in the health institutions

For better and smooth flow of information from the national level to all the periphery institutions there is need for a national health information infrastructure (Patient Safety, 2014) Determined attempts to encourage sharing of information and utilization of the same in different levels of the health systems (interoperability) and dissemination of data is useful in managing people and communities in the world by indulging in aggressive research in targeted health problems. Poorly managed HIS can lead to

unreliable information which will not be of any meaningful use to the providers of health care and the recipient of the care (Glaser, 2013). The best remedy for this is in cooperating Interoperability in the health systems as lack of this component may lead to discontinuity of care among service providers (Sass, Feko A, 2013) .

2.3.5 Health institutions are not able to disseminate information regionally.

Globally it has been seen that sharing experiences from one region to another enhances improvement and implementation of computer technology. In a study which was done in united Kingdom by Australia nursing federation it revealed that the sharing of experiences in HIS by the two governments , that is united states of America and the united kingdom enhanced quality and efficient health care delivery to their country men and women (Australian Nursing Federation, 2015).

In Africa it was demonstrated that in order for the institutions to share medical knowledge, research, and other related health issues there is need to come up with publications of articles and scientific journals. However this cannot be achieved easily in the developing countries which can be a breakthrough in information dissemination. Paton, Househ, Malik, 2013).

2.4 Gaps in the Literature Review

In most of the studies that I consulted, there was little literature on the relationship of social-demographic characteristics and computer technology utilization in the provision of nursing care.

There was evidence of lack understanding of the results as many of the studies looked at health workers in general and were not very specific to nurse midwives.

Most of the studies reviewed in the literature had emphasized more on technical infrastructure required for the utilization of the same and the service providers were left out.

Studies which were done in remote areas with challenges in technical infrastructure related to computer utilization were as most of the studies were done in developed countries .thus there is need for these studies to be done where there are challenges on these technical infrastructure to establish the current status and be able to generate new knowledge on the same.

The studies were also having some limitations that my research is addressing the same . The researcher went further and determined whether social-demographic characteristics like age and gender, level of training, work experience play role in the uptake of utilization of computer technology by nurse-midwives.

Method of analysis of the data was in some studies giving conflicting results. Thus in my study I just applied a quantitative paradigm approach to analyse the data.

2.5 Theory involved in the utilization of computer technology.

Theories in nursing are very important when one is doing a nursing research as they provide a plan and linkages that assist in coming up with a research framework and this made a base of the researcher's conceptual framework. In my study used **unified theory of acceptance and use of technology** (**UTAUT**) (Venkatesh,2003)

The **unified theory of acceptance and use of technology** (**UTAUT**) is a technology acceptance model formulated by Venkatesh and others in "User acceptance of information technology: Toward a unified view The UTAUT aims to explain user intentions to use an information system and subsequent usage behavior. I found this theory to be very useful in my study because it gives a lee way of how to approach in totality, the whole issue of determining computer technology utilization by nurse-

midwifes in Kwale county in a health system which is deeply rooted in analog nursing practices. The theory has four instrumental factors: a) performance expectancy, b) effort expectancy, c) social influence, and d) facilitating conditions.

The first three of these factors focus on identification of usage intention and behavior, mainly used to forecast how individuals will behave based on their earlier attitudes and behavioural intentions. A person's resolution to agree to behave in a particular behaviour is based on the outcomes the individual desires will come as a result of performing the behaviour. A good example is looking at what the benefits the nurses-midwives will have after adapting the computer technology and how eventually will benefit the patients at large.

The fourth instrumental factor (facilitating conditions) is a direct determinant of user behavior. Gender, age, experience, work environment or institution one is working in and voluntariness of use is posited to moderate the impact of the four instrumental factors on usage intention and behavior.

My conceptual framework is anchored on these behavioral intentions and my independent variables are linked to this.

2.6 Conceptual framework

It was of paramount importance to understand the awareness and the perceptions of the service providers on importance of computer technology utilization in patient care. In the study I managed to establishment the role of the social-demographic characteristics of the nurse-midwives of Kwale county which included; marital status, residence, education level, work experience, gender and age. This is well linked in the fourth instrumental factor on the theory of UTAUT

Furthermore I considered the nurse-midwives related factors in utilization of computer technology which included; knowledge in computer operational skills, attitudes; culture, values, beliefs attitudes of nurses in the utilization of computer technology. These are well demonstrated in the first three instrumental factors in Venkatesh's theory. It was also necessary to consider institutional related factors in the utilization of computer technology where I looked for the availability of guidelines, policies, regulations, availability of computers and technical infrastructure which to me were the facilitating factors which is key in the UTAUT.

Figure 1 below gives an illustration of the conceptual framework for this study

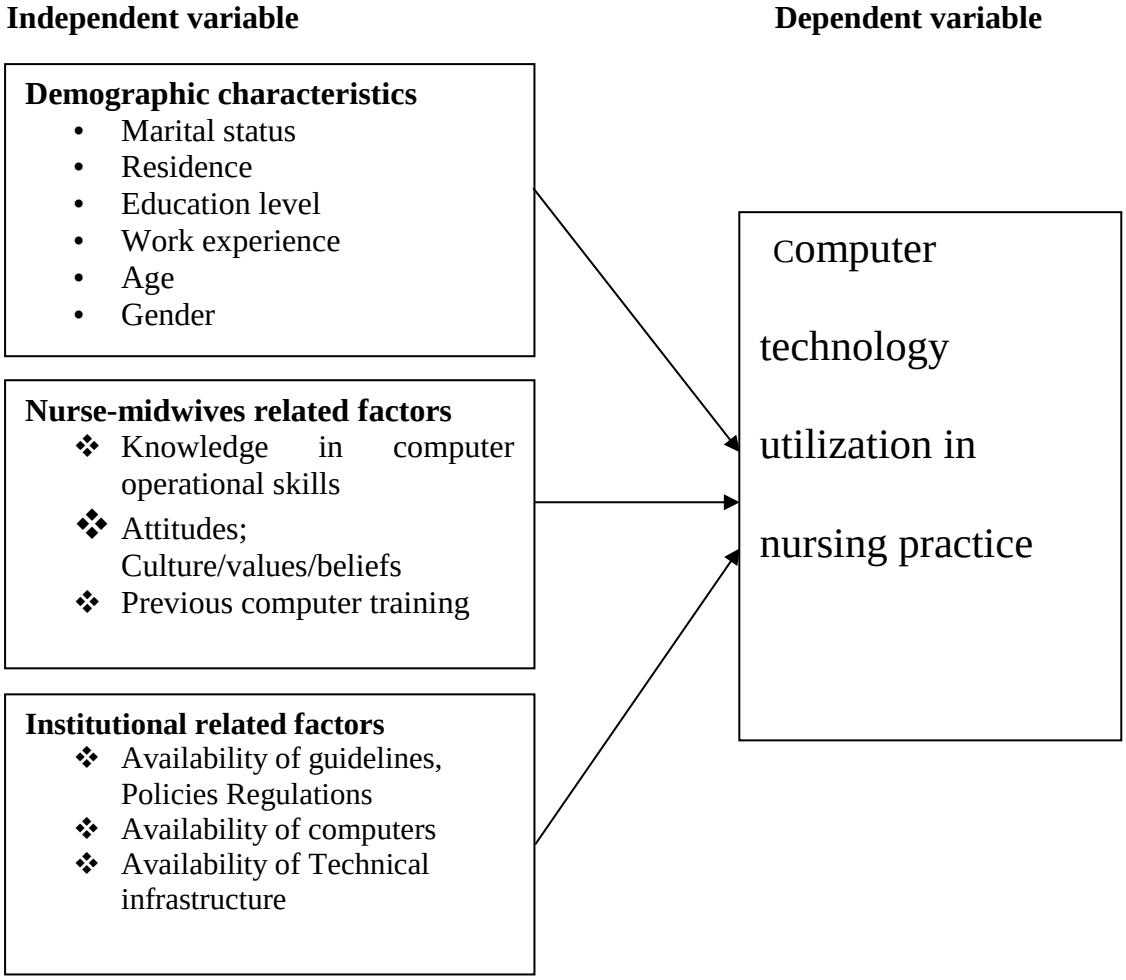

Figure 1: The conceptual framework for the study

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter specified the methodology that I used in determining the determinants of computer technology utilization by Nurse - Midwives in the maternity units in Kwale County. It described the research design, location of the study, study population, target population, sample size, sampling procedures, research tools, the inclusion criteria, the study setting, data collection methods, data analysis, limitations and delimitation, ethical considerations, and modalities that were considered in upholding the validity and reliability of the research.

3.1 Research Design

It was a cross-sectional study design which employed quantitative parameter which was done at Kwale County and specifically in Kinango sub county Hospital, Kwale sub county Hospital and Msambweni County referral hospital amongst nurse – midwives which aimed at establishing the determinants of computer technology utilization among nurse-midwives in nursing practice. The choice of locale was driven by the fact that studies of this nature have not been done and I wanted to generate knowledge on this particular subject. Also my choice to use Quantitative paradigm was that this method of research systematically examines a phenomenon and is capable of coming out with tangible statistically proven outcomes as opposed to themes and narrations (Yin, 2009). Furthermore quantitative research can be used to explain why certain characters tend to behave in a certain manner (Austin, Sutton 2014). During data collection analysis and presentation quantitative research approach was able to uphold and provided a more concrete and reliable findings and gave a foresight of computer utilization in nursing

practice by nurse-midwives in Kwale County. It investigated all the issues surrounding the utilization of computer technology in the provision of nursing care by Nurse – Midwives in Kwale County and by so doing I was able to give answers to my research questions and hence manage to reach my research objectives. In the study I utilized a Likert scale plus a survey questionnaire with close-ended questions which enabled me as the researcher to gather detailed and concrete data on the issues surrounding the utilization of computer technology in nursing practice by Nurse – Midwives in Kwale County.

3.2 Location of the Study

The study was conducted in Kwale County in Kenya. Kwale County had a population of 649,931 based on the 2009 census *Kenya* National bureau of statistics *(web).*with a population growth rate of 3.3 the projected population by 2017 December was 842698: males 409551 and females 433147. It covers an area 8,270 km². It was estimated that 80% of the population lived in the rural areas.

3.3 Target population

My target population were the nurses in Kwale County who were working in Kinango, Kwale, and Msambweni Hospitals. Total number of nurses in Kwale County is 463 out of 1076 health workers translating to 43% of the total health workers in the County. The nurse - midwives whom I targeted were those that had worked in Maternity and I included even those who worked that unit during their time of training.

3.4 The study population

The study population comprised of the health service providers who were nurse – midwives and who were either holders of Kenya enrolled community health nurse certificate, Kenya registered community health nurse diploma certificate and holders of Bachelor of Science in Nursing degree with or without knowledge in computer operation skills in Kinango sub county Hospital, Kwale sub county Hospital and Msambweni County referral hospital. Kwale County has 3 sub- county hospitals: **Kinango sub-county hospital, Kwale Sub-county hospital and Lungalunga sub-county hospital** and one County referral hospital which was **Msambweni County referral hospital.**

Table 1: An illustration of bed capacity, average number of deliveries per month and the number of nurse-midwives in the respective hospitals.

Hospital Name	Bed Capacity	Number Of Deliveries Per Month	Total Number Of Nurse-Midwies
Msambweni county referral hospital	201	250	93
Kinango sub-county Hospital	121	100	52
Kwale Sub-county hospital	78	75	42
Lungalunga Sub-county Hospital	31	50	15

Source: County staff returns DHIS

3.5 Inclusion /exclusion criteria

3.5.1 Inclusion Criteria

1. Nurse-Midwives who during their service delivery were at one point involved in the provision of care in a maternity unit including the time of their pre service training before they were employed
2. Nurse-midwives in the three hospitals that was Kinango Sub-county Hospital, Kwale Sub-county hospital and Msambweni County referral Hospital.
3. Those that consented.

3.5.2. Exclusion Criteria

1. Non- nurse midwives.
2. Those who declined to participate

3.6 Variables

3.6.1 Independent variables

In the study the **Demographic characteristics** was one of the independent variables where the researcher looked into Marital status, Residence, Education level, Age, Gender level of education, computer skills, and work experience, another variable was **Nurse-midwives related factors** where the researcher looked at the Knowledge of computer operational skills by the nurse-midwives, Attitudes; Culture/values/beliefs, Work experience and previous computer training. The last independent variable was **Institutional related factors** where the researcher looked into the following areas availability of guidelines, Policies, regulations, availability of computers, and availability of Technical infrastructure

3.6.2 Dependant variable

The dependant variable was; Determinants of computer technology utilization in nursing practice among nurse - midwives in Kwale County**.**

3.7 Sampling procedure

Considering the characteristics of study population and the objective of the study the researcher used Purposive sampling technique as he sampled the three hospitals to conduct the study rather than including all the nurse-midwives randomly in all the facilities in the County. That was why Purposive sampling was used as it was appropriate for the study and it allowed simple randomization and was easier to implement for the study. However the researcher used systematic random sampling method by the use of the duty roster to select the respondents at the three selected hospitals.

3.8 Sample Size determination

In order for the researcher to come up with a precise sample size which would uphold validity of the study he used a formula by Yamane (1967:886) to calculate the sample size as shown below. A 95% confidence level and P = 0.05 was assumed for the below Equation;

$$n = \frac{N}{1+N(e)2}$$

N was the sample size of my target population in the 3 hospitals which was 187 and was an equivalent to the number of Nurse-midwives in those Hospitals.

e was the level of precision at 95% confidence level e = 0.05

Where n was the sample size to be determined

n = 187⁄1+187(0.05)2 = 127.42759 = 128

10% margin error 10% of 128 = 12.9 = 13

Sample size was 128 + 13 = 141

Number of nurse-midwives respondents per hospital will be calculated by using ratios: Msambweni hospital a total of 93 nurse-midwives, Kinango hospital has a total of 52 nurse-midwives and Kwale hospital has a total of 42 nurse-midwives. The sample size of 141 nurse-midwives will be divided in the ratio of 93:52:42

93+52+42 = 187 the proportions will be 93/187 52/187 42/187

1/187 of 141 = 0.754 = 0.75

Therefore;

0.75x93 = 69.75 = 70 respondents for Msambweni hospital

0.75x52 = 39 respondents for Kinango hospital

0.75x42= 31.5 = 32 respondents for Kwale hospital and all these respondents will make a total of 141 – which was the desired sample size.

Table Distribution of Nurse-midwives as per their Cadres

QUALIFICATION	**NUMBER OF NURSES**	**PERCENTAGE**
Degree Holder	12	8.51%
Diploma Holder	107	75.89%
Certificate Holder	22	15.60%
TOTAL	**141**	**100%**

Source: Author, (2018)

3.9 Data Collection Tool

A self-administered objective questionnaire was developed and used for the study. It was in English language as the service providers were conversant with that language and there was no need for translation to another language. The questionnaire focused on social-demographic characteristics, knowledge and attitudes towards computer utilization. The questionnaire included computer attitudes statements that were rated on a five-point Likert scale ranging from '1' (Completely object) to '5' (Completely concur). The scale was informed by published literature (Kaya N, 2014) and took the rural African settings into account. (Boonstra A, Broekhuis M. 2013) Among the computer attitudes statements some were negatively and others were positively phrased however to avoid prejudice when it came to giving response, the flow of the questions were framed in a random manner.

The statements were based on the nurse-midwives' attitudes on the utilization of computer technology and their capability to use the same for the provision of nursing care. Demographic variables, Knowledge, attitudes and nurse-midwife related factors and institutional related factors on utilization of computer technology in nursing practice were evaluated.

The researcher developed a check list which he used to determine the level of computer application skills where the researcher asked the respondents to demonstrate how they were able to start and turn off a computer, how they were able to use a spread sheet, how they were able to browse the internet, how they were able to use a excel, how they could retrieve documents or information from the computer.

3.10 Pretesting of Study Tool

It was of paramount importance to uphold trustworthiness of the data collecting tool and the certainty of upholding that was done by pretesting the tool at Lungalunga Hospital as the Hospital had the same characteristics to those of the three Hospitals which were under study. However, every participant during the pre-testing underwent a screening procedure to meet the standard operating procedure of inclusion criteria as stipulated in the study. It was through the pre-testing process which enabled the researcher to pin point the underlying shortcomings which were addressed accordingly.

3.11 Validity and reliability of research instruments

Validity is the extent to which a research instrument measures what it is intended to measure and perform the desired expectations accurately as it was designed to perform and that ensured that all aspects of the findings and analysis included there in were valid. On the other hand, reliability involves the degree of the quality of being trustworthy and performing consistently well in deferent scenarios (Campbell & Stanley, 1966).

I made sure the validity and reliability were upheld by subjecting the questionnaire to a pre-testing at Lungalunga Sub-county hospital in an effort to come up with any shortcomings of the data collecting tool. In this case a sample of 14 Nurse-midwives which was 10% of the expected respondents was subjected to complete the questionnaire. After the pre-test at Lungalunga Hospital all the shortcomings for instance inconsistence numbering, flow, order, skip patterns, timing, and overall respondent well-being were noted and the opinions and inputs of the participants were put in account. I engaged my supervisors on the same and a comprehensive discussion

to interrogate the areas which needed fine tuning was done which ensured that the data collecting tool had the validity and reliability that was not questionable..

3.12 Data management

3.12.1 Data Collection

Upon the receipt of site visit approval from Kinango sub-county Hospital, Kwale Sub-County Hospital and Msambweni referral Hospital, a data collection tool was dispatched to the selected respondents until a total of 70 subjects were reached for Msambweni Hospital, 39 subjects for Kinango hospital and 32 subjects for Kwale Hospital making a total of 141 respondents. A detailed explanation was given to the respondents as pertaining to the way the data collection tool was supposed to be filled and all the questions and their concerns were addressed accordingly by the researcher and the research assistants.

Privacy, confidentiality and independence were ensured which boosted the respondents' openness and freedom to respond to the questions when they were tackling the question in the data collection tool. The respondents consented through signing a prewritten consent form and they were informed that it would not bind them just in case one decided to opt out as a respondent in the study as the participation solemnly depended on one's willingness to do so. The researcher ensured that the nurse-midwives daily duties were not interfered with thus the whole exercise was done in the Hospital surroundings and during normal working hours.

Three trained research assistants hand-delivered the questionnaire to the nurse-midwives who filled them and then the research assistants collected them immediately the respondents were through with the filling process.

3.12.2 Data storage

Data was stored in form of soft and hard copies as guided by Mount Kenya University Policies and guidelines for storing research data by students.

3.12.3 Data Analysis

Completed questionnaires were entered and analysed using SPSS version 21. Descriptive statistics (mean, standard deviation, percentages, and range) as well as inferential statistics (correlation, chi-square) between biographical characteristics, knowledge and perceptions were calculated. P values of ≤ 0.05 was considered statistically significant.

3.12.4 Data presentation

Data was presented inform of Graphs, Pie charts and tables.

3.13 Ethical Consideration

Approval to conduct the study was obtained from Mount Kenya University Ethics and review Committee then informed consent was obtained from all the participants. Further consent was sorted at, Kwale county ethics and review committee. Authority was also sorted from (NACOSTI). The sole purpose of the research was to improve nursing practice and fulfillment of academic requirement thus the respondents were informed that there would be no payment for their participation and that was why it was conducted during their normal working hours. The participants' were reassured that their dignity, anonymity was upheld and no names appeared on the questionnaires.

3.14 Assumptions

It was assumed that all the respondents were able to speak in English

It was also assumed that the respondents would be honest when responding to the questions specifically the part on self-rating on computer utilization

CHAPTER FOUR

RESEARCH RESULTS AND DISCUSSIONS

4.1 Introduction

In this chapter, results were presented according to the specific objectives of the study. The researcher first presented the overall questionnaire response rate, followed by the influence of socio-demographic characteristics on computer technology utilization, influence of nurse related factors on utilization of computer technology and influence of institutional related factors on utilization of computer technology. Descriptive information is presented first for each variable, frequencies and percentages, followed by inferential statistics (chi squared tests) at p value of <0.05, to test for any significance in association, between the independent variables and the dependent variable.

4.2 Questionnaire response rate

A total of 141 questionnaires were completed by the respondents which represented a 100% response rate.

4.3 Influence of socio-demographic characteristics on computer technology utilization

The respondents had various patterns of computer use both at work and away from work:

Table 2: Frequency of computer use at work

Frequency of computer use	Frequency(n)	Percent (%)
Never	94	66.7
Once a month	9	6.4
Once a week	21	14.9
Every day	17	12.1
Total	**141**	**100.0**

Source: Field Data (2019)

Table 2 above on page 39 shows that 94(66.7%) of the respondents never used computer at work, 9(6.4%) used computers once a month, 21(14.9%) used computers once a week and 17(12.1%) used computers every day.

Table 3: Frequency of computer use outside of work

Frequency of computer use	Frequency(n)	Percent (%)
Never	53	37.6
Once a month	27	19.1
Once a week	31	22.0
Every day	30	21.3
Total	**141**	**100.0**

Source: Field Data (2019)

Table 3 shows that 53(37.6%) of the respondents never used computers outside of work, 27(19.1%) used computers once a month, 31(22%) used computers once a week and 30(21.3%) used computers outside of work every day.

Utilization in this study however, referred to practical use of computers. Practical use of computers was assessed through an observation check-list, which touched on twenty different computer competence areas as shown in figure 4.3 below on page 47.

Table 4: Utilization of Computer Technology by Respondents

Frequency of Computer Technology by Respondents	Frequency(n)			
Basic computer skills	4(%)	3(%)	2(%)	1(%)
Start and close programs	68.1	9.2	5	17.7
Highlight, drag, and drop	58.9	12.8	7.1	21.3
Use a mouse, including left, right, and double clicks	63.8	12.1	5.0	19.1
Manage files	47.5	17.7	10.6	24.1
Use "My Computer" to access various drives	48.2	18.4	9.2	24.1
Word Processing				
Create documents in a word processing program	46.8	17.7	12.8	22.7
Save documents	46.8	18.4	9.2	25.5
Copy and paste	41.8	19.1	9.2	29.8
Insert a table	39	17.7	12.1	31.2
Presentation				
Create a slide presentation that includes text and clipart	32.6	20.6	17	29.8
Save a presentation as a web page	28.4	21.3	16.3	34
Add an action button to a slide in a presentation	27	21.3	18.4	33.3
Spreadsheets				
Create and save worksheets	27.7	18.4	19.9	34
Change and sort data in an existing worksheet	25.5	20.6	18.4	35.5
Internet				
Access the Internet	53.2	14.2	9.9	22.7
Navigate the Internet	46.8	19.1	10.6	23.4
Email				
Open and delete email	56	12.8	7.8	23.4
Forward and reply to email messages	55.3	14.2	6.4	24.1
Create and send email messages	54.6	14.9	6.4	24.1
Attach files to messages	50.4	15.6	8.5	25.5

Key to table 4. above: 4 = Yes 3 = With Occasional Minor Assistance 2 = Only With Assistance 1 = No

Source: Field Data (2019)

Table 4 above shows that, more than a half of respondents i.e.96 (68.1%) were able to start and close computer programs and the most wanting competence area was changing and sorting data in existing work sheet, which was performed by 36(25.5%) of the respondents.

The 20 competence areas were regrouped into two categories each i.e. “competent” or “incompetent” based on respondents’ performance. “Competent” referred to the ability to perform the respective tasks without assistance while “incompetent” referred to inability to perform the tasks, performing the tasks only with assistance or performing the tasks with occasional minor assistance.

A competence score was computed out of the 20 competence areas, in order to determine the competence levels. Ability to perform at least 10 tasks was considered as low competence level, while ability to perform more than ten tasks was considered to be high competence level. Those with low competence levels were considered not to utilize computer technology, while those with high competence levels were considered to utilize computer technology.

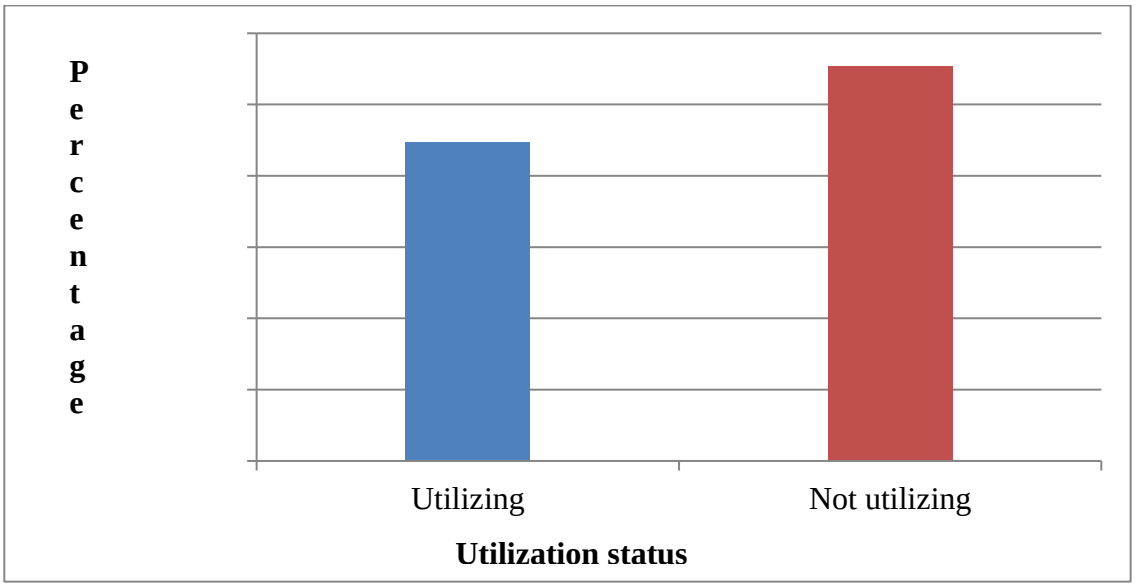

Figure 2: Respondents’ computer technology utilization

Figure 2 above shows that 63(44.7%) of the respondents utilized computer technology, while 78(55.3%) did not. This study reveals that majority of the nurse - midwives are reluctant to apply computer technology. And this agrees with a study conducted by Felix Sukums in Uganda which demonstrated that the successful adoption of computer technology in nursing practice is obstructed by insufficient application of computer technology Felix Sukums et al. (2014).

4.3.1 Respondents' ages and utilization of computer technology

Table 5: Ages of the respondents

Ages of the respondents	Frequency(n)	Percent (%)
20-30years	38	27.0
31-40years	44	31.2
41-45years	18	12.8
Above 45years	41	29.1
Total	**141**	**100.0**

Source: Field Data (2019)

Table 5 above shows that majority of respondents 44(31.2%) were aged 31-40 years, 38(27%) were aged 20-30 years, 18(12.8%) were aged 41-45 years and 41(29.1%) were aged above 45 years.

The ages of the respondents were collapsed into two categories namely, 45 years and below, and above 45 years. These two categories were cross tabulated with computer technology utilization and chi square tests run.

Table 6: Association between respondents' ages and computer technology utilization

		What is your age?		Total
		45 years and below	above 45 years	
Utilization versus non-utilization	Utilization	52	11	63
	Non-utilization	48	30	78
Total		100	41	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.453[a]	1	.006		
Continuity Correction[b]	6.470	1	.011		
Likelihood Ratio	7.712	1	.005		
Fisher's Exact Test				.009	.005
Linear-by-Linear Association	7.401	1	.007		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.32.

b. Computed only for a 2x2 table

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Utilization versus non-utilization (utilization / non-utilization)	2.955	1.335	6.539
For cohort what is your age = 45 years and below	1.341	1.088	1.653
For cohort what is your age = above 45 years	.454	.248	.832
N of Valid Cases	141		

Source: Field Data (2019)

Table 6 above on page 42 shows that, respondents' ages were significantly associated with utilization of computer technology (χ^2 (1, N=141)=7.453, p=0.006) whereby those respondents who were aged 45 years and below were 2.9 times more likely to utilize computer technology.

The demonstration above agrees with a study done in Tanzania by Kaya in 2014 which revealed that young nurses were more interested in applying computer technology than their older fellows.

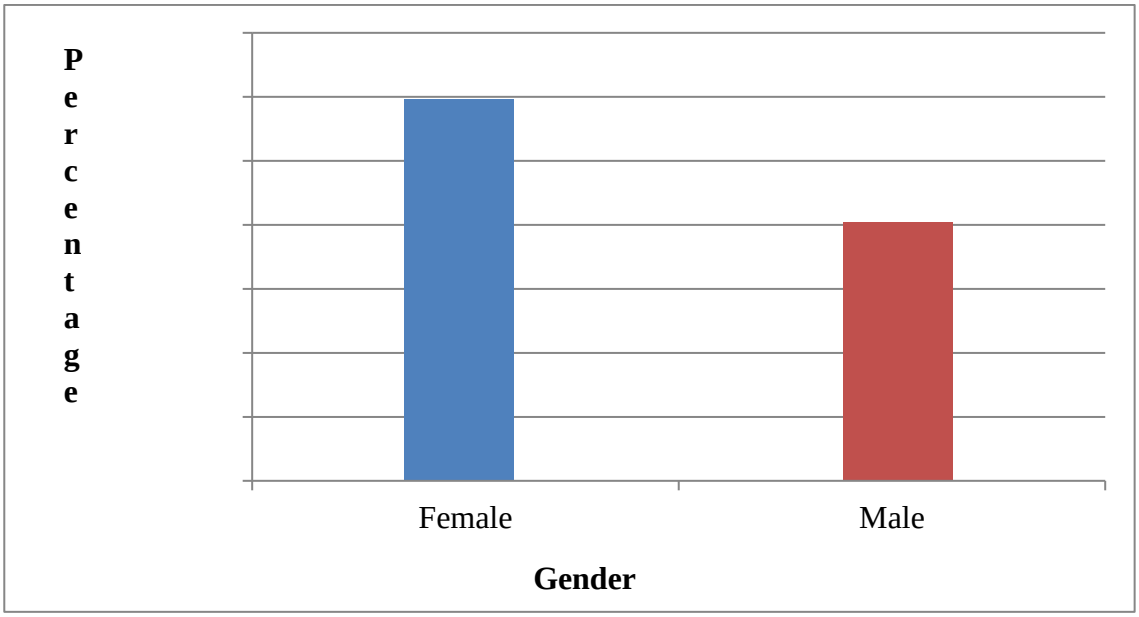

Figure 3: Respondents' genders and utilization of computer technology

Figure 4 above shows that most respondents i.e. 84 (59.6%) were females while 57 (40.4%) were males. Respondent's genders were cross-tabulated against utilization and chi squared tests were performed.

Table 7: Association between gender and utilization of computer technology

Count				
		What is your gender?		Total
		Male	Female	
Utilization vs non-utilization	Utilization	29	34	63
	Non-utilization	28	50	78
Total		57	84	141

Chi square test

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.486[a]	1	.223		
Continuity Correction[b]	1.095	1	.295		
Likelihood Ratio	1.485	1	.223		
Fisher's Exact Test				.233	.148
Linear-by-Linear Association	1.476	1	.224		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 25.47.

b. Computed only for a 2x2 table

Source: Field Data (2019)

Table 7 above shows that there was no significant association between gender and utilization of computer technology (χ^2 (1, N=141) =1.486, p=0.223)

Most respondents 84 (59.6%) were females while 57 (40.4%) were males. Respondent's genders were cross-tabulated against utilization and chi squared tests were performed. This revealed no significant association between gender and utilization of computer technology (χ^2 (1, N=141) =1.486, p=0.223).

This finding is bridging the gap in literature review where most of the studies did not check for this kind of variable.

4.3.2 Respondents' marital statuses and utilization of computer technology

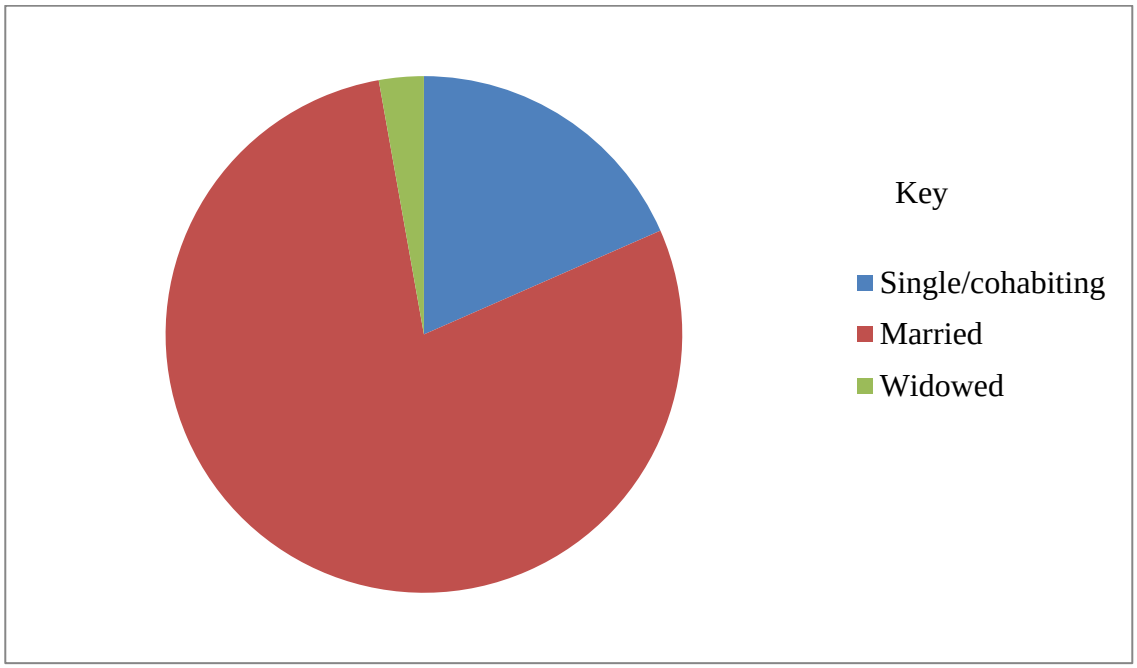

Figure 4: Marital statuses of the respondents

Figure 4 above shows that 26(18.4%) of the respondents were either single or cohabiting, 111 (78.7%) were married, and 4 (2.8%) were widowed. Marital statuses did not significantly influence computer technology utilization among the respondents (χ^2 (2, N=141) =0.436, p=0.804). This component was also overlooked in most of the studies and in this study we prove statistically that there is no relationship.

4.3.3 Highest academic qualification and utilization of computer technology

Table 8: Highest academic qualifications of the respondents

Highest qualification	Frequency(n)	Percent (%)
Nursing certificate	22	15.6
Nursing diploma	107	75.9
Nursing degree	12	8.5
Total	**141**	**100.0**

Source: Field Data (2019)

Table 8 above on page 47 shows that 22(15.6%) of the respondents had a certificate in nursing, 107(75.9%) had diploma in nursing and 12 (8.5%) had a degree in nursing.

Table 9: Association between respondents' highest qualification and utilization of computer technology

Count				
		What is your highest qualification?		Total
		Diploma in Nursing & above	Certificate in Nursing	
Utilization vs non-utilization	Utilization	58	5	63
	Non-utilization	61	17	78
Total		119	22	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.083[a]	1	.024		
Continuity Correction[b]	4.085	1	.043		
Likelihood Ratio	5.393	1	.020		
Fisher's Exact Test				.034	.020
Linear-by-Linear Association	5.047	1	.025		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.83.
b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Utilization vs non-utilization (utilization / non-utilization)	3.233	1.120	9.330
For cohort what is your highest qualification? = Diploma in Nursing & above	1.177	1.026	1.351
For cohort what is your highest qualification? = Certificate in Nursing	.364	.142	.932
N of Valid Cases	141		

Source: Field Data (2019)

Table 9 above shows that respondents' qualifications influenced utilization of computer technology (χ^2 (1, N=141) =5.083, p=0.024), whereby, those with diploma in nursing and above were 3.2 times more likely to utilize computer technology.

This finding is in line with a study which was done in Bukinafaso by Seon et al which showed that high level of education accelerates up take and mastering of utilization of computer technology (Seon, Yoon and Nancy Staggers, (2014).

4.3.4 Nursing jobs and utilization of computer technology

Table 10: Nursing jobs of the respondents

Specialization	Frequency(n)	Percent (%)
General nurse	107	75.9
Nurse specialist	12	8.5
Nurse supervisor	14	9.9
Nurse midwife	8	5.7
Total	**141**	**100.0**

Source: Field Data (2019)

Table 10 above shows that 107 (75.9%) were general nurses, 12 (8.5%) were nurse specialists, 14(9.9%) were nurse supervisors, 8(5.7%) were midwives.

Nursing jobs were collapsed into two categories namely “nurse supervisor” and “other jobs” and cross-tabulated against utilization. This was followed by chi squared tests of associations.

Table 11: Association between nursing jobs and utilization of computer technology

Count

		What is your nursing job?		Total
		Nurse supervisor	Other jobs	
Utilization vs non-utilization	Utilization	10	53	63
	Non-utilization	4	74	78
Total		14	127	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.499[a]	1	.034		
Continuity Correction[b]	3.378	1	.066		
Likelihood Ratio	4.546	1	.033		
Fisher's Exact Test				.047	.033
Linear-by-Linear Association	4.467	1	.035		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.26.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Utilization vs non-utilization (utilization / non-utilization)	3.491	1.039	11.729
For cohort What is your nursing job = nurse supervisor	3.095	1.019	9.401
For cohort What is your nursing job = Other jobs	.887	.787	.999
N of Valid Cases	141		

Source: Field Data (2019)

Table 11 above on page 47 shows that, nursing jobs significantly affected computer technology utilization (χ^2 (1, N=141) =4.499, p=0.034) whereby, those nurses in supervisory positions were 3.5 times more likely to utilize computer technology.

This study is revealing that Nurse Managers do utilize computer technology but they are not passing that vice to junior colleagues.

This demonstration goes hand in hand with a study conducted in USA by McGonigle where the results showed that the biggest challenge for nurse manager was to persuade higher level managers to come up with the appropriate ICT that will be able to be tolerated and accommodated by the junior nurses to solve thorny problems and deliver standardized care and which will be easy to operate. (McGonigle et al, 2015).

4.3.5 Residence and computer technology utilization

Most respondents i.e. 92(65%) were rural dwellers while 49(35%) were urban dwellers. Residence was cross-tabulated with computer technology utilization and chi squared tests were performed.

Table 12: Association between residence and computer technology utilization

Count				
		Where do you reside?		Total
		Rural	Urban	
Utilization vs non-utilization	Utilization	38	25	63
	Non-utilization	54	24	78
Total		92	49	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.221[a]	1	.269		
Continuity Correction[b]	.860	1	.354		
Likelihood Ratio	1.218	1	.270		
Fisher's Exact Test				.290	.177
Linear-by-Linear Association	1.212	1	.271		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 21.89.

b. Computed only for a 2x2 table

Source: Field Data (2019)

Table 12 above shows that residence did not significantly affect computer technology utilization (χ^2 (1, N=141) =1.221, p=0.269)

This revelation above on page 49 agrees with a study which was done Bukinafaso. Ghana and Tanzania by Mehdi which showed that due to nurse-midwives richness in work experience in nursing service provision their uptake of computer technology utilization was as good as that of an urban nurse. (Mehdi Kahouei, Hassan Baba Mohhamed, Hasamedin Askari majdadi, 2014)

4.3.6 Number of years worked and utilization of computer technology

Table 13: Number of years worked as a nurse by the respondents

Number of years worked as a nurse	Frequency (n)	Percent (%)
1-4 years	39	27.7
5-9 years	30	21.3
10-19 years	29	20.6
20-24 years	18	12.8
Above 25 years	25	17.7
Total	141	100.0

Source: Field Data (2019)

Table 13 above shows that 39(27.7%) had worded for 1-4 years, 30(21.3%) had worked for 5-9 years, 29(20.6%) had worked for 10-19 years, 18(12.8%) had worked for 20-24 years and 25(17.7%) had worked for above 25 years.

Working years were collapsed into two categories i.e. 19 years and below, and 20 years and above and cross-tabulated against utilization

Table 14: Association between years worked and utilization of computer technology

Count

		How many years have you worked as a nurse?		Total
		19 years and below	20 years and above	
Utilization vs non-utilization	Utilization	52	11	63
	Non-utilization	46	32	78
Total		98	43	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	9.131[a]	1	.003		
Continuity Correction[b]	8.053	1	.005		
Likelihood Ratio	9.477	1	.002		
Fisher's Exact Test				.003	.002
Linear-by-Linear Association	9.066	1	.003		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 19.21.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Utilization vs non-utilization (utilization / non-utilization)	3.289	1.490	7.258
For cohort How many years have you worked as a nurse? = 19 years and below	1.400	1.126	1.739
For cohort How many years have you worked as a nurse? = 20 years and above	.426	.234	.775
N of Valid Cases	141		

Source: Field Data (2019)

Table 14 above shows that there was a significant association between number of years worked and computer technology utilization (χ^2 (1, N=141) =9.131, p=0.003) whereby,

those who had worked for 19 years and below were 3.3 times likely to utilize computer technology.

This demonstration agrees with a study done in Tanzania by Kaya in 2014 which revealed that young nurses were more interested in applying computer technology than their older fellows.

4.3.7 Departments that respondents worked in and utilization of computer technology

Table 15: Departments that the respondents worked in

Department worked in	Frequency (n)	Percent (%)
Maternity	29	20.6
Female ward	11	7.8
Male ward	6	4.3
Pediatric ward	12	8.5
Sub-county office	8	5.7
A&E	3	2.1
OPD	29	20.6
CCC	1	.7
ICU	4	2.8
MCH	12	8.5
Dispensary	2	1.4
Theatre	9	6.4
Administration	5	3.5
General ward	4	2.8
Renal	4	2.8
NBU	2	1.4
Total	**141**	**100.0**

Source: Field Data (2019)

Table 15 above shows that most respondents worked in the OPD and maternity departments, which had 29(20.6%) each, 11 (7.8%) worked in the female ward, 6(4.3%) worked in the male ward, 12(8.5%) worked in the paediatric ward, 8(5.7%)

worked in the sub-county office, 3(2.1) worked in the A&E department, 1(0.7%) worked in the CCC, 4(2.8%) worked in the ICU, 12(8.5%) worked in the MCH, 2(1.4%) worked in the dispensary, 9(6.4%) worked in theatre, 5(3,5%) were in administration, 4(2.8%) worked in the general ward, 4(2.8%) worked in the renal unit and 2(1.4%) worked in the NBU.

Departments were collapsed into two categories i.e. category one, which consisted of sub-county office, administration, CCC, and ICU and category two which consisted of the rest. Collapsed departments were cross-tabulated against computer technology utilization.

Table 16: Association between respondents' departments and utilization of computer technology

Count

		In which department do you work?		Total
		Sub-county office/Administration/CCC/ICU	Other departments	
Utilization vs non-utilization	Utilization	13	50	63
	Non-utilization	3	75	78
Total		16	125	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	9.765[a]	1	.002		
Continuity Correction[b]	8.167	1	.004		
Likelihood Ratio	10.173	1	.001		
Fisher's Exact Test				.003	.002
Linear-by-Linear Association	9.696	1	.002		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.15.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Utilization vs non-utilization (utilization / non-utilization)	6.500	1.762	23.979
For cohort In which department do you work? = Sub-county office/Administration/CCC/ICU	5.365	1.599	18.004
For cohort In which department do you work? = Other departments	.825	.722	.943
N of Valid Cases	141		

Source: Field Data (2019)

Table 16 above on page 57 shows that, there was a significant association between departments the respondents worked in and utilization of computer technology (χ^2 (1, *N*=141) =9.765, *p*=0.002) whereby, those working in sub-county office/administration/CCC/ICU were 6.5 times likely to utilize computer technology.

These findings are in line with the study which conducted by Wachter in united Kingdom where he found out that Nurse Managers/Administrators/Nurse specialist are literate in computer technology and are better in managing and monitoring their patient and human resource management as pertaining to the nursing staff in general. (Wachter, 2016.)

4.3.8 Previous computer training and utilization of computer technology

Majority of the respondents i.e. 85(60.3%) had previous computer training while 56 (39.7%) had no previous computer training. This was cross-tabulated against utilization and chi squared tests of associations were performed.

Table 17: Association between previous computer training and utilization of computer technology

Count

		Do you have previous computer training?		Total
		Yes	No	
Utilization vs non-utilization	Utilization	52	11	63
	Non-utilization	33	45	78
Total		85	56	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	23.561[a]	1	.000		
Continuity Correction[b]	21.910	1	.000		
Likelihood Ratio	24.831	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	23.394	1	.000		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 25.02.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Utilization vs non-utilization (utilization / non-utilization)	6.446	2.924	14.211
For cohort previous computer training = yes	1.951	1.470	2.589
For cohort previous computer training = no	.303	.171	.535
N of Valid Cases	141		

Source: Field Data (2019)

Table 17 shows that previous computer training significantly affected computer technology utilization (χ^2 (1, N=141) =23561, p=<0.001) whereby, those who had previous computer training were 6.5 times likely to utilize computer technology.

After identifying the socio-demographic characteristics that were significantly associated with utilization of computer technology (p values of <0.05), the researcher performed multiple regression analysis (binary logistic regression) to identify the socio-demographic factors that contributed significantly to the overall change in the dependent variable (utilization of technology). Variables were entered using forward selection method.

Table 18: Regression analysis of socio-demographic characteristics influencing computer technology utilization

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Training	1.864	.403	21.348	1	.000	6.446
	Constant	-2.318	.558	17.266	1	.000	.098
Step 2[b]	Department collapsed	1.872	.719	6.770	1	.009	6.499
	Training	1.863	.419	19.783	1	.000	6.446
	Constant	-5.870	1.549	14.350	1	.000	.003
Step 3[c]	Age collapsed	1.118	.495	5.102	1	.024	3.059
	Department collapsed	2.190	.754	8.437	1	.004	8.935
	Training	1.692	.430	15.509	1	.000	5.428
	Constant	-7.642	1.818	17.672	1	.000	.000

a. Variable(s) entered on step 1: training.
b. Variable(s) entered on step 2: department collapsed.
c. Variable(s) entered on step 3: age collapsed.

Source: Field Data (2019)

Table 18 above shows that, previous training (wald=15.509, df=1, p=<0.001, ExP (B)=5.428), departments that respondents were working in (wald=8.437, df=1, p=0.004, Exp (B)=8.94) and ages of the respondents (wald=5.102, df=1, p=0.024, Exp (B)=3.06) all contributed significantly to the overall change in the utilization of computer technology.

This demonstration in this study agrees in totality with the study which was done in Wales UK by Tennent et al, they found that, there is need for nursing educators to be

literate in utilization of computer technology through proper training for them to pass the same to their learners and instil confidence in them. (Tennent, Becker & Kehoe, 2015; Warren & Connors, 2017).

4.4 Nurse- midwife related factors influencing utilization of computer technology

In this study, the nurse-midwife related characteristics of interest were the knowledge and attitudes of nurses on computer technology.

Knowledge of the nurses was determined by their own self rating of computer knowledge, while attitudes were determined by use of a likert scale.

4.4.1 Knowledge and computer technology utilization

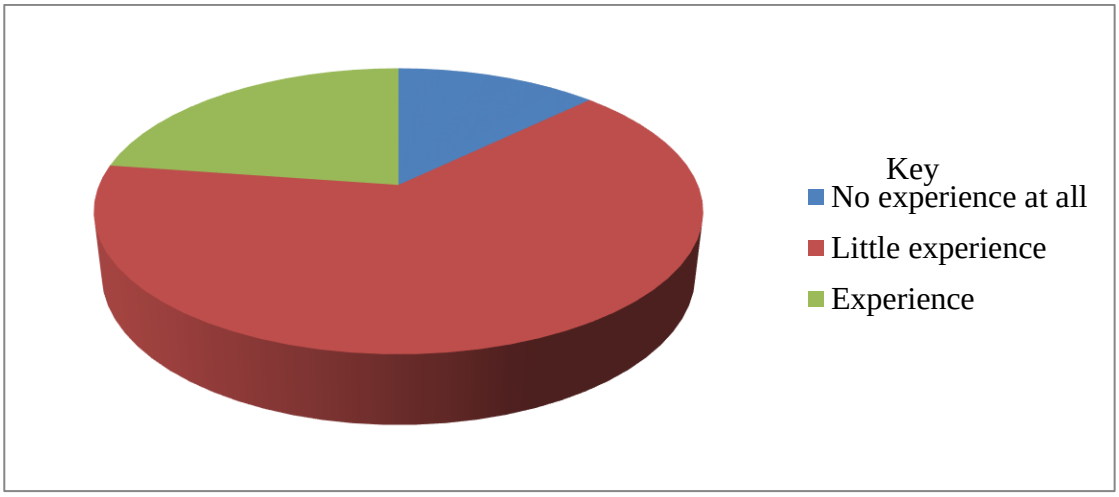

Figure 5: Self-rating of computer knowledge by respondents

Figure 5 above shows that 18 (12.8%) had no computer experience at all, 91(64.5%) had little experience and 32(22.7%) were experienced. Computer knowledge was cross-tabulated against utilization of computer technology.

Table 19: Association between knowledge and utilization of computer technology

Count				
		What is your level of computer knowledge?		Total
		Experienced	Little or no experience	
Utilization vs non-utilization	Utilization	27	36	63
	Non-utilization	5	73	78
Total		32	109	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	26.388[a]	1	.000		
Continuity Correction[b]	24.351	1	.000		
Likelihood Ratio	27.838	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	26.200	1	.000		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 14.30.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Utilization vs non-utilization (utilization / non-utilization)	10.950	3.892	30.806
For cohort What is your level of computer knowledge? = Experienced	6.686	2.733	16.356
For cohort What is your level of computer knowledge? = Little or no experience	.611	.489	.762
N of Valid Cases	141		

Source: Field Data (2019)

Table 19 above shows that the self-rated computer knowledge significantly influenced utilization of computer technology (χ^2 (1, N=141) =26.338, p=<0.001) whereby, those

who rated themselves as being experienced were 11 times likely to utilize computer technology.

This revelation tallies very well with a study which was conducted by Hersh et al, in Ghana which showed that experienced computer users who are best called Informaticians stand a better chance in application of computer technology utilization than those who have little knowledge in computer operations.(Hersh, et al, 2013).

4.4.2 Attitude and utilization of computer technology

Respondents' attitudes towards computer technology, was assessed using a set of 10 likert form statements, against which they were to respond as follows: Completely Object (CO), Object (O), Whichever (W), Concur (C) or Completely Concur (CC). These responses were coded as 1,2,3,4 & 5 respectively to facilitate mathematical operations. Statements 3, 5, 7 & 9 were negatively phrased and were therefore reverse coded before analysis. Those who completely objected, objected or said "whichever," were considered as having a negative attitude, while those who concurred or completely concurred were considered to have a positive attitude.

This is illustrated below on page 60.

Table 20: Overall attitudes towards computer technology utilization

Likert statement	CO (%)	O (%)	W (%)	C (%)	CC (%)
Computer training should be included in basic nursing training	5.7	2.1	2.1	34.8	55.3
Use of computers will make documentation easier for nurses	7.1	6.4	3.5	73	9.9
Use of IT in health care by nurses increase workload***(reverse-coded)***	10.6	22.7	3.5	42.6	20.6
Quality of health care will improve with computerization	7.1	5.7	6.4	43.3	37.6
Only computer department staff should be assigned to handle computers***(reverse-coded)***	2.1	15.6	5.7	39	37.6
Use of IT in nursing practice increases nursing professional status	6.4	12.1	3.5	43.3	34.8
Cost of computer use in nursing is too expensive***(reverse-coded)***	3.5	22.7	1.4	47.5	24.8
Nurses should be encouraged to specialize in computer studies	10.6	12.1	7.8	58.9	10.6
Computerizing nursing practice will alienate nurses from clients***(reverse-coded)***	6.4	10.6	2.1	53.9	27
Computer application knowledge should be a criteria in nurse promotion	27	29.1	7.1	24.8	12.1

Source: Field Data (2019)

Table 20 above shows that, over 50% of the responses either concurred or completely concurred, which was generally indicative of a positive attitude.

To determine the attitudes of individual respondents, the researcher computed a variable known as “attitude score”, by summing up all the numerical codes assigned to

the various responses. Those who scored at least 40 out of 50 were presumed to have a positive attitude, because, most of their responses must have been “concur” which had code 4(4×10=40). On the other hand, those who scored below 40 were presumed to have a negative attitude.

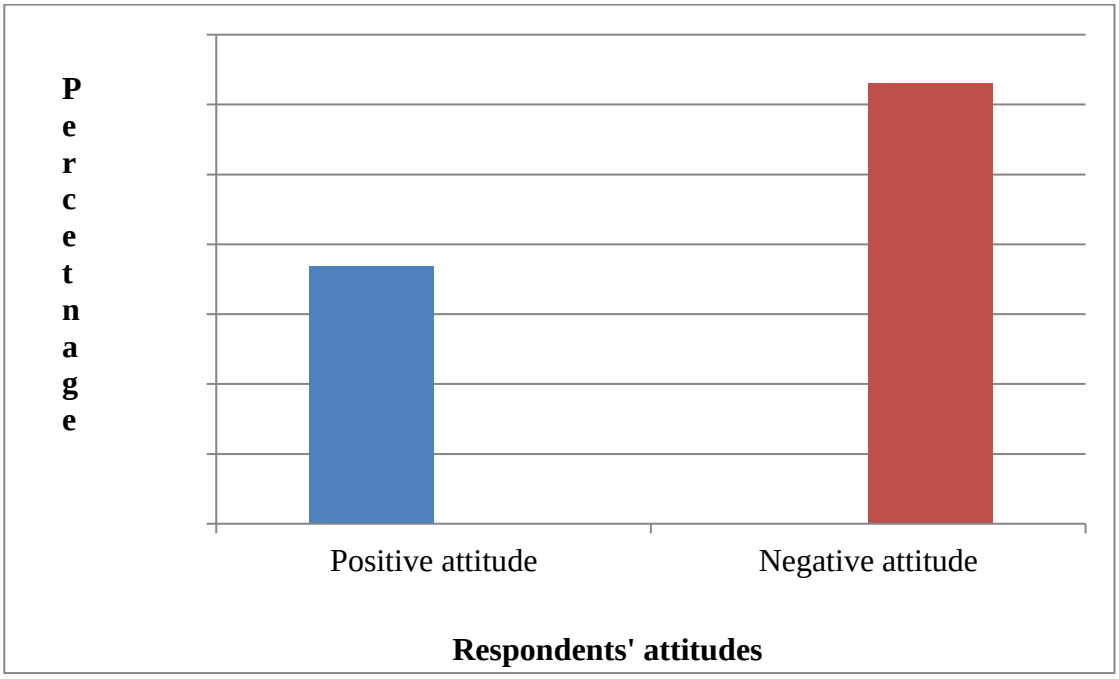

Figure 6: Respondents’ attitudes towards computer technology

Figure 6 above shows that, 52(36.9%) of the respondents had a positive attitude, while majority of the respondents 89(63.1%) had a negative attitude towards computer technology. This demonstration agrees with a study conducted in Iran by Hassan Baba Mohhamed et al where they were investigating Nurses’ attitudes towards the benefits of utilizing computer technology in Iran, which showed that Nurse-midwives’ resistance to change to new information technology is expected and negativity always outweighs positivity on the same but to them they described it as normal response (Hassan Baba Mohhamed, Hasamedin Askari majdadi 2014).

Table 21: Association between attitude and utilization of computer technology

Count				
		Positive vs negative attitude		Total
		Positive attitude	Negative attitude	
Utilization vs non-utilization	Utilization	29	34	63
	Non-utilization	23	55	78
Total		52	89	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.098[a]	1	.043		
Continuity Correction[b]	3.418	1	.064		
Likelihood Ratio	4.097	1	.043		
Fisher's Exact Test				.054	.032
Linear-by-Linear Association	4.069	1	.044		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 23.23.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Utilization vs non-utilization (utilization / non-utilization)	2.040	1.018	4.085
For cohort positive vs negative attitude = Positive attitude	1.561	1.010	2.412
For cohort positive vs negative attitude = Negative attitude	.765	.585	1.002
N of Valid Cases	141		

Source: Field Data (2019)

Table 21 above shows that, respondents' attitudes significantly influenced computer technology utilization (χ^2 (1, N=141) =4.098, p=0.043) whereby, those with positive attitude were 2 times likely to utilize computer technology. This scenario goes in line with a study which was done in Australian by Cooper which demonstrated that nurses

who had positive attitude towards emerging information technology had an uptake rate of 85% compared to those who had negative attitude. (Cooper, Hamer 2014).

Attitude score was correlated against utilization score which demonstrated a positive correlation.

Table 22: Correlation between attitude and utilization of computer technology

		Attitude score	Utilization score
Attitude score	Pearson Correlation	1	.272**
	Sig. (2-tailed)		.001
	N	141	141
Utilization score	Pearson Correlation	.272**	1
	Sig. (2-tailed)	.001	
	N	141	141

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Field Data (2019)

Table 22 above shows that there was a significant positive relationship between attitude scores and utilization scores (r (139) =.272, p=0.001)

4.5 Influence of institutional related factors on utilization of computer technology

The institutional factors of interest in this study were: availability of policies, availability of guidelines, availability of regulations, availability of computers, and availability of Wi-Fi. These were assessed by use of a check-list.

4.5.1 Availability of policies and utilization of computer technology

Majority i.e. 113 (80.1%) of the set-ups indicated absence of policies regarding computer technology utilization, while 28(19.9%) indicated presence of policies

Table 23: Association between presence of policy and utilization of computer technology

Count

		Are policies regarding computer technology utilization available?		Total
		yes	no	
Utilization vs non-utilization	Utilization	12	51	63
	Non-utilization	16	62	78
Total		28	113	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.047[a]	1	.828		
Continuity Correction[b]	.000	1	.996		
Likelihood Ratio	.047	1	.828		
Fisher's Exact Test				1.000	.500
Linear-by-Linear Association	.047	1	.829		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.51.

b. Computed only for a 2x2 table

Source: Field Data (2019)

Table 23 above shows that, presence of policy on computer technology was not significantly associated with utilization (χ^2 (1, N=141) =0.047, p=0.828)

4.5.2 Availability of guidelines and utilization of computer technology

Majority i.e. 113 (80.1%) of the set-ups indicated absence of guidelines regarding computer technology utilization, while 28(19.9%) indicated presence of guidelines.

Table 24: Association between presence of guidelines and utilization of computer technology

Count

		Are guidelines regarding computer technology utilization available?		Total
		Yes	No	
Utilization vs non-utilization	Utilization	12	51	63
	Non-utilization	16	62	78
Total		28	113	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.047[a]	1	.828		
Continuity Correction[b]	.000	1	.996		
Likelihood Ratio	.047	1	.828		
Fisher's Exact Test				1.000	.500
Linear-by-Linear Association	.047	1	.829		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.51.

b. Computed only for a 2x2 table

Source: Field Data (2019)

Table 24 above shows that, presence of guidelines on computer technology was not significantly associated with utilization (χ^2 (1, N=141) =0.047, p=0.828)

4.5.3 Availability of regulations and utilization of computer technology

Majority of the set-ups i.e. 112(79.4%) had no regulations governing computer use while 29(20.6%) had such regulations.

Table 25: Association between availability of regulations and utilization of computer technology

Count

		Are regulations regarding computer technology utilization available?		Total
		Yes	No	
Utilization vs non-utilization	Utilization	13	50	63
	Non-utilization	16	62	78
Total		29	112	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.000[a]	1	.986		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.000	1	.986		
Fisher's Exact Test				1.000	.574
Linear-by-Linear Association	.000	1	.986		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.96.

b. Computed only for a 2x2 table

Source: Field Data (2019)

Table 25 above shows that, availability of guidelines did not significantly influence utilization of computer technology (χ^2 (1, N=0.000), p=0.986)

The overall picture in this study on these variables is that there are no policies, guidelines, regulations or legal frame work in place in most of the service areas which were under study.

This agrees with a study which was done in Kenya by Ragneskog which showed that there are no known agendas or policies in place which indicate that there is a plan to

adopt nursing informatics in the health systems in the near future especially in the public hospitals (Ragneskog, 2016).

However according to the findings of this study these variables do not have significant influence in the utilization of computer technology of which this demonstration disagrees with a study which was done in Japan by Nagle et al which showed that inclusion of nurse-midwives during deliberations on policies and guidelines governing computer technology adoption in nursing practice is of paramount importance and will significantly enhance up take of computer utilization amongst nurse-midwives (Nagle Lynn, Sermeus, Junger, 2017

4.5.4 Availability of computers and utilization of computer technology

In 67 (47.5%) of the situations, computers had been availed in the working area, while in 74(52.5%) of the situations, computers had not been availed.

Table 26: Association between availability of computers and utilization of computer technology

Count

		Are computers available in the working area?		Total
		Yes	No	
Utilization vs non-utilization	Utilization	30	33	63
	Non-utilization	37	41	78
Total		67	74	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.000[a]	1	.983		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.000	1	.983		
Fisher's Exact Test				1.000	.559
Linear-by-Linear Association	.000	1	.983		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 29.94.

b. Computed only for a 2x2 table

Source: Field Data (2019)

Table 26 above shows that, availability of computers in the working areas was not significantly associated with utilization of computer technology (χ^2 (1, N=141) =0.000, p=0.983).

4.5.5 Availability of free Wi-fi and utilization of computer technology

In most cases i.e. 128(90.8%), free Wi-fi was not provided, while in 13(9.2%) cases it was provided.

Table 27: Association between provision of free wi-fi and utilization of computer technology

Count

		Does your institution provide a free wifi?		Total
		Yes	No	
Utilization vs non-utilization	Utilization	3	60	63
	Non-utilization	10	68	78
Total		13	128	141

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.704[a]	1	.100		
Continuity Correction[b]	1.827	1	.176		
Likelihood Ratio	2.878	1	.090		
Fisher's Exact Test				.144	.086
Linear-by-Linear Association	2.685	1	.101		
N of Valid Cases	141				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.81.

b. Computed only for a 2x2 table

Source: Field Data (2019)

Table 27 above shows that, availability of free wi-fi was not significantly associated with utilization of computer technology (χ^2 (1, N=141) = 2.704, p=0.1)

From these findings it is shown here that **over half** of the service areas under study had no computers in place and Free WI-FI facility.

This scenario agrees in part with a study which was done in Ghana by Fraser et al, (2015) which demonstrated that it was difficult to obtain the required computer systems as most of the African countries are struggling to become developed and as such they may have conflicting demands in place due to compromised resources as such availing

of computers and technical infrastructure may not be in their priorities (Fraser HS, Biondich P, Moodley D, 2015). However this study did not show significant influence between these variables and computer technology utilization in the service areas which were under study.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of major findings

Most respondents 55.3% were not utilizing computer technology while 47.7% used computer technology.

Ages of respondents significantly influenced utilization of computer technology (χ^2 (1, N=141) =7.453, p=0.006).

Most respondents 75.9% had diploma in nursing. Qualification significantly influenced utilization of computer technology (χ^2 (1, N=141) =5.083, p=0.024). Majority 75.9% were general nurses and nursing job significantly influence utilization of computer technology (χ^2 (1, N=141) =4.499, p=0.034).

Most respondents 21.3% had worked for 5-9 years. Number of years worked as a nurse significantly affected utilization of computer technology (χ^2 (1, N=141) =9.131, p=0.003). Most respondents 20.6% worked either in maternity or OPD departments. The departments that respondents worked in significantly affected utilization of computer technology (χ^2 (1, N=141) =9.765, p=0.002). Majority 60.3% had previous computer training and this significantly affected utilization of computer technology (χ^2 (1, N=141) =23561, p=<0.001).

Concerning nurse- midwife related factors, majority 64.5% had little experience with regard to self-rated computer knowledge. Self-rated computer knowledge significantly affected utilization of computer technology (χ^2 (1, N=141) =26.338, p=<0.001). Most respondents 63.1% had a negative attitude towards computer technology. Attitude significantly influenced utilization of computer technology (χ^2 (1, N=141) =4.098, p=0.043). There was a significant positive correlation between attitude and utilization of computer technology (r (139) =.272, p=0.001)

Concerning institutional related factors, most set ups i.e. 80.1% indicated absence of policy on computer use. Availability of policies, guidelines, regulations did not influence utilization of computer technology (χ^2 (1, N=141) =0.047, p=0.828), (χ^2 (1, N=141) =0.047, p=0.828), (χ^2 (1, N=0.000), p=0.986) respectively

5.2 Conclusions

On the determinants of Nurse-midwives related factors the study has demonstrated that majority of the nurse-midwives in Kwale County demonstrated basic knowledge in computer operation skills. Higher qualification, previous computer training, nursing job and the number of years worked as a nurse had significance influence in computer technology utilization in nursing practice. More than a half of the nurse-midwives had negative attitude towards utilization of computer technology

On the determinants of social demographic characteristics on computer technology utilization the findings from this study revealed that gender, marital status, and residence did not have any significant association with utilization of computer technology in nursing practice.

On the evaluation of institutional related factors the study identified that there are no guidelines, regulations, policies governing the utilization of computer technology. In the same focus the study revealed that free WI-FI was rarely available in the facilities.

5.3 Recommendations

The researcher gave his recommendation as per his research objectives

On the determinants of social-demographic characteristics on computer technology utilization among nurse-midwives the study found out that higher qualification in Nursing enhances utilization of computer technology therefore the research recommends the County training committee to encourage and support the nurse-midwives to upgrade to Diploma level and above and also come up with a modality of assisting the nurses to acquire literacy in computer applications and operation skills. On determine nurse-midwives related factors the study has shown that the nurse-midwives related factors has direct impact on the utilization of computer technology thus the County health committee in conjunction with Nurse Managers and supervisors should address the issue of negative attitude amongst the nurses through supportive supervision, provision of technical infrastructure and on job training.

The Kwale County health committee should take an initiative of formulating logical strategies transforming analogical practice of nursing to digital forms of nursing practice by embracing computer technology utilization in the health institutions in the County.

On institutional related factors the study has revealed the health institution are lucking basic things like policies, guidelines and legal framework to govern the application of computer technology utilization therefore there is need for the Kwale County health committee to advise the CEC health through MCAs to come up with policies that will govern the utilization of information technology in the county. The same committee should take the initiative to capacity build the nurses and health institutions by equipping them with infrastructural and technical support in form of computers, trainings and free WI-FE. More research of this nature can be done in the Counties.

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APPENDICES

Appendix I: Consent Form/Letter

Consent to be signed by the respondent before participating in the study

My name is Elvis Dagamra, currently a Master of Science in Nursing student at Mount Kenya University. I am conducting a study on the area: **Determinants of computer technology utilization in nursing practice among nurse-midwives in Kwale County, Kenya** specifically in Kinango Sub-County Hospital, Kwale sub-county hospital and Msambweni county referral hospital.

The objective of this study is to enable the researcher to come up with recommendations that will be geared to the improvement the quality of nursing practice in the maternity units in kwale County as the study will be able to unveil the determinants of computer technology utilization in the County. At the same time this study is academically fulfillment of my postgraduate dissertation program. This process will enable me to gather a primary data which is paramount to meet the university's requirement.

This letter therefore is to eagerly ask for your participation in this process by completing this survey questionnaire.

Respondent consent.

I hereby acknowledge that confidentiality on my identity and suggestions towards this whole process will be compromised and be exposed to the public domain, neither will my personal details be used in this survey questionnaire and in the final document. Further more Iam aware that I am not bonded in anyway and I can always withdraw from participating without any repercussions what so ever.

I hereby agree to participate in this process voluntarily.

_____

Signature

_____

Date

_____

Witness/me

I am very grateful for your valued contributions towards this whole process. Kindly complete the survey questionnaire attached herein.

Appendix II: Questionnaire

Questionnaire number.

Social and demographic factors

Kind Tick your choice

1.1 What is your age-bracket (years)?

☐ 20-30 years

☐ 31-40

☐ 41-45

☐ Above 45 years

1.2.Gender

☐ Male

☐ Female

1.3.What is your marital status?

☐ Single/Cohabiting

☐ Married

☐ Separated

☐ Divorced

☐Widowed

1.4.Kindly state your highet academic qualification in the boxies provided below

☐Nursing certificate

☐Nursing diploma

☐Nursing degree

1.5. What is your Nursing Job?

☐General nurse

☐Nurse Specialist

☐Nurse supervisor

☐Nurse-midwives

1.6. Where do you reside

☐Rural

☐Urban

1.7. Tick the number of years you have been working as a nurse in the box provided

☐1-<5 years

☐ 5-<10 years

☐ 10-<20years

☐ 20-<25 years

☐ Above 25 years

1.8.In which department do you work

☐ Maternity

☐ Female surgical ward

☐ Female medical ward

☐ Male surgical ward

☐ Male medical ward

☐ Paediatric ward

1.9.Previous computer training

☐ Yes

☐ No

Section 2 Self rated computer knowledge

Kindly tick your answer in the box provided

2.1. What is your level of computer knowledge?

☐ No experience at all

☐ Little experience

☐ Experienced

Section 3. Nurse-midwives related factors

- **Attitudes of nurse towards computer use in nursing practice**

Please tick your answer in the box provided

3.1. Computer training should be included in basic nursing training

☐ Completely object

☐ Object

☐ Whichever

☐ Concur

☐ Completely concur

3.2. Uses of computers will easy work of documentation by nurses

☐ Completely object

☐ Object

☐ Whichever

☐ Concur

☐ Completely concur

3.3. Use of IT in health care by nurses increase workload

☐ Completely object

☐ Object

☐ Whichever

☐ Concur

☐ Completely concur

3.4. Quality of health care will improve with computerization

☐ Completely object

☐ Object

☐ Whichever

☐ Concur

☐ Completely concur

3.5.Only computer department staff should be assigned to handle computers.

☐ Completely object

☐ Object

☐ Whichever

☐ Concur

☐ Completely concur

3.6. Use of IT in nursing practice increases nursing professional status

☐ Completely object

☐ Object

☐ Whichever

☐ Concur

☐ Completely concur

3.7. Cost of Computer use in nursing is too expensive

☐ Completely object

☐ Object

☐ Whichever

☐ Concur

☐ Completely concur

3.8. Nurses should be encouraged to specialize in computer studies

☐ Completely object

☐Object

☐Whichever

☐ Concur

☐ Completely concur

3.9. Computerizing nursing practice will alienate nurses from clients.

☐Completely object

☐Object

☐ Whichever

☐Concur

☐Completely concur

3.10. Computer application knowledge should be criteria in nurse promotion

☐ Completely object

☐ Object

☐Whichever

☐ Concur

☐ Completely concur

- **Availability of Policies, Guidelines, and regulations on the utilization of computer technology.**

3.14. Check list to assess availability legal framework regarding application of nursing informatics to be assessed by the researcher or researcher assistance who will then tick in the appropriate box after verifying the availability of the same.

i. Availability of policies regarding computer technology utilization

☐ Yes ☐ No

ii. Availability of guidelines regarding computer technology utilization

☐ Yes ☐ No

iii. Availability of regulations regarding computer technology utilization

☐ Yes ☐ No

3.15. Availability of computers and technical infrastructure

i. Do you have computers in your working area?

☐ yes

☐ No

ii. Do you use computers for nursing service delivery?

☐ Yes

☐ No

iii.Does your institution provide free Wi-Fi?

☐ Yes

☐ No

Computer Knowledge Assessment Checklist

The researcher will tick the box that describes the respondent's frequency use of computer

4 = every day 3 = Once a week 2 = Once a month 1 = Never

Frequency of computer use	4	3	2	1
How often do you use computer at work?				
How often do you use a computer outside of work home, library, etc.?				

The researcher will observe the respondents perform the below basic computer tusks then tick appropriately.
4 = Yes 3 = With Occasional Minor Assistance 2 = Only With Assistance 1 = No

Basic computer skills	4	3	2	1
Start and close programs				
Highlight, drag, and drop				
Use a mouse, including left, right, and double clicks				
Manage files				
Use "My Computer" to access various drives				
Word Processing				
Create documents in a word processing program				
Save documents				
Copy and paste				
Insert a table				
Presentation				
Create a slide presentation that includes text and clipart				
Save a presentation as a web page				
Add an action button to a slide in a presentation				
Spreadsheets				

Create and save worksheets				
Change and sort data in an existing worksheet				
Internet				
Access the Internet				
Navigate the Internet				
Email				
Open and delete email				
Forward and reply to email messages				
Create and send email messages				
Attach files to messages				

Appendix III: Certificate of Ethical Clearance

Mount Kenya University

NOVEMBER 28, 2018

Ref. No. MKU/ERC/1086

CERTIFICATE OF ETHICAL CLEARANCE

This is to certify that the proposal titled **"DETERMINANTS OF COMPUTER TECHNOLOGY UTILIZATION IN NURSING PRACTICE AMONG NURSE MIDWIVES IN KWALE COUNTY, KENYA"** Whose Principal Investigator is Mr Elvis Karuku Dagamra (MScN/55122/2016) has been reviewed by Mount Kenya University Ethics Review Committee (ERC), and found to adequately address all ethical concerns.

Dr. Francis W. Makokha
Secretary, Mount Kenya University ERC

Sign: _____ **Date:** 28·11·2018

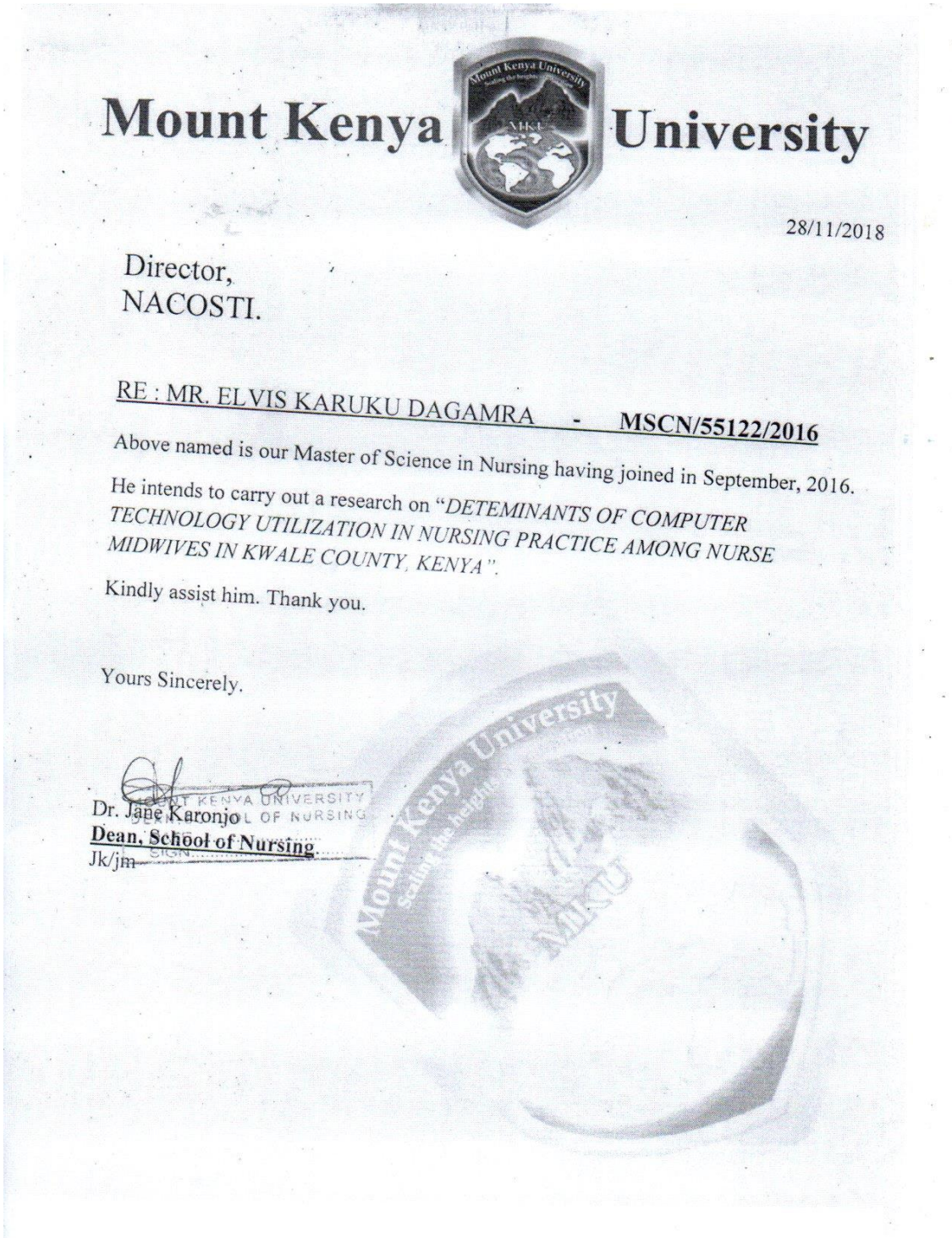
Prof. Francis W. Muregi
Chairman, Mount Kenya University ERC

Sign: _____ **Date:** 28·11·2018

The Chairman
Mount Kenya University
Ethics Review Committee
0100, Thika

Main Campus, General Kago Road, P.O. Box 342-01000 Thika. Tel: +254 67 2820 000,

Appendix IV: Letter of Introduction from the School



Mount Kenya University

28/11/2018

Director,
NACOSTI.

RE : MR. ELVIS KARUKU DAGAMRA - **MSCN/55122/2016**

Above named is our Master of Science in Nursing having joined in September, 2016.

He intends to carry out a research on "*DETEMINANTS OF COMPUTER TECHNOLOGY UTILIZATION IN NURSING PRACTICE AMONG NURSE MIDWIVES IN KWALE COUNTY, KENYA*".

Kindly assist him. Thank you.

Yours Sincerely.

MOUNT KENYA UNIVERSITY
SCHOOL OF NURSING

Dr. Jane Karonjo
Dean, School of Nursing
Jk/jm

Appendix V: Research Authorization letter from NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471, 2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/19/21267/27312**

Date: **17th January, 2019**

Elvis Karuku Dagamra
Mount Kenya University
P.O. Box 342-01000
THIKA

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Determinants of computer technology utilization in nursing practice among nurse - midwives in Kwale County, Kenya"*** I am pleased to inform you that you have been authorized to undertake research in **Kwale County** for the period ending **17th January, 2020.**

You are advised to report to **the County Commissioner, the County Director of Education and the County Director of Health Services, Kwale County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Kwale County.

The County Director of Education
Kwale County.

Dr. Hajara El Bursaid

25/1/2019

The County Director of Health Services
Kwale County.

COUNTY DIRECTOR
HEALTH SERVICES
25 JAN 2019
KWALE COUNTY
P. O. Box 200 - 80403

Appendix VI: Research Permit from NACOSTI

THIS IS TO CERTIFY THAT:
MR. ELVIS KARUKU DAGAMRA
of MOUNT KENYA UNIVERSITY, 0-80113
MARIAKANI,has been permitted to
conduct research in *Kwale County*

on the topic: *DETERMINANTS OF COMPUTER TECHNOLOGY UTILIZATION IN NURSING PRACTICE AMONG NURSE - MIDWIVES IN KWALE COUNTY, KENYA*

for the period ending:
17th January,2020

Permit No : NACOSTI/P/19/21267/27312
Date Of Issue : 17th January,2019
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.....
Applicant's Signature

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Director General
National Commission for Science, Technology & Innovation

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REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH LICENSE

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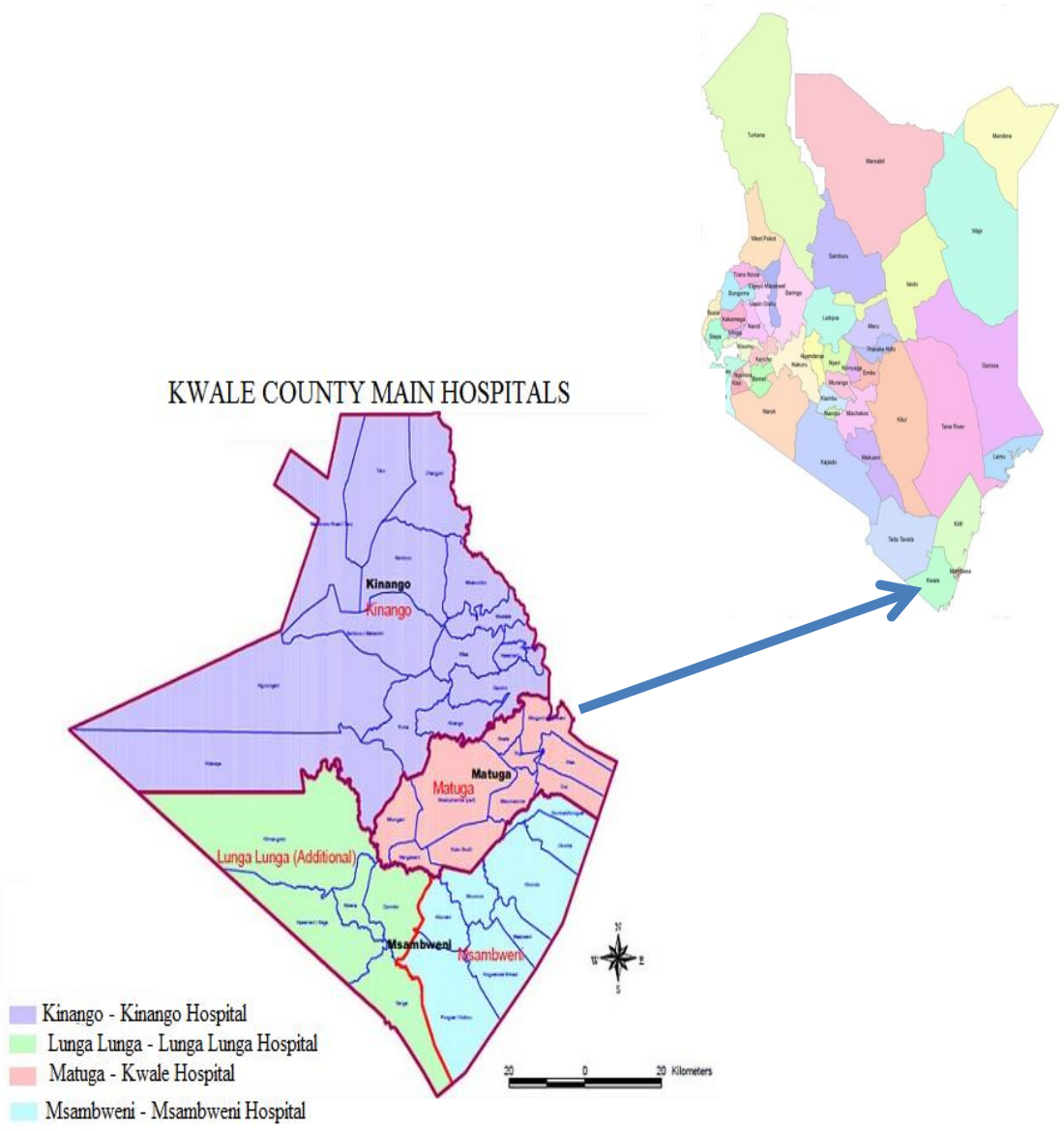
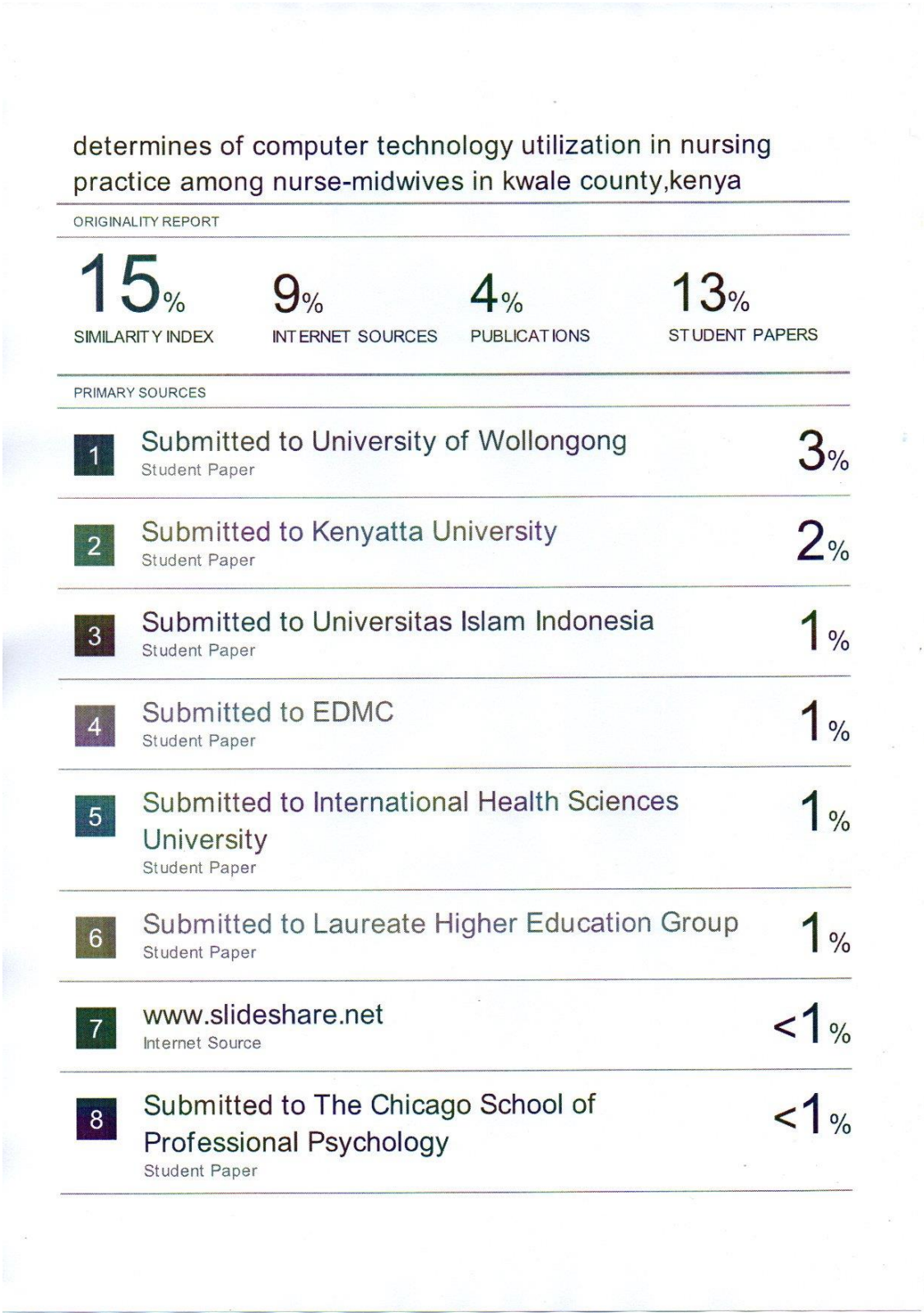
CONDITIONS: see back page

Appendix VII: Map of Study Area



Appendix VIII: Similarity Index



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