NURSING RESEARCH AND EVIDENCE BASED PRACTICE: ASSESSMENT, EDUCATIONAL INTERVENTION AND ITS OUTCOME AT KENYATTA NATIONAL HOSPITAL, KENYA

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DECLARATION

I, Mutisya Albanus Kyalo, declare that this thesis entitled **'Nursing Research and Evidence Based Practice: Assessment, Educational Intervention and its Outcome at Kenyatta National Hospital, Kenya'** is completed as an independent work. I certify that all material in this thesis which is not my own work has been identified and cited and that no material has previously been submitted and approved for the award of a degree by this or any other University.

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This thesis project has been done under our supervision and guidance and the report is submitted for award of Doctor of Philosophy in Nursing of the University of Nairobi with our approval as university supervisors.

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DEDICATION

To all men and women who endeavor to search for new knowledge for the betterment of mankind.

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TABLE OF CONTENTS

Contents **Page**

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS/ACRONYMS

ACNO - Assistant Chief Nursing Officer

ANOVA - Analysis of Variance

CNO - Chief Nursing officer

CCUs - Critical Care Units

CPD - Continuing Professional Development

DCNO - Deputy Chief Nursing Officer

EBP - Evidence Based Practice

EBNP - Evidence Based Nursing Practice

ECN - Enrolled Community Nurse

ED - Emergency Department

FGD - Focus Group Discussion

ICU - Intensive Care Unit

ICN - International Council of Nurses

KAP - Knowledge Attitude and Practice

KNH - Kenyatta National Hospital

KTA - Knowledge To Action process

MPH - Master of Public Health

NACOSTI - National Commission for Science, Technology and Innovation

NCK - Nursing Council of Kenya

NO 1 - Nursing Officer one

NO 11 - Nursing Officer two

NO 111 - Nursing Officer three

OR - Operating Room

PhD - Doctor of Philosophy

SEN - Senior Enrolled Nurse

SNO - Senior Nursing Officer

UNESCO - United Nations Educational, Scientific and Cultural Organization

UON - University of Nairobi

OPERATIONAL DEFINITION OF TERMS

Evidence based practice – Practice that heavily relies on knowledge gained through research as a basis for rationalization of the activities involved therein. Practice that utilizes information from research findings, clinical expertise and incorporates patient values and preferences.

Evidence based nursing practice – Nursing care or practice that is not based on tradition but on knowledge that has thoroughly been researched and found to be the appropriate practice. It involves utilization of information from research findings, clinical experiences, patient preferences and values. In this context, evidence based practice is being used interchangeably to mean the same.

Nursing research – The scientific process of collecting data, analysing it and coming up with findings that are significant to extent knowledge or solve identified problems. It is a systematic enquiry that seeks to add new nursing knowledge to benefit patients, families and communities.

Participation in research - Involvement in different research activities including development of research proposal, conducting research or utilization of research findings.

Research utilization - undertaking of research and/ or applying research findings in nursing practice.

Critical Care Units– These refer to Intensive Care Unit, Cardiology Unit, Burns Unit, Renal Unit, Operating rooms and Emergency Department.

EXECUTIVE SUMMARY

Background: Nurses need not only to rely on their history and experience but also to critically examine what in nursing practice has beneficial outcomes for clients and which intervention works best (Roxburgh, 2006). Evidence based practice (EBP) has been shown to lead to quality, cost-effectiveness and safety in health care provision (Brown *et al*, 2009). The International Council of Nurses (ICN) actively supports nurses' active participation in nursing research and the use of research to inform EBP (ICN, 2007). Despite the fact that professions and governments all over the world are adopting research based practice, this is not the case in most developing countries including Kenya where most research activities are linked to educational or academic programs (Gerrish and Lacey, 2006).

Literature shows gaps in knowledge, conduct of nursing research and use of research findings to improve patient care practices. This is despite the much reported inconsistencies in nurses' knowledge, skills and attitudes and lack of strategies to enhance them (Hart *et al*, 2008). Educational efforts to assist nurses conduct research or use findings in practice have had mixed results. The status in Kenya has not been established. Studies recommend situational analysis of research activities and the influencing factors so that barriers can be effectively addressed and the concepts incorporated into practice. Helga *et al* (2010) argue that for research based practice to become a reality and results to be implemented and adapted in daily practice, the first necessary step is a comprehensive appraisal and assessment of the current situation. The gained information helps to identify problematic areas and to initiate necessary changes.

Objective: To assess research activities among nurses at Kenyatta National Hospital (KNH) and identify factors influencing them in order to develop, implement and examine the outcome of an

educational intervention on Nursing Research and EBP so as to promote quality of nursing services.

***Methods*:** The study was conducted at six critical care units at KNH. These included the intensive care unit, renal unit, burns unit, cardiology unit, emergency department and operating theaters. It adopted a pre-intervention, intervention and post-intervention survey design. The pre-intervention phase (May – October, 2013) was done to survey baseline data among the nurse participants on their involvement in research activities and utilization of findings in nursing practice. During this phase, data was collected using a self-administered questionnaire from 183 nurses who were randomly sampled from the six study areas. The questionnaire had four parts with the fourth part incorporating the 'Barriers to research utilization scale' by Funk *et al* (1991). This scale was used because it has been found to have high face and content validity by various researchers.

Qualitative data was collected using a focus group discussion with 8 senior nurses comprising clinicians, administrators and educators. Also, key informant interviews were conducted with 13 nurses conveniently selected from each of the study areas. Further information was obtained from the Nursing Council of Kenya (NCK) with regard to the various syllabi for nurses' training in Kenya. The combination of quantitative and qualitative methods yielded more useful data than either used alone. Quantitative data was analyzed using SPSS version 20.0 and qualitative data analyzed using themes. Pearson's chi square was used to describe the associations between participants' demographic characteristics and performance of research activities. The findings from phase one formed the basis for phase two.

The intervention phase (November 2013 – September 2014) involved development, pretesting and implementation of a training program on principles of Nursing Research and EBP as per the

needs identified in the baseline survey. The training was conducted for one month to a proportionate sample of 67 out of the initial 183 nurses and included a written pretest, lectures, discussions, formation of journal clubs, presentations and a posttest. The trained cohorts were followed up and monitored in the study areas for four months as they performed different roles of a nurse in research. The post-intervention phase (October – November 2014) involved data collection from the trained nurses. The data was analyzed and results compared to those in the first phase in order to evaluate the outcomes of the training program. Paired t-tests of mean differences between participants' scores and performance of research activities before and after intervention were computed. Mean differences in performance of research activities between all six study areas and nursing qualifications were analyzed using one-way ANOVA.

***Results*:** The baseline survey results showed low level of research participation and/or implementation of research findings in nursing practice. About 21% (n=38) of the nurse participants oftenly or very oftenly participated in research related to their work with the most participated activity being data collection (74.3%). The rest (79%, n=145) were rarely or not participating in research activities at all. Only 20.8% had done a research other than the one they did during nursing training for academic qualification. A minority, (11.5%, n=21) read journals/publications weekly or fortnightly.

About 71% of the respondents indicated basing their evidence for practice on knowledge gained during their nursing training. Pearson's correlation showed significant association between post basic training or short courses, professional qualification and roles played with doing research and/or implementation of research findings in nursing practice ($P < 0.05$). The underpinning factors to the low level of research involvement and non-utilization of findings in practice were inadequate knowledge/skills, viewing research as difficult, lack of mentorship and support,

unavailability of research reports and findings not being disseminated. Many participants indicated lack of emphasis of research and EBP during the training period and expressed need for guidance on how to get started.

Following the training intervention, nurses' knowledge in research, their involvement in research activities and/or utilization of findings in nursing practice increased significantly. The participants formed 22 journal clubs comprising 3-4 nurses from the same study area each of which developed and presented a concept research proposal for implementation at the end of training. In addition, theoretical knowledge/skills improved significantly from a pretest mean of 71 to a posttest mean of 86 (T=15.684, P=0.001). Similarly, participation in carrying out research increased significantly from 20.6% to 49.2% (T=3.565, P=0.001) while frequency of participation in research related to one's work increased from 14.7% to 44.2% (T=3.435, P=0.001). Implementation of research findings in practice improved significantly from 59% to 77% (T= 2.87, P=0.001). More than half of the participants started utilizing research findings as a source of evidence for practice after the training intervention. The participants showed great understanding of the importance of research in nursing practice and especially for evidence based practice.

Conclusion: The results in phase one identified gaps in knowledge/skills, motivation, mentorship, time and support as the main reasons for nurses' low level of involvement in research activities. The training intervention in phase two which was an in-service training was associated with increased research and evidence based practice activities among the nurses.

Nursing research and EBP awareness, knowledge, skills and practices improved after the training intervention. It is therefore confirmed that such short-term training programs are essential in engaging nurses in research and EBP.

Recommendation: Based on the findings, short term training programs on nursing research and EBP should be provided to all practicing nurses in health care settings including incorporating such in new nurses' induction programs. Nursing Research Units should be established in health care institutions to create awareness, motivate and enhance nurses' knowledge and abilities. There is need to focus what is taught about nursing research through curriculum adjustments to put emphasis not only on 'how to do research' but also on 'being able to gather and assess evidence from a variety of sources.' This will provide knowledge and skills that are greatly needed for EBP. The findings led to development of a framework to enhance nursing research capacity and incorporate EBNP in health care systems in Kenya.

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Nursing research is a systematic enquiry that seeks to add new nursing knowledge to benefit patients, families and communities. It encompasses all aspects of health that are of interest to nursing, including promotion of health, prevention of illness, care of people of all ages during illness and recovery or towards a peaceful and dignified death (ICN, 2007). It applies the scientific approach in an effort to gain knowledge, answer questions, or solve problems. The knowledge generated through nursing research is used to develop evidence-based practice, improve the quality of care and to maximize health outcomes and cost-effectiveness of nursing interventions.

Evidence Based Practice (EBP) is the process of clinical decision making by integrating the best research evidence with clinical expertise and patient values (Sacket *et al*, 2000). Evidence Based Nursing (EBN), which is part of EBP is the deliberate use of available evidence when making decisions about the care of individual patients, and it combines information about research results, clinical expertise, patient concerns and patient preferences (Sigma Theta Tau International, 2005).

Nursing research and EBP have become a by word in nursing textbooks. Good nursing researches have been carried out that have provided knowledge that has transformed practice. Though conducting nursing research requires extensive post graduate training, nurses generally need to participate in research at different levels in the producer- consumer continuum of research.

These range from reading research reports to develop new skills and keep up to date on relevant findings affecting practice to designing and implementing studies to find what works best for the clients.

Between the two ends are other roles that include participation in journal clubs, attending research presentations, evaluating completed researches for utilization in practice, data collection, reviewing proposed researches & offering clinical expertise to improve them, collaborating in development of a research idea, assisting researchers in recruiting potential study participants, solving clinical problems using research findings, providing information/advice to clients about participation in research, discussing implications/relevance of research findings with clients, writing articles and/or publishing materials (Polit and Beck, 2010).

There is need not only to rely on the history and the experience of nurses but also to critically examine what in nursing practice has beneficial outcomes for clients. Nurses need to determine whether an intervention brings about desired effects for clients and also determine whether an intervention works or which intervention works best (Roxburgh, 2006).

Nurses should use research and EBP to sharpen their assessment skills, develop and implement policies and procedures, execute effective nursing interventions and develop plans of care to promote positive patient outcomes. This process, which has gained popularity in developed countries has been found to provide the best standards for the provision of safe and compassionate health care. It involves evaluating and incorporating the best clinical knowledge related to the patients' state, the clinical setting and the clinical circumstances (Haynes *et al*, 2002).

The International Council of Nurses (ICN) actively supports nurses' active participation in nursing research and the use of research to inform evidence-based practice (ICN, 2007). Many countries have adopted EBP and developed initiatives to ensure care is provided based on best evidence rather than tradition (Glacken & Chaney 2004).

1.2 Background information

Nurses are expected to provide clinical care of a high quality. There is need to shift from historical and intuitive care practices to evidence-driven services in order to meet the changing needs of both the consumers and the providers of health care (Roxburgh, 2006). To achieve this, evidence-based practice should be the gold standard. Nurses have a responsibility to deliver care based on current evidence, best practices and validated research. Some countries like Sweden have enacted laws that require nurses to perform care based on research findings and best experiences (Socialstyrelsen, 2005). When implementing research evidence, nurses are required to be knowledgeable and professional in various aspects of research and utilization of research findings in practice. This approach to nursing care bridges the gap between the best evidence available and the most appropriate nursing care of individuals, groups and population with varied needs.

Implementing research evidence in practice is not an easy task. To successfully implement EBP programs, there is need to understand factors influencing the same. These could be related to nurses' research knowledge and skills, clinical practice environment, organizational or educational issues (Ozdemir and Akdemir, 2009). A nurse's decision to incorporate EBP findings into practice is affected by the nurse's attitude, knowledge and skills towards nursing research (Upton and Upton, 2005). The great potential of nurses as producers and consumers of research is not being fully realized.

Nurses need not only to conduct research to answer questions they have about practice but also have easy access to research findings that are applicable to their practice besides the skills to assess research for its value to practice. Measures need to be devised to ensure nurses gain adequate skills in undertaking research and assessing research findings for application to practice. They need to be empowered with knowledge and skills in problem solving so as to be able to make recommendations for practice changes and have the ability to adapt to changing care environments (Burns and Grove, 2009).

With introduction of teaching research methods in nursing programs, we should be seeing a turnabout in the attitudes and beliefs about research held by nurses. Many nurses have phobia for research. Many scholars firmly believe that nurses have a great potential in research and that research is an essential part of nursing practice. We need to focus what we teach about research to provide knowledge and skills and tools that are needed to deal with it as needed in EBP.

Efforts should be made to enable nurses to achieve more reliable professional practice by using research findings in clinical practice. Nurse leaders need to develop effective and cost-efficient strategies to educate nurses about EBP initiatives and research utilization to facilitate a culture that promotes the use of EBP in clinical settings. Literature consistently reports gaps between the conduct of nursing research and the use of research findings to improve patient care and clinical practice. Several studies have investigated nurses' attitudes towards research as well as facilitators and barriers to involvement in research activities and the utilization of research in nursing practice.

Some of the individual determinants identified include beliefs and attitudes, involvement in research activities, information seeking, professional characteristics, education and other socioeconomic factors (Estabrooks, *et al*., 2003).

Scales to identify nurses' perceptions or barriers to research utilization have been developed including the commonly used 'Barriers to Research Utilization Scale' (BARRIERS Scale) created by Funk *et al*., (1991) which is based on Rogers (1983) model of diffusion of innovations.

The common reported barriers include lack of time, lack of authority to change practice, organizational cultures that reward routine, task-based practice; misconception about evidence-based practice, lack of administrative support, lack of mentorship, lack of access to resources, poor understanding of statistics and critical appraisal, unclear workplace expectations and inconsistent basic knowledge and experience with research. These barriers are described as (a) factors related to the quality of the research, (b) factors related to the nurse, (c) factors related to the organization and (d) factors related to the communication of the research (Funk *et al*., 1991a, Retsas 2000, Fink *et al*., 2005, Kajermo *et al*., 2008).

On the other hand, support from management, an academic degree, education, availability of relevant research, time, positive attitudes and mentorship have shown a positive relationship to nurses' intentions to undertake and use research in practice (Hutchinson & Johnston 2004, Kajermo *et al*., 2008).

From the foregoing, it can be seen that despite attempts to identify the barriers to the conduct of research and utilization of findings in practice, research practice gaps remain. It is difficult to know why these gaps have persisted without conducting a baseline survey (Schoonover, 2009).

1.3 Statement of the problem

The principles and methods of nursing research were introduced 25 years ago in Kenya in the post basic nursing curricula (Karani *et al*., 2003).

Nurses in Kenya are trained at certificate, diploma, specialised diploma, degrees, masters and even at doctoral levels. In all these training programmes, nursing research is incorporated as part of the learning content. In most of these programmes, nursing students are required to develop and present research proposals or reports as part- fulfilment for their qualification (NCK, 2012).

Despite the teaching of research, many nurses do not undertake or utilize nursing research. Research knowledge among nurses and use of research in practice remains poor (Mukthar, 2006). In addition, utilization of research evidence by nurses in clinical settings is still not perceived favorably or used proactively by the majority of nurses. Research utilization is of peripheral importance to nursing staff. This is especially important in critical care units owing to the special nature of the care provided in these units which needs to be based on evidence.

According to WHO (2001), most research activities in Africa are linked to educational or academic programmes. The same applies to the Kenyan situation. One of the biggest challenges of the Ministry of Health and regulatory authorities like the Nursing Council of Kenya is to ensure high quality of health care delivery to improve standards and quality of life. Professionals therefore need to develop better and more efficient methods of health care delivery (Karani, 2001).

Despite the international initiatives on EBP, studies reveal that up to 40% of patients still receive health care that is not based on scientific evidence and up to 25% receive unnecessary and /or potentially harmful care (Graham, Logan, Harrison, Straus, Tetroe *et al*, 2006).

Despite the fact that professions and governments all over the world are adopting research based practice, this is not the case in most developing countries including Kenya. Also clear educational strategies as to how practitioners can be supported in achieving this goal do not exist.

Further, few researches have been done to assess outcomes of educational interventions on nursing research and EBP. This is despite the much reported inconsistencies in nurses' knowledge, skills and altitudes and lack of strategies to enhance them.

To improve client care outcomes, incorporation of evidence based approach to nursing care is important. Nurses have a mandate to facilitate evidence based nursing through undertaking research and incorporation of findings into practice. Other aspects of evidence to apply in practice are clinical experiences, patient experiences and local context (Kitson *et al*, 2008), though factors within practice environment and within nurses make incorporation difficult.

Studies recommend research to be strengthened in order to find new ways of uplifting nursing standards. It is impossible to provide health services that are consistent with the current professional knowledge without research undertaking and utilization of the results (Schoonover, 2009).

Mukthar (2006) asserts that very little scientific nursing research has been done in Kenya and even where it is done; it has not translated to improve nursing practice. There is knowledge gap as to why the proportion of nurses who undertake nursing research is still minimal and little is known as to how much nursing research is being used to improve nursing practice and especially in the critical care units. Though nurses need to be aware of recent and relevant research findings and use them to inform practice, this is often not the case owing to limited knowledge and skills. Moreover, there has not been any interventions geared towards rectifying this.

If nurses do not undertake and utilize nursing research, they will continue using knowledge acquired during their years in training and nursing knowledge will stagnate hence affecting the quality of care provided.

Perhaps that is why we need to ask the question: 'What is wrong with undertaking and utilization of nursing research in critical care units in Kenya?' Is it a problem with nursing training programmes or in nursing practice? No study has been conducted in Kenya to assess the situation so that appropriate corrective measures can be taken.

These issues were addressed in this study in order to strengthen nursing research capacity and therefore impact on evidence based nursing practice ultimately improving the quality of healthcare and increase provider satisfaction. Preparing nurses to incorporate research and evidence based findings into nursing practice is important to meet the needs of patients and their families in today's health care arena. Education helps to nourish EBP.

1.4 Justification

Nurses are the largest group of serving staff in health service organizations. Their practice especially in the critical care units takes place in a context of ongoing advances in research and technology. They are the only professional group in health care to provide 24-hour bed side care and thus have a great opportunity to undertake research and apply their knowledge to meet patients' needs and improve patient care outcomes. They spend about 50% of their time evaluating patients in their care and view patients holistically in order to generate choices and make decisions (Garbutt, 2006).

The time is now that the professional knowledge is required to deliver safe, effective and compassionate healthcare to our population (Schoonover, 2009). Increased public awareness of their rights as clients has led to heightened expectations resulting to demand for high quality of care and a shift of focus to the kind of services provided by clinical health care workers notably the nurses. Nurses who fail to base their current practice on evidence will be ill equipped to meet the challenges facing them.

Educating and engaging nurses in nursing research and EBP is essential to promote positive patient outcomes (Hart *et al*, 2008). The high proportion of nurses who report inadequate knowledge and skills on nursing research and EBP and the low level of participation in research activities led to the development of an educational program to increase both awareness and competency in undertaking, evaluating and integrating research into clinical practice.

The role of facilitation is emphasized throughout the literature in order to ease and promote the process of change in the individual and at the organizational level. Nurses need facilitators who play a supporting role in encouraging them as their knowledge, skills and confidence develop (Harvey *et al.*, 2002). Ozdemir and Akdemir (2009) argue that, in order to encourage research based practice as a viable substitute for tradition based practice, health organization would greatly benefit from the expertise of facilitators to create these changes. Educational programs that use examples of current practice need to be developed to encourage learning and enhance skills.

Evidence shows that patients who receive care based upon the best evidence from the latest well designed clinical studies experience 28% better outcomes than their counterparts who do not. Also, providers who utilize evidence-based practice when providing care have higher levels of satisfaction than those who simply provide care that is "steeped in tradition" (Melnyk & Fineout-Overholt, 2005).

It was imperative that the status of research activities among nurses at Kenyatta National Hospital (KNH) and the factors that influence them be identified so that appropriate intervention measures could be developed to address them. Through the identification of these, valuable information was gathered that was utilized as a basis for program planning that assisted in addressing the barriers to research undertaking and results utilization, helped initiate capacity

building on nursing research and evidence based practice thereby improving the quality of healthcare while increasing provider satisfaction.

The study, which was done in three phases addressed the gap between knowledge of nursing research, conducting nursing research and utilizing the results in practice and will go a long way in building nursing research capacity and incorporation of EBNP in Kenya. It was also useful as a quality improvement programme in nursing practice.

1.5 Research Questions

The study helped answer the following questions:

1. Which research activities are nurses in the critical care units at KNH engaged in and which factors influence their involvement?
2. Which factors influence utilization of research results to guide clinical practice of nurses in the critical care units at KNH?
3. What is the basis of evidence for nurses' practice in the critical care units at KNH?
4. What are the outcomes of a training intervention on nursing research and EBP among nurses?
5. What difference exist in nurses' knowledge and practice of nursing research and EBP before and after an educational intervention?

1.6. Research Hypotheses:

1. There is no relationship between nurses' self-reported knowledge in research and doing research.

2. There is no relationship between an educational intervention on nursing research and EBP and nurses' knowledge in research.

3. There is no relationship between an educational intervention on nursing research and EBP and carrying out research/implementing research findings in practice.

1.7 Objectives

1.7.1 Main objective

To assess research activities among nurses at KNH and identify and address factors influencing them in order to promote quality of nursing services by encouraging acceptance and integration of evidence based nursing practice.

1.7.2 Specific Objectives

The study was conducted to specifically achieve the following objectives based on the three phases:

Phase 1: Baseline survey

1. To determine the socio-demographic characteristics (age, sex, level of professional education, work station, experience and position) of the nurses
2. To identify nurses' research activities and number of nurses involved
3. To determine the extent of utilization of nursing research findings in nursing practice.
4. To establish factors that influence conduct of nursing research and utilization of research findings in nursing practice.
5. To determine the relationship between nurses' demographic characteristics and doing research/utilizing results in practice.

Phase 11: Intervention

6. To develop a training curriculum (training modules) on nursing research and evidence based nursing practice based on the needs identified in baseline survey.

7. To train nurses on practical research methods and EBP and reinforce knowledge/skills and practice on the same.

Phase 111: Monitoring and Evaluation

8. To evaluate the outcomes of the training intervention on nurses' knowledge/skills and practice

9. To utilize the findings to inform policy on nursing research, education and practice.

10. To develop a framework for capacity building on nursing research and EBP for nurses.

1.7.3 Expected outcome

The end result of this three phase research work is a training program and a framework for building and strengthening nursing research capacity and encouraging acceptance and integration of evidence based nursing practice in collaboration with stakeholders in Kenya.

1.8 Conceptual Framework

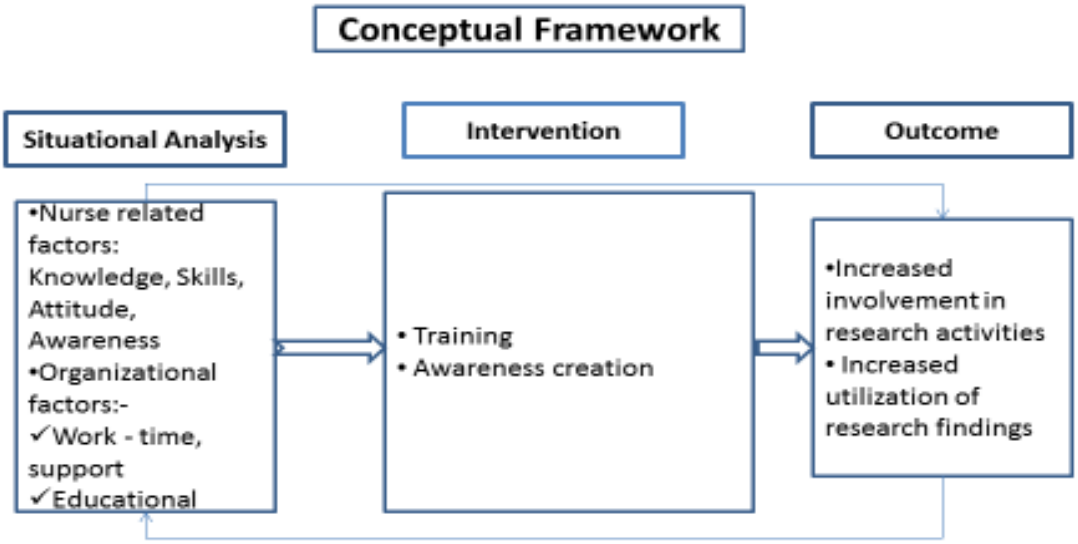


Fig 1: Conceptual framework

The conceptual framework depicts that, nurse-related factors such as knowledge, skills, attitude and awareness of research/EBP plus education or work related organizational factors such as time, support, motivation and emphasis of research and EBP during training period act as predictor variables for nurses' involvement in research activities or utilization of research findings in practice. These could be ascertained though a situational analysis.

It is expected that with proper knowledge/skills, attitude, awareness, time, support, motivation and emphasis of research and EBP, nurses will greatly be involved in research activities and utilization of research findings in nursing practice (the outcome/ dependent variables). These could be achieved through appropriate intervention measures such as training and/ or creating awareness.

1.9 The Theoretical framework

The Knowledge To Action process (KTA) framework and the Ottawa Model of Research Use (OMRU) were utilized as theoretical frameworks in this study.

The KTA framework is useful for facilitating the use of research knowledge by several stakeholders such as practitioners, policymakers, patients, and the public while OMRU addresses the implementation of existing research knowledge.

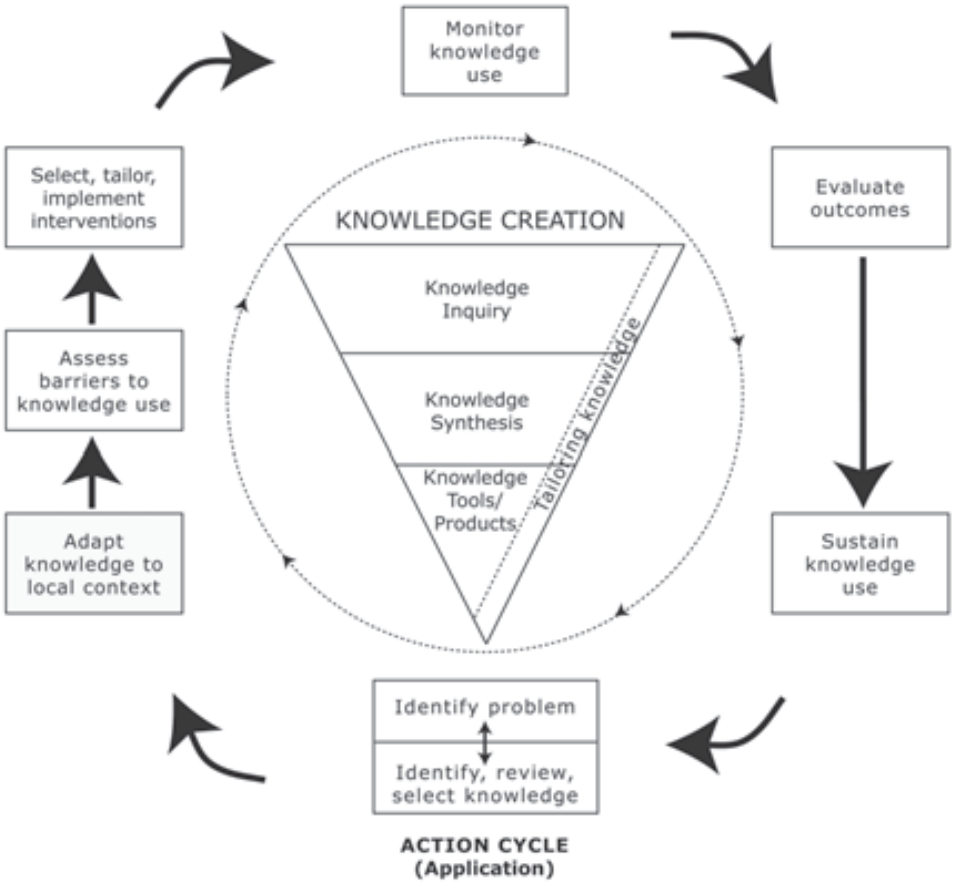


Fig 2: The Knowledge-to-Action Process (Adapted from Graham *et al*., 2006):

1.9.1 The Knowledge-to-Action Process

Graham *et al* (2006) proposed the knowledge-to-action (KTA) process framework. The KTA process has two components: (1) knowledge creation and (2) action. Each component contains several phases.

The authors conceptualized the KTA process to be complex and dynamic, with no definite boundaries between the two components and among their phases. The phases of the action component may occur sequentially or simultaneously, and the knowledge-creation-component phases may also influence the action phases.

In the KTA process, knowledge is mainly conceptualized as empirically derived (research-based); however, it encompasses other forms of knowing, such as experiential knowledge. The emphasis in this particular study is for nurses to provide care that is based on research findings (not on tradition) besides relying on useful experiences. The KTA framework also emphasizes the collaboration between the knowledge producers and knowledge users throughout the KTA process. There is need for research knowledge gained by nurses during their training or otherwise to be put into practice so as to bridge the theory-practice gap.

Knowledge creation consists of three phases: (1) knowledge inquiry, (2) knowledge synthesis, and (3) knowledge tools/products. Knowledge creation is conceptualized as an inverted funnel, with a vast number of knowledge pieces present in the knowledge inquiry process in the beginning. Those pieces are then reduced in number through knowledge syntheses and, finally, to an even a smaller number of tools or products to facilitate implementation of the knowledge. The authors stated that as knowledge moves through the funnel, it becomes more distilled and refined, and presumably becomes more useful to the stakeholders. The needs of potential knowledge users can be incorporated into each phase of knowledge creation, such as tailoring the research questions to address the problems identified by the users, customizing the message for different intended users, and customizing the method of dissemination to better reach them.

Nurses are taught research knowledge generally so that they can synthesize and apply the knowledge as it can be practical in their areas of practice. Nursing researches can range from the simplest descriptive to the complex experimental designs as they fit particular contexts.

The action cycle represents the activities needed for knowledge application. The action cycle is conceptualized as a dynamic process in which all phases in the cycle can influence one another and can also be influenced by the knowledge creation process. The action cycle often starts with an individual or group identifying the problem or issue, as well as the knowledge relevant to solving it. Included in this phase is the appraisal of the knowledge itself in terms of its validity and usefulness for the problem or issue at hand. The knowledge is then adapted to fit the local context.

The next step is to assess the barriers and facilitators related to the knowledge to be adopted, the potential adopters, and the context or setting in which the knowledge is to be used. Nurses in Kenya are given relevant theoretical research knowledge during their various trainings. They are therefore expected to be conducting researches and utilizing research findings in practice. The study assessed the research activities and EBP among nurses and identified factors that influenced them. This information was then used to develop and execute a plan and strategies to facilitate and promote awareness and implementation of the knowledge.

Once the plan is developed and executed, the next stage is to monitor knowledge use or application according to types of knowledge use identified (conceptual use, involving changes in levels of knowledge, understanding, or attitudes; instrumental use, involving changes in behavior or practice; or strategic use, involving the manipulation of knowledge to attain specific power or profit goals).

This step is necessary to determine the effectiveness of the strategies and plan so they can be adjusted or modified accordingly. During the KTA process, it is also necessary to evaluate the impact of using the knowledge to determine if such use has made a difference on desired outcomes for patients, practitioners, or the system. A plan also needs to be in place to sustain the use of the knowledge in changing environments as time passes.

As stated by Graham and colleagues (2006), the relationships between the action phases within the cycle are not unidirectional. Rather, each action phase can be influenced by the phase that precedes it and vice versa. For example, knowledge not being adopted and used as intended could indicate the need to review the plans and strategies again to improve the uptake of knowledge. This framework incorporates the need to adapt the knowledge to fit with the local context and the need to sustain knowledge use by anticipating changes and adapting accordingly.

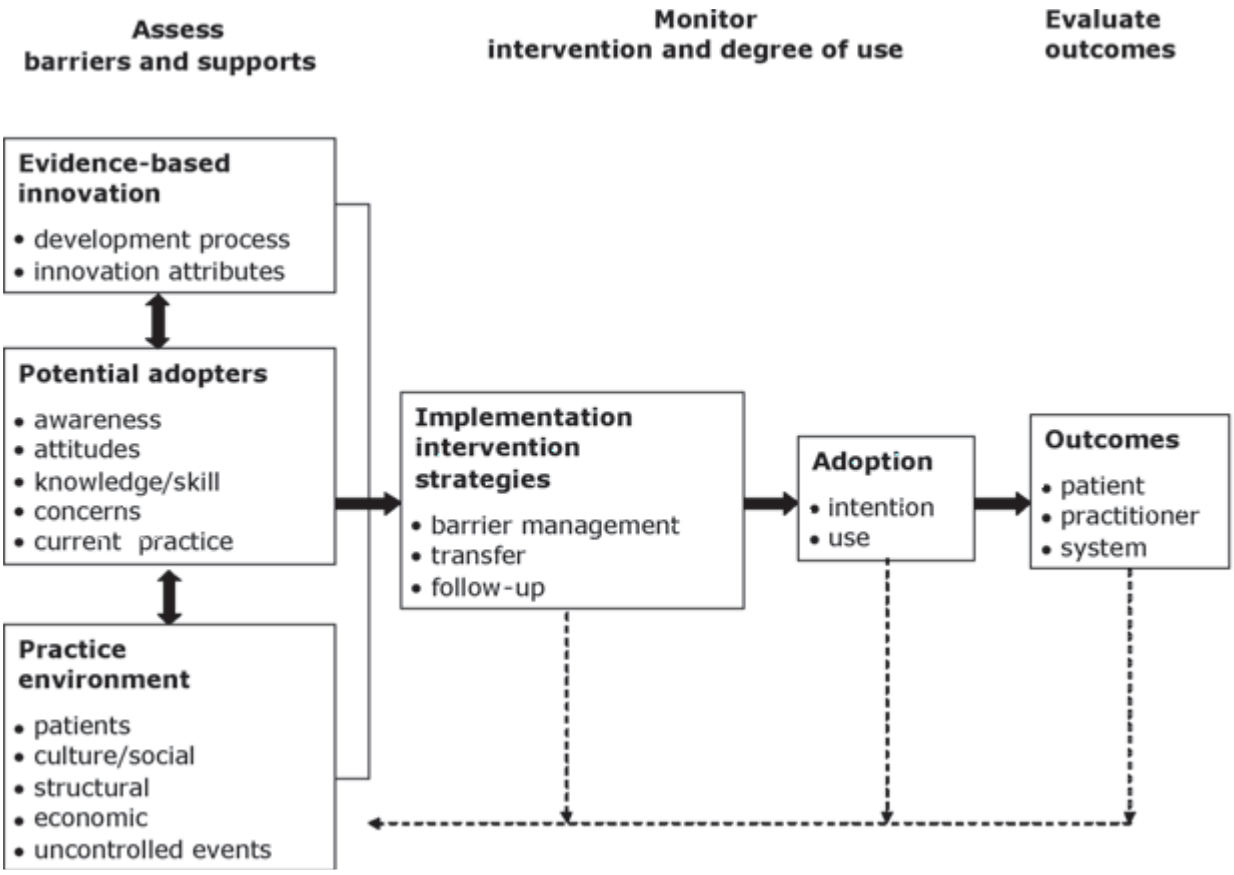
The identification of factors influencing nursing research and EBP was used to develop a plan (Training program/modules) which was executed to address the barriers and enhance the facilitators of research activities (tailored to problem areas). The outcome of this training was evaluated to assess its contribution to nurses' knowledge/skills and practice of nursing research and EBP. A framework has been developed to ensure sustained knowledge use through building and strengthening nursing research capacity and encouraging acceptance and integration of evidence based nursing practice in Kenya.

1.9.2 The Ottawa Model of Research Use

The Ottawa Model of Research Use (OMRU) is an interactive model developed by Logan and Graham (1998). The feasibility and effectiveness of using the OMRU in actual practice contexts was supported by findings from a number of studies (Hogan and Logan, 2004; Stacey *et al*., 2006).

The OMRU views research use as a dynamic process of interconnected decisions and actions by different individuals relating to each of the model elements.

Fig 3: The Ottawa Model of Research Use (Adapted from Logan and Graham (1998) :



The most recent version of the OMRU has six key elements as follows:

1. Evidence-based innovation

2. Potential adopters

3. The practice environment

4. Implementation of interventions

5. Adoption of the innovation

6. Outcomes resulting from implementation of the innovation

According to Graham and Logan (2004), the OMRU relies on the process of assessing, monitoring, and evaluating each element before, during, and after the decision to implement an innovation. Barrier assessments must be conducted on the innovation, the potential adopters, and the practice environment to identify factors that could hinder or support the uptake of the innovation. The implementation plan is then selected and tailored to overcome the barriers and enhance the supports identified. Introduction of the implementation plan is monitored to ensure that the potential adopters learn about the innovation and what is expected of them. The monitoring is ongoing to help determine whether any change in the current implementation or a new implementation plan is required. Finally, the implementation outcomes are evaluated to determine whether the innovation is producing the intended effect or any unintended consequences.

Application

This study was be done in three phases. During phase one, data on factors influencing nursing research in the major referral hospital was collected and analyzed (Assessment) to come up with findings which formed basis for the second phase. This involved use of questionnaires to obtain socio-demographic information about the nurses, their research activities and use of the barriers

to research utilization scale to determine the facilitators or hindrances to nursing research. The scale assesses factors related to the nurses themselves, their work environments or researches. In phase two, training modules were developed based on the identified needs (tailored to problem areas) and training workshops conducted (Implementation) to address the barriers and enhance the facilitators of research activities.

Phase three was the evaluation phase to assess outcome after training and to determine and enhance factors needed for sustainability. During each step, effective monitoring and follow up of activities was ensured.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter discusses literature review on nursing research, utilization of research findings in nursing practice, various sources of evidence for nursing practice and importance of evidence based nursing practice. The chapter discusses findings on the factors influencing research and EBP in different regions of the world. It ends by summarizing outcomes of various interventions to increase uptake of research and evidence based practice.

2.1 Nursing research

Nursing research is a systematic enquiry that seeks to add new nursing knowledge to benefit patients, families and communities. It encompasses all aspects of health that are of interest to nursing, including promotion of health, prevention of illness, care of people of all ages during illness and recovery or towards a peaceful and dignified death (ICN, 2007). Nursing research applies the scientific approach in an effort to gain knowledge, answer questions, or solve problems.

Nursing research, both qualitative and quantitative, is critical for quality, cost-effective health care. Nursing research is needed to generate new knowledge, evaluate existing practice and services, and provide evidence that will inform nursing education, practice, research and management. It is a powerful means of answering questions about health care interventions and finding better ways of promoting health, prevention of illness and providing care and rehabilitation services to people of all ages and in different settings.

The knowledge generated through nursing research is helps to generate evidence for nursing practice so as to improve the quality of care and to maximize health outcomes and cost-

effectiveness of nursing interventions. Research-based practice is a professional responsibility in nursing.

The main goal of nursing research is to improve care outcomes by advancing nursing knowledge and practice and to inform health policy. International Council of Nurses facilitates and promotes the conduct, dissemination and utilization of research related to nursing, health and health care systems (ICN, 2007).

International Council of Nurses has identified nursing research priorities in two broad areas that address the phenomena of interest to nursing. These are Health and Illness and Delivery of Care Services. Nursing research in health and illness focuses on a number of areas including health promotion, prevention of illness, control of symptoms, living with chronic conditions and enhancing quality of life, caring for clients experiencing changes in their health and illness, assessing and monitoring client problems, providing and testing nursing care interventions and measuring the outcomes of care. The recommended nursing research priorities relating to Health and Illness include issues such as HIV/AIDS and other sexually transmitted infections, chronic illness, infection control, women's health and mental health.

Nursing research priorities in Delivery of Care Services focus on quality and cost effectiveness of care, community based care, nursing workforce and health care reform. Areas for nursing research include impact of nursing interventions on client outcomes, evidence-based nursing practice, primary health care, home care, quality of nurses' work life, retention, satisfaction with work, impact of reform on health policy, program planning and evaluation, impact upon equity and access to nursing care and its effects on nursing, and the financing of health care (ICN, 2007).

There has been remarkable growth in nursing research in the past few decades especially in the developed world. This has provided nurses with increasingly sound knowledge base for the practice of nursing. In Kenya, introduction to research methods is a mandatory course in the basic diplomas, post graduate diplomas, undergraduate and post graduate programs in nursing based on the Nursing Council of Kenya (NCK, 2012). The introduction of teaching research methods in nursing programs should lead to changes in the attitudes and beliefs about research held by nurses. Many still do not look at it as feasible.

There is need to focus teaching about research to the provision of knowledge and skills and tools needed in EBP. Though conducting nursing research require extensive postgraduate training, nurses generally need to participate in research at different levels in the producer – consumer continuum of research.

Research should be regarded as a priority in nursing, whether it is in formulating an appropriate care strategy, evaluating an aspect of care or carrying out a research project. Also, there is a great need for recognition of nurses as researchers due to the emphasis on evidence-based practice and the quest for increased professional recognition and autonomy (Jootun & McGhee, 2003).

The stated fundamental purpose of nursing research is to improve the quality of patient care through the provision of knowledge for practice and the incorporation of substantiated and relevant research into practice (Deaton, 2001).

Nurses in Kenya need to be empowered with knowledge/skills through training and re-training and encouraged to undertake nursing research in order to keep up with the trends internationally. In the era of evidence based practice and knowledge-driven health care, nurses are constantly challenged to discover new and better ways of delivering care that is grounded on new

knowledge and evidence derived through research. Nurses have a professional obligation to society to provide care that is constantly reviewed, researched and validated (ICN, 2007).

2.2 Nursing research and Nursing practice

Quality nursing care is no longer done only for professional excellence. It is rather the right of the consumer. Nursing research is the way of evaluating practices and services provided and changing them. Qualified nurses should be able to identify areas of their practice which require to be researched on, to read research articles and reports critically, have basic understanding of the research process, principles and issues and to use research to improve patient care practices. Nurses in the clinical settings generate a lot of data in their day to day caring processes and these opportunities are many a times not put into good use (Ofi *et al*., 2008).

Reports from research and observations show that the degree of nurses' participation in the conduct of research varies from passive observers through passive data collectors and consumers of research reports. The great potential of nurses as producers and consumers of research is not being fully utilized. There is need not only to rely on the historical and the experiences of nurses but also to critically examine what in nursing practice has actual beneficial outcomes for clients. Nurses need to determine whether an intervention brings about desired effects for clients and also determine which intervention works best (Roxburgh, 2006).

Nurses in practice need not only to conduct research to answer questions they have about practice, but also have easy access to research findings that are applicable to their practice besides the skills to assess research for its value to practice. Measures need to be devised to ensure nurses gain adequate knowledge/skills in understanding research and assessing research findings for application to practice. They need skills on practical research methods not merely

the traditional roles and techniques of doing research. Also, they need to be empowered to see research and nursing together rather than separately (Roxburgh, 2006).

Understanding the research process is the first step in using evidence in everyday nursing practice. Obstacles to this can be categorized into three areas; education, beliefs and attitudes and support (Boswell and Cannon, 2011). Common practices revered by nurses regardless of their contribution to quality health care or patient outcomes must cease. These are practices blessed by time but not necessary by science. They are behavioral patterns that may no longer be effective.

Research-based practice will lead to the improvement of the nursing profession. Research utilization is now part of the nurses' professional role and responsibility, which has been associated with concepts of efficiency, effectiveness and quality improvement in health care (McMillan and Conway, 2003). Nurses need to demonstrate that their professional practice is effective, efficient and worthwhile, and more likely to be appropriate and justifiable.

In spite of the increase in the quantity and quality of nursing research and the teaching of research in nursing programs, research knowledge among nurses and its use in practice is still low (Jolley, 2002). In addition, utilization in clinical settings is still not taken positively by the majority of nurses.

Research utilization is of peripheral importance to nursing staff. Nevertheless, to achieve health care service of high quality, implementation of research findings is an issue of important concern for the nursing profession (Kajermo *et al*., 2000). The notion that research-based knowledge is necessary to improve clinical practice is not new (Edward *et al*., 2002). However, research

utilization is a new paradigm in Kenyan nursing and nurses need empowerment to undertake research that influence practice.

As in most other developing countries, increasing cost limitations, a push for quality of clinical care, and patient-centered care are some of the forces that require health care to be based on scientific research. Kenyan nurses need to use sound research evidence in practice. Health care systems should search for programs and strategies to establish research-based nursing practice. Assessing nurses' research activities and evidence based practice plus the factors that influence them forms the first step in designing programs for getting EBP into education and practice.

2.3 Nursing Research and Evidence Based Nursing Practice

Evidence Based Practice (EBP) is the process of clinical decision making by integrating the best research evidence with clinical expertise and patient values (Sacket *et al*, 2000). Evidence Based Nursing (EBN), which is part of EBP, is the integration of the best evidence available, nursing expertise and the values and preferences of the individuals, families and communities who are served (Sigma Theta Tau International, 2005).

It is a process approach to collecting, reviewing, interpreting, critiquing and evaluating research articles and other relevant literature for direct application to patient care. It uses evidence from research, performance data, quality improvement studies e.g. hospital or nursing report cards, program evaluations and surveys, national and local consensus recommendations of experts and clinical experience. The process further involves integration of both clinician-observed evidence and research directed evidence. This leads to a state-of-the art integration of available knowledge and evidence in a particular area of clinical concern (Kelly, 2012). It helps in identifying recommendations for improving practice.

Evidence based practice is a process where, in cases of perceived uncertainty on appropriate care, the clinician defines a searchable question, seeks out relevant knowledge, critically appraises and compiles the identified knowledge, implements it in clinical practice and evaluates the outcome (Fineout-Overholt *et al*., 2005).

2.3.1 Sources of evidence for nursing practice

Nursing has historically acquired knowledge through traditions, authority, borrowing, trial and error, personal experience, role modeling, Intuition and reasoning. Only in the last one and half decade has many of the research findings been included in nursing textbooks or instructors' lectures (Burns and Grove, 2009).

- Tradition: These include 'truths' or beliefs that are based on customs and trends. These have been passed to present by written and oral communications and role modeling, and they continue to influence the practice of nursing. Though these can positively influence nursing practice, they can also narrow and limit the knowledge sought for nursing practice. In addition, most haven't been evaluated for their value.

- Authority: This refer to a person with expertise and power capable of influencing opinion and behavior. These can maintain many customs or traditional ways of knowing. However, much of the knowledge acquired from authorities need to be validated by research. Though the knowledge may be useful, it needs to be analyzed for evidence of truth.

- Experience: Personal experience enables the nurse to gain skills and expertise. It increases the ability of the expert nurse to grasp a situation intuitively with accuracy and speed. However, it may be too limited to generalize and research is needed to clarify

dynamics of expert nursing practice and determine methods of facilitating meaningful personal experiences.

- Role modeling: This is learning by imitating the behavior of an expert. This is good but may as well not be validated.
- Intuition: This is an insight into or understanding of a situation or event. It cannot be explained logically/scientifically.
- Trial and Error: Success occurs when least expected by just trying something.
- Logical Reasoning: This is processing and organizing of ideas in order to reach conclusions. It can involve:
  - Inductive reasoning which moves from specific to general.
  - Deductive reasoning which move from general to specific
- Scientific Method: Though the above methods are important in nursing, they are inadequate in providing scientific knowledge base for nursing practice. The scientific method utilizes quantitative and qualitative ways to generate the needed knowledge. It is the most advanced method of acquiring knowledge (scientific data) and has been used to generate knowledge for nursing practice (Burns and Grove, 2009).

According to Kelly (2012), common examples of types of evidence include:

- Published researches
- Published quality improvement reports
- Published meta-analysis

- Published systematic literature reviews
- Policies, procedures, protocols
- Published guidelines
- Conference proceedings, abstracts, presentations

2.3.2 Levels of hierarchy for evidence

These identify the strength or quality of evidence generated from a study or report. They are arranged from the highest to the lowest levels as follows:

Level I: Meta-analysis of multiple randomized clinical trials ('Gold standard')

Level II: Individual randomized clinical trials

Level III: Quasi-experimental/Controlled trials

Level IV: Non-experimental; case-control & cohort studies

Level V: Systematic reviews of descriptive/qualitative studies

Level VI: Single descriptive/qualitative study

Level VII: Opinion of respected authorities, Program evaluation; Quality improvement; case reports

2.3.3 Importance of best evidence and evidence based nursing

- Ensures patient/clients receive the care that fits their needs thus reducing their length of stay, re-admissions and improving their satisfaction.

- Facilitates sound decision making leading to improved employee satisfaction, recruitment and retention of nurses.
- Minimises risk to the patient/client hence reducing mortality and morbidity
- Provides the nurse with the skills and knowledge to evaluate healthcare literature and practice
- Exposes gaps in knowledge and conflicts in evidence

Optimal nursing care is provided when nurses and health care decision makers have access to a synthesis of the latest research, a consensus of expert opinion and are able to exercise their judgement as they plan and provide care that takes into account cultural and personal values and preferences (STTI, 2005).

Evidence-based practice has been recognized by the healthcare community, as well as by regulatory agencies, as the best way for the provision of safe and compassionate health care (Brown *et al*., 2009). It is continuously evolving as new and relevant evidence emerge and clinical practice decisions change to promote optimal patient care. Good nursing researches have been carried out providing knowledge base that has transformed practice.

Health care regulatory organizations in the USA recognize evidence-based practice as a critical step in improving healthcare quality. The Joint Commission has consistently supported the implementation of evidence-based practice in medicine and nursing as a means of improving healthcare systems as it has repeatedly been shown to improve patient outcomes (Joint Commission, 2008).

Evidence-based practice (EBP) is currently one of the most important underlying principles in modern healthcare provision. World over, there is a rapidly growing knowledgebase in

healthcare owing to its extensive generation (Florin *et al.*, 2012). However, the translation of that knowledge into clinical practice is often hampered (Thompson *et al*., 2008), resulting in considerable variation in clinical practice, with the consequence that not all patients have equal access to appropriate care (Grol & Grimshaw, 2003). EBP helps to standardize the care process.

There is need to create a knowledge driven health services in which clinical, managerial and policy decisions are based on sound information. The International Council of Nurses supports nurses' active participation in nursing research and the use of research to inform evidence-based practice (ICN, 2007). Globally, governments have embraced evidence-based practice and developed initiatives to advance provision of health care based on best evidence rather than on tradition (Retsas, 2000, Glacken & Chaney, 2004).

The Scottish Executive Health Department (2002) emphasizes the need for clinical services to be underpinned by a robust evidence base. This is based on the assumption that, the new evidence-based culture where care is based on soundly derived empirical evidence, is more likely to be cost-effective, appropriate and justifiable. This therefore will mean that, diminishing health-care resources can be used in a more efficient way, patients can be protected against outdated and dangerous interventions and health-care professionals can be safeguarded, to some extent, from potential litigation (Roxburgh, 2006).

Nurses need to shift from historical and intuitive care practices to evidence driven services to meet the changing needs of both the consumers and the providers of health care (Roxburgh, 2006). They have a responsibility to deliver care based on current evidence, best practices and validated research. Strategies to promote evidence-based practice must be based on evidence and must address known barriers or facilitators to the adoption of evidence-based practice by nurses if they are to be successful (Brown *et al*., 2009).

In order to do this, nurses need to have a basic ability to evaluate research findings, reflect over current clinical practice and incorporate research-based knowledge into their clinical practice. However, implementing new knowledge is not a straightforward and easy process, as it involves both organizational and individual factors. Studies on nurses and nurse educators in the United States of America and in Australia have shown that attitudes to, and beliefs about, the benefit of EBP are often rated high, whereas knowledge and skills related to EBP are rated low or moderate (Melnyk *et al.*, 2004, Waters *et al*., 2009).

Research utilization has been reported to be low among nurses in many countries. This raises the question of whether scientific perspectives underpinning nursing education are actually transformed and used in clinical practice (Forsman *et al*., 2009). Furthermore, there are indications that increased work experience implies that RNs rely on experience to a greater extent, instead of using current appropriate knowledge (Kenny, 2005).

Beliefs, attitudes and various educational variables, have been identified as potential determinants of research utilization at individual level (Estabrooks *et al*., 2003), while provision of education was associated with increased research utilization (Meijers *et al*., 2006).

2.4 Factors influencing nursing research and evidence based practice

2.4.1 Barriers and facilitators

Many researchers have identified both barriers and facilitators to the undertaking and utilization of research findings in nursing practice and therefore to the adoption of evidence-based practice. A Chinese study conducted by Tsai (2000) explored staff nurses and nurse managers' participation in research using a Research Participation Questionnaire.

In this study, a total of 246 (64%) nurses reported participating in research activities. The level of research preparation demonstrated that more than two thirds subscribed and read research journals. About half had taken a research or statistics course and 21% were studying for an advanced degree. The most participated activities in the research process were data collection (54%) and writing proposals (43%). Many had participated in research seminars while 53% had given national presentations of research and 37% had written for journal publications.

Published reports over a considerable number of years have stated factors, which constrain active participation of nurses in conduct of research in developed and developing countries. Typical barriers to nursing research and EBP include organizational cultures that reward routines, inadequate knowledge or education, heavy workloads and resistance from colleagues (Fineout-Overholt *et al*., 2012; Gerrish and Clayton, 2004).

Other barriers reported in literature include lack of time, lack of authority to change practice, task-based practice, misconception about evidence-based practice, lack of administrative support; lack of mentorship; lack of access to resources, poor understanding of statistics and critical appraisal, unclear workplace expectations; and inconsistent basic knowledge and experience with research plus lack of knowledge on accessing and critiquing of research papers (Funk *et al*., 1991a; Fink *et al*., 2005; Kajermo *et al*., 2008).

On the other hand, participatory management, an academic degree, education, availability of relevant research, time, positive attitudes and mentorship have been shown to have a positive relationship to nurses' intentions to undertake research and use findings in practice (Estabrooks *et al*., 2003; Hutchinson & Johnston, 2004; Kajermo *et al*., 2008).

Also, failure to develop necessary programmes for encouraging conduct of research and acceptance and integration of research findings in practice and lack of a positive research culture within wards are other reasons cited (Nelson *et al.*, 2009).

In Scotland, nurses are provided with opportunities to conduct research in its fullest sense, including designing research protocols and bidding for funding (Scottish Executive Health Department, 2002). Interestingly, many nurses do not utilize the opportunities citing lack of time and need for peer and managerial support (Roxburgh, 2006).

In literature, the fundamental aim of nursing research is to broaden knowledge and improve practice (Robson, 2002; White & Taylor, 2002; Blenkinsop, 2003). However, Davies *et al* (2002) highlighted in their study of practice nurses that recognition of effort would encourage practice nurses to participate in research.

Much literature focuses on identifying nurses' involvement in research activities and utilization of research findings in practice (EBP). Much less is available regarding developing research capacity in clinical settings among practicing nurses and also effect of interventions that have been conducted so far. This is despite awareness of the problem for many years (Purkis *et al*., 2008).

2.4.2 Research knowledge and culture

A number of studies have shown there is a strong association between education and scientific knowledge. Education has been shown as one of the main factors underpinning change. An obstacle for evidence-based practice is the nurses' insufficient knowledge and competence about reading and evaluating scientific articles and results. Review of published literature by many authors found knowledge deficit as a major factor in relation to research activities and processes

by nurses (Roxburgh, 2006). Their limited ability to understand research articles was placed ahead of barriers related to their work setting (Kuupelomaki and Tuomi, 2005).

Hicks (1998) investigated three aspects of research utilization: nurse's attitudes to research, their level of research activity and problems encountered using research. Using a random selection of 500 nurses in England, Scotland and Wales, He found that, the three highest ranked barriers were lack of knowledge of research methods, lack of time and lack of confidence.

Engaging nurses in research and improving their knowledge offers the opportunity for them to move beyond being passive research participants to being active team members. By encouraging ownership of nurses' own clinical concerns, consequent research may begin to reduce the research-practice gap (Purkis *et al*., 2008). It is therefore crucial that opportunities are available for practicing nurses to engage in research should they wish to do so. However, creating a clinical research culture and increasing nursing research capacity is not necessarily straightforward. Nurses need instruction in both the research and evaluating processes if they are to develop proficiency in applying results from studies.

Segrott *et al* (2006) identified a variety of important challenges to developing research capacity among nurse educators, albeit in academic departments. Their review of the literature suggested there are many challenges facing nurses and emphasized the need to understand the local context as much as possible. The two main themes in their study were material constraints and organizational contexts and the changing roles and expectations of nurses.

Funk *et al*., (1991) while looking at the challenges in trying to develop a research culture in nursing emphasized the importance of putting the local nursing context into consideration. Funk's model took its base from the work of Rogers (1983), who suggested there are four key

factors in the adoption of change: the characteristics of the adopter; the organization; the innovation; and the communication. They translated these for the purposes of application to a clinical setting as: the characteristics of the nurse; the setting; the research; and the presentation and accessibility of research.

2.4.3 Organizational support and availability of resources

Organizational support and availability of resources have been cited as significant motivators to research undertaking and results utilization. Lack of these has been associated with limited or no research undertaking and/or research results utilization. Adams (2001) conducted a small phenomenological study exploring the research perceptions of qualified orthopedic nurses. Specifically, the setting and the research were reported as being most important to this group of nurses.

Bryar *et al*., (2003) suggested that, historically, organizational constraints have been paramount, which could add weight to the setting being a key factor. Conversely, however, they indicated that for this cohort of nurses practicing in the north of England, the main barriers to use were not necessarily reported as 'organizational' ones. Nurses reported issues of time, lack of individual authority, issues with the research itself and lack of peer support.

The most common barriers were related to the characteristics of the organization; insufficient time for nurses to implement new ideas was the most frequent barrier, found in 73% of the studies. Lack of authority to change patient care procedures was also a common barrier to nurses' use of research (found in 49% of the studies) (Carlson and Plonczynski, 2008). Lack of interest on the part of leaders and management was also found to inhibit utilization (McCormack *et al*., 2002; Bryar *et a*l., 2003; Hannes, 2007).

Interestingly, in some studies, administrators did not perceive themselves as an obstacle to the process of research implementation. Though the organization is being viewed as a barrier, it can as well be used to enhance research utilization and evidence-based practice.

2.4.4 Research Experience

Nurses' participation in organized research-related activities was found to have more positive score on attitudes towards EBP (Larrabee *et al*., 2007) and so was an EBP educational programme for senior nurses (Sheriff *et al*., 2007). Lack of experience in research has been shown to negatively influence nurses' involvement in research activities. As with many other allied health professions, research teaching is now an integral part of the nursing curriculum and, increasingly, post-qualification professional development requirements encourage a research orientation (NMC, 2007).

2.5 Outcomes of education interventions on nursing research and EBP

Some researchers have initiated strategies to encourage research activities and incorporate EBP in nursing practice. A literature search by Hart *et al* (2008) using CINAHL, Medline, EBSCO Host and ProQuest databases found several descriptive and exploratory studies with few interventional nursing studies. An educational intervention on principles of EBP and research utilization via three computer based learning modules found statistically significant differences in perceptions of knowledge, attitude and skill level after nurses participated in the computer-based educational intervention.

In this research, despite the fact that nurses had positive attitude about using research to support best nursing practice, gaps in knowledge and skills in retrieving, research publications, evaluating evidence and incorporating the evidence into practice remained. The researchers

recommended diverse and effective methods in educating and engaging nurses in EBP and research utilization (Hart *et al.*, 2008).

Ellis *et al* (2005) examined effects of a facilitator-led educational program to assist nurses in developing protocols to address practice issues. Participants reported increased understanding about EBP and were more confident about their ability and skills to improve best practices after participating in the facilitated workshop.

Hundley *et al* (2000) evaluated effectiveness of two approaches to increase research awareness among midwives and nurses. The control group was provided with an education and training program only while the interventional group was provided with the education and training program as well as policy and practice interventions. The results showed that, the interventional group was more likely to engage in research utilization and participate in reading research journals.

Research utilization and change to research based nursing practice were found to be complex issues which require organizational and educational efforts (Nelson *et al.*, 2009). Their study involved a two-year educational program to facilitate the dissemination and implementation of research findings in clinical practice at unit level.

Examination of the effects of an eight week research utilization course by Tsai (2002) in China found nurses in the experimental group to have more positive attitudes towards research, perceived greater support from their institutions and had higher levels of participation in research than those in the control group.

An online electronic survey conducted by Sigma Theta Tau International (STTI) among registered nurses in the United States found that EBP is not only gaining recognition but also

expanding application in nursing. The vast majority (90%) of the respondents reported actively accessing and applying EBP while only 8% seldom recognized need to make effort to EBP. Only 2% never practiced EBP (STTI, 2006).

The importance of nursing education and organizational support in order to accomplish the implementation of evidence based nursing is further recommended by Ozdemir and Akdemir (2009) from their study in Turkey. According to them, implementing research evidence in nursing practice is a daunting task and one needs to understand the factors related to nurses' knowledge and skills. Also, efforts need to be made to enable nurses to achieve more reliable professional practice environment by using research findings in clinical practice.

Purkis *et al* (2008) found engaging nurses in research difficult. Few nurses were interested in their action research project and hence had a slow build up. Lack of understanding was a key concern. Nurses needed guidance on how to get started. They argued that such initiatives could be instrumental in supporting and developing the individual characteristics and demystifying research. Also, support and information is likely to be accessed if it is in the practice area. They recommended that, more courses on research methodology and other relevant training be made available to practicing nurses.

Many researchers argue that strategies to enhance nursing research and evidence based practice need to focus on several facets including enhancement of individual nurses and nurse leaders' knowledge/skills and availability of resources and mentors. Also, a recognition or reward system for those who fully engage in the effort need to be considered.

There is need for roles to be defined for each individual in implementation and sustainability of EBP and cultivation of a context and culture that support it (Dogherty, Harrison, Gram, Vandyk

and Keping-Burke, 2013; Melnyk, 2008; Fineout-Overholt *et al*., 2012). Nursing services managers and educators need to promote better research education by focusing on nurses' current knowledge, experience and attitudes towards research.

Studies recommend replication of interventions in different regions of the world so that findings could be more generalized. Building a culture in which research is valued and EBP becomes the norm among nurses and nurse leaders is essential to the progress of nursing practice. Diverse and effective methods are essential in educating and engaging nurses in research utilization and EBP.

In summary, findings show that nurses need more knowledge and skills in nursing research and EBP to be able to understand research, evaluate researches and incorporate best evidence into their nursing practice. Moreover, measures need to be instituted to ensure sustainability thereafter.

Melnyk *et al* (2014) argue that, nursing education systems should actively support the development of EBP in nursing by designing educational strategies for nurses. They recommend advancement of nursing training in our health care institutions.

CHAPTER THREE: METHODOLOGY

3.1 Study Design

The study utilized a pre- and post-test interventional design with a baseline survey (Phase I), Intervention (Phase II) and Evaluation (Phase III). Baseline survey established nurses', research activities, their participation in different research activities and basis of evidence for nursing practice and identified gaps. The intervention phase addressed the gaps identified in phase I while the evaluation phase determined the outcomes of the intervention in phase II. According to Brown *et al* (2009), strategies to promote nursing research and evidence based practice must be based on evidence and should address locally known barriers to adoption by nurses if they are to be successful. Hence this was the best approach to answer the research questions.

3.2 Study site

The study was undertaken in six critical care units of Kenyatta National Hospital (KNH). These included Intensive Care Unit (ICU), Burns Unit, Renal Unit, Cardiology Unit, Emergency Department and Operating Theatres. There were 340 nurses working in these units. Their nursing qualifications ranged from masters and bachelors' degrees, higher diplomas, basic diplomas and certificates. KNH is the largest referral and university affiliated teaching hospital in Kenya.

It was chosen because it has served as a teaching hospital and clinical experience setting for many health care providers including nurses. Critical care units were chosen because of the specialized nature of care needed by patients in these units. Besides, acute, critical and the specialized care need to be based on evidence hence the choice of the six units. Also, a lot of research activities go on in this institution. In addition, one of the key functions of the hospital is to participate in research activities and health policy formulation. It is expected that what

happens in this institution with regard to nursing research and EBP reflects the situation in the entire country as it is the main teaching and referral center for health care. Also many nurses undergo their training in this institution after which they are deployed in other parts of the country where they replicate their knowledge and skills.

3.3 Study population

The study population included all nurses working in the critical care units at KNH. The hospital has 1600 nurses in total with 340 deployed to the critical care units as follows: Intensive Care Unit - 100; Burns Unit - 30; Renal Unit - 30; Cardiology Unit - 10, Operating Theatres - 80 and Emergency Department - 90) (KNH Records, 2013). The study considered nurses with an experience of at least one year post nursing school training and deployed in either clinical work environments, in administration, in clinical supervision or in training sections.

3.4 Phases of the study

The study was done in three phases. In phase I, a baseline survey was done to establish the involvement of nurses in research activities and evidence based practice and to identify needs. This was followed by phase II which involved an intervention to train nurses on nursing research and evidence based practice based on the needs identified in phase I. Finally an evaluation of the outcomes of the training intervention was undertaken in phase III. The activities in each phase were as described below.

3.5 Phase 1: Identification of nursing research and EBP gaps

During this phase, data was collected to establish the status of involvement of nurses in research activities, their utilization of research findings in nursing practice and their evidence basis for nursing practice. This was necessary in order to identify needs/gaps on the same. Various

methods were used to collect this baseline data including self-administered questionnaires, key informant interviews, focus group discussion and record analysis from the Nursing Council of Kenya. For data collection using self-administered questionnaires, the study sample was first calculated and determined as described below.

3.6 Study sample and sample size determination for phase I

The study considered the population of nurses who qualified for the study to be 340 as stated under study population.

The following formula (Polit and Beck, 2010) was used for sample size determination as follows:

$$n = \frac{Z^2pq}{d^2}$$ Where:

n = the desired sample size (if the target population is greater than 10,000)

Z= the standard normal deviation at 95 % confidence level (=1.96)

P= the expected population correlation coefficient (population effect size)

(Since no studies have been done on these subjects, 50% (large effect size) was used to determine the sample size)

q= 1- p

d= level of precision (set at +/- 5 % or 0.05)

Substituting these figures in the above formula:

$$n = \frac{(1.96)^2 (0.50) (0.50)}{(0.05)^2}$$

$$= 384$$

Since the target population was less than 10,000, the sample size was adjusted using the following formula:

$$nf = \frac{n}{1+(n / N)}$$

Where nf = the desired sample size when population is less than 10,000

n = the desired sample size when population is more than 10,000

N= the estimate of the population size

$$\text{Hence } nf = \frac{384}{1+ (384/ 340)}$$

$$= 384/ 2.13$$

$$= \mathbf{180}$$

Thus, the calculated sample size was **180** Nurses.

3.7 Sampling method for Phase I

Simple random sampling method was used to obtain the proportionate sample from each critical care unit as shown below:

ICU – 100/340x180 = 53 nurses

Burns Unit – 30/340x180 = 16 nurses

Renal Unit – 30/340x180 = 16 nurses

Cardiology Unit – 10/340x180 = 5 nurses

Operating Theatres – 80/340x180 = 42 nurses

Emergency Department – 90/340x180 = 48 nurses

Total = 180 Nurses

3.8 Selection criteria

For inclusion in the study, one was required to be a nurse, male or female working in either of the critical care units with a minimum nursing experience of at least one year and working in either clinical environment, administration, clinical supervision or in training sections.

3.9 Selection and training of research assistants

Four research assistants at the level of Bachelor of Science in Nursing were recruited and trained on the purpose of the research, the objectives, how to implement the research tools and data collection techniques. Also, checking the tool for completeness, coding and data entry into the computer were demonstrated. The research assistants were introduced to the Deputy Director, Nursing Services and to the assistant chief nurses in-charge of the study areas in the hospital. During the data collection process, the researcher explained the purpose of the research and emphasized the importance of 'honest' responses to the participants. The research assistants then supervised the questionnaire filling exercise and ensured that participants did not influence each other which could have introduced bias. After each filling exercise, they assisted the researcher in collecting the filled questionnaires.

3.10 Pretesting of the study tools

Twenty five questionnaires were pretested among nurses working in the acute room at KNH Emergency Department. This room functions as an acute/critical care unit in the emergency department and handles patients who eventually are admitted to the critical care unit.

Nurses from this section were not included in the main study. After pretesting, the items in the questionnaire were modified accordingly mainly on the respondents' instructions on how to respond.

3.11 Validity and reliability

The validity and reliability of the study tools (Questionnaire) was ensured through pre-testing after which appropriate corrections were made to the items in the questionnaire. This involved clarifying the instructions on how to respond to the different items in the questionnaire.

Also, expert review was done by my supervisors for face and content validity. The primary threat to internal validity for this type of research design was related to selection of participants. To minimize threats to internal validity associated with this design, random sampling method was used to get the sample. In addition, the tool has been shown to have high Cronbach's alpha coefficients of between 0.81 and 0.87 for the four factors in the Barriers Scale (Kajermo *et al.*, 2000). Careful planning and the study design enhanced the validity of the study. Thus, there were good reasons to believe that the scale would measure what it was intended to measure.

3.12 Data collection methods and procedures in phase I

Mixed methods of data collection were used. Retsas, (2000) recommends that further studies to increase our understanding of nurses' perceptions of barriers to their use of research should use a

variety of methods. Qualitative methods ensured deeper exploration of experiences, perceptions and issues faced by nurses in their practice. Both designs yielded more useful data than either used alone.

3.12.1 Self-administered questionnaire

To obtain baseline data on nurses' research activities and basis of evidence for nursing practice, information was first obtained from 183 randomly sampled nurses from the six study areas using a self-administered questionnaire (Appendix 1). These questionnaires were filled under supervision of the researcher and research assistants and this exercise was witnessed by the supervisors. The questionnaire obtained information on nurses' socio-demographic information and data on nurses' level of involvement in research activities, their utilization of research findings, and attitudes towards research plus the perceived barriers to active research involvement. It was designed by the researcher and verified for content validity by two supervisors.

The questionnaire was divided into four parts. Part one captured socio-demographic information, part two obtained information on nurses' knowledge of research and involvement in research activities, part three sought information about research and EBP training needs of the study participants and part four incorporated the Barriers Scale by Funk *et al*, (1991) to assess the perceived barriers/facilitators to research utilization. The participants' socio-demographic information included age in years, sex, educational background, nursing experience, work station and level of appointment (designation) and participation in continuing education activities.

The Barriers Scale incorporated in part four of the questionnaire was originally developed and published by Funk *et al*, (1991a, 1991b). It was developed to assess clinicians', administrators',

and academicians' perceptions of barriers to utilization of research findings in practice. The Scale has 29 items which are grouped into four factors: (a) characteristics of the adopter: the nurse's research values, skills, and awareness, (b) characteristics of the organization: setting, barriers and limitations, (c) characteristics of the innovation: qualities of the research, and (d) characteristics of the communication: presentation and accessibility of the research. Each of the 29 items was rated on a five-point scale which indicates an item as a barrier to 1= 'no extent', 2= 'Little extent', 3= 'Moderate extent', 4= 'Great extent' and 5= 'No opinion'.

In addition, the scale includes two free-text items for respondents to list other barriers and facilitators to research utilization.

Funk et al, utilized factor analytic procedures to establish reliability of the instrument. Cronbach's alpha co-efficients for the four factors on the instrument were found to be .65-.80, with item-total correlation .30 -.53 (Funk *et al,* 1991). This scale was used because it has been found to have high face and content validity by various researchers. Kajermo *et al*, (2000) also reported high reliability coefficients (between 0.81 and 0.87) for the four factors described by Funk *et al*, (1991a, 1991b). Thus, there were good reasons for believing that the scale would measure what it was intended to measure. Permission to use the scale was gained from Sandra G. Funk, by submitting a signed permission form available online (Funk, 2001).

Selected participants completed the questionnaire in their unit at the same time before beginning work, generally needing about 20 minutes to complete. The filled questionnaires were then collected by the researcher or his assistant, assessed for completeness and coded for data entry into the computer. They provided both quantitative and qualitative data.

3.12.2 Focus Group Discussion guide

Data collection using questionnaires was followed by a focus group discussion (FGD) with eight nurse leaders involving three nurse clinicians, three nurse administrators and two nurse educators conveniently selected from KNH. They were selected because of their knowledge and experience of the study topic. The use of focus group discussion helps to draw upon participants' attitudes, beliefs, feelings, experiences and reactions in a way which would not be feasible using other methods (Jamieson & Williams, 2003).

It elicits a variety of views within a group context. The discussion was conducted by the researcher who acted as the moderator assisted by a note taker.

The discussion started by the researcher welcoming and thanking the participants for agreeing to participate. This was followed by introductions and the researcher explaining the purpose of the focus group discussion. Participants signed consent forms and were then randomly assigned codes which were used to refer to each one of them during the discussion in order to ensure anonymity. The participants were reminded that the discussion was open for honest and different viewpoints and that there were no right or wrong answers. Besides, they were requested to respect each other and their opinion.

Confidentiality was assured including the reason for tape recording the discussion in order to capture everything. Led by the researcher using a FGD guide (Appendix 4), the focus group discussed topical issues on nursing research and research activities among nurses, research education, expertise, practice and utilization of research findings. The note taker took notes as the discussion went on while the researcher noted the main points which were later combined with the tape-recorded discussion points as retrieved verbatim. These formed comprehensive

focus group discussion notes and provided qualitative data on nursing research and evidence based practice activities among nurses, factors influencing them and suggestions for improvement.

3.12.3 Key Informant Interviews

After completing the focus group discussion, key informant interviews were conducted with 13 nurses conveniently selected from each of the critical care areas. The nurses were chosen because of their involvement in ward/unit leadership, clinical supervision and continuing education activities. Single informant interview is a conversation between the participant and researcher under conditions acceptable to the participant. It helps to obtain individual's views, attitudes, beliefs and feelings.

Each interview was planned and began with an open question 'what motivated you to take part in this research' as a common starting point and as a way of getting the participant talking. This was after explaining the purpose of the interview and obtaining consent. An interview guide was utilized to collect data (Appendix 3). It was structured to make sure that information about research activities, research training and knowledge, and nursing practice, research and utilization is collected.

Like the focus group discussion, key informant interviews were tape-recorded to capture all information. Field notes were also taken for use in the analysis process. The taped records were fully transcribed verbatim. The interviews also provided qualitative data.

The employment of qualitative research methods contributed further to knowledge about facilitators and barriers to research utilization by nurses by allowing deeper exploration of experiences, perceptions and issues faced by nurses in their practice (Hutchinson & Johnston,

2004). Such an approach allowed drawing upon participants' attitudes, experiences, and reactions in a way that would not be feasible using self-report studies.

Information was also obtained from the Nursing Council of Kenya (NCK) with regard to the various syllabi for nurses' training and the scope of practice for nurses in Kenya. Phase one took six months.

3.13 Data management

3.13.1 Data cleaning and entry

Once collected quantitative data was cleaned and edited for easier analysis. It was then entered into the computer. Trustworthiness of the qualitative data was established through peer debriefing and member checks to confirm the emerging themes.

3.13.2 Data analysis and presentation of results in phase I

In phase I, quantitative data from the questionnaire was analyzed using SPSS version 20.0. Demographic information was utilized to describe the sample. Frequencies were obtained for nurses' demographic characteristics, research knowledge and activities, basis of evidence for practice and research and EBP training needs of participants.

Part IV of the questionnaire incorporated the 29-item Barriers Scale by Funk *et al* (1991) to assess the perceived barriers/facilitators to research utilization.

Each of the 29 items was rated on a five-point scale indicating an item as a barrier to 1= 'no extent', 2= 'Little extent', 3= 'Moderate extent', 4= 'Great extent' and 5= 'No opinion'. The 29 items are further grouped into four factors reflecting (a) the nurse's research values, skills, and

awareness, (b) characteristics of the organization: setting, barriers and limitations, (c) qualities of the research, and (d) presentation and accessibility of the research.

The individual responses for each of the 29 items on the Barriers Scale were averaged and so did the responses on items in each of the four factors. The factor analysis allows for the reduction of the number of variables into groups and in interpretation of the structure of the data, but does not provide for the importance of the individual items on the scale. In order to determine which individual items were perceived as the single largest barriers to research utilization, the number of respondents who reported each barrier as a moderate or great barrier were calculated and items rank ordered accordingly. Descriptive statistics were used. The strength of relationships between variables was determined using Pearson's chi-square at 95% confidence level ($P \leq 0.05$).

Regarding qualitative data, content analysis was used to analyze open-ended items in the questionnaire and explore narrative data from key informant interviews and focus group discussion for emergence of patterns and themes. This was done manually. Qualitative data from the questionnaires was assessed and similar themes coded then analyzed quantitatively. For the focus group discussion and key informant interviews, responses obtained from each participant was analyzed and compared across all participants using framework analysis (UK National Center for Social Research). This method is used to organize and manage data through the process of summarization and is useful in many areas such as health research, policy development and program evaluation. The framework creates a new structure for the data that is helpful to summarize the data in a way that can support answering the research questions (Gale *et al*., 2013). An issue that was identified or mentioned by 5 out of the 8 participants in the focus group discussion was regarded as an important factor and coded as a theme. Likewise, an issue

identified or mentioned by 7 out of the 13 participants in the key informant interviews was also coded as a theme. The emerging themes were identified, noted and summarized by the researcher and cross checked separately by each of the 4 research team members. Then the final agreement was arrived at through a discussion by the researcher and the 4 research team members and confirmed by the supervisors. The team based approach ensured consistency and agreement about the emerging themes through discussion.

Results were presented in form of tables, figures and narrative and the findings formed basis for the second phase of the study.

3.15 Phase II: Development of curriculum, Training and Monitoring

In phase II, the main activity was development and implementation of a curriculum for continuing education training of nurses on 'Nursing Research and Evidence Based Practice.' The training was based on topics that were identified and rated by nurse participants during the first phase. This was necessary in order to fill the gaps on nursing research and evidence based practice identified in phase I of the research.

Globally, a lot of emphasis is being put on EBP which has been recognized by health care organizations and regulatory authorities as the 'gold standard' for the provision of quality, cost-effective, safe and compassionate health care (Brown *et al*, 2009). This has also been associated with in increased satisfaction among providers of health care (Melnyk and Fineout-Overholt, 2005).

3.15.1 Development of training curriculum and pretest/posttest

It is on the basis of gaps identified in phase one that a training program on 'Nursing Research and Evidence Based Practice' (Appendix XIV) was developed. During data collection process in the first phase, the 180 participants who filled the questionnaires listed and rated various topics on nursing research and evidence based practice which they wished to be trained on. Also, participants in the focus group discussion and key informant interviews identified specific topics on nursing research and EBP for training of nurses so as to empower and make them more effective. From their clinical experiences and expertise, they observed that the topics were useful for nurses to get acquainted with global trends. The various topics identified included research methodology, research process, research designs, literature review, sampling techniques, data collection and data collection methods, data management and analysis, report writing and dissemination of results plus research utilization and evidence based practice. The scope of

practice for nurses by the Nursing Council of Kenya prescribes involvement of different cadres of nurses in various research activities in the producer – consumer continuum of research (NCK, 2012). This has been found not the case in many health care settings. Also information from National Nurses Association of Kenya reports few nurses being involved in research activities despite the global emphasis on nursing research and EBP. Therefore, the content included in the training program was sufficiently justified from the participants' perspectives, regulatory authority and the nurses' professional body. Building research capacity in health was recognized as a priority area during the 2008 UNESCO and WHO Global Ministerial Forum on Research for Health in Bamako, Mali.

The program was in order to train and sensitize nurses on practical research methods and evidence based practice to equip them with knowledge and skills and change their attitudes towards research. It also aimed at providing mentorship in nursing research and evidence based practice and equipping nurses with information to motivate and empower them to recognize various research resources available. This would make them recognize the many research opportunities that exist in their clinical environments. The overall goal was to increase involvement of nurses in their own research activities and increase utilization of research findings to improve nursing practice.

Opportunities for study and continuing education to combat deficits in knowledge, skills, confidence and awareness have been identified in some settings to be important facilitators of nursing research and EBP. Despite of this fact, no much attention has been paid to establishing the most effective ways of overcoming barriers to the same (Bradley *et al.,* 2004). Milne *et al* (2007) recommends development, implementation and evaluation of such programs to overcome the barriers.

The primary focus of this specific training program was for nurses to acquire knowledge, skills and abilities necessary to undertake basic/applied/operational researches and find existing evidence, appraise it carefully and then decide what could be implemented into practice. This would make them act as departmental change agents.

The training program was approved by the Nursing Council of Kenya so that the participants could earn continuing professional development credit points after completing the training for retention in their appropriate registers as required by the Council.

Alongside the developed training modules, a pretest/posttest (Appendix XV) consisting of 40 multiple choice questions on nursing research and evidence based practice was developed. Each question had five options for the participants to choose the correct one(s). The pretest/posttest complied with Blooms (1956) taxonomy of educational objectives ensuring that the participants covered and were tested on cognitive, affective and psychomotor domains of learning. It tested recall/recognition, comprehension, synthesis, analysis and application of nursing research and EBP concepts. This pretest/posttest was necessary in order to assess participants' research knowledge/skills before and after intervention.

The specific topics covered for each day of training are as indicated in table 1 below.

Table 1: Specific Training Content Covered

Day 1	✓ Meaning of research/nursing research & its significance in nursing profession ✓ Scientific research method	✓ Roles of the nurse in research ✓ Types of researches & research designs	✓ Statement of research problem: o Components and criteria o Formulation
Day 2	✓Research objectives ✓ Research hypothesis ✓ Research questions	✓ Literature review: o Data bases o Search engines - CINAHL,MEDLINE,PUBMED	✓ Sampling and sampling techniques/methods
Day 3	✓ Methods of data collection ✓ Ethical issues in research	✓ Data processing o Editing o Coding o Classification o Tabulation	✓ Basic statistics and data analysis ✓ Data interpretation and dissemination
Day 4	✓Utilization of research results	✓Proposal development ✓Research collaborations	✓Research report ✓Analysis and critiquing of research articles
Day 5	✓Meaning of: • EBP • EBNP ✓Importance of EBP and the role of Nurses	✓Levels/types of evidence ✓Promoting evidence based best practices	✓Getting started ✓Mentorship

KEY:

CINAHL - Cumulative Index to Nursing and Allied Health Literature

MEDLINE - Medical Literature Analysis and Retrieval System Online

PUBMED – Public Medline

3.15.2 Sample size and sampling method in phase II

The training targeted 90 nurses out of the initial sample of 180 in the first phase. This represented 50% of the original sample in baseline survey.

This number was adequate owing to limited resources to train the entire sample at once. They were sampled randomly and proportionately from the six study areas in the hospital as shown in Table 2 below.

Table 2: Proportionate sampling for phase II of the research

Study area	**No of Participants in baseline survey**	**Proportionate sample taking 50% from participants in baseline**	**No of Training Participants/Week**			
			Week 1	Week 2	Week 3	Week 4
ICU	56	28	7	7	7	7
Emergency department	47	23	6	6	6	5
Operating Theatres	40	20	5	5	5	5
Renal unit	18	9	3	2	2	2
Burns unit	17	8	2	2	2	2
Cardiology unit	5	2	1	1	0	0
Total	**183**	**90**	**24**	**23**	**22**	**21**

3.15.3 Validity and reliability of developed curriculum and pretest/posttest

To ensure face and content validity of the developed curriculum and the pretest/posttest, they were pretested on fifteen participants from the study areas who were not included in the actual training exercise. Besides, they were reviewed and discussed by the supervisors and appropriate rectifications made on the specific items.

3.15.4 Training and monitoring

The sampled nurses were divided into four cohorts and each cohort trained for one week using the developed curriculum. They were then monitored for four months. This monitoring period was adequate in order to minimize loss of subjects to attrition.

Treece and Treece (1986) recommend that the researcher must recognize that the time span between the first test and the second test can be confounded by age, fatigue and maturation. Thus, unnecessary prolongation of time was avoided to prevent a scenario where some nurses could have transferred or moved from the study areas for some reasons hence reducing the sample.

3.15.5 Mode of assessment and evaluation during the training period

In order to determine prior knowledge/skill on nursing research and evidence based nursing practice, a written pretest was administered (before training) and a score obtained by each participant. The same examination was administered at the end of training (post-test) and a score recorded for each participant. This was in order to compare the scores for each participant and assess effect of the training experience.

3.16 Phase 3: Evaluation

This phase involved evaluation of outcomes of the training intervention. It was done at two levels. That is, immediately after the end of training sessions for each cohort of participants and at four months after completing the entire training. Immediate evaluation involved assessing changes in participants' knowledge in nursing research and EBP by comparing scores obtained in the written pretest and posttest.

It also involved assessing participants' ability to apply the acquired knowledge/skills in development and presentation of a concept research proposal based on issues of concern in their respective work stations. Evaluation at four months after training involved participants filling the same questionnaire used in the baseline survey so as to compare their knowledge and practice of nursing research and EBP before and after undergoing the training.

3.16.1 Data collection methods and procedures in phase III

Evaluation at four months after training was done using the same questionnaire and procedure used in the baseline survey. The questionnaire assessed participants' self-reported knowledge in research and their practice or involvement in research activities and evidence based practice after the training intervention. It was divided into three parts. Part one captured nurses' socio-demographic information, part two obtained information on nurses' knowledge of research and involvement in research activities and part three sought information about evidence basis for nursing practice. It excluded the Barriers Scale (Funk *et al.*, 1991) which was used in the baseline survey to establish the barriers/ facilitators to research utilization.

After obtaining informed consent from the participants, they completed the questionnaire in their unit at the same time before beginning work, generally needing about 15 minutes to complete. The filled questionnaires were then collected by the researcher and/or his assistant, assessed for completeness and coded for data entry into the computer. They provided both quantitative and qualitative data.

The measurable outputs in this phase included the difference in scores obtained by each participant from the written pretest and post-test, ability to develop and present concept research proposals by participants and the differences in self-reported knowledge in research and involvement in research activities and EBP by each participant after the training intervention.

3.16.2 Data management in phase III

After entry into the computer, participants' responses in phase III were paired with their responses in phase I. The data was then analyzed using SPSS version 20.0. Demographic information was utilized to describe the sample. Frequencies were obtained for nurses' demographic characteristics, research knowledge and activities and basis of evidence for nursing practice. Descriptive statistics were used. Statistical testing was done using paired samples t-test to compare results before and after training intervention.

One-way analysis of variance (ANOVA) was also used to assess relationship of study variables within or between groups. The confidence level was set at 95% ($P \leq 0.05$). Results were presented in form of tables, figures and narrative.

3.17 Ethical considerations

Authority was granted by the KNH/UoN Ethics and Research Committee. A clearance permit from the National Commission for Science, Technology and Innovation was obtained.

Permission was obtained from the management of KNH through the office of the Research and Programs department since the findings are very useful for administrative and educational purposes.

A written consent was obtained from all participants. Whoever agreed to participate signed a consent form. No one was coerced nor induced in any way to participate in the study. The questionnaires were serialized and the respondents were not required to write their names or any other identification numbers. Information provided was treated with utmost confidentiality and this was communicated to the respondents.

Assurance was given to the respondents that the information given was to be used only for the intended purpose of informing the nursing research/EBP policy in Kenya and that no plans whatsoever were intended to victimize anybody.

Before each interview and focus group discussion, the participants were informed about the purpose of the study, how it would be carried out, and that their participation was voluntary. Participants were advised that they could leave the interviews at any time.

To ensure confidentiality no names were included or used in the questionnaire. All data remained anonymous. An additional concern that participants may be disappointed if barriers are identified and then no action is taken to remove the barriers to research utilization (Schoonover, 2009) were addressed during the intervention phase.

The benefits to participants were the opportunity to participate in the training program and in research activities thereafter. Additionally, the identification of barriers to conducting nursing research and/or utilization of findings in practice offered the opportunity for program planning (Training workshops) to address the barriers.

The removal of the barriers to research utilization and the establishment of evidence-based practice have the potential to improve patient care outcomes and increase provider satisfaction. The study findings were made available to individual participants, KNH management and regulatory authorities.

3.18 Assumption

The study assumed that understanding the factors that influence nursing research and EBP and improving on the barriers would help strengthen nursing research capacity and therefore enhance evidence based nursing practice in the hospital.

This would consequently impact on the quality and cost effectiveness of health care provision. This is important because nurses form 70% of the health care workforce.

3.19 Study limitations

The self-report method utilized in this study could result in reporting bias (Parahoo & McCaughan, 2001).

These were countered by appropriate information to the respondents about the purpose of the study and the significance of 'honesty' responses. Funds were initially a limitation owing to the magnitude of the study and this delayed the starting of the research work. The preparation of the training modules, its implementation, training of research assistants, stationary and data management and analysis were all expansive and expensive ventures. The study was greatly supported by Partnerships for Innovative Medical Education in Kenya (PRIME-K/MEPI), NIH Grant Number 5R24 TW008889-02 and Jomo Kenyatta University of Agriculture and Technology.

CHAPTER FOUR: RESULTS

This chapter describes the details of the findings in phase one and phase three. The results from phase I are tabulated in tables 3-30 and illustrated in figures 4-23. Findings from open-ended items in the questionnaire, focus group discussion and key informant interviews are summarized in themes and narratives. Results from phase III are tabulated in tables 31-51 and illustrated in figures 24-32. The chapter ends by giving comparisons of the findings in phase three to those in phase one which show improvements in nurses' research knowledge, involvement in research activities and evidence basis for nursing practice.

4.1 PHASE I RESULTS (FINDINGS FROM BASELINE SURVEY)

The pre-intervention survey was completed by 183 nurses and the post-intervention survey completed by the trained 61 nurses. The pre-intervention survey results were as shown below.

4.1.1 Demographic characteristics of the participants (n = 183)

In total, 183 nurses from the critical care units were involved in filling the questionnaires. All of them returned the questionnaires representing a 100% response rate though 3 (1.6%) questionnaires were incompletely filled.

4.1.11 Sex of respondents

Females comprised 74% (n=135) of the participants with males constituting 26% (n=48) as shown in figure 4 below.

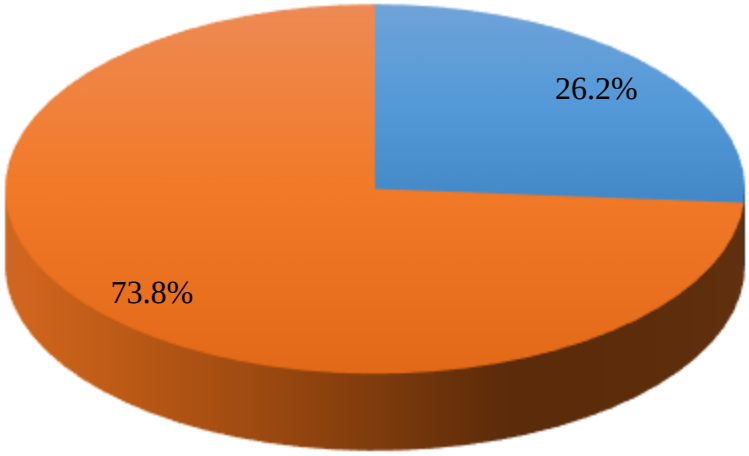


Fig 4: Pie chart showing sex of participants

4.1.12 Age of respondents

Table 3: Age distribution of the respondents:

Age bracket (Years)	Frequency	Percentage
Over 50	5	2.7
41-50	57	31.1
31-40	113	61.8
20-30	8	4.4
Total	**183**	**100**

The participants' ages ranged from 28 – 57 years with a mean of 39. Majority (61.8%, n=113) were in the age bracket of 31 – 40 years followed by those in the age bracket of 41 – 50 years (31.1%, n=57) (Table 3).

4.1.13 Professional qualifications

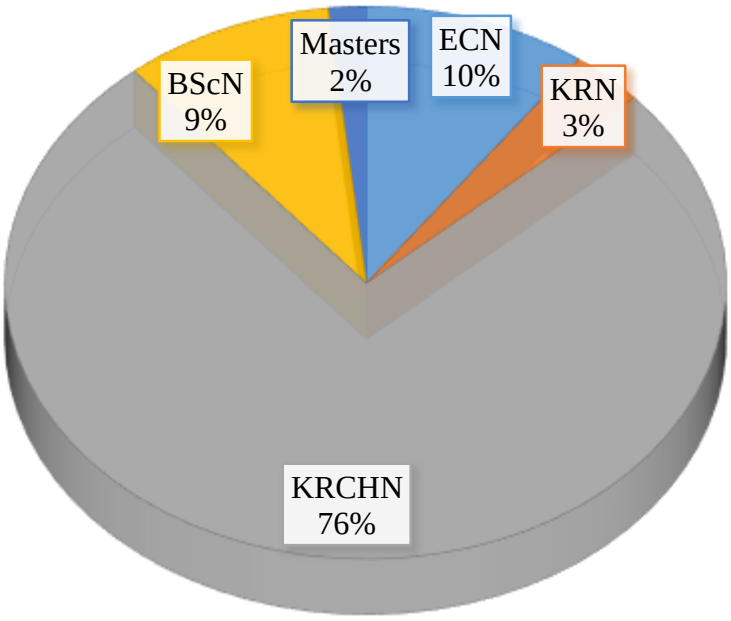


Fig 5: Pie chart showing qualifications of participants

As shown in figure 5, slightly more than three-quarters (76%, n=139) of the respondents were KRCHN, followed by enrolled nurses and BScN who constituted 10% (n=18) and 9% (n=17) respectively.

4.1.14 Nursing experience

Table 4: Years of nursing experience

Years of nursing experience	Frequency	Percentage
2-4	6	3.3
5-9	31	16.9
10-15	83	45.4
16-20	35	19.1
21-25	18	9.8
Over 25	10	5.5
Total	**183**	**100**

The results in table 4 show that nearly two-thirds (64.5%) of participants had a nursing experience of between 10 and 20 years (Table 4). This is a long experience if it is indeed useful. Only 3.3% had a nursing experience of less than 5 years.

4.1.15 Work station

Table 5: Work station:

Work station	Frequency	Percentage
Intensive Care Unit	56	30.6
Emergency department	47	25.7
Renal unit	18	9.8
Burns unit	17	9.3
Cardiac unit	5	2.7
Operating Theatres	40	21.9
Total	**183**	**100**

Table 5 shows that**,** most (30.6%, 56) of the respondents came from ICU, followed by 25.7%, (47) from Emergency Department and 21.9%, (40) from Operating Theatres. The least number of participants came from cardiology unit.

4.1.16 Position

Most (71.6%, n=131) of the participants were at the rank of Nursing officer I. Only about 5% (n=9) were at senior level during the baseline survey (Fig 6).

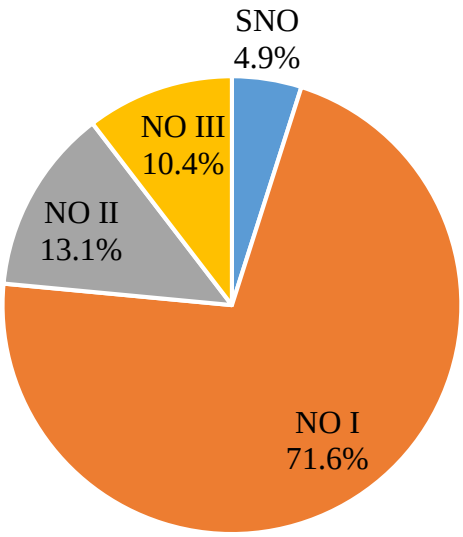


Fig 6: Pie chart showing positions held by participants

4.1.17 Roles played by participants

Direct patient care was the main role as shown in table 6, played by 86.3% of the participants. Slightly below a third (31.1%) of the participants were involved in administrative duties.

Table 6: Roles played

Role	Frequency	Percentage
Direct patient care	158	86.4
Administration/Nursing policy implementation	57	31.1
Clinical instruction/teaching	20	10.9
Infection control	27	14.8
Health promotion	38	20.8
Total	**183**	**100**

4.1.18 Other courses done by participants

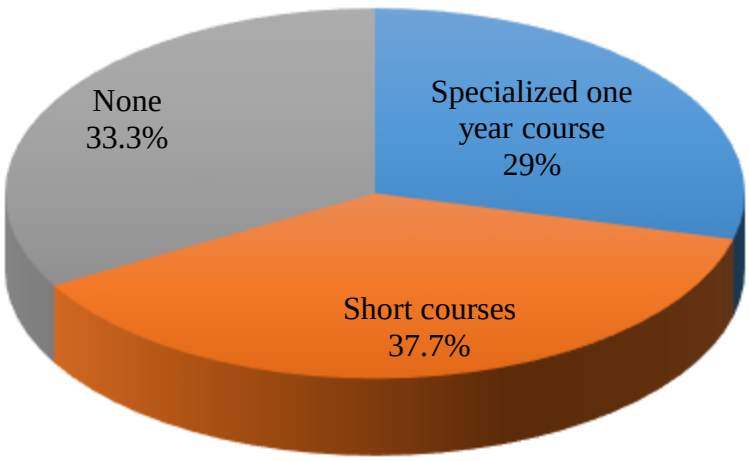


Fig 7: Pie chart showing other courses done by participants

Asked to indicate other courses done to improve practice within the last two years, 37.7% (n=69) had taken other short courses (Figure 7) in basic/advanced life support, infection prevention and customer care. These are some of the mandatory courses offered to the staff by the hospital.

Another 29% (n=53) had done the one-year specialized courses mainly in critical care, accident and emergency nursing, nephrology nursing and perioperative nursing. A third of the participants had not taken any course for the preceding two years.

4.1.2 Nurses' research knowledge and activities

4.1.21 Research teaching and its adequacy

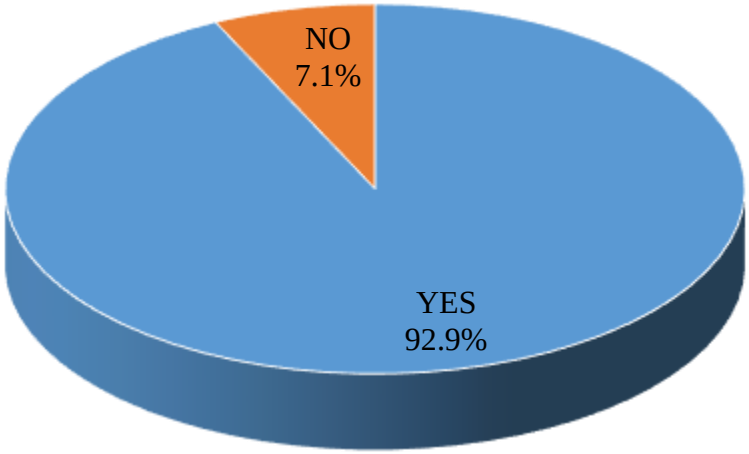


Fig 8: Pie chart showing participants agreeing to research teaching

The results in figure 8 above show that, about 93% (n=170) of the participants indicated having undergone basic training in research methods during their college course as prescribed by the Nursing Council of Kenya (NCK, 2012).

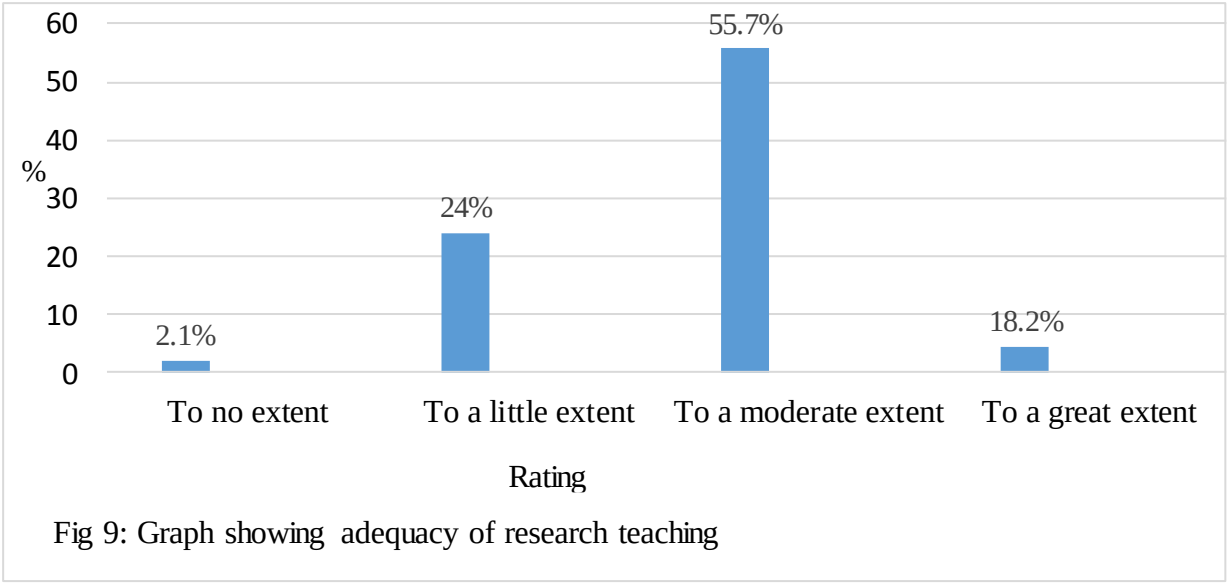


Fig 9: Graph showing adequacy of research teaching

Nearly three quarters (125, 73.9%) of the participants rated this research teaching as adequate to either a moderate or great extent in enabling them to carry out basic research to improve practice (Fig 9).

4.1.22 Level of research knowledge

Asked to rate their level of research knowledge, 62.3% (n=114) of the participants rated their knowledge as good while 2.2% (n=4) rated theirs as excellent (Fig 10).

This rating together with that of adequacy of research teaching to enable conduct research was however contradicted by the qualitative statements of the study participants citing it to be inadequate and research not being emphasized.

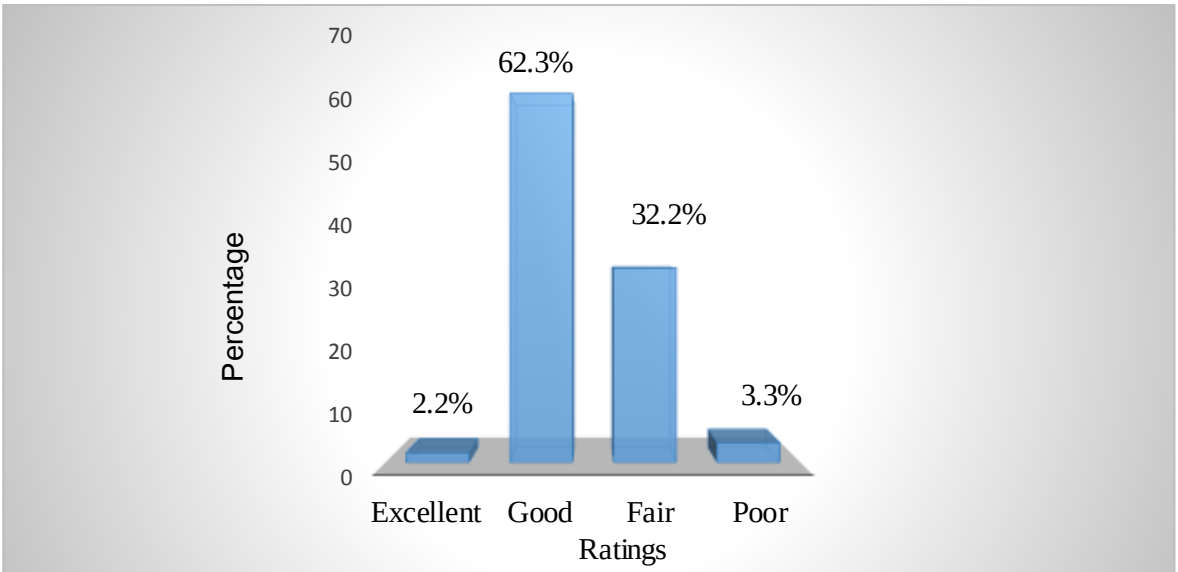


Fig 10: Rating level of research knowledge

4.1.23 Researches done other than the academic one

Only 38 (20.8%) indicated having done a research other than the one they did for academic qualification (Fig 11).

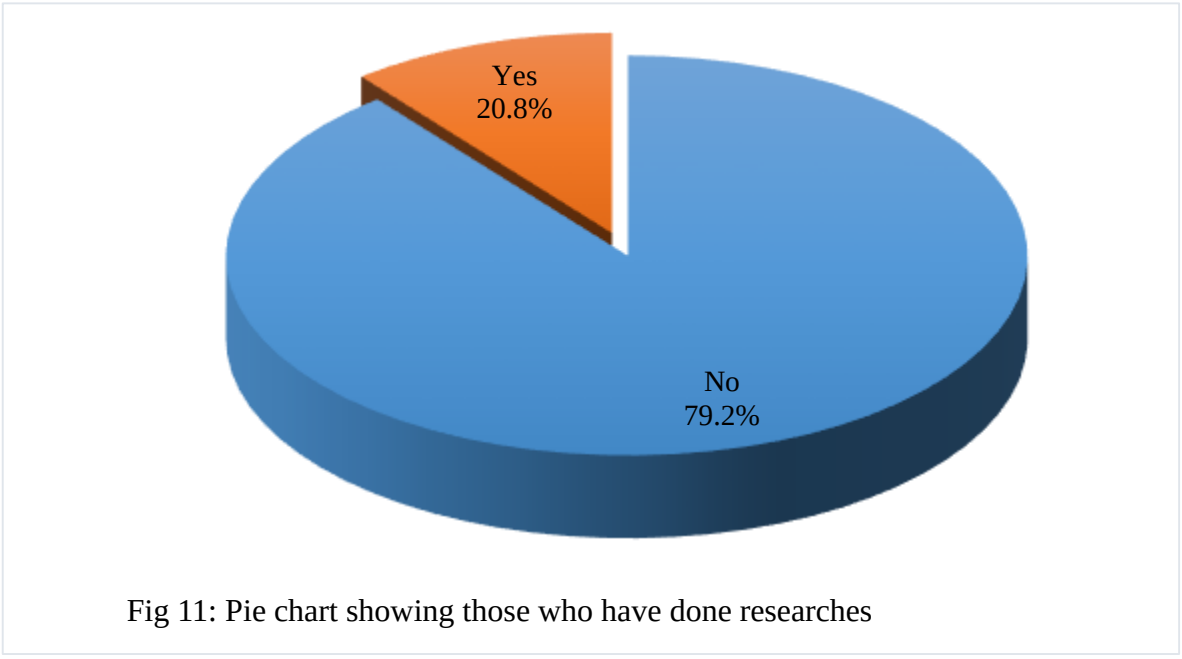


Fig 11: Pie chart showing those who have done researches

Out of the ones who had carried out researches, only six (3%) participants had done at least two researches (Table 7). Most of these were operational or applied researches aimed at solving practically identified problems.

Table 7: Number of researches done other than the one done at nursing school (n=183)

Number of researches done	Frequency	Percentage
1	31	17
2	4	2
3	1	.5
5	1	.5
None	146	80
Total	**183**	**100.0**

4.1.24 Frequency of participation in research

About twenty one percent (n=38) oftenly or very oftenly participated in research related to their work with 79% (n=145) rarely or not participating in research activities at all (Fig 12).

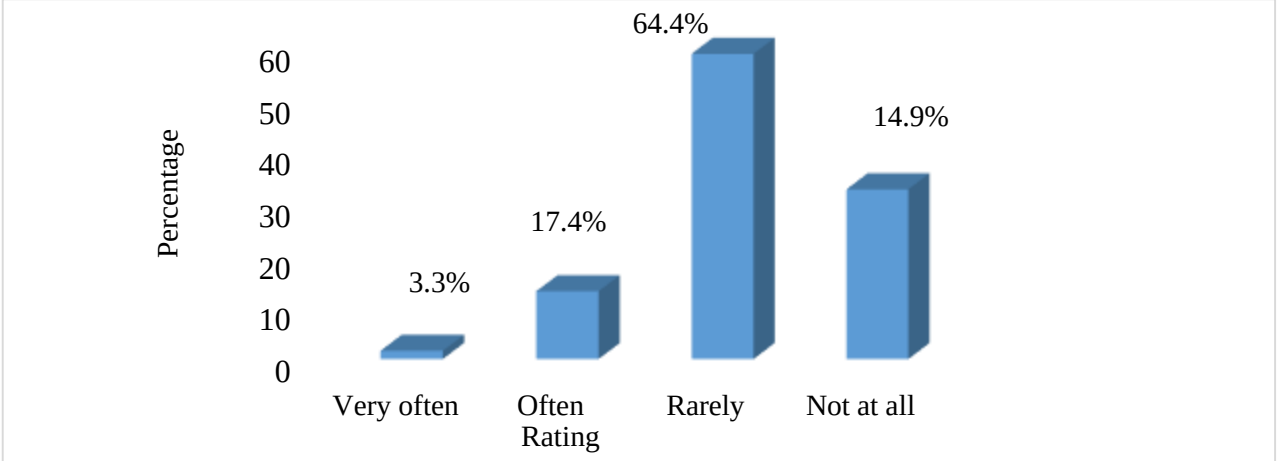


Fig 12: Frequency of participation in research related to work

4.1.25 Frequency of reading journals

A minority (21, 11.5%) read journals weekly or fortnightly while a majority (120, 65.6%) read them at least monthly. About forty percent (n=72) rarely or never read journals at all (Table 8). The main journals/publications read included Kenya Nursing Journal (n=14), Nursing Council of Kenya Newsletter (n=8), Journal of Critical Care Nursing (n=6), Journal of Perioperative Nursing (n=5) and Accident & Emergency Nursing Journal (n=5) (Table 9).

Table 8: Frequency of reading journals

Frequency of reading Journals	Frequency	Percentage
>Monthly	90	49.2
Weekly & Fortnightly	21	11.5
Rarely	49	26.8
Never	23	12.5
Total	**183**	**100**

Table 9: Main nursing journals read (n = 183)

Main nursing journals read	Frequency	Percentage
Kenya nursing journal	14	7.7
NCK Newsletter	8	4.4
Journal of critical care nursing	6	3.2
Journal of perioperative nursing	5	2.7
Accident & Emergency nursing	5	2.7
Others	73	39.9
None	72	39.4
Total	**183**	**100.0**

4.1.26 Updates on research methods

Table 10: Last updates on research methods after training (n = 183)

Last update of research methods since training	Frequency	Percentage
Within last 12 months	46	25.1
13-24months ago	24	13.1
25-36months ago	19	10.4
37-48months ago	6	3.3
Over48months ago	22	12
Never	62	33.9
No response	4	2.2
Total	**183**	**100.0**

Only a quarter (25.7%, n=46) of the participants had their last updates on research methods within the last one year while about 47% (n=88) never had any updates or had theirs more than four years ago (Table 10). Most of them (40%, n=74) got these updates from a college or university course meaning that this was either an upgrading course or a post graduate training (Table 11).

Table 11: Place of update on research methods (n = 183)

Place of update	Frequency	Percentage
University/college course	74	40
CPD	30	16
Place of work	24	13
Seminar/workshop	15	8
Internet	1	0.5
Own reading	3	2

4.1.27 Participation in different research activities

Asked to indicate research activities ever participated in, majority **(**74.3%, n=136) indicated data collection as the most commonly participated activity. This was followed by literature review, data analysis and interviewing which were respectively indicated by 47.5% (n=87), 45.4% (n=83) and 41% (n=75) of the participants. The research activities least participated in were paper (10.9%, n=20) and poster (16.9%, n=31) presentations in conferences (Table 12).

Table 12: Research activities ever participated in (n = 183)

Research activities ever participated in	Frequency	Percentage*
Literature review	87	47.5
Data collection	136	74.3
Data analysis/simple statistics	83	45.4
Interviewing	75	41
Poster/Abstract presentation	31	16.9
Report writing	62	33.9
Article/paper presentation in a conference	20	10.9
Proposal writing	37	20.2

***The percentage does not add up to 100 as respondents could choose more than one activity**

4.1.28 Access to library facilities and research activities

Asked to rate accessibility to library facilities and research activities (Table 8), 26.3% (n=46) of the participants indicated a well-equipped library as easily accessible with 42.9% (n=75) indicating this to be sometimes accessible. Accessibility to internet was indicated by 26.4% (n=46) as easily accessible with 40.2% (n=70) indicating this to be sometimes accessible. Professional journals were indicated by only 5.8% (n=10) as easily accessible with 46.2% (n=79) indicating them to be sometimes accessible. Accessibility to research courses or nurses doing research was indicated by only 6.9% (n=12) and 13.8% (n=24) respectively as easily accessible.

Table 13: Accessibility to library facilities and research activities at work place (n = 183)

Accessibility to library facilities and research activities at work place	**Easily accessible (n/%)**	**Sometimes accessible (n/%)**	**Not accessible (n/%)**
Well-equipped library	46(26.3)	75(42.9)	54(30.9)
Internet	46(26.4)	70(40.2)	58(33.3)
Professional journals	10(5.8)	79(46.2)	82(48)
Continuing education/training	53(30.5)	101(58)	20(11.5)
Research courses/seminar	12(6.9)	81(46.6)	81(46.6)
Nurses doing research	24(13.8)	93(53.4)	57(32.8)
Nurses presenting research findings	5(2.9)	79(45.4)	90(51.7)

4.1.29 Importance of research to nurses' job

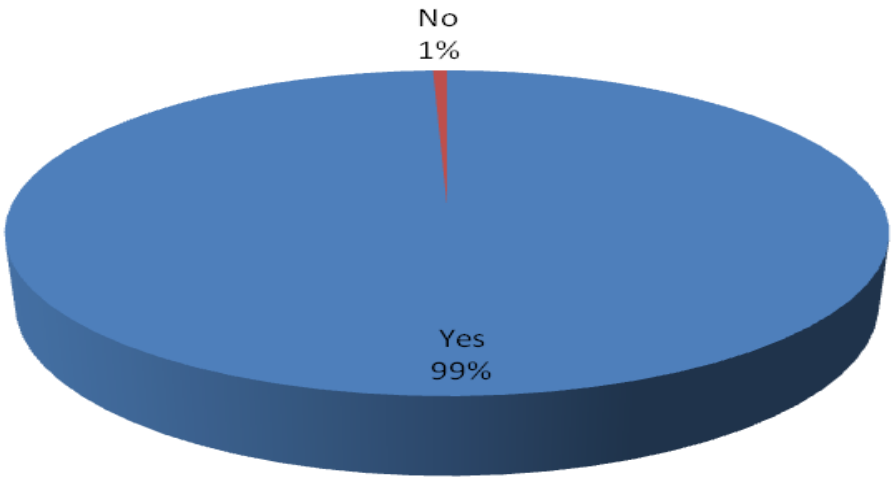


Fig 13: Importance of research to nurses' job (n = 183)

Figure 13 above shows that, almost all the participants (99%) appreciate the importance of the research component to nurses' job with 60.7% (n=111) indicating that it helps provide evidence for practice and to improve quality of nursing practice (Table 14). Other statements given for the importance of research to nurses' job include the fact that it widens knowledge in nursing practice (7.1%), updates standards of practice (7.1%) and helps solve identified problems in practice (6%).

Table 14: Comment on importance of research to nurses' job (n = 183)

Comment on importance of research	Frequency	Percentage
Helps provide evidence for practice and improve quality of nursing practice	111	60.7
Helps solve identified problems in practice	11	6.0
Updates standards of practice	13	7.1
Widens knowledge in nursing practice	13	7.1
No comment	35	19.1
Total	**183**	**100.0**

4.1.3: Implementing research findings in nursing practice

Asked whether they implement research findings in practice, 62% (n=113) of the participants responded positively (Fig 14). Most of the researches whose findings were implemented were local surveys. Table 15 summarizes the different comments on implementation of research findings in nursing practice.

As shown, about 38% (n=69) of the participants implemented findings and helped to solve identified problem. Also, the implementation led to improvements in practice. As noted earlier, majority (79.4%, n= 143) had not done any research. Some commented that no researches had been done (6.6%, n= 12) while others blamed failure to give feedback after doing research as the reason for non-implementation (4.9%, n=9). Others indicated lack of administrative support and/or resistance to change (4.3%) as the barriers to implementation.

The main reasons given for not implementing research findings in practice were that no researches done and /or no feedback is given after doing research. More than three quarters (77%) appreciated that researches add value to practice.

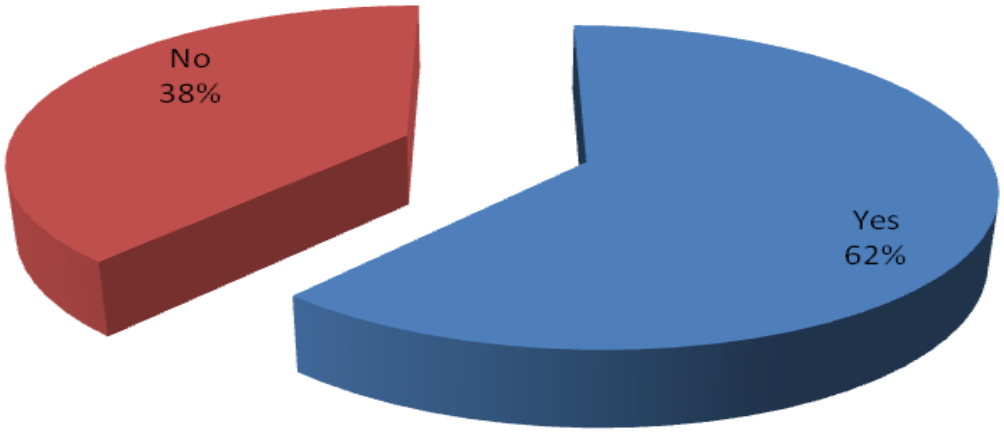


Fig 14: Implementing research findings in nursing practice (n = 183)

Table 15: Comment on implementing research findings in practice

Do you implement findings in practice	Frequency	Percentage
Implemented, solved problems and improved practice	69	37.7
No researches done	12	6.6
No feedback is given after research	9	5.0
Lack of administrative support/goodwill	7	3.8
No chances for research	1	.5
Not implemented	6	3.3
No opportunity to implement	1	.5
Resistance to change	1	.5
No comment	77	42.1
Total	**183**	**100.0**

4.1.4: Basis of evidence for nursing practice

Asked to indicate their basis of evidence for nursing practice, 70.7% (n = 129) cited knowledge gained during nursing school training while 65.2% (n = 119) relied on experience gained at the work place. About a quarter or less were relying on knowledge from either doing research or reading research findings from journals (Fig 15). Accessibility to journals or journal articles was indicated as a major barrier to using findings is practice owing to low or no subscription (70%, n – 128).

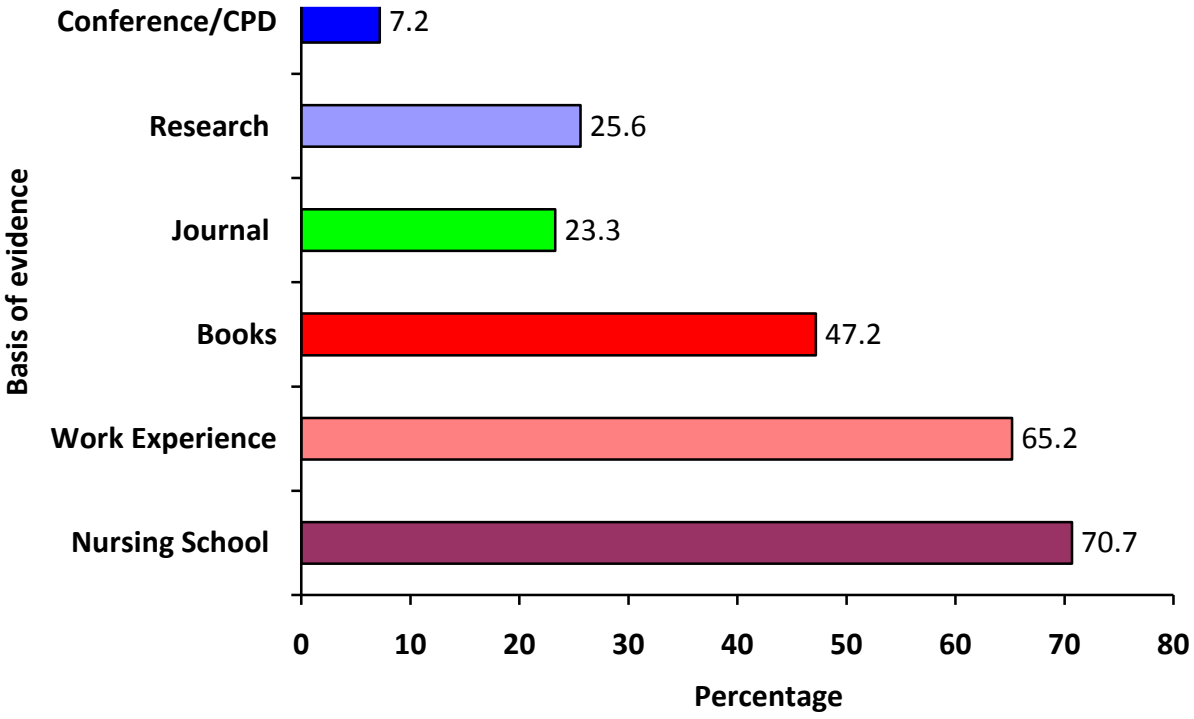


Fig 15: Basis of evidence for nursing practice (n=183)

4.1.5 Dissemination of findings

The results in table 16 show that, only 8% (n=14) of the participants had presented research findings at a nursing conference while 2% (n=3) had published.

Table 16: Dissemination of research findings

Presented research findings at a nursing conference	**Frequency (n = 183)**	**Percentage**
Yes	14	8
No	169	92
Total	**183**	**100**
Ever published findings	**n =183**	**%**
Yes	3	2
No	180	98
Total	**183**	**100**

4.1.6: Topics on research methods and EBP needed by participants for training

Participants were asked to rate topics on research methods and EBP as they would wish them to be included in development of syllabus/modules for training of nurses. More than three quarters of the participants wished to be trained further on the research process (147, 82.6%), Literature review (141, 79.6%), Proposal development (142, 80.2%), Data collection methods (147, 83.5%), Data analysis (144, 81.4%), Basic/simple statistics (141, 79.6%), Report writing (147, 83.5%), EBP/Utilization of research findings (140, 79.1%), and Article/paper presentation in conferences (136, 76.8%). Many of them also expressed need for further training on the meaning of research (72.9%, 129) and Dissemination of research findings/writing for publication (129, 74.2%) (Table 17).

Table 17: Topics on research methods and EBP rated by participants as needed for development of a syllabus for training of nurses (n = 183)

Rating topics on research methods and EBP needed for training	Great extent n (%)	Moderate extent n (%)	Total n (%)
Meaning of research	101 (57.1)	28 (15.8)	129 (72.9)
The research process	130 (73)	17 (9.6)	147 (82.6)
Literature review/search engines	119 (67.2)	22 (12.4)	141 (79.6)
Proposal development	117 (66.1)	25 (14.1)	142 (80.2)
Data collection methods	119 (67.6)	28 (15.9)	147 (83.5)
Data analysis	123 (69.5)	21 (11.9)	144 (81.4)
Basic/simple statistics	113 (64.2)	28 (15.9)	141 (79.6)
Report writing	127 (71.8)	20 (11.7)	147 (83.5)
EBP/ Utilization of research findings	123 (69.5)	17 (9.6)	140 (79.1)
Dissemination/Writing for publication	116 (66.7)	13 (7.5)	129 (74.2)
Article/paper presentation in conferences	125 (70.6)	11 (6.2)	136 (76.8)

4.1.7: Barriers to Research Utilization

Participants were asked to rate barriers to research utilization using the 29-item Barriers Scale by Sandra Funk *et al* (1991). The scale rated barriers from 1- 5 with 1 being a barrier to 'no extent', 2 = barrier to a 'little extent', 3 = barrier to a 'moderate extent' and 4 = barrier to a 'great extent' with 5 = 'no opinion'. The 29 items are classified into four factors: (a) the nurse's research values, skills, and awareness, (b) characteristics of the organization: setting, barriers and limitations, (c) qualities of the research, and (d) presentation and accessibility of the research.

The individual responses for each of the items of the Barriers Scale were averaged. In order to determine which individual items were perceived as the single largest barriers to research utilization, the number of respondents who reported each barrier as a moderate or great barrier were calculated and items rank ordered accordingly. Also, individual responses for each item on the four factors were averaged.

Items for which the individual responded “no opinion” or left blank were eliminated. Therefore, the divisor for the mean was the number of items with valid responses.

The results showed that, the greatest barriers to research utilization were those related to accessibility and communication of the research (Mean 2.84, SD 1.05) with three of the top six barriers falling in this category (Table 18 and 19). The major barrier cited was unavailability of research reports/articles (68.7%), followed by implications for practice not being clear (66.5%), facilities being inadequate for implementation (66.4%) plus lack of understanding of statistical analyses used (62.5%). Characteristics of the organization featured prominently encompassing lack of time, support, authority to change practice and results not being generalizable to own setting (Mean 2.99, SD 1.19).

This was followed by presentation and accessibility of the research which involved research reports not being readily available, unclear implications for practice and lack of understanding of statistical analyses (Mean 2.84, SD 1.05). Qualities of the research had a mean of 2.80 (SD, 1.25) with the main individual barrier being lack of publication of research reports. The nurses’ research values, skills and awareness was the least barrier factor with a mean of 2.70 (SD, 1.23) and the most important individual barrier being resistance to change or to try new ideas.

The scale included free open spaces where respondents indicated other factors they thought could act as barriers or facilitators to research utilization. Most of them expressed a dire need for short courses and mentorship on how to begin (n=140). Equally, many others indicated that research results are not available owing to nurses not doing research (n=120). Even where researches have been done, the results are not presented or made available to the concerned departments. Many expressed a need for forums where research findings can be presented and also for time off to attend these presentations.

Table 18: Barriers to Research Utilization Scale Ratings (Adapted from Sandra Funk et al, 1991; Scale: Barrier to 1-no extent 2-little extent 3-moderate extent 4-great extent)

Barriers Scale Items	n	Item as moderate/great barrier (n/%)	Mean Score/ SD	Overall item rank
Factor 1: Characteristics of the adopter (The nurse's research values, skills, awareness)			**2.70(1.23)**	
The nurse is unwilling to change/try new ideas.	177	99 (56)	2.81(1.17)	11
The nurse is unaware of the research.	179	97 (54.2)	2.86(1.24)	13
The nurse feels the benefits of changing practice will be minimal.	175	95 (54.3)	2.74 1.20)	12
The nurse sees little benefit for self.	178	93 (52.3)	2.76(1.25)	15
The nurse does not feel capable of evaluating the quality of the research.	176	86 (48.9)	2.73(1.24)	18
The nurse is isolated from knowledgeable colleagues with whom to discuss the research.	176	83 (47.2)	2.65(1.25)	20
There is not a documented need to change practice.	177	77 (43.5)	2.71(1.30)	23
The nurse does not see the value of research for practice.	177	64 (36.1)	2.35(1.21)	27
Factor 2: Characteristics of the organization (setting, barriers, limitations)			**2.99(1.19)**	
The facilities are inadequate for implementation.	176	117 (66.4)	3.23(1.11)	3
The nurse does not feel she/he has enough authority to change patient care procedures.	174	113 (65)	3.09(1.20)	4
The nurse feels results are not generalizable to own setting.	177	108 (61)	2.93(1.09)	7
The nurse does not have time to read research.	177	105 (59.3)	2.93(1.13)	8
Other staffs are not supportive of implementation.	176	102 (58)	3.01(1.20)	9
Physicians will not cooperate with implementation.	176	99 (56.3)	3.18(1.27)	10
There is insufficient time on the job to implement new ideas.	175	94 (53.7)	2.9(1.25)	14
Administration will not allow implementation.	174	80 (46)	2.67(1.28)	22
Factor 3: Characteristics of the innovation (Qualities of the research)			**2.80(1.25)**	
Research reports/articles are not published fast enough.	176	112 (63.7)	3.17(1.17)	5
The research has not been replicated.	176	89 (50.6)	2.95(1.28)	17
The research has methodological inadequacies	178	85 (47.8)	2.82(1.25)	19
The nurse is uncertain whether to believe the results of the research.	177	81 (45.8)	2.63(1.22)	21
The literature reports conflicting results.	177	74 (41.8)	2.72(1.35)	24
The conclusions drawn from the research are not justified.	176	67 (38)	2.53(1.26)	26
Factor 4: Characteristics of the communication (Presentation and accessibility of the research)			**2.84(1.05)**	
Research reports/articles are not readily available.	179	123 (68.7)	3.21(1.06)	1
Implications for practice are not made clear.	179	119 (66.5)	3.23(1.08)	2
Statistical analyses are not understandable.	179	112 (62.5)	3.08 (1.12	6
The amount of research information is overwhelming	176	90 (51.1)	2.78(1.23)	16
The relevant literature is not compiled in one place.	176	86 (48.9)	2.85(1.27)	18
The research is not reported clearly and readably.	178	71 (39.9)	2.51(1.28)	25
The research is not relevant to the nurse's practice.	176	47 (26.7)	2.20(1.34)	28

Table 19: Barriers to Research Utilization Scale Rankings (Adapted from Sandra Funk et al, 1991; Scale: Barrier to 1-no extent 2-little extent 3-moderate extent 4-great extent)

Item	N	Item as moderate/ great barrier (n/%)	Overall rank	Mean score/SD
Research reports/articles are not readily available	179	123 (68.7)	1	3.21 (1.06)
Implications for practice are not made clear	179	119 (66.5)	2	3.23 (1.08)
The facilities are inadequate for implementation	176	117 (66.4)	3	3.23 (1.11)
The nurse does not feel she/he has enough authority to change patient care procedures	174	113 (65)	4	3.09 (1.20)
Research reports/articles are not published fast enough	176	112 (63.7)	5	3.17 (1.17)
Statistical analyses are not understandable	179	112 (62.5)	6	3.08 (1.12
The nurse feels results are not generalizable to own setting	177	108 (61)	7	2.93 (1.09)
The nurse does not have time to read research	177	105 (59.3)	8	2.93 (1.13)
Other staff are not supportive of implementation	176	102 (58)	9	3.01 (1.20)
Physicians will not cooperate with implementation	176	99 (56.3)	10	3.18 (1.27)
The nurse is unwilling to change/try new ideas	177	99 (56)	11	2.81 (1.17)
The nurse feels the benefits of changing practice will be minimal	175	95 (54.3)	12	2.74 (1.20)
The nurse is unaware of the research	179	97 (54.2)	13	2.86 (1.24)
There is insufficient time on the job to implement new ideas	175	94 (53.7)	14	2.91 (1.25)
The nurse sees little benefit for self	178	93 (52.3)	15	2.76 (1.25)
The amount of research information is overwhelming	176	90 (51.1)	16	2.78 (1.23)
The research has not been replicated	176	89 (50.6)	17	2.95 (1.28)
The relevant literature is not compiled in one place	176	86 (48.9)	18	2.85 (1.27)
The nurse does not feel capable of evaluating the quality of the research	176	86 (48.9)	18	2.73 (1.24)
The research has methodological inadequacies	178	85 (47.8)	19	2.82 (1.25)
The nurse is isolated from knowledgeable colleagues with whom to discuss the research	176	83 (47.2)	20	2.65 (1.25)
The nurse is uncertain whether to believe the results of the research	177	81 (45.8)	21	2.63 (1.22)
Administration will not allow implementation	174	80 (46)	22	2.67 (1.28)
There is not a documented need to change practice	177	77 (43.5)	23	2.71 (1.30)
The literature reports conflicting results	177	74 (41.8)	24	2.72 (1.35)
The research is not reported clearly and readably	178	71 (39.9)	25	2.51 (1.28)
The conclusions drawn from the research are not justified	176	67 (38)	26	2.53 (1.26)
The nurse does not see the value of research for practice	177	64 (36.1)	27	2.35 (1.21)
The research is not relevant to the nurse's practice	176	47 (26.7)	28	2.20 (1.34)

4.1.8: Thematic analysis of qualitative data

Factors influencing carrying out research, utilizing research findings in nursing practice or being involved in research activities that were identified during the focus group discussion and key informant interviews were analyzed manually using framework analysis (Gale *et al*., 2013). Responses obtained from each participant were analyzed and compared across all participants. An issue that was identified or mentioned by 5 out of the 8 participants in the focus group discussion was regarded as an important factor and coded as a theme. Likewise, an issue identified or mentioned by 7 out of the 13 participants in the key informant interviews was also coded as a theme. Similar themes emerged from the participants in the two methods. Some of the factors identified were also stated by participants in the open-ended spaces of the questionnaire. This justifies the use of different methods of data collection in order not only to cross validate and get a more detailed picture of the data but also to get regularities in the research data and produce accurate results for certainty. The various themes that were identified and summarized are as outlined and quantified in tables 20 and 21 and described vide infra.

Table 20: Main themes emerging from FGD about barriers to carrying out research, utilizing research findings in practice or involvement in research activities

Theme	(Focus Group discussion) Participant indicating theme as influential								Frequency (n/8)	Percent
	1	2	3	4	5	6	7	8		
Inadequate knowledge, skills	✓	✓	✓	✓	✓	✓	✓	✓	**8**	**100**
Attitude	✓	✓	✓	✓	✓	✓	✓	✓	**8**	**100**
Mentorship	✓	✓	✓	✓	✓		✓	✓	**7**	**88**
Motivation	✓	✓			✓	✓		✓	**5**	**63**
Heavy workloads	✓		✓	✓		✓	✓		**5**	**63**
Support/ Resources		✓	✓		✓	✓	✓	✓	**6**	**75**

Table 21 Main themes emerging from Key Informant Interviews about barriers to carrying out research, utilizing research findings in practice or involvement in research activities

Theme	(Key Informant Interview) Participant indicating theme as influential													Frequency (n/13)	Percent
	1	2	3	4	5	6	7	8	9	10	11	12	13		
Inadequate knowledge, skills	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	**13**	**100**
Attitude	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	**12**	**92**
Mentorship	✓		✓	✓	✓			✓		✓		✓	✓	**8**	**62**
Motivation	✓	✓			✓			✓		✓	✓		✓	**7**	**54**
Heavy workloads	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	**11**	**85**
Support/ Resources	✓	✓	✓		✓		✓	✓	✓		✓		✓	**10**	**77**

Description of emerging themes

4.1.81 Inconsistent/insufficient knowledge and skills on research and awareness

It emerged that the knowledge and skills that nurses have on research is insufficient or inconsistent. Moreover, many of them do not know that research is part of their responsibilities. This is despite many of them indicating that, research brings about evidence in practice besides helping to improve and solve problems in practice. Also participants indicated that the concept of evidence based practice is new and not emphasized during training. **Participant No 7:** "*Nurses need to be informed or updated with knowledge to know how to start off and also made aware of the new concepts and research opportunities.*" **Participant No 13:** "Nurses *lack training in research*." **Participant No 9:** *"Lack of knowledge. Nurses need extra training to understand the new concepts*. W*e have not understood the concept."* **Participant No 1, 2, 5 and 7:** "*Give nurses knowledge/trainings showing them it is not difficult. What is needed are refresher trainings. Put a lot of weight on short trainings on research.*

Make nurses know the importance of research and evidence based practice. Make them understand the importance of doing it on their own. Simplifying it for them. Let them know they can do it through periodic sensitization." *Nurses can participate in different researches in their specific areas of work. We have the patients, the wards, relatives and among ourselves."*

4.1.82 Nurses' attitude towards research

Most nurses think research is difficult or is for others who are well trained. They look at it as difficult and too complex to understand. This is despite the fact that many appreciate its importance. Others are happy with status quo and resist change. Generally, research culture is lacking. The way in which research is taught during training also emerged. Participants cited how research is taught as a difficult subject. **Participant No 1:** *Most nurses look at research as a big mountain. They feel that they need to have someone with them. They fear research because they do not understand the process of research.*" **Participant No 3 and No 5:** "*Nurses view research as a very complicated discipline. It is taught as very difficult subject. Are afraid of research. People tend to shy off when it comes to research in nursing. They think research is for others who are well trained. The concepts needs to be simplified during training. They are happy to be data collectors*." Almost all participants (n=11) indicated that research results are not available owing to nurses not doing research.

Even where researches have been done, the results are not presented or made available to the concerned departments. "*Most researches done are for academic purposes and the findings are never provided back. The results are not shared to concerned departments*."

4.1.83 Support from institutions/colleagues

It emerged that carrying out research is not emphasized in the work place. Most of the staff do not consider it as part of their job description. Also, there is not much support with regard to resource availability and accessibility. Innovation is not encouraged.

It is only recently that a program was instituted to support research by availing research funds. **Participant No 12 and 13:** "*There is no support for nurses to do research. No much support from administration*. Cooperation and support from colleagues is also lacking. Mostly, those wishing to do research do it alone. There are few or no collaborative efforts among nurses. **Participant No 1, 3 and 4:** "*There is lack of team approach. Nurses generally don't have interest to do things together. There is lack of support from fellow nurses. Leaders should first understand the process so that they provide an enabling environment for the others. As leaders we have to identify people, support them materially, financially and through policies*. **Participant No 6, 7 and 8:** *"We can make our nurses understand that we can begin small then do broadband research. The introduced financial support is a good move in the right direction. Now we can have funds to do research."*

4.1.84 Motivation and Mentorship

Few nurses are motivated to do research. Internal motivation is lacking and this is accentuated by lack of incentives to do research. Also, there are no mentors in nursing research. **Participant No 9 and 11:**"*There is no mentoring for nurses who wish to do research. There is need to have nurses leading the way"* **Participant No 4: "***In other professions, seasoned researchers pair up even with students. In nursing, seasoned researchers do not pair up with inexperienced*

researchers." **Participant No 5:** "*If nurses were exposed to attend conferences and listen to fellow nurses they can motivate them.*

As a way of rewards, you can have a letter in their files about what they have. **Participant No 8:** *"Recognize the nurses who have done research and others will get motivated"*

4.1.85 Workload/Time factor

Nurses are overwhelmed by the much work that they have to do owing to shortage of staff. They thus get no time to do research. Time factor was identified by almost all the participants in the in-depth interview (n=12). **Participant No 7 and No 10:** "*The kind of work is demanding. There is no time as you are fatigued at end of the day*." **Participant No 3:** *"Research is very time consuming."* **Participant No 2, 6 and 11:** *"Nurses need time off to conduct research and attend scientific presentations."*

The most outstanding finding of this study was the significance that participants gave to the need for `sensitization/re-training sessions on the research process'. Five of the seven items that loaded onto this factor were reported as moderate or great barriers (Likert score 3 or 4, respectively)

Nurses were shown to view research as a very difficult subject to understand. This was so even though they indicated it is important to improve the care of patients and in provision of rationales for nursing care interventions. The importance of providing support and resources by organizations as well as incentives in order for nurses to carry out research in their practice was also confirmed in the qualitative statements made by participants.

All respondents in the key informant interviews and views from the focus group discussion appreciated the importance of utilizing research findings in practice and especially for evidence based practice which lead to improvement in the care of patients and provision of rationales for

nursing care interventions. Almost all participants (n =12) indicated the need for appropriate mentoring and an organized approach in creating a research culture among the nurses.

4.1.9: Cross-tabulation between participants' characteristics and outcome variables

Cross-tabulation between participant characteristics and outcome variables showed that, professional qualification, roles played (nursing administration or clinical instruction), having undertaken a short course or post basic training and work station had a significant positive association with doing research and/or implementing research findings in nursing practice ($P < 0.05$) (Table 21).

However, gender, years of nursing experience, position held and even the level of self-reported research knowledge had no significant association with doing research or implementing research findings in nursing practice ($P>0.05$) (Table 22). Therefore the hypothesis that 'There is no relationship between nurses' self-reported knowledge in research and doing research' is upheld.

The findings showed that nurses trained at degree level or those holding post basic training or those who had attended short courses within the preceding two years were more likely to be involved in research activities or utilization of research findings in practice. They were more likely to carry out a research and/ or implement findings in practice than the others who mainly participated on a small scale in other research activities like data collection and patient interviews. Also, nurses in administrative positions or in teaching or clinical instruction roles were significantly more involved than those in direct patient care, infection control or in health promotion. Nurses from intensive care unit, cardiology and renal unit were significantly more involved in research activities than those from other specialized care areas like accident and emergency department, operating theatres and burns unit.

Table 21: Significant cross-tabulations of participant characteristics and doing research or implementing research findings in practice

Participant characteristic			**Doing research/implementing findings**		
Nursing qualification	**Yes**	**No**	**Total**	**Pearson's chi-square**	**P Value**
ECN	1	14	15		
KRN	4	2	6		
KRCHN	23	116	139		
BScN	8	9	17		
Masters	1	2	3		
Total	**37**	**143**	**180**	14.744	0.05
Short courses					
Specialized 1 yr course	14	39	53		
Short courses	16	52	68		
None	7	51	58		
Total	**37**	**142**	**179**	24.993	0.05
Work station					
Intensive Care Unit	16	40	56		
Renal unit	4	14	18		
Burns unit	0	16	16		
Cardiology unit	3	2	5		
Accident and Emergency	8	39	47		
Operating theatres	6	32	38		
Total	**37**	**143**	**180**	12.026	0.034
Major roles played					**P Value**
Nursing administration					
Yes	9	16	25		
No	27	127	154		
Total	**36**	**143**	**179**	4.566	0.033
Teaching/clinical instruction					
Yes	8	12	20		
No	28	130	158		
Total	**36**	**142**	**178**	5.461	0.019
Research					
Yes	5	3	8		
No	31	139	170		
Total	**36**	**142**	**178**	9.279	0.002
Self-rating level of research knowledge					
Excellent	2	1	3		
Good	25	87	112		
Fair	9	50	59		
Poor	1	5	6		
Total	**37**	**143**	**180**	5.191	0.158

Table 22: Non-significant cross-tabulations of participant characteristics and doing research or implementing research findings in practice

Participant characteristic			Doing research or implementing findings in practice		
	Yes	No	Total	Pearson's chi-square	P Value
Gender					
Female	25	108	133		
Male	12	35	47		
Total	**37**	**143**	**180**	0.965	0.401
Experience (years)					
2-4	2	4	6		
5-9	8	23	31		
10-15	17	64	81		
16-20	6	29	35		
21-25	3	15	18		
26-30	1	7	8		
>30	0	1	1		
Total	**37**	**143**	**180**	2.126	0.908
Position held					
SNO	3	6	9		
NO1	31	98	129		
NO2	1	23	24		
NO3	2	16	18		
Total	**37**	**143**	**180**	6.785	0.079
Self-rating level of research knowledge					
Excellent	2	1	3		
Good	25	87	112		
Fair	9	50	59		
Poor	1	5	6		
Total	**37**	**143**	**180**	5.191	0.158

4.2 BASELINE SURVEY RESULTS FOR THE 61 TRAINED NURSES

Sixty seven out of the targeted 90 nurses participated in the training program. However, baseline results for 61 of them were extracted for comparison purposes in phase III. This is because the cohort of 61 trained nurses was the same that was evaluated at four months after training intervention using the posttest questionnaire.

The remaining six were lost to attrition. Their number reduced because two of the trained nurses were on maternity leave during this period while one had left the hospital. Three others were on annual leave. Their detailed results were as described below.

4.2.1: Demographic characteristics of the trained participants

4.2.11 Sex of nurses who participated in training

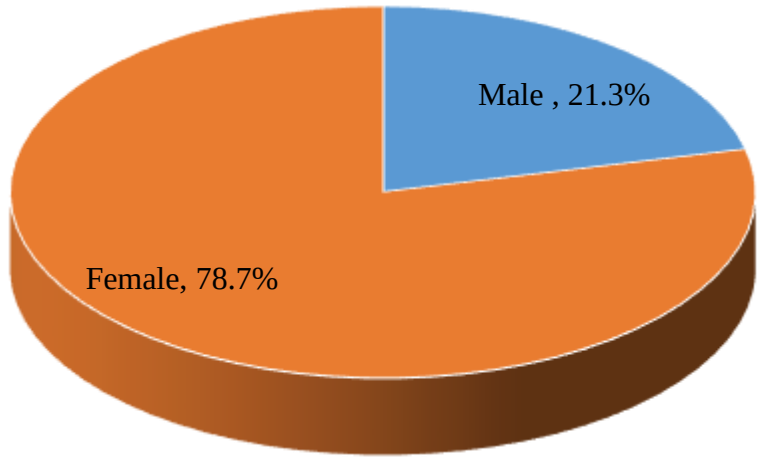


Fig 16: Pie chart showing sex of trained nurses

Figure 16 above shows that, over three quarters (78.7%, n=48) of the participants were females while 21.3% (n=13) were males. Their ages ranged from 29 to 58 years with a mean of 37 and median of 36 years.

4.2.12 Nursing qualifications

Three quarters of the participants (n=46) were Kenya Registered Community Health Nurses (KRCHN) while 12% (n=7) were Bachelor of Science Nurses (BScN) (Fig 17). Majority of nurses in Kenya are KRCHN.

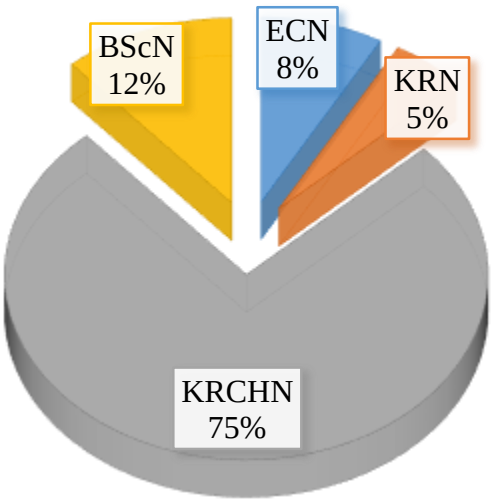


Fig 17: Pie chart showing participants qualifications

4.2.13 Position held by participants

Figure 18 below shows that, unlike during the baseline survey, most participants (63.9%, n=39) who were in the position of Nursing Officer 1 during the baseline survey had been promoted to Senior Nursing Officers and a further 26.2% (n=16) promoted to the position of Nursing Officer 1. This was necessitated owing to a hospital policy of recognizing those nurses who had gone through a degree level of education or those who had stagnated in one position/rank for a long time.

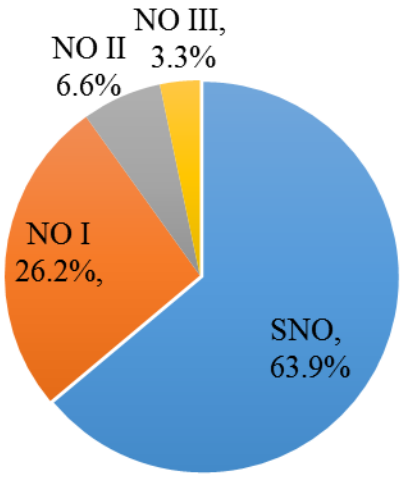


Fig 18: Pie chart showing participants' positions/ranks

4.2.14 Nursing experience

Table 22: Years of nursing experience:

Years of nursing experience	Frequency	Percentage
2-4 yrs	1	1.6
5-9 yrs	7	11.5
10-15 yrs	29	47.5
16-20 yrs	8	13.1
21-25 yrs	8	13.1
Over 25 yrs	8	13.1
Total	**61**	**100**

The findings in table 22 show that, most (47.5%, n=29) had a nursing experience of 10-15 years while 26.2% (n=16) had an experience of over 20 years.

4.2.15 Work station

The results in table 23 show that, most (37.7%, n=23) were from Intensive Care/Cardiology Units, 14 (23%) from Accident and Emergency department, 9 (14.8%) each from Renal Unit and Operating Theaters and 6 (9.8%) from Burns Unit.

Table 23: Work station:

Work station	Frequency	Percentage
ICU/cardiology	23	37.7
Renal unit	9	14.8
Burns unit	6	9.8
Accident & Emergency	14	23
Operating Theatres	9	14.8
Total	**61**	**100**

4.2.16 Major roles played by participants

Majority of the participants (90.2%, n=55) were involved in direct patient care, 52.5% (n=32) in nursing administration and 21.3% (n=13) in clinical instruction (Table 24). Participants could choose more than one role.

Table 24: Major roles played:

Major role	Frequency	Percentage
Direct patient care	55	90.2
Administration/Nursing policy implementation	32	52.5
Clinical instruction/teaching	13	21.3
Infection control	7	11.5
Health promotion	8	13.1
Research	8	13.1
Total	**61**	**100**

4.2.17 Other courses done by participants

Forty one (67%, n=41) of the participants had done a short or a specialized course within the previous two years in order to improve their skills as shown in figure 19.

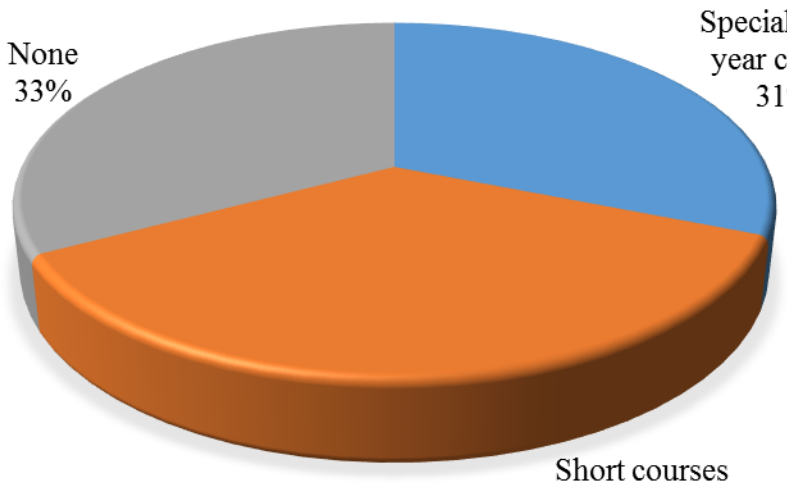


Fig 19: Pie chart showing other courses done

4.2.2: Nurses' theoretical knowledge before training intervention (Pretest Scores)

The pretest was administered on the 67 nurses who went through the training program. Their pretest scores ranged from 37 to 88 as shown in tables 25-28 below with a pretest mean score of 71.06.

Table 25: Pretest scores for first cohort (Group 1)

S/No	Code	Work station	Pretest (%)
1	GK	A&E	82
2	NY	Renal Unit	81
3	JY	A&E	81
4	RB	Cardiology	77
5	KY	ICU	72
6	BG	Burns Unit	71
7	PX	ICU	71
8	GP	Renal Unit	67
9	KW	Renal Unit	67
10	ZB	Operating Theatres	64
11	AB	Operating Theatres	58
12	IC	ICU	49
13	FZ	A&E	47
14	CL	ICU	37
Total			**924**

Table 26: Pretest scores for second cohort (Group 2)

S/No	Code	Work Station	Pretest (%)
1	OL	Cardiology	74
2	GX	Renal Unit	72
3	JU	Renal Unit	73
4	WZ	ICU	82
5	GR	ICU	70
6	DY	ICU	66
7	DZ	Burns Unit	68
8	GT	A&E	71
9	BI	A&E	69
10	LY	Burns Unit	68
11	IT	ICU	71
12	DE	ICU	75
13	MS	ICU	73
14	DK	ICU	75
15	GL	Operating Theatres	60
16	AC	A&E	75
17	LV	A&E	71
18	FY	Operating Theatres	80
Total			**1293**

Table 27: Pretest scores for third cohort (Group 3)

S/No	Code	Work Station	Pretest (%)
1	QP	ICU	88
2	ZE	Burns Unit	67
3	FT	Burns Unit	68
4	GW	A&E	83
5	JL	Operating Theatres	67
6	PJ	ICU	76
7	AK	ICU	64
8	GS	ICU	66
9	YO	Renal Unit	73
10	BD	ICU	65
11	AI	A&E	83
12	LD	Renal Unit	68
13	SY	ICU	69
14	GV	Operating Theatres	83
Total			**1020**

Table 28: Pretest scores for fourth cohort (Group 4)

S/No	Code	Work Station	Pretest (%)
1	ZI	Burns Unit	70
2	PR	Renal Unit	80
3	IZ	ICU	75
4	IQ	ICU	78
5	PZ	A&E	64
6	RC	A&E	65
7	KQ	A&E	72
8	AE	ICU	69
9	FI	ICU	73
10	MX	ICU	80
11	FQ	Operating Theatres	69
12	BS	Operating Theatres	68
13	DM	Renal Unit	73
14	NS	ICU	75
15	CM	ICU	77
16	IR	ICU	68
17	PH	Burns Unit	76
18	BT	A&E	76
19	LB	Operating Theatres	69
20	OC	A&E	75
21	ZP	Operating Theatres	74
Total			**1524**

Total pretest scores = 4761

Average = 4761/67

= **71.06**

4.2.3: Nursing research knowledge and activities

4.2.31 Level of research knowledge

The results in figure 20 below show that, self-rating level of nursing research knowledge for good and excellent before the training intervention was 63.9% (n=39). However, this did not match with participants' qualitative statements which indicated inadequacy in research knowledge.

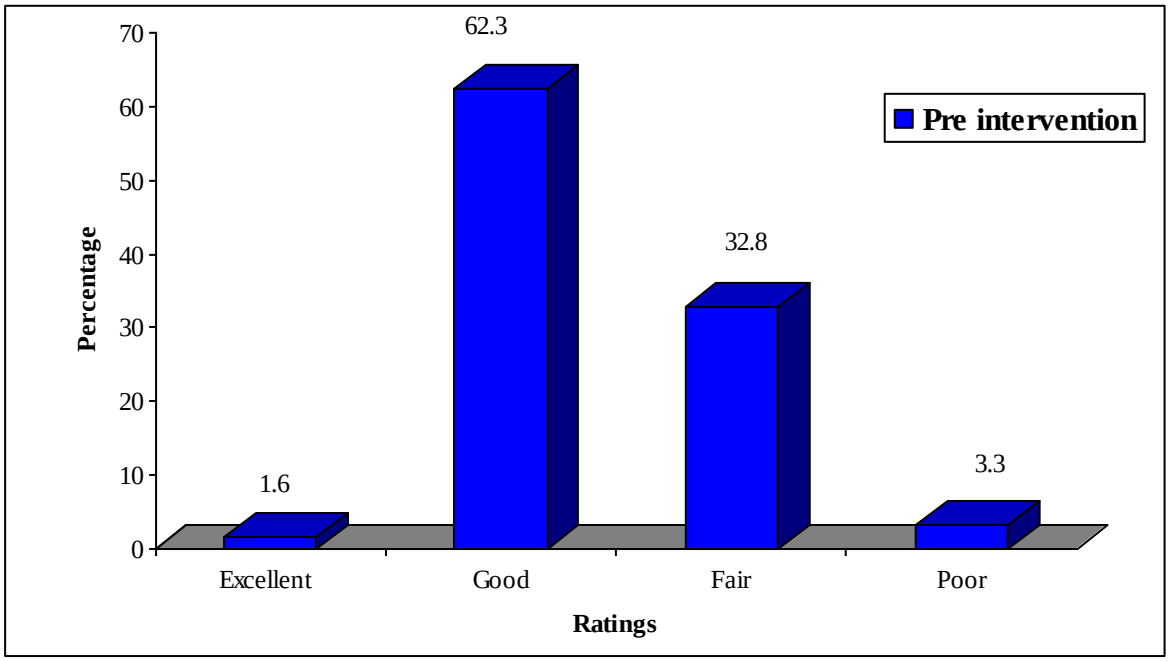


Fig 20: Rating level of research knowledge

4.2.32 Frequency of participation in research related to work

Figure 21 below shows that proportion of participation in research related to ones work for 'often' and 'very often' was 14.7% (n= 9) while proportion of those who rarely or did not participate in research at all was 59% (n=36) and 32.8% (n=20) respectively.

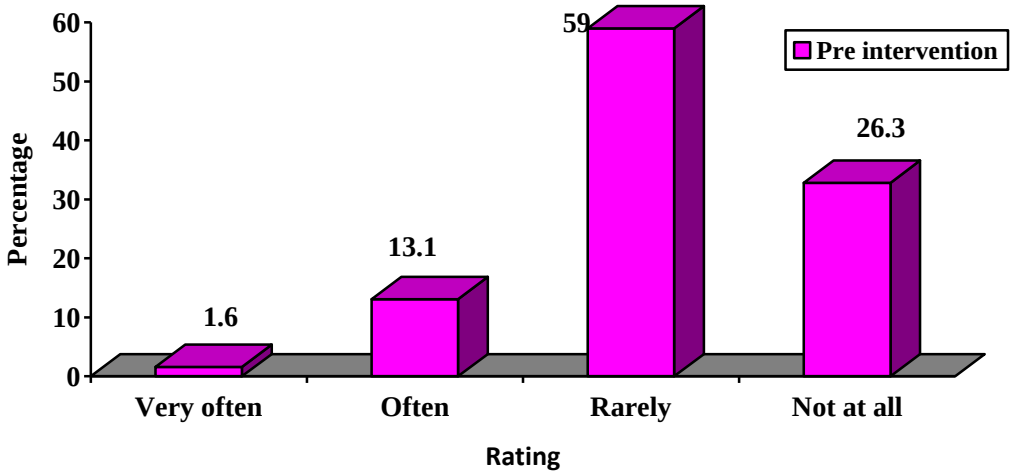


Fig 21: Frequency of participation in research related to work

4.2.33 Participation in different research activities

Table 29 below, shows frequency of participation in research activities. The results show that data collection was the most participated research activity with about 56% (n=34) followed by literature review (39.3%, n= 24) and data analysis (32.6, n=20). The least participated research activity was article/paper presentation in conferences (8.2%, n= 5).

Table 29: Research activities ever participated in (n = 61)

Research activities ever participated in	**Before intervention (n=61)**	
	Frequency	**Percentage**
Literature review	24	39.3
Data collection	34	55.7
Data analysis/simple statistics	20	32.8
Interviewing	16	26.2
Poster/Abstract presentation	10	16.4
Report writing	15	24.6
Article/paper presentation in a conference	5	8.2

The results in figure 22 below show that, the number of participants who had participated in carrying out research was 20.6% while those who had implemented findings in practice was 59% of those who carried out a research. The proportion of those who presented findings in different fora or published findings was 6.6% and 1.6% respectively.

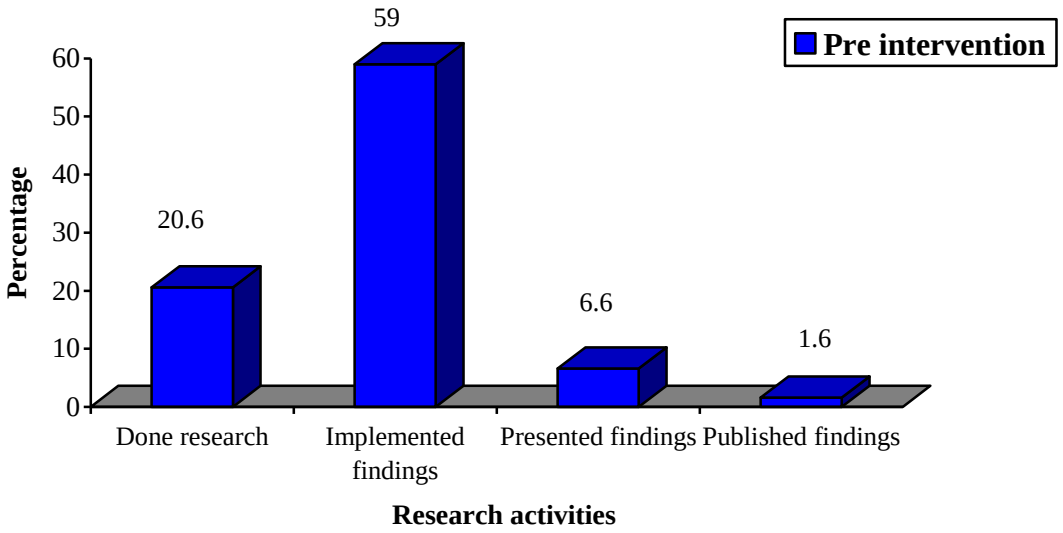


Fig 22: Research activities before intervention

Table 30: Frequency of reading journals (n=61)

Frequency of reading journals	Before intervention	
	Frequency	**Percentage**
Weekly or Fortnightly	6	9.8
Monthly	1	1.6
>Monthly	39	64
Rarely	10	16.4
Never	5	8.2
Total	**61**	**100**

Results in table 30 above show that, the combined frequency of reading journals for those doing it either weekly/fortnightly or monthly was 11.4% while for those who rarely or never read them was 24.6%. The proportion of those who took more than a month to read a journal was 64%.

4.2.4 Basis of evidence for nursing practice

In figure 23 below, the number of participants who were relying on knowledge gained from nursing school or experience as a source of evidence for practice was 70.5%(n= 43) and 64% (n= 39) respectively. The proportion of those who relied on information from journals or undertaking research was 23% (n=14) and 24.6% (n=15) respectively.

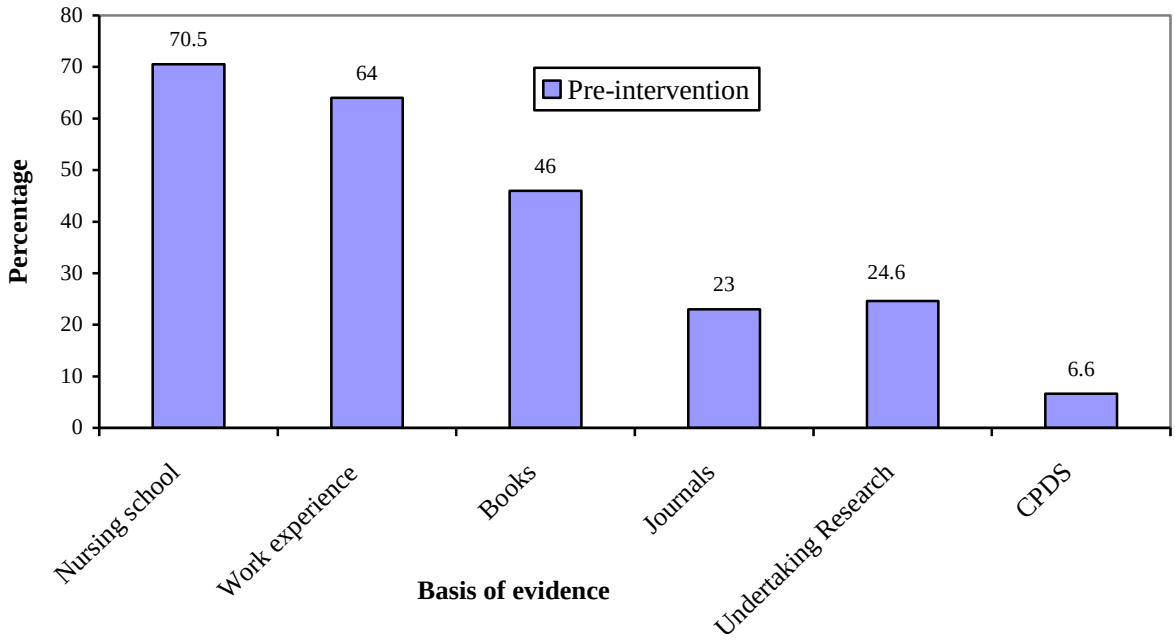


Fig 23: Basis of evidence for nursing practice

Findings from phase one indicated that, though about two-thirds (66.3%, n=114) of nurses rated their level of research knowledge as good, few nurses were involved in research activities (20.8%, n=38) and little research was being used to inform nursing practice (38%, n=70). The participants' self-rating level of research knowledge contradicted their qualitative statements which indicated their knowledge to be inadequate.

Many indicated lack of emphasis of research and EBP during the training period and expressed need for guidance on how to get started. Only 38 (20.8%) had carried out a research other than the one they did for nursing qualification.

These findings concurred with the assertion by WHO (2008) that most research activities in Africa are linked to educational or academic programs. This was further complicated by unavailability of research reports/articles or lack of dissemination of findings from locally conducted researches which was cited by 68.7% (n=123) of the participants. In addition, more than three-quarters (79%, n=145) rarely or were not participating in research related to their work. The major research activity among the participants was data collection which was quoted by 74.3% (n=136). This was done mainly for other researchers in which case nurses are rarely acknowledged.

A minority, (11.5%, n=21) read journals/publications weekly or fortnightly with the Kenya Nursing Journal (n=14) and Nursing Council of Kenya Newsletter (n=8) being the most read publications. These two publications are limited in terms of scientific content, scope and coverage and thus they may not be reliable to provide the much needed scientific evidence for practice.

About 71% (n=130) of the participants indicated basing their evidence for practice on knowledge gained during their nursing school training. In addition, only about a quarter (25.7%, n=46) had updates on research methods within the last one year while 47% (n=88) never had any updates.

It is therefore not surprising that many were basing their evidence for practice on knowledge from their nursing school training and/or experience gained at work place which may not be in keeping with current practice.

The above scenarios show that our practice on nursing research and evidence basis for practice are not in tandem with the global trends where nurses are expected to base their practice on research evidence. The baseline survey established that, the underpinning factors to the low level of research involvement and non-utilization of research findings in nursing practice were that:

- Nurses had inadequate knowledge/skills and lacked mentorship in nursing research
- Nurses viewed nursing research as difficult and for other professionals
- There was no support/motivation for nurses who wished to undertake research in order to improve nursing practice
- Research reports are not available and findings are not disseminated

Nurses need to be empowered with knowledge to recognize the many research opportunities that exist in their clinical environments. Statistical testing with Pearson's correlation showed a significant relationship between post basic training or short courses and carrying out research/utilizing research findings in nursing practice ($P<0.05$). The findings led to development of a model for capacity building on nursing research and evidence based practice (Fig 24).

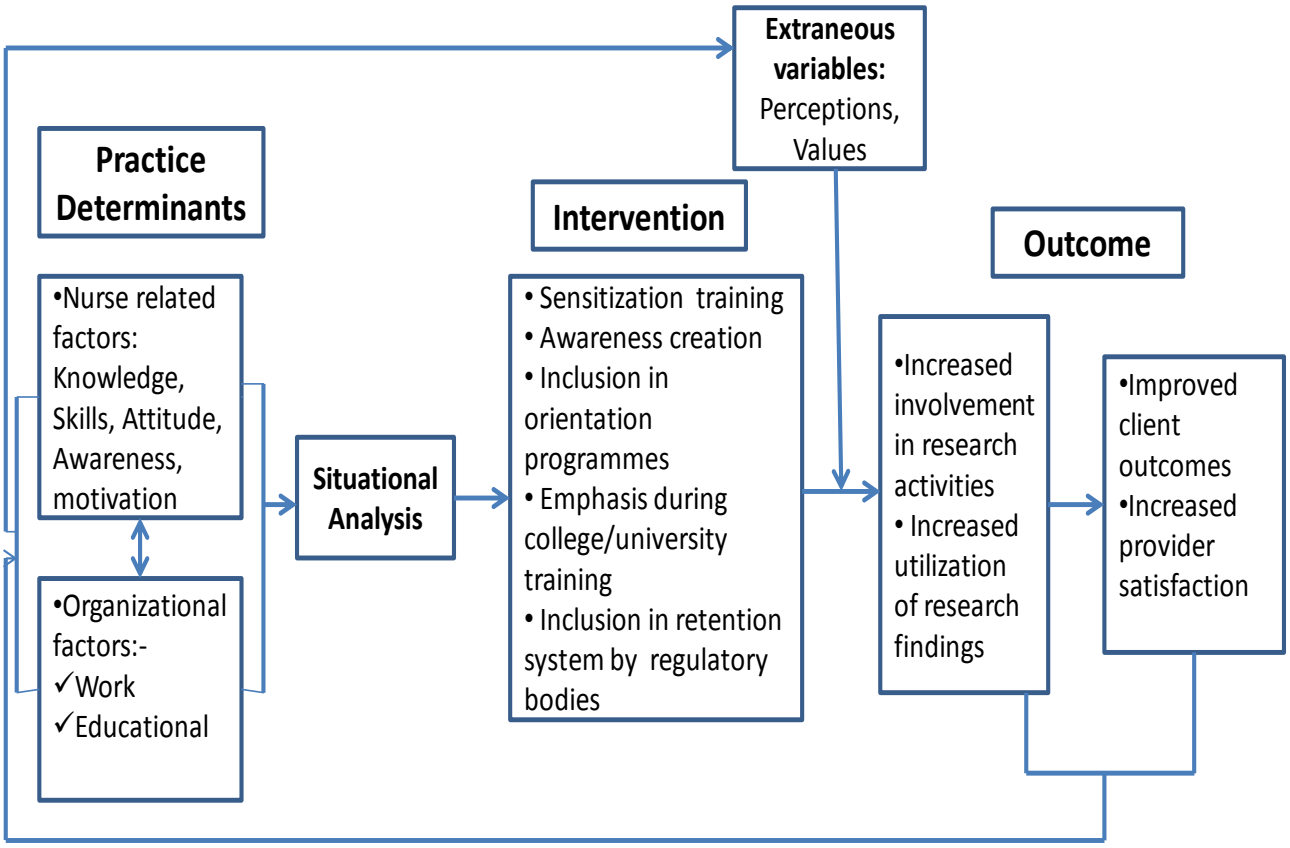


Fig 24: Kyalo's Model

The conceptual model shows the relationship of various factors in influencing nurses' involvement in research activities or utilization of research findings in nursing practice. These are hereby referred to as practice determinants. On the one hand, there are the factors that relate to the individual nurse. These include factors such as knowledge, skills, attitude and awareness of nursing research and EBP plus the motivation to get involved. On the other hand are the organizational factors. These could either be related to the organization where one is working or the institution where one got their nursing training. Work related organizational factors include

mentorship, time, support and motivation while education-related factors include nursing research and EBP content covered and their emphasis during training period. The nurse-related factors and/or the organizational factors act as important predictor variables for nurses' involvement in research activities and utilization of research findings in practice (The outcome variables).

It is expected that with proper knowledge, skills, attitude, awareness, time, support, motivation and emphasis of research and EBP during training, nurses will greatly be involved in research activities and utilization of research findings in nursing practice. The status can be ascertained though a situational analysis. Once determined, implementation could be achieved or enhanced through appropriate intervention measures such as sensitization training, awareness creation, inclusion in induction or continuing education programs and/or emphasis during college or university education.

4.3 PHASE II (INTERVENTION): TRAINING AND MONITORING

During this phase, nurses were trained using the developed curriculum (Appendix XIV) on 'Nursing Research and Evidence Based Practice.' based on needs that were identified and topics rated by participants during the first phase. This was necessary in order to fill the gaps identified.

The simplified training modules consisting of 7 units ranged from seminars/workshops on research methodology, research process, research designs, sampling techniques, data collection and data collection methods, data management and analysis, report writing and dissemination of results plus evidence based practice.

Alongside the developed training modules, a pretest/posttest (Appendix XV) consisting of 40 multiple choice questions on nursing research and evidence based practice was developed. Each question had five options for the participants to choose the correct one(s). The pretest/posttest complied with Blooms (1956) taxonomy of educational objectives ensuring that the participants covered and were tested on cognitive, affective and psychomotor domains of learning. It tested recall/recognition, comprehension, synthesis, analysis and application of nursing research and EBP concepts. This pretest/posttest was necessary in order to assess participants' research knowledge/skills before and after intervention.

The measurable outputs (results) in this phase included the difference in scores obtained by each participant from the pretest/post-test developed by the researcher. Another measurable output was the development and presentation of a concept research proposal by members of each of the 22 research journal clubs. The participants from the six different critical care units formed research journal clubs during the training period which comprised of 3 to 4 participants from the

same clinical area. They identified an area of concern in their specific work environment and developed a concept research proposal utilizing knowledge/skills acquired during the learning experience with guidance from the researcher. These concept proposals were presented by members of each journal club and critiqued by the researcher, other invited researchers and participants during the last day of training.

4.3.1 Training

The nurses were divided into four groups and each group was trained for one week. The training took five full working days from 8AM to 5PM from Monday to Friday (40 Hours). The training was done in the month of May 2014. At the end of four weeks, 67 out the targeted 90 nurses from the study areas in KNH were trained on Nursing Research and EBP. Due to shortage of staff and heavy workloads in the study areas, the remaining 23 nurses were not able to be released to attend the training. This is understandable owing to the strained nurse-patient ratios and specialized nature of care provided in the study areas. The 67 represented a response rate of 74%. This rate was reasonable and adequate for interpretation purposes (Polit & Beck, 2008). The two supervisors were overseeing the progress of the training program and they gave guidance as necessary.

4.3.2 Teaching/learning process and methods

The training involved various activities. After registration, the training objectives were discussed. This was followed by a written pretest for all participants to assess their level of knowledge/skills before the learning process began. The pretest consisted of 40 multiple choice questions where participants were required to indicate whether each option was true or false

regarding the specific question. Each correct response earned one point and therefore the total points to be earned were 200. The final score was calculated in percentage.

The teaching/learning methods included lectures, discussions, assignments, individual and group presentations, tutorial sessions and problem based learning. Besides, participants shared experiences from their clinical areas of work, formed research journal clubs, discussed and identified research topics based on specific needs in their areas of work, wrote concept research proposals which were presented and critiqued by fellow participants under guidance of the researcher and the supervisors.

The notes/content discussed in class were provided to participants for further reading and as resource materials for group discussions. The whole training exercise for each group was culminated with a post-test taken by each participant. This posttest was the same examination that was done as a pretest before the training started.

The training emphasized on various aspects with regard to nursing research and evidence based practice that included:

- The major topics of learning as identified by the participants in the first phase of the research and incorporated in the training program.
- Making the training exercise as practical and as simple as possible since the way research is taught as a very complex and difficult subject had been identified as a barrier by participants in the baseline survey.
- Involving the participants as much as possible and drawing upon their usual experiences in the clinical areas since the emphasis of the intervention was to sensitize participants to identify areas in need of improvement/adjustment in their areas of practice.

- Using different methods of teaching including group discussion, individual and group presentations and role plays.

4.3.3 Monitoring

Monitoring was done in conjunction with the training consultants both during the training and for the four months' follow up in the clinical areas of practice after training. This monitoring period was adequate and necessary to ensure that all or majority of the nurses in the sample during the training in phase II were still in the study areas during the evaluation in phase III.

Treece and Treece (1986) recommend that the researcher must recognize that the time span between the first test and the second test can be confounded by age, fatigue and maturation. Thus, unnecessary prolongation of time was avoided to prevent a scenario where some nurses could have transferred or moved from the study areas for some reasons hence reducing the sample.

Monitoring during the training period involved the following activities:

- Ensuring all participants participated in all training and learning activities including sharing of experiences from the clinical areas, discussions and presentations.
- Ensuring that each of the participants joined a research journal club from their respective clinical areas. The journal clubs formed provided a less formal setting in which to develop participant's skills in reflection and discussion.
- Ensuring that each participant signed attendance for the morning and afternoon sessions for all the days of training to ensure adequate coverage of and compliance with the training syllabus.

- Each participant undertook a pretest before the training began to assess prior knowledge/skills and a post test at the end of the training to assess knowledge/skills acquired as a result of the training intervention (effects of the training)
- Each journal club discussed and identified a research topic on an issue from their respective clinical practice areas that was of interest/importance and geared towards resolving an existing problem
- For the identified topic, each journal club discussed and came up with background information, the statement of the problem, justification, objectives, supporting literature and methodology including study design, study population and sample, data collection and analysis methods and ethical considerations as per the topics covered during the training. Also, each journal club developed a timeframe and budget projections for the research proposal
- Participants were able to do/practice presentation skills
- Each participant/group was supported and encouraged to refine their research project for submission to ethics and research committee and final implementation in their areas of practice.

The participants from the six different critical care units formed 22 research journal clubs during the training period. Each club, which consisted of 3 to 4 participants from the same clinical area, identified an area of concern in their specific work environment and developed a concept research proposal utilizing knowledge/skills acquired during the learning period. With guidance from the researcher, participants identified very exciting and interesting topics which highlighted critical areas in their practice that needed to be addressed. The participants appreciated the clarity and simplicity of the research process approach. Their comprehension and internalization of the learned content led to identification of issues of concern in each of the critical care areas and

development of the concept proposals. The proposals were presented by members of each journal club and critiqued by the researcher, other invited researchers and participants during the last day of training.

The hospital showed a lot of commitment in supporting the training program by releasing participants in the four cohorts to attend the training for the four weeks. Also the deputy director, nursing services was available to address the training participants during the closing session of the training program and promised support to the participants in their endeavor to apply the acquired knowledge and skills in undertaking nursing research and applying research findings to practice.

Monitoring after training was done at least twice a month and involved:

- Visits to the study areas to assess progress of journal clubs in refining the research proposals that they had developed during the training period
- Establishing whether the trained nurses were practicing the various roles of the nurse in research as learned during the training period through observations and reports from workmates and supervisors
- Determining whether the trained nurses were involved in some other research activities
- Establishing whether the trained nurses shared the training experience with colleagues
- Establishing whether the trained nurses gave feedback about the training in their respective clinical areas either as individuals or in groups
- Determining number of the trained nurses who presented research findings or patient/client reports in any forum
- Determining utilization of search engines in literature review
- Determining number of participants who published articles

After the training sessions, members continued refining the concept research proposals in readiness for submission for ethical approval and subsequent implementation. They formed cohorts which were followed up in their areas of work. They were observed and guided by the researcher in refining the research proposals and as they performed the various other roles of the nurse in research. Participants were encouraged to continue the journal club activities even after the evaluation period and also to perform searches for relevant sites and health information and not to use internet only for social networks.

4.4 PHASE III (POST-INTERVENTION) RESULTS

During this phase, evaluation of the outcomes of training intervention was done. This evaluation was done at two levels. Immediate evaluation at the end of training was done by administering a posttest and obtaining a score for each participant. It was done on 67 nurses who participated in the training intervention. Also, the 67 participants formed 22 research journal clubs which presented and handed in the concept research proposals developed during the training period.

The second evaluation was done at four months after training intervention using the same questionnaire and procedure used in the baseline survey but excluding items on the Barriers Scale and training needs. This evaluation was done on 61 out of the 67 nurses who participated in the training. Their number reduced because two of the trained nurses were on maternity leave during this period while one had left the hospital. Three others were on annual leave.

This observation justifies why post-intervention evaluation was done on the fourth month after training. Treece and Treece (1986) recommend that the researcher must recognize that the time span between the first test and the second test can be confounded by age, fatigue and maturation.

Thus, unnecessary prolongation of time was avoided to prevent a scenario where some nurses could have transferred or moved from the study areas for some reasons hence reducing the sample.

The evaluation was done at the participants' places of work. Each cohort of trained nurses was gathered at their place of work and requested to fill in the post-intervention questionnaires. The questionnaire assessed participants' self-reported level of research knowledge and their practice or involvement in research activities and basis of evidence for nursing practice after the training intervention.

The serialized and coded questionnaires were collected by the researcher and/or the assistant and analyzed for completeness. Data was then entered into the computer and analyzed using SPSS version 20.0. The results were as presented below.

4.4.1 Participants' characteristics

The characteristics of the 61 participants who were evaluated in phase III are as described in 4.2.1 above under the sub-heading 'Demographic characteristics of the trained participants.'

4.4.2 Nurses' theoretical knowledge after training intervention (Posttest Scores)

At the end of training intervention, 67 nurses had been trained. The results of the posttest scores showed improved performance as shown in tables 31-33 below. The lowest score was 66 with the highest being 98. The posttest mean score was 85.85.

Table 31: Posttest scores for first cohort (Group 1)

S/No	Code	Work station	Posttest (%)
1	GK	A&E	92
2	NY	Renal Unit	81
3	JY	A&E	86
4	RB	Cardiology	91
5	KY	ICU	81
6	BG	Burns Unit	83
7	PX	ICU	79
8	GP	Renal Unit	89
9	KW	Renal Unit	88
10	ZB	Operating Theatres	90
11	AB	Operating Theatres	78
12	IC	ICU	89
13	FZ	A&E	66
14	CL	ICU	75
Total			**1168**

Table 32: Posttest scores for second cohort (Group 2)

S/No	Code	Work Station	Posttest (%)
1	OL	Cardiology	94
2	GX	Renal Unit	90
3	JU	Renal Unit	88
4	WZ	ICU	95
5	GR	ICU	80
6	DY	ICU	79
7	DZ	Burns Unit	85
8	GT	A&E	83
9	BI	A&E	83
10	LY	Burns Unit	80
11	IT	ICU	86
12	DE	ICU	90
13	MS	ICU	89
14	DK	ICU	90
15	GL	Operating Theatres	86
16	AC	A&E	92
17	LV	A&E	87
18	FY	Operating Theatres	90
Total			**1567**

Table 33: Posttest scores for third cohort (Group 3)

S/No	Code	Work Station	Posttest (%)
1	QP	ICU	98
2	ZE	Burns Unit	76
3	FT	Burns Unit	68
4	GW	A&E	89
5	JL	Operating Theatres	94
6	PJ	ICU	86
7	AK	ICU	86
8	GS	ICU	76
9	YO	Renal Unit	89
10	BD	ICU	90
11	AI	A&E	88
12	LD	Renal Unit	87
13	SY	ICU	78
14	GV	Operating Theatres	93
Total			**1198**

Table 34: Posttest scores for fourth cohort (Group 4)

S/No	Code	Work Station	Posttest (%)
1	ZI	Burns Unit	75
2	PR	Renal Unit	90
3	IZ	ICU	87
4	IQ	ICU	90
5	PZ	A&E	85
6	RC	A&E	80
7	KQ	A&E	90
8	AE	ICU	81
9	FI	ICU	87
10	MX	ICU	90
11	FQ	Operating Theatres	86
12	BS	Operating Theatres	83
13	DM	Renal Unit	88
14	NS	ICU	85
15	CM	ICU	89
16	IR	ICU	89
17	PH	Burns Unit	92
18	BT	A&E	96
19	LB	Operating Theatres	86
20	OC	A&E	88
21	ZP	Operating Theatres	84
Total			**1819**

Total post test scores = 5752

Average = 5752/67

= **85.85**

4.4.3 The concept research proposals developed

A wide range of concept research proposals were developed during the training period which continued being refined during the follow up period. Details of the concept research proposals developed and their progress as at four month's follow up post training are as listed in Table 35 below.

Table 35: Topics of concept research proposals developed by the Journal clubs and their progress

No	Concept research proposal topic	Progress at four months after training
1	Factors contributing to increased incidence of diarrhea in patients on nasogastric tube feeding admitted in Critical Care Unit, KNH	Refining before submission to ERC
2	Factors influencing length of stay of patients admitted with head injuries in Critical Care Unit, KNH	Refining before submission to ERC
3	Assessment of effectiveness of hand washing among nurses working in Critical Care Unit, KNH	At ERC
4	Causes of nosocomial infections among patients admitted in Critical Care Unit, KNH	At ERC
5	Practice and attitude of nurses after completing critical care nursing course	Refining before submission to ERC
6	Assessment of compliance to aseptic technique in central venous catheter dressing among nurses in Critical Care Unit, KNH	At ERC
7	Factors predisposing neonates to Acute Kidney Injury at the Renal Unit in KNH	At ERC
8	Causes of vascular access infection among patients on dialysis at the Renal Unit, KNH	At ERC
9	Hemodialysis machines: Effects of breakdown and reduced number on patients in Renal Unit, KNH	Refining before submission to ERC
10	Causes of inadequacy in dialysis among patients undergoing hemo-dialysis in Renal Unit, KNH	Refining before submission to ERC
11	Perception of patients on communication following cancellation of surgery at KNH	At ERC
12	Factors associated with increased incidence of pseudomonas infections among patients with burns at KNH	At ERC
13	Epidemiology of burn injuries at KNH	Refining before submission to ERC
14	Retrospective assessment of outcomes of open heart surgery at KNH in year 2013	Refining before submission to ERC
15	Incidence of nosocomial infections in patients admitted to Critical Care Unit, KNH	At ERC
16	Factors leading to delayed wound healing in patents with burns at KNH	At ERC
17	Factors influencing start of surgical operations in the operating theatres at KNH	Refining before submission to ERC
18	Hospital factors influencing mortality at Accident & Emergency department, KNH	Refining before submission to ERC
19	Factors causing delayed processing of laboratory results in Accident & Emergency department, KNH	Refining before submission to ERC
20	The burden of disasters among staff working in Accident & Emergency department, KNH	At ERC
21	Factors associated with failure of graft uptake among patients with burns at KNH	Refining before submission to ERC
22	Assessment of efficiency in utilization of surgical consumables in Accident & Emergency department, KNH	Refining before submission to ERC

Ten out of the 22 proposals had been forwarded to ethics and research committee (ERC) for review and approval while the rest were being refined for submission. All participants described the training program as beneficial and worthwhile. It gave them confidence in research, making it less frightening and achievable. One participant commented "*You mean research isn't that difficult? I now feel confident and able to get involved*." Many other participants expressed similar sentiments with those who had enrolled for BScN upgrading terming the training program as timely and very useful.

Participants suggested that the program should be held regularly and done for all nurses to appreciate their roles and simplify the research process to many who view it as extremely difficult and as for others.

4.4.4 Nurses' practice/performance after training intervention

Results here show significant improvement in participants' knowledge in nursing research and EBP and their involvement in research activities. Also, their basis of evidence for nursing practice shifted from relying mainly on knowledge gained during nursing school training and experience to getting scientific updates from reading journals, research and attending professional development sessions.

4.4.5 Nursing research knowledge and activities

4.4.51 Level of research knowledge

The results in figure 25 show that, self-rating level of nursing research knowledge for good and excellent increased to 85.3% after the training. This was a significant improvement from the pre-intervention proportion of 63.9%.

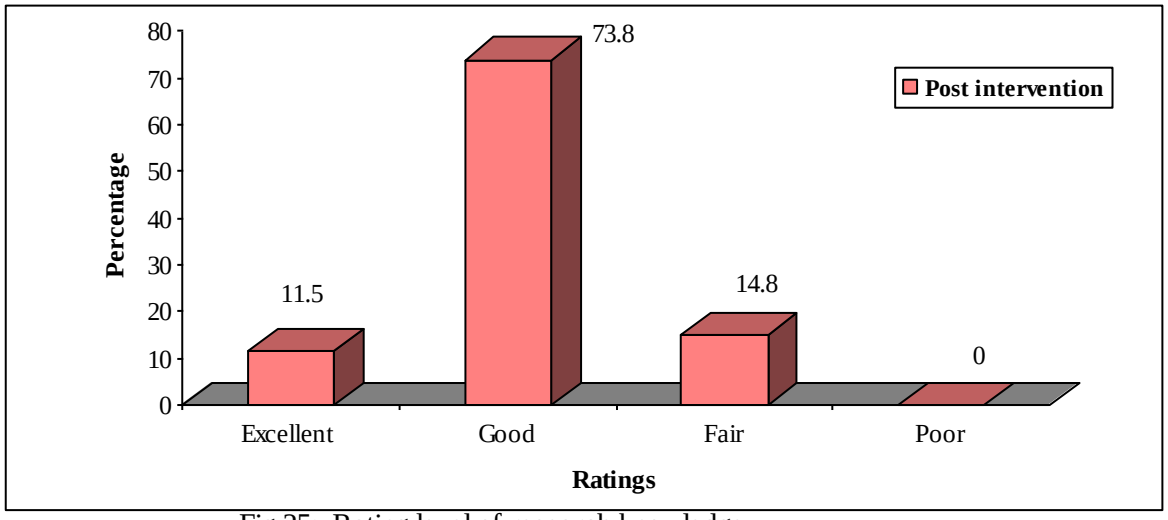


Fig 25: Rating level of research knowledge

4.4.52 Frequency of participation in research related to work

Figure 26 below shows the frequency of participation in research related to ones work which increased.

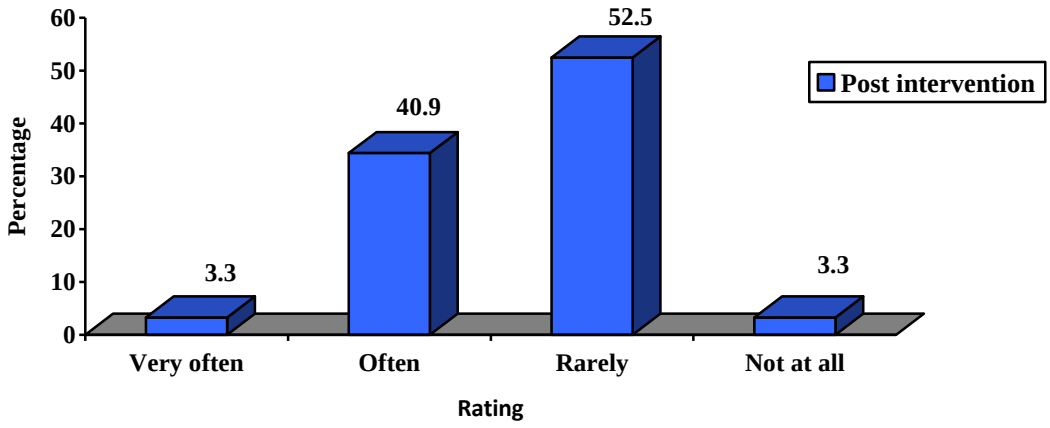


Fig 26: Frequency of participation in research related to work

4.4.53 Participation in different research activities

Table 36: Research activities ever participated in (n = 61)

Research activities ever participated in	After intervention (n=61)	
	Frequency	Percentage
Literature review	29	47.5
Data collection	45	73.8
Data analysis/simple statistics	28	45.9
Interviewing	25	41
Poster/Abstract presentation	10	16.4
Report writing	21	34.4
Article/paper presentation in a conference	7	11.5
Gave feedback	22	36.1
Shared training experience	50	82
Gave presentation on importance of research	7	11.5
Developed concept research proposal	58	95.1
Talked to clients about participation in research	4	6.6
Talked to clients about research results	4	6.6
Prepared and presented client reports	5	8.2
Case study presentation	6	9.8
Implemented research findings	11	18
Collaborating with others	9	14.8

In table 36 above, participation in almost all research activities increased with a margin of more than 10% after the training intervention. In addition, 95.1% of the nurses participated in identification of priority areas for research and development of concept research proposals, 82% shared the training experience with colleagues at the work place and 36.1% gave feedback about the training.

Moreover, 18% implemented research findings into practice and 11.5% prepared and gave presentations on the importance of research at their work place. About 15% started collaborations in research.

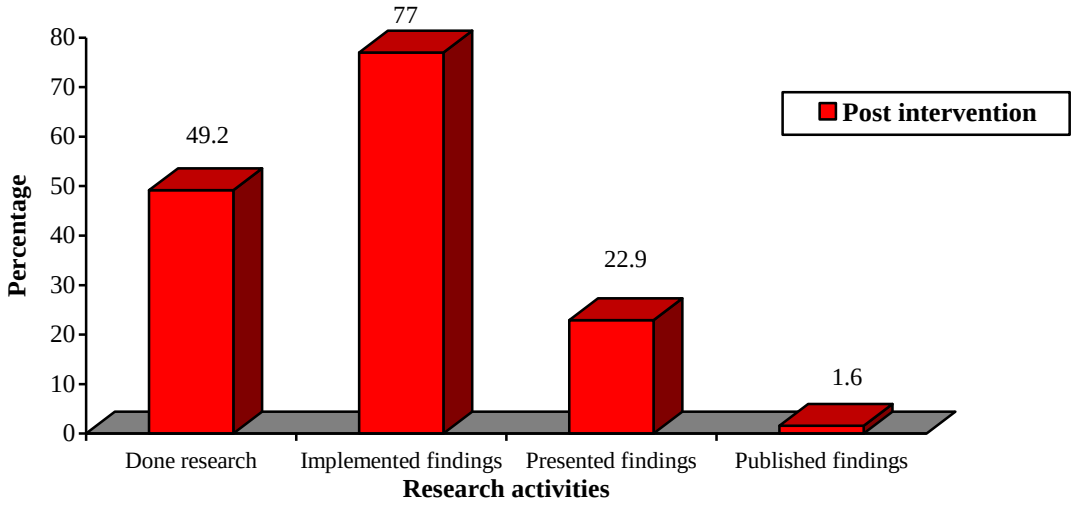


Fig 27: Research activities after training intervention

The results in figure 27 show the number of participants who participated in carrying out a research, implemented findings in practice, presented or published findings after the training intervention.

Table 37: Frequency of reading journals (n=61)

Frequency of reading journals	After intervention	
	Frequency	**Percentage**
Weekly or Fortnightly	7	11.5
Monthly	13	21.3
>Monthly	33	54
Rarely	5	8.2
Never	3	5
Total	**61**	**100**

Results in table 37 above shows the frequency of reading journals among the trained nurses.

4.4.6: Basis of evidence for nursing practice

The results in figure 28 below show that, more than half (52.5%) of the participants reported utilizing research findings as a source of evidence after the training. Also, about half (49.2%) reported reading health care updates while 91.8% reported getting practice updates from attending continuing professional development (CPD) sessions. The proportion of participants relying on knowledge gained during nursing school training was 37.9% while those reading information from journals was 32.8%.

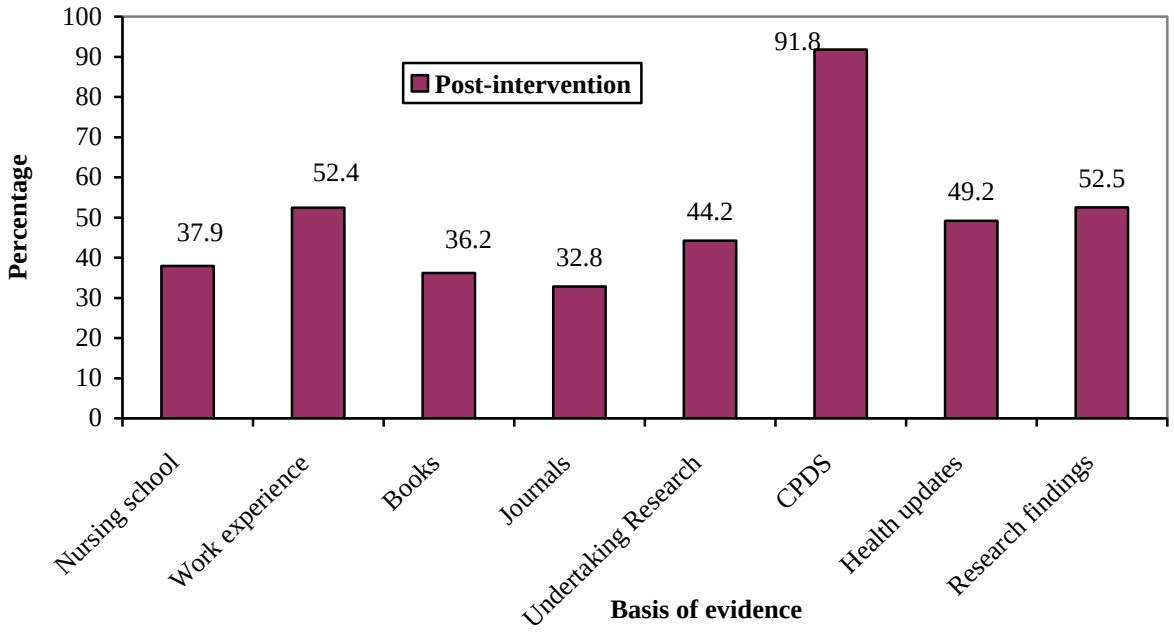


Fig 28: Basis of evidence for nursing practice after training

4.5 COMPARISON OF PHASE I AND PHASE III RESULTS

The results obtained in phase III were matched and then compared with those obtained in phase I. This was necessary in order to assess the changes in the knowledge, point of view and performance of the nurses after training. It was also necessary in order to determine factors that need reinforcement for sustainability of nursing research capacity and culture of evidence based practice among the staff.

Overall, the results showed marked improvements in nurses' knowledge/skills on nursing research and EBP. In addition, their involvement in research activities and/or utilization of research findings in practice increased after the training intervention.

4.5.1: Comparing nurses' theoretical knowledge (Pretest - Posttest Scores)

Nurses' knowledge on nursing research and evidence based practice was assessed by comparing the matched pretest and posttest scores for each of the 67 participants. This was in order to ascertain the difference in scores before and after training intervention and hence determine effect of the training. The results are presented and compared in four cohorts as per the four weeks of training intervention (Tables 38 – 41).

Table 38: Comparing pretest and posttest scores for first cohort (Group 1)

S/No	Code	Work station	Pretest (%)	Post Test (%)	% adjustment
1	GK	A&E	82	92	**+10**
2	NY	Renal Unit	81	81	**0**
3	JY	A&E	81	86	**+5**
4	RB	Cardiology	77	91	**+14**
5	KY	ICU	72	81	**+9**
6	BG	Burns Unit	71	83	**+12**
7	PX	ICU	71	79	**+8**
8	GP	Renal Unit	67	89	**+22**
9	KW	Renal Unit	67	88	**+21**
10	ZB	Operating Theatres	64	90	**+26**
11	AB	Operating Theatres	58	78	**+20**
12	IC	ICU	49	89	**+40**
13	FZ	A&E	47	66	**+19**
14	CL	ICU	37	75	**+38**
	Total		**924**	**1168**	**244**

Table 39: Comparing pretest and posttest scores for second cohort (Group 2)

S/No	Code	Work Station	Pretest	Post Test	% Adjustment
1	OL	Cardiology	74	94	**+20**
2	GX	Renal Unit	72	90	**+18**
3	JU	Renal Unit	73	88	**+15**
4	WZ	ICU	82	95	**+13**
5	GR	ICU	70	80	**+10**
6	DY	ICU	66	79	**+13**
7	DZ	Burns Unit	68	85	**+17**
8	GT	A&E	71	83	**+12**
9	BI	A&E	69	83	**+14**
10	LY	Burns Unit	68	80	**+12**
11	IT	ICU	71	86	**+15**
12	DE	ICU	75	90	**+15**
13	MS	ICU	73	89	**+16**
14	DK	ICU	75	90	**+15**
15	GL	Operating Theatres	60	86	**+26**
16	AC	A&E	75	92	**+17**
17	LV	A&E	71	87	**+16**
18	FY	Operating Theatres	80	90	**+10**
	Total		**1293**	**1567**	**274**

Table 40: Comparing pretest and posttest scores for third cohort (Group 3)

S/No	Code	Work Station	Pretest	Post Test	% Adjustment
1	QP	ICU	88	98	**+10**
2	ZE	Burns Unit	67	76	**+9**
3	FT	Burns Unit	68	68	**0**
4	GW	A&E	83	89	**+6**
5	JL	Operating Theatres	67	94	**+27**
6	PJ	ICU	76	86	**+10**
7	AK	ICU	64	86	**+22**
8	GS	ICU	66	76	**+10**
9	YO	Renal Unit	73	89	**+16**
10	BD	ICU	65	90	**+25**
11	AI	A&E	83	88	**+5**
12	LD	Renal Unit	68	87	**+19**
13	SY	ICU	69	78	**+9**
14	GV	Operating Theatres	83	93	**+10**
	Total		**1020**	**1198**	**178**

Table 41: Comparing pretest and posttest scores for fourth cohort (Group 4)

S/No	Code	Work Station	Pretest	Post Test	% Adjustment
1	ZI	Burns Unit	70	75	**+5**
2	PR	Renal Unit	80	90	**+10**
3	IZ	ICU	75	87	**+12**
4	IQ	ICU	78	90	**+12**
5	PZ	A&E	64	85	**+21**
6	RC	A&E	65	80	**+15**
7	KQ	A&E	72	90	**+18**
8	AE	ICU	69	81	**+12**
9	FI	ICU	73	87	**+14**
10	MX	ICU	80	90	**+10**
11	FQ	Operating Theatres	69	86	**+17**
12	BS	Operating Theatres	68	83	**+15**
13	DM	Renal Unit	73	88	**+15**
14	NS	ICU	75	85	**+10**
15	CM	ICU	77	89	**+12**
16	IR	ICU	68	89	**+21**
17	PH	Burns Unit	76	92	**+16**
18	BT	A&E	76	96	**+20**
19	LB	Operating Theatres	69	86	**+17**
20	OC	A&E	75	88	**+13**
21	ZP	Operating Theatres	74	84	**+10**
	Total		**1524**	**1819**	**295**

Total pretest scores = 4761

Average = 4761/67

Pretest mean score = **71.06**

Total post test scores = 5752

Average = 5752/67

Posttest mean score = **85.85**

Score difference = 85.85 – 71.06

= 14.8

= 15%

The results showed that, knowledge improved after the training intervention from a pretest mean of 71 to a posttest mean of 86. The results were subjected to paired samples test. The improvement in knowledge was statistically significant with a T = 15.684 (P=0.001) (See Table 42 below). Therefore, the hypothesis that, 'There is no relationship between an educational intervention on nursing research and EBP and nurses' knowledge in research' is rejected.

Table 42: Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
POSTEST PRETEST	14.048	4.105	.896	12.179	15.916	15.684	20	.000

A scatter plot comparing pretest and posttest scores was generated in order to determine whether the training benefited all participants equally. As shown on the scatter plot, the training benefitted all participants equally with both those who had lower or higher scores in the pretest improving in almost equal margins in the post test (Figure 29 below).

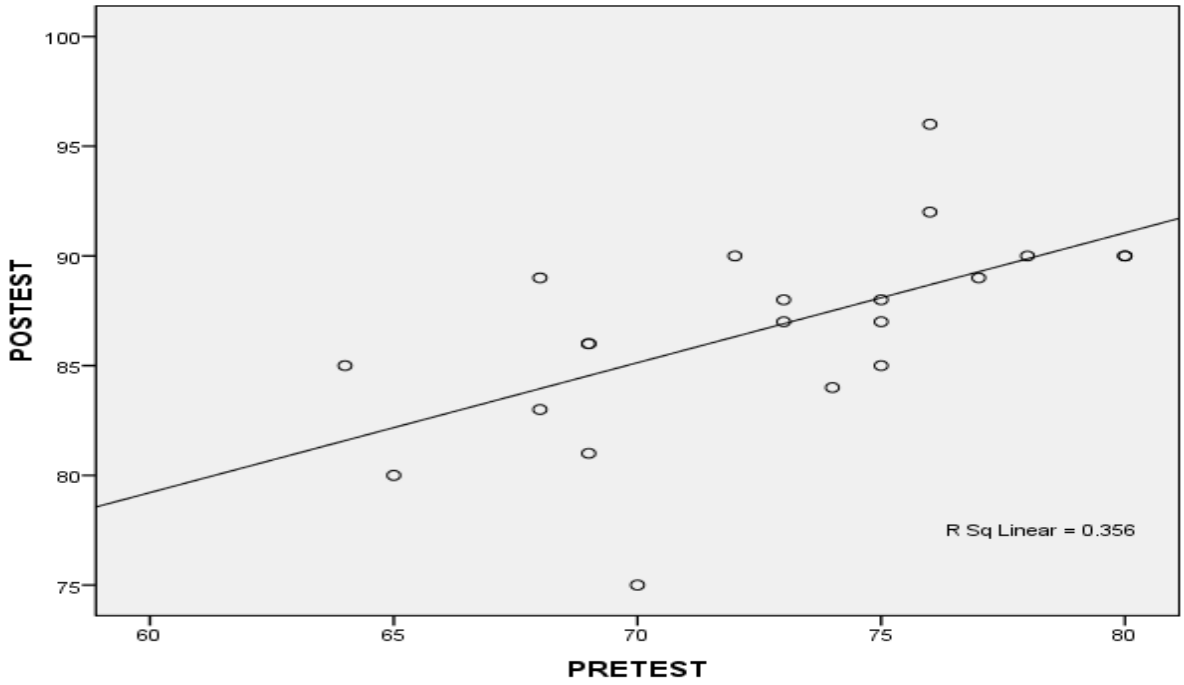


Fig 29: Scatter plot: Comparing performance in posttest and pretest results

4.5.2 Nursing research knowledge and activities

4.5.21 Level of research knowledge

The results in figure 30 show that, self-rating level of nursing research knowledge for good and excellent increased from 63.9% to 85.3% after the training. When subjected to paired samples test, this was statistically significant with T = 3.584 (P=0.001) (Table 43). The improved knowledge and confidence led one participant to say "*The skills have empowered me to speak with more authority when reporting patient statistics*." (Participant No 10).

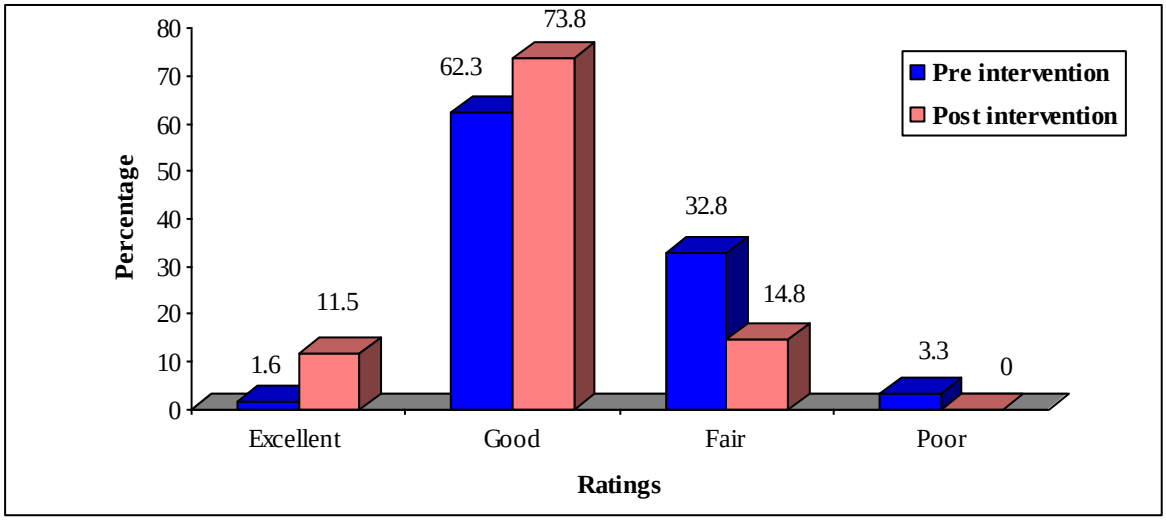


Fig 30: Rating level of research knowledge

Table 43: Paired Samples Test

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	level of research knowledge - level of research knowledge	.344	.750	.096	.152	.536	3.584	60	.001

4.5.22 Frequency of participation in research related to work

Frequency of participation in research related to ones work increased for often and very often from 14.7% to 44.2% after the training intervention and this was statistically significant with T =3.435 (P=0.001) (Fig 31).

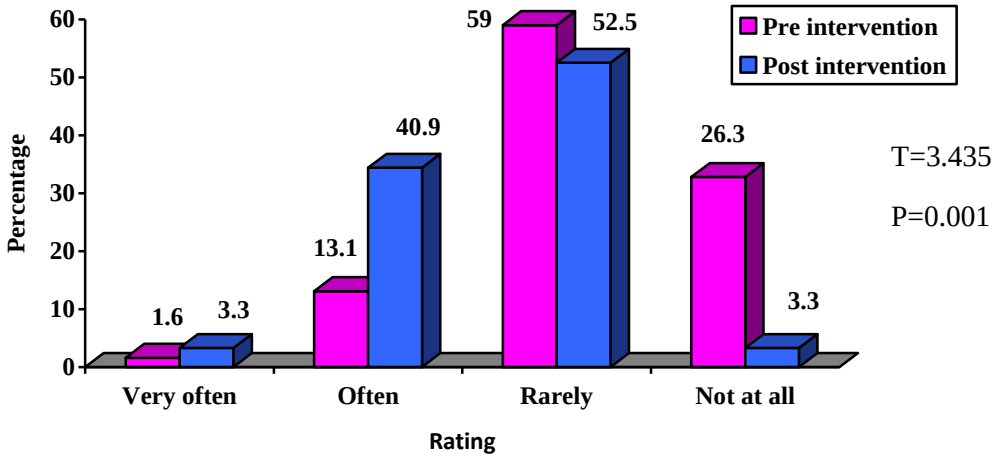


Fig 31: Frequency of participation in research related to work

One-way analysis of variance (ANOVA) showed no statistically significant differences either within or between groups in participants' work station and frequency of participation in research (P= 0.461) (Table 44) nor was there any statistically significant associations either within or between groups in participants' professional qualification and frequency of participation in research (P=0.118) (Table 45).

Table 44: One way ANOVA - work station by frequency of participation in research activities

ANOVA

Work station

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.019	2	4.509	.785	.461
Within Groups	315.757	55	5.741		
Total	324.776	57			

Table 45: One way ANOVA - nursing qualifications by frequency of participation in research activities

ANOVA

professional qualification

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.632	1	2.632	2.525	.118
Within Groups	53.179	51	1.043		
Total	55.811	52			

4.5.23: Comparing participation in different research activities

In table 46 below, participation in almost all research activities increased with a margin of more than 10%. For instance, involvement in data collection increased from 55.7% to 73.8% while involvement in interviews increased from 26.2% to 41%. In addition, 95.1% of the participants participated in identification of priority areas for research and development of concept research

proposals, 82% shared the training experience with colleagues at the work place and 36.1% gave feedback about the training. Moreover, 18% implemented research findings into practice and 11.5% prepared and gave presentations on the importance of research at their work place. About 15% started collaborations in research which did not exist before.

Table 46: Research activities participated in

Research activities participated in	**Before intervention (n=61)**		**After intervention (n=61)**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Literature review	24	39.3	29	47.5
Data collection	34	55.7	45	73.8
Data analysis/simple statistics	20	32.8	28	45.9
Interviewing	16	26.2	25	41
Poster/Abstract presentation	10	16.4	10	16.4
Report writing	15	24.6	21	34.4
Article/paper presentation in a conference	5	8.2	7	11.5
Gave feedback			22	36.1
Shared training experience			50	82
Gave presentation on importance of research			7	11.5
Developed concept research proposal			58	95.1
Talked to clients about participation in research			4	6.6
Talked to clients about research results			4	6.6
Prepared and presented client reports			5	8.2
Case study presentation			6	9.8
Implemented research findings			11	18
Collaborating with others			9	14.8

Table 47: Frequency of reading journals (n=61)

Frequency of reading journals	Before intervention		After intervention	
	Frequency	Percentage	Frequency	Percentage
Weekly or Fortnightly	6	9.8	7	11.5
Monthly	1	1.6	13	21.3
>Monthly	39	64	33	54
Rarely	10	16.4	5	8.2
Never	5	8.2	3	5
Total	**61**	**100**	**61**	**100**

Results in table 46 above shows that, the frequency of reading journals increased for those doing it weekly/fortnightly and monthly from 9.8% to 11.5% and 1.6% to 21.3% respectively.

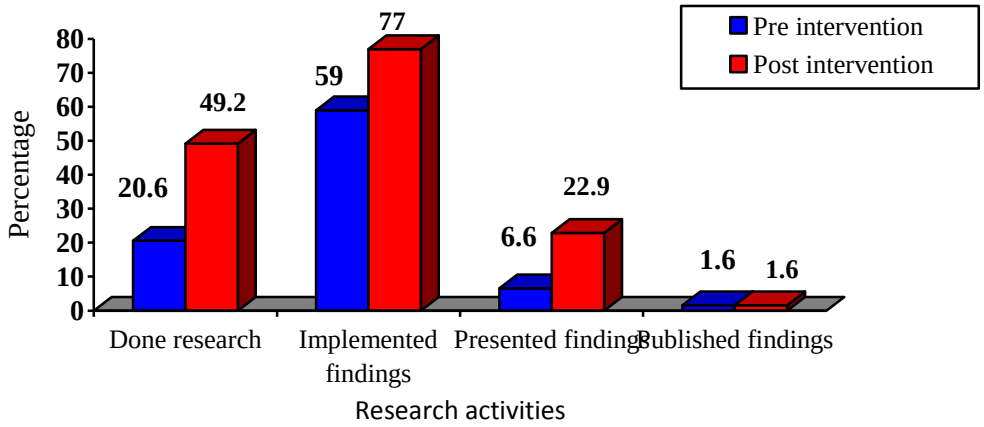


Fig 32: Comparing research activities pre and post intervention

The results in figure 32 above show that, the number of participants who had participated in carrying out a research increased from 20.6% to 49.2% while those who had implemented findings in practice increased from 59% to 77%. This was statistically significant with T = 15.163 (P=0.001) and T= 3.633 (P=0.001) respectively. Those who presented findings in different fora increased from 6.6% to 22.9% (Figure 31).

Therefore the hypothesis that 'There is no relationship between an educational intervention on nursing research and EBP and carrying out research/implementing research findings in practice' is rejected.

One-way analysis of variance (ANOVA) showed no statistically significant differences either within or between groups in participants' work station and doing research (P=0.825) (Table 48).

Table 48: One way ANOVA- workstation by any other research done

ANOVA

Work station

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.048	1	.048	.049	.825
Within Groups	56.136	58	.968		
Total	56.183	59			

Also, there was no statistically significant associations either within or between groups in participants' professional qualification and doing research (P=0.720) (Table 49).

Table 49: One way ANOVA - nursing qualifications by any other research done

ANOVA

professional qualification

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.127	1	.127	.129	.720
Within Groups	56.008	57	.983		
Total	56.136	58			

One-way analysis of variance (ANOVA) showed no statistically significant differences either within or between groups in participants' work station and implementing research findings in practice (P=0.337) (Table 50). Similarly, there was no statistically significant associations either within or between groups in participants' professional qualification and implementing research findings in practice (P=0.214) (Table 51).

Table 50: One way ANOVA - workstation by implementing findings in practice

ANOVA

work station

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.380	1	5.380	.936	.337
Within Groups	333.220	58	5.745		
Total	338.600	59			

Table 51: One way ANOVA - nursing qualification by implementing findings at work place

ANOVA

professional qualification

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.058	1	9.058	1.586	.214
Within Groups	291.244	51	5.711		
Total	300.302	52			

4.5.3: Basis of evidence for nursing practice

The results in figure 33 below show that more than half (52.5%) of the participants reported utilizing research findings as a source of evidence after the training. Also, about half (49.2%) reported reading health care updates while 91.8% reported getting practice updates from attending continuing professional development (CPD) sessions/seminars. The CDP attendance showed a marked improvement from 6.6% before the training intervention. The number of participants who previously were relying on knowledge gained from nursing school reduced from 70.5% to 37.9%. Those reading information from journals increased from 23% to 32.8%.

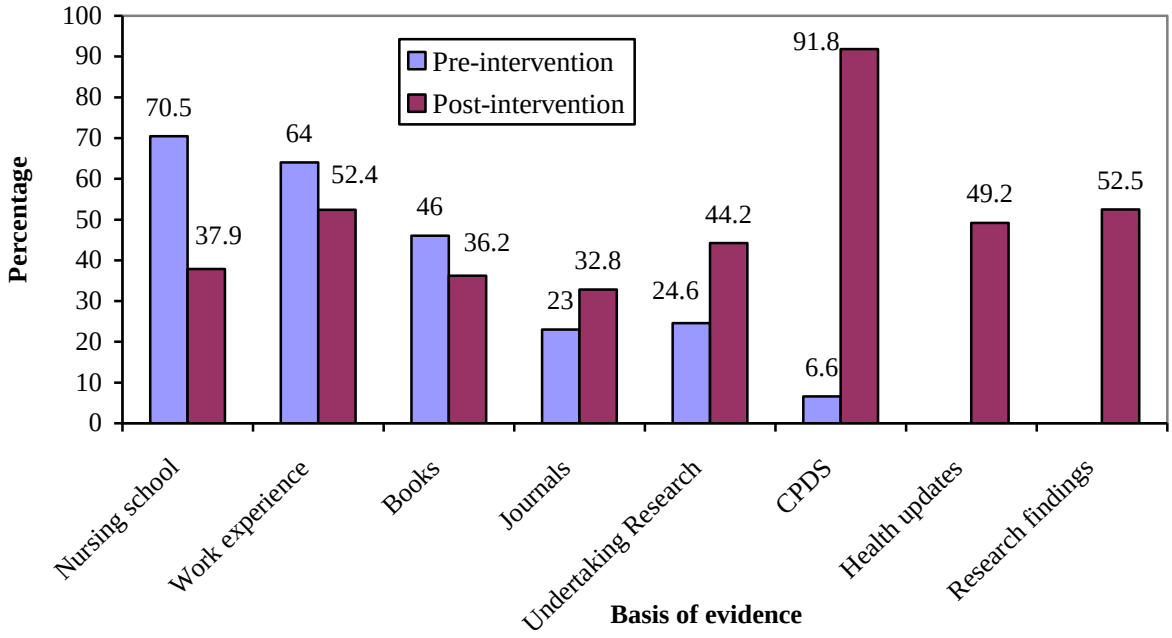


Fig 33: Comparing basis of evidence for nursing practice

4.5.4: Accessibility to library facilities and research activities at work place

Awareness of research and research resources increased after the training intervention and participants were able to identify and utilize the available resources. Participants indicated increased:

- Utilization of internet via phone
- Reading of journal articles
- Access to nurses doing research
- Expression of interest in and attendance of research seminars/courses, scientific conferences and presentations.

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0: Introduction

This chapter discusses the findings of the research in relation to findings from other studies on nursing research and evidence based practice. It ends by giving recommendations that can help to enhance nursing research and EBP capacity and incorporate the concepts in health care settings.

5.1: Discussion

The study found increased participation of nurses in research activities and utilization of findings in nursing practice after the training intervention. Many researchers agree that, strategies to enhance nursing research and evidence based practice need to focus on several facets including enhancing nurses' knowledge, skills and availing resources and mentors (Dogherty, Harrison, Gram, Vandyk and Keping-Burke, 2013; Fineout-Overholt *et al*., 2012). Boswell and Cannon (2011) emphasize the importance of understanding the research process as a first step in being able to use research findings in nursing practice.

Almost all nurses indicated undergoing training in basic research as prescribed by the Nursing Council of Kenya (NCK, 2012). This finding is not unusual as research teaching in almost all countries is now an integral part of the nursing curriculum and post basic trainings encourage a research culture (Purkis *et al.*, 2008). Although nurses are expected to be involved in research activities including conducting them and applying findings in practice, few nurses in this research were initially conducting them or involved in research activities and/or utilizing

findings in practice. Nurses especially those in clinical settings are usually in research-like environments and should focus and drive the research agenda (Purkis *et al.*, 2008).

In this study, only 20.8% of the participants were involved in research activities during the baseline survey while 20.6% had conducted a research other than the one they had done for nursing qualification. This number was relatively low though comparable to findings in some studies conducted in developed and some developing countries regarding nurses' research activities. In China, a study done by Sing-Ling Tsai (2000) and by Eui-Geum Oh (2007) in Korea found low participation in research by nurses and so was the finding by Mehrdad *et al* (2008) in Iran.

Ofi *et al* (2008) found few nurses in Nigeria using research findings in practice or aware of relevant research findings and recommended nurses to be involved in the conduct of research (Ofi *et al*, 2008). According to the World Health Organization (WHO, 2003), nurses have a pivotal role to play in the health system to meet the set health targets. All over the world, nurses are adopting the research agenda with a great zeal and those in Kenya should not be left behind. The low level of research involvement in this study can be a stimulating wake up call to nurse managers and leaders to introduce and strengthen the research role for practicing nurses in health care settings.

The most common research activity that nurses were participating in was data collection (74.3%) followed by literature review (47.5%) and data analysis (45.4%). Many studies report data collection as the most participated research activity by nurses. This is usually not for their own researches but for other researchers (Smirnoff *et al.*, 2007; Olade, 2004; Purkis *et al.*, 2008). Studies report different levels of involvement in specific research activities in different countries (Brown *et al*., 2009; Gerrish and Lacey, 2006; Helga *et al.*, 2010). Though research participation

was low in China, overall, 64% participated in some form of research activities with data collection and presentation at conferences being the most frequent activities. However, the baseline survey in this study found low levels of presentation at conferences (7.7%) and publications (1.6%). Baseline findings in this study indicating that only 11.5% read journals weekly or fortnightly concurred with literature reports that only a minority of nurses read journals on a regular basis (Helga *et al*, 2010). Failure to read journals, conduct research and disseminate the findings for utilization may be taken to imply that nurses' practice is based on 'old' knowledge.

The reasons given in this study during the baseline survey for the low level of involvement or participation in research and/or utilization of findings in practice were that nurses had inadequate knowledge, skills and lacked mentorship in nursing research. Besides, they viewed nursing research as difficult and for other professionals and there was no support or motivation for nurses who wished to undertake research. In addition, heavy workloads meant lack of time.

The results are similar to findings from other regions of the world regarding factors that influence nurses' research activities. For instance, Mehrdad and Salsali (2008) in Iran reported lack of time, mentorship, limited knowledge and skills in research and lack of support as the main factors associated with low research participation while in Austria, Helga *et al* (2010) reported lack of sufficient knowledge and interest. In Nigeria Ofi *et al* (2008) associated the low level of research participation by nurses on deficient knowledge and experience in research. Also, Carrion *et al* (2004) in Spain found the main barriers to be related to characteristics of the organization or personal characteristics of the nurses that included knowledge, skills, motivation and support.

The typical barriers reported in other studies include organizational cultures that reward routines, inadequate knowledge or education, heavy workloads and resistance from colleagues (Fineout-Overholt *et al*., 2012; Gerrish and Clayton, 2004). Also lack of time, lack of administrative support; lack of mentorship and poor understanding of statistics and critical appraisal are other barriers reported in literature (Retsas, 2000; Fitzpatricks, 2007; Brown *et al*, 2009). Despite the similarity in the reasons given for low participation in research activities, studies in different countries usually report factors that are unique to their situations and environments hence the importance of understanding the factors in relation to the local context. Thomson *et al*., (2008) argue that indication of time as part of the constraints could have underlying meanings implying lack of interest, need or even knowledge. It may also reflect unwillingness to take unfamiliar or additional duties and roles. This is where organizational efforts are needed to encourage and support nurses.

A major reason given in this study for not implementing research findings in practice was that, research reports were not available and findings were not usually disseminated. The fact that research reports were not available and research findings were seldom disseminated is reported in some studies. In Sweden, Kajermo *et al* (2008) reported a similar finding where majority of the Swedish nurses thought research reports were not readily available and so was the case in Australia (Retsas, 2000).

More than half of the nurses in a Turkish study by Ozdemir and Akdemir (2009) reported inaccessibility of research findings as main factor impeding research utilization. This finding is contrary to what has been found in some other countries where the amount of research information is overwhelming and nurses have a problem choosing which findings to apply. For instance, Adamsen *et al* (2003) in Denmark found that 90% of the nurses in their study believed

there was an overwhelming amount of research results in different clinical specialties (Adamsen *et al.*, 2003).

The proportion of nurses who had implemented research findings in practice was 59% of those who had conducted researches. This is close to the 62% of the participants who were utilizing research findings in practice in the Nigerian study by Ofi *et al*, (2008). However, Sing-Ling Tsai (2000) reported that only about half the nurses in his study had utilized research to change practice in the preceding three years. Nurses have a responsibility to deliver care based on current evidence, best practices and validated locally conducted researches. This will ensure that clients receive care that conforms to existing scientific base.

There is increasing pressure on nurses of all levels to use research findings in daily nursing practice as a base for decision making. Evidence based practice has been shown to lead to provision of high quality care that is cost effective, competent and compassionate This has taken root in many countries. Carlson and Plonczynski, (2008) argue that patients are entitled to receive high quality care based on up-to-date scientific evidence. This evidence come from various sources including research findings and information from publications. Studies have shown that nurses do not read journals regularly (Thomson *et al.*, 2001) so it was hardly surprising initially that only 11.5% of nurses in this study read journals weekly or fortnightly. Efforts need to be made to ensure institutional accessibility to journal articles through regular subscription so that nurses can benchmark their practice.

Majority of the nurses were relying on knowledge gained during nursing school training (70.7%) and experience (65.2%) as their basis of evidence for nursing practice as opposed to utilizing research findings. This baseline survey finding is similar to that by Achterberg *et al* (2008) in The Netherlands, Thomson *et al* (2008) in UK and Melnyk *et al* (2008) in US. In England,

Gerrish *et al* (2004) found nurses relying on experiential knowledge rather than from knowledge gained from journals and research. Though useful experiences are good, they need to be validated to ensure that practitioners do not stick to traditions. If nurses do not undertake research and utilize the findings in practice which is essential to promote positive patient outcomes, they will continue using the 'old' knowledge acquired during their years in training with impact on the quality of care provided. Moreover, they will be ill equipped to meet the dynamic needs of themselves and the clients they serve. Nurses who view research as an important role in their practice are more likely to get involved. Comprehension and internalization of this role can well be established during nursing training. This can be taken up by nursing training institutions to refine content on nursing research and evidence based practice in the curricula and have it emphasized during training.

In Britain, Upton and Upton (2005) found that, nurses' decision to incorporate EBP findings into practice is affected by the nurses' attitude, knowledge and skills towards nursing research. They suggested development of effective and cost efficient strategies to educate nurses about EBP initiatives and research utilization to facilitate a culture that promotes the use of EBP in clinical settings. The introduction of retention system by the Nursing Council of Kenya requiring nurses to undergo prescribed number of training hours every three years so as to be retained in the register is an important quality and safety improvement strategy in practice. This will create a culture of continuous education and promote nursing practice based on current issues. In order to improve the nurses' knowledge and skills and change their attitude to research and EBP that were found in this study to negatively influence involvement in research activities, Nursing Council of Kenya can play an extremely important role. Aspects of nursing research and EBP can be incorporated as part of the content for the training hours. This could be significant and

possible since the council retains the central and national role of regulating standards of nursing practice and education after the devolvement of the health care function to county governments in Kenya.

The baseline survey results showed significant positive association between professional qualifications, post basic training/short courses, roles played and work station with doing research and/or implementing research findings in nursing practice ($P<0.5$). This finding agrees with findings in other regions of the world where education has consistently been associated with positive research uptake and utilization (Estabrooks *et al*., 2003, Hutchinson & Johnston 2004, Kajermo *et al.*, 2008).

The study highlights that nurses trained at degree level or those holding post basic training or those who have attended short courses within preceding two years were more likely to be involved in research activities or utilization of research findings in practice. This finding may have two different meanings. Training at degree or post basic levels expose the trainees to their research role as nurses and therefore they are more likely to get involved. Also, regularly attending short courses sensitizes the nurses and are more likely to be enthusiastic and motivated to get involved. This finding agrees with literature that attending short courses or regularly reading scientific articles lead to a more positive attitude towards research and increase ability to use research to improve patient care (Adamsen *et al*., 2003).

Nurses in administrative positions or in teaching or clinical instruction were significantly more involved than those in direct patient care, infection control or in health promotion. This may be reflecting the job demands of the two roles where administrators need to conduct audits and give reports as part of their job description while those in education are involved in teaching and /or

supervising students' projects. Both cases can be used as important enhancement or starting points to increase nurses' involvement in research or utilization of findings.

Nurses from intensive care unit, cardiology and renal unit were significantly more involved in research activities than those from other specialized care areas. This could be explained by the fact that a lot of research activities are carried out in these areas and by witnessing or participating in some of the activities, more and more nurses could be getting motivated. This is anchored in literature where having experience or role models can encourage involvement in research activities or utilization of findings (Kitson *et al*., 2008).

The respondents showed significant understanding of the importance of research in nursing practice and especially for evidence based practice. Majority (over 80%) of respondents in the baseline survey indicated the need for re-training/sensitization seminars on the research process and EBP. Topics identified and rated by the participants for training included the research process, proposal development, literature search and review, data collection and analysis, report writing, dissemination and utilization of research findings to inform practice. The expression of need for training by participants in this study was higher than what was found in Austria by Helga *et al* (2010). In their study, more than half of the nurses (60.4%) indicated their willingness to participate in further training regarding nursing research and nursing science (Helga *et al.*, 2010).

Helga *et al* (2010) argue that for research based practice to become widespread in reality and research results to be implemented and adapted in daily practice, the first necessary step is a comprehensive appraisal and assessment of the current situation. The gained information makes

it possible to identify problematic issues on individual as well as institutional levels and to initiate necessary changes (Helga *et al.*, 2010).

Ozdemir and Akdemir (2009) indicated the importance of understanding factors influencing nursing research and EBP programs in order to successfully implement them.

From their study in Turkey, they argued that, this could be related to nurses' research knowledge and skills, clinical practice environment, organizational or educational issues. Strategies to promote nursing research and EBP need to take into account the local context and practice environment.

Research has shown that nurses who attend research courses or regularly read scientific articles have a more positive attitude towards research and feel more able to use research to improve care (Adamsen *et al.*, 2003).

The baseline survey established the factors influencing nurses' involvement in research activities and/or utilization of research findings in practice. Participants' desire and beliefs about the benefits of a nursing research and evidence based practice training were strong. A training program was thus developed to enhance the capacity of the nursing workforce to undertake research and/or to use research findings to inform practice.

Following the training intervention on nursing research and EBP, nurses' knowledge in research, their involvement in research activities and/or utilization of findings in nursing practice increased significantly. For instance, theoretical knowledge/skills improved significantly after the training intervention from a pretest mean of 71 to a posttest mean of 86 (T=15.684, P=0.001). A scatter plot generated showed the training benefitted all participants equally. Also self-rating level of

nursing research knowledge for good and excellent increased significantly from 63.9% to 85.3% (T=3.584, P=0.001).

The results agree with the findings by Hart *et al* (2008) who found statistically significant differences in nurses' perceptions of knowledge, attitude and skill level after nurses participated in a computer-based educational intervention.

Similarly, in a facilitator-led educational program to assist nurses in developing protocols to address practice issues, participants reported increased understanding of EBP and were more confident about their ability and skills to improve best practices after participating in the facilitated workshop (Ellis *et al*., 2005). The results equally agree with those found by Milne *et al* (2007) in Australia.

Their project to promote evidence based care through a clinical research fellowship program enhanced participant's confidence, knowledge and skills.

According to Boswell and Cannon (2011), understanding the research process is the first step in using evidence in everyday nursing practice. They argue that when nurses believe they have the knowledge and skills in a specific aspect, they gain confidence in it. Education has been one of the reported facilitators of conducting research and utilizing the findings in practice. The fact that most of those involved in research had a BScN degree or were pursuing the course is consistent with previous studies that education is important in conducting research and utilizing findings in practice (Olade, 2004). The findings are consistent with my theoretical framework, 'The Knowledge To Action Process' by Graham *et al* (2006). According to this framework, the knowledge gained during training should be synthesized, adapted and applied in the area of

practice for it to bring the desired change. A core body of nursing knowledge is derived from the process in which research is incorporated into practice.

Participation in carrying out research increased significantly from 20.6% to 49.2% (T=3.565, P=0.001) while frequency of participation in research related to one's work increased from 14.7% to 37.7% (T=3.000, P=0.001).

Implementation of research findings in practice improved significantly from 59% to 77% (T= 2.87, P=0.001) after the training intervention while presentation of findings in different fora increased from 6.6% to 22.9%.

About 15% of the participants started collaborations in research which were nonexistent before and more than half started utilizing research findings as a source of evidence after the training intervention.

These findings concur with what was found by Tsai (2002) in China where higher levels of participation in research were found among nurses in the experimental group after an eight week research utilization course. Also, in an interventional study conducted by Hundley *et al* (2000) comparing effectiveness of two approaches to increase research awareness among midwives and nurses, participants in the interventional group were more likely to engage in research utilization and participate in reading research journals. In US, continuing education programs developed to spearhead knowledge and skills on different research tasks received overwhelming response and led to improved research uptake (Witzke *et al.*, 2008).

It is important to note that implementation of programs to increase research uptake is not always easy. Purkis *et al* (2008) in UK found engaging nurses in research difficult as few were initially

interested in their action research project. It thus had a slow build up due to lack of understanding. Also, in a project to increase nursing research capacity in the work place in England, Gerrish and Lacey (2006) found engaging nurses in research both in carrying it out and using the findings in practice 'notoriously difficult.' In Sweden, a quasi-experimental study by Son *et al* (2009) reported that, an interactive teaching strategy increased participants' knowledge and use of EBP but did not change their attitude towards and future practice of it (Son *et al.*, 2009).

These initiatives can however be important by supporting and developing nurses and changing their attitude towards research. Such strategies need to be accessible within practice settings. Developing countries can improve the quality of care given to their clients by using evidence gained from local research findings. Nurses need education systems that can prepare them to meet the changing health care demands. Nurses need re-teaching in research to improve the standards of nursing practice.

In line with recommendation by the National Academy of Sciences (2010), there is need for academic-practice partnerships to make efficient use of resources and expand clinical education. This will make nurses recognize the research-rich environments in which they work.

As indicated in this study, presence of mentors has been reported to have a positive relationship to nurses' intentions to undertake and use research in practice. Mentors act as role models for nurses to learn from. They provide the needed practical support and experience that is vital for nurses to emulate. Appropriate mentoring provide nurses with a step by step experiential learning that can help demystify research.

Harvey *et al* (2002) argue that, nurses need facilitators who play a supporting role in encouraging them as their knowledge, skills and confidence develop. In order to encourage research based practice as a viable substitute for tradition based practice, Ozdemir and Akdemir (2009) recommend that health care organizations should utilize the expertise of facilitators to create these changes.

Nurses need to be empowered to recognize that research can be undertaken from their daily work activities rather than looking for 'special' areas.

They need to be shown that their daily challenges and observations are research opportunities and that a critical analytical view of everyday practice forms the basis of research and foundation of EBP (Fitzpatrick *et al.*, 2007). Empowerment will make nurses especially in developing countries like Kenya initiate and develop research-focussed nursing practice. Health care systems need to implement interventions that increase knowledge and skills of nurses and make them understand its benefits.

The 22 concept research proposals developed during the training period reflected application of the acquired knowledge/skills. The training gave participants confidence in research, making it less frightening and achievable as reflected in their qualitative statements "You mean research isn't that difficult? I now feel confident and able to get involved." The fact that ten out of the 22 proposals had been forwarded to ethics and research committee (ERC) for review and approval showed that the participants had developed interest, enthusiasm and motivation for this undertaking. This finding resembles that by Rutledge *et al* (2004) in US. In an effort to implement and refine a research utilization course for oncology nurses, several participants were able to carry out, present/publish successful projects owing to increased confidence and skill. In order to have multiplier effects, the developed program in this study should be held regularly and

done for all nurses to appreciate their roles and simplify the research process to those who view it as extremely difficult and as for other professionals.

Education helps to nourish EBP. Educating and engaging nurses in nursing research and EBP is essential to promote positive patient outcomes (Hart *et al*, 2008). Also educational programs that incorporate examples of current practice should be developed to encourage learning and foster skills. The high proportion of nurses who reported inadequate knowledge and skills on nursing research and EBP and the low level of participation in research activities led to the development of an educational program to increase both awareness and competency in understanding research, evaluating and integrating research into clinical practice.

The evaluation response rate was 91% which was reasonably adequate for interpretation purposes (Polit & Beck 2010). The results provide important information that will influence future program development. The strengths of the program included participant enjoyment and an overall sense of benefiting personally and professionally.

The program changed the way many of the participants thought about research and practice and the way they approached practice problems

The participants evaluated the training by rating it from 1 (very useful) to 3 (not useful) for content and usefulness of course presentations. They appreciated the importance of the course for empowering them with knowledge, skills and abilities on nursing research and EBP and suggested it to be held regularly and done for all nurses. Participants in a project to promote evidence based care through a clinical research fellowship program conducted by Milne *et al* (2007) in Australia found it to be worthwhile and beneficial to their everyday practice. The program enhanced their confidence, knowledge and skills.

Similarly, participant's feedback in an American didactic and self-directed course indicated the course was relevant to their area of work and helped them apply the new knowledge and skills. Participants were successful in achieving the objectives of the program (Hinds *et al.*, 2004). Evaluation of a ten-week critical appraisal skills course in UK, showed that, nurses benefited not only from increased knowledge of EBP but also on how to obtain information. There were increased personal confidence in making presentations and writing reports as well as fostering a more critical approach to practice (Jack *et al.*, 2003).

Such programs are essential and needed to increase nurses' abilities and confidence to generate research questions that are meaningful to practice. Nursing training institutions need to reinforce and provide the type and level of research skills needed for evidence based practice. Measures need to be put in place to ensure continuity and sustainability of these efforts. In developed and some developing countries, EBP has taken root among nurses with centers being created to gather and disseminate evidence reports (Olade, 2004). Developing countries including Kenya can get started by first enhancing capacity among the nurses.

The organization, processes and implementation of the training program in this study reinforced the recommendations by Kelly (2012) that nurses need to be alert for opportunities to improve practice and they can get started by:

- Website searches for EBP guidelines
- Paying attention to the latest news, research and standards
- Subscribing to one or more nursing and /health care journals
- Starting a journal club for discussion of evidence based articles
- Incorporating EBP guidelines into the revision of procedures and guidelines as they are reviewed

- Collaborating with researchers at their hospitals or local universities as necessary
- Partnering with faculty, other health care professionals and students on EBP.

5.1.1: Implications for Practice and/or policy

- ✓ Findings highlight the need to provide short-term training programs on Nursing Research and EBP for practicing nurses in health care settings and establishment of Nursing Research Units (NRUs) to support them in these endeavors.
- ✓ Health care institutions should include aspects of nursing research and EBP in nurses' orientation and induction programs and in CPD sessions, and organize fora for dissemination of research findings.
- ✓ The significance of nursing research/evidence based practice needs to be reinforced and emphasized during the undergraduate and even postgraduate training period by making curriculum adjustments at these levels to put emphasis not only on 'how to do research' but also on 'being able to gather and assess evidence from a variety of sources.'

  This will help students develop an enhanced understanding of clinical questions and ways of addressing them and therefore move from what Jan Shultz calls 'practices blessed by time but not necessarily by science.'

- ✓ The findings led to development of model for health care institutions to begin educational initiatives to enhance nursing research capacity and incorporate EBP in their settings.

5.1.2: Limitations

Though the study found significant increase in nurses' frequency of involvement in research activities and utilization of findings in nursing practice, some limitations are worth noting. First the participants in this study were recruited from one public health care setting and it would be

appropriate to undertake a study in a non-government health care setting and see how the influence of nurse-related factors or the organizational factors compare with the public setting. Also, the researcher focused on the situation in specialized care areas owing to resource limitations and it is important to replicate this study in other clinical sections of the hospital to gain deeper understanding on the issues highlighted in the present study.

5.2: Conclusions

The study identified various research activities in which nurses were involved before and after the training intervention. Some nurses had carried out researches and utilized research findings in practice. The respondents showed great understanding of the importance of research in nursing practice and more so for evidence based practice. They expressed great interest for sensitization, mentorship and support and to be facilitated to carry out research or be involved in it. There was a significant positive association between doing research and nursing qualification, post basic training and work station.

The main barriers to conducting or involvement in research and utilization of findings in nursing practice identified in the baseline survey were addressed in the training intervention. Nursing research and EBP awareness, knowledge, skills and practices improved after the one week training program. The proportion of nurses involved in research activities increased after the training intervention. This therefore confirms that such short term training programs are useful in empowering nurses to engage in nursing research and evidence based practice.

The findings of this study add to the already known knowledge on nursing research and EBP by nurses. Their value should be emphasized and encouraged at all levels of nursing education. Collaborative efforts are needed among researchers, educators and practitioners in all health care

settings to ensure that research findings are disseminated and reports submitted to the settings where research was conducted. This will ensure translation of research into action. There is need for academic-practice partnerships. If possible, a research researcher (role model) could be stationed in health care settings to mentor and guide nurses and initiate nursing research and EBP activities.

Effective and cost-efficient strategies are needed to educate nurses on EBP initiatives and research utilization for them to play the role of change agents. These need to be based in the practice settings and in forms that are easy to understand. They need participants who are interested and enthusiastic, knowledgeable facilitators and support from the organization.

Nurses are likely to benefit from increased knowledge, skills and abilities as the organization benefits in terms of safety and quality in health care provision. Nursing training programs need to integrate and emphasize the concepts of nursing research and evidence based practice and provide the level and type of research skills needed for use in practice.

The model developed (Fig 24) can be replicated among practicing nurses to enhance nursing research capacity and incorporate EBP in health care systems.

5.3: Recommendations

It is recommended that;

- Such short term training program on nursing research and evidence based practice be implemented among practicing nurses in health care settings so as to create awareness, motivate and enhance nurses' research abilities and improve practice both at national and county levels. This can be achieved through establishment of Nursing Research or Evidence Based Practice Units to:

- ✓ Facilitate conduct of research with emphasis on local relevance and dissemination of research findings
- ✓ Coordinate hospital-wide network of research and EBP groups at ward and departmental levels.
- ✓ Ensure internet access for relevant clinical information needed.
- ✓ Generate research questions or problems from practice.
- ✓ Focus on specific trainings e.g.
    - Searching for current best evidence
    - Responsible conduct of research
    - Critiquing research articles and applying findings in practice.

- ➢ Aspects of nursing research and evidence based practice be included in nurses' induction programs so as to create a positive culture on the same within practice settings. This will ensure all nurses are sensitized and that they acquire knowledge and skills on the two concepts.
- ➢ For sustainability, nursing research and evidence based practice topics are made compulsory topics for continuing professional development sessions by the Nursing Council of Kenya. Since every nurse is required to undergo 40 hours of continuing professional development training within 3 years, this will ensure compliance and hence sustainability. This is possible since although health care function has been devolved, the

role of regulating standards of nursing practice and nursing education are centrally held by the council.

- The significance of nursing research and evidence based practice needs to be reinforced and emphasized during the undergraduate and even postgraduate training period. This could be achieved by making curriculum adjustments to put emphasis not only on 'how to do research' but also on 'being able to gather and assess evidence from a variety of sources.' This will help students develop an enhanced understanding of clinical questions and ways of addressing them and therefore move from what Jan Shultz calls 'practices blessed by time but not necessarily by science' (Mellinger and McCanless, 2010).

- To facilitate uptake and motivate stakeholders, selection of best health care institutions for awards and recognition or staff promotions could take into consideration the use and support for nursing research and evidence based practice as a criteria in order to promote a nursing research culture just like the Magnet Recognition Program in US.

- Further research should be undertaken in a non-government health care setting and also in different clinical settings to compare the findings and gain deeper understanding on the issues highlighted in the present study.

- Further research should be undertaken to assess effects of implementing the research findings in practice on patient care outcomes.

- It should be a policy that once a research is done, the findings or reports must be submitted to the concerned setting where the research was undertaken to increase research translation into action.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE FOR NURSES

QN NO: …… **DATE: …….**

Research on 'Factors influencing nursing research and evidence based practice among nurses in Critical Care Units at Kenyatta National Hospital, Kenya'

Instructions:

1. The purpose of this questionnaire is to obtain information for the purpose of strengthening nursing research capacity in critical care units in Kenya and therefore enhance the concept of evidence based nursing practice. It will also be useful as a quality improvement programme in nursing practice. Information obtained will be treated with total confidentiality and will be used only for the intended purpose.
2. Do not write your name or any other identification anywhere on the questionnaire.
3. The questionnaire has three sections. Complete all the sections.
4. Put the filled in questionnaire in the given envelope and seal it. Hand it over to the researcher or the research assistant.

Section A: Demographic factors

Respond by circling (O) or ticking ( ) the most appropriate responses

1. Please indicate your Gender:
    1) Female
    2) Male
2. Indicate your age in completed years …….
3. Indicate your nursing qualifications: (**Tick appropriately**)
    1) ECN
    2) KRN
    3) KRN/M
    4) KRCHN
    5) BScN
    6) MScN (specify area of specialization)…….
    7) PhD

4. What other courses have you undertaken within the last 2 years to improve your work performance?
    1)……...

5. Please indicate your work station: (**Tick appropriately**)
    1) Intensive Care Unit/ Critical Care Unit
    2) High Dependency Unit
    3) Renal Unit / Nephrology Unit
    4) Burns Unit / Burns Centre

5) Cardiac Unit/ Cardiac Centre
6) Other (Please specify)……

6. Please indicate your major role in the unit: (**Tick appropriately**)
    1) Direct patient care
    2) Administration
    3) Teaching / Clinical instruction
    4) Infection control
    5) Research
    6) Health promotion / Health education
    7) Nursing Policy implementation
    8) Other (Please specify)……..
7. What is your level of appointment (Your designation) in this unit? (**Tick appropriately**)
    1) Chief Nursing officer
    2) Nurse director
    2) DCNO
    3) ADCNO
    4) ACNO
    5) SNO
    6) NO 1
    7) NO 11
    8) NO 111
    7) SEN
    8) ECN 1
    9) ECN 11
    10) ECN 111
    11) Lecturer
    13) Other (Please Specify)……..
8. How many years have you practiced nursing?
    1) 2 – 4 years
    2) 5 – 9 years
    3) 10 - 15 years
    4)16 - 20 years
    5) 21 – 25 years
    6) 26 – 30 years
    7) Over 30 years

Section B: Research knowledge / activities

9. Rate your level of nursing research knowledge?
    1) Excellent
    2) Good
    3) Fair
    4) Poor
10. Was "**research methods**" taught in your nursing training?
    1) Yes
    2) No If No, go to Question 12.
11. If **Yes** in question 10 above, how **adequate** was the knowledge to enable you conduct research? It was adequate: (**Tick One only**)
    1) To no extent 2) To a little extent 3) To a moderate extent 4) To a great extent

12. When did you lastly get updates on research methodology after your training? (**Tick One only**)
    1) Within last 12 months
    2) Within 13 – 24 months ago
    3) Within 25 – 36 months ago
    4) Within 37 – 48 months ago
    5) Over 48 months ago
    6) Never
13. Where did you get the research methodology updates from? (**Tick appropriately**)
    1) Place of work
    2) University/college course
    3) Seminar / workshop
    4) Continuing professional education session
    5) Other (Please specify)……
14. What aspects of research methodology have you ever participated in? (**Tick appropriately**)
    1) Literature review
    2) Data collection
    3) Data analysis/simple statistics
    4) Interviewing
    5) Poster/abstract preparation
    6) Report writing
    7) Article/Paper presentation in a conference
    8) Other (please specify)……
    9) None
15. How often do you participate in the above research activities? (**Tick One only**)
    1) Very often
    2) Often
    3) Rarely
    4) Not at all
16. What aspects of research methodology do you like reading/participating in? (**Tick appropriately**)
    1) Literature review
    2) Data collection
    3) Data analysis/simple statistics
    4) Interviewing
    5) Poster/abstract preparation
    6) Report writing
    7) Article/Paper presentation in conferences
    8) Other (please specify)……
    9) None
17. When was the last time you read a nursing journal? (**Tick One only**)
    1) Last week
    2) Last month
    3) >1 month ago
    4) >3 months ago
    5) >6 months ago

6) >1 year ago
7) Don't know

18. How frequent do you read nursing journals? (**Tick One only**)
    1) Weekly 3) Monthly 5) Rarely
    2) Fortnightly 4) >Monthly 6) Never
19. Indicate the main nursing journals which you usually read……

Indicate how accessible the following services are to you or your work place using the following KEY:

1) Easily accessible 2) Sometimes accessible 3) Not accessible

20. Access to a well equipped library……
21. Access to internet…….
22. Access to professional journals……
23. Access to continuing education / training……
24. Access to research courses/seminars/workshops…….
25. Access to nurses doing research……..
26. Access to nurses presenting research findings……

27. Is research an important component of the nurses' job?
    1) Yes
    2) No

    Please explain your response…….
    Is research an important component of the nurses' job in your work place/institution?
    3) Yes
    4) No

Please explain your response…….……

28. Have you ever undertaken any research other than the one you did at your nursing school?
    1) Yes
    2) No

Please explain types and number of researches done…….....

29. How often do you undertake or participate in research related to your work? (**Tick one only**)
    1) Very often
    2) Often
    3) Rarely
    4) Not at all
30. What kind of researches have you undertaken in your work place? (**Tick appropriately**)
    1) Action research
    2) Experimental research
    3) Clinical trials
    4) Survey research
    5) Literature review assignments
    6) Performance appraisal researches
    7) Other (Please specify)……
    8) None

31. Do you implement the research findings from your work place to practice?
    1) Yes
    2) No

Please explain your response…….

32. Do the researches add value to your practice?
    1) Yes
    2) No

Please explain your response……

33. What scientific evidence do you base your nursing practice on? (**Tick appropriately**)
    1) Knowledge gained from nursing school
    2) Knowledge gained from reading books
    3) Knowledge gained from reading journals
    4) Experience gained over time
    5) Knowledge gained from undertaking research
    6) Other (Please specify)……

34. Have you ever presented a paper /your research findings at a nursing conference?
    1) Yes
    2) No

    Please state where …….

35. Have you ever published your research findings in a journal?
    1) Yes
    2) No

Please state the Journal(s)…….

Section C: Nurses' Training Needs

36. Rate the aspects of research methodology below as you would like them to be incorporated in a **training program** to improve your **conduction** and **utilization** of research in nursing practice using the following key: (THIS IS NEEDED:-
    (1 = To no extent; 2 = To a little extent; 3 = To a moderate extent; 4 = To a great extent 5 = Don't know) (**<u>Circle as appropriate</u>**)

    1) What is research 1 2 3 4 5
    2) The research process 1 2 3 4 5
    3) Literature review 1 2 3 4 5
    4) Proposal development 1 2 3 4 5
    5) Data collection methods 12 3 4 5
    6) Data analysis 1 2 3 4 5
    7) Basic / simple statistics 1 2 3 4 5
    8) Report writing 1 2 3 4 5
    9) Dissemination /utilization of findings 12 3 4 5
    10) Writing for publication 1 2 3 4 5
    11) Article/Paper presentation in conferences 1 2 3 4 5
    12) Others (please specify)…….1 2 3 4 5

Section C: Barriers and Facilitators to Using Research in Practice (Adapted from Sandra Funk et al, 1991)

Articles in nursing journals indicate that nurses in practice do not use the results of research to help guide their practice. There are a number of reasons why this might be. We would like to know the extent to which *you* think each of the following situations is a barrier to nurses' use of research to alter/enhance their practice. For each item, circle the number of the response that best represents your view from the scale shown. Thank you for sharing your views with us.

THIS IS A BARRIER (1= To no extent; 2= To a little extent; 3= To a moderate extent 4= To a great extent; 5= No opinion)

1. Research reports/articles are not readily available 1 2 3 4 5
2. Implications for practice are not made clear 1 2 3 4 5
3. Statistical analyses are not understandable 1 2 3 4 5
4. The research is not relevant to the nurse's practice 1 2 3 4 5
5. The nurse is unaware of the research 1 2 3 4 5
6. The facilities are inadequate for implementation 1 2 3 4 5
7. The nurse does not have time to read research 1 2 3 4 5
8. The research has not been replicated 1 2 3 4 5
9. The nurse feels the benefits of changing practice will be minimal 1 2 3 4 5
10. The nurse is uncertain whether to believe the results of the research 1 2 3 4 5
11. The research has methodological inadequacies 1 2 3 4 5
12. The relevant literature is not compiled in one place 1 2 3 4 5
13. The nurse does not feel she/he has enough authority to change patient care procedures 1 2 3 4 5
14. The nurse feels results are not generalizable to own setting 1 2 3 4 5
15. The nurse is isolated from knowledgeable colleagues with whom to discuss the research 1 2 3 4 5
16. The nurse sees little benefit for self 1 2 3 4 5
17. Research reports/articles are not published fast enough 1 2 3 4 5
18. Physicians will not cooperate with implementation 1 2 3 4 5
19. Administration will not allow implementation 1 2 3 4 5
20. The nurse does not see the value of research for practice 1 2 3 4 5
21. There is not a documented need to change practice 1 2 3 4 5
22. The conclusions drawn from the research are not justified 1 2 3 4 5
23. The literature reports conflicting results 1 2 3 4 5
24. The research is not reported clearly and readably 1 2 3 4 5
25. Other staff are not supportive of implementation 1 2 3 4 5
26. The nurse is unwilling to change/try new ideas 1 2 3 4 5
27. The amount of research information is overwhelming 1 2 3 4 5
28. The nurse does not feel capable of evaluating the quality of the research 1 2 3 4 5
29. There is insufficient time on the job to implement new ideas 1 2 3 4 5

Are there other things you think are barriers to research utilization?
If so, please list and rate each on the scale:

30. _____ 1 2 3 4 5
31. _____ 1 2 3 4 5
32. _____ 1 2 3 4 5
33. _____ 1 2 3 4 5
34. Which of the above items do you feel are the *three greatest barriers* to nurses' use of research?

Greatest Barrier ..... Item #: _____
Second Greatest Barrier ..... Item #: _____
Third Greatest Barrier ..... Item #: _____

35. What are the things you think *facilitate* research utilization?
_____

THANK YOU FOR TAKING YOUR TIME TO FILL THE QUESTIONNAIRE

APPENDIX 2: PARTICIPANTS' CONSENT FORM

Research on 'Factors influencing nursing research and evidence based practice among nurses in Critical Care Units at Kenyatta National Hospital, Kenya'

Dear respondent,

My name is Mr Mutisya Kyalo. I am a student at the University of Nairobi pursuing a degree in Doctor of Philosophy. One of the requirements for award of the degree is to carry out a research. In regard to this, am carrying out a research on '**Research on 'Factors influencing nursing research and evidence based practice among nurses in Critical Care Units at Kenyatta National Hospital, Kenya.'** The research has been approved by the Ethics and Research Committee of KNH and permission to carry it out granted by your institution. It involves interviewing nurses working at various settings.

In order to obtain the information, a questionnaire will be utilized. I am kindly requesting you to participate in the study by filling in the questionnaire. Participation is voluntary and there is no penalty for declining to participate. There are no risks involved. The information you provide will be treated with total confidentiality as permitted by law. You are not required to write your name or any other identification number on the questionnaire. You are free to withdraw from the study at any stage without fear of victimization.

The results of the study will help identify factors influencing the undertaking and utilization of nursing research in Kenya which will guide development of training modules to improve nursing research capacity and hence enhance evidence based nursing practice in the country. Benefits to you will be the opportunity to participate in training workshops and in research activities thereafter.

If you wish to know the results, they will be given to you once the study is completed. You may ask any questions about your rights as a participant or anything else about the research that is not clear. You can also contact me on **0721 48 48 69** or my Supervisors below in case you have any questions later.

Supervisors:

1. Prof Anna Karani …….. **0721850910**
2. Prof Christine Kigondu …**0733730796**

Thank you for your time.

Respondent's consent:

I have read and understood the above details about the research. I voluntarily agree to participate in the study.

Respondent's sign …….. Date: ……..

Investigator's sign ……... Date: ……..

APPENDIX 3: INTERVIEW GUIDE FOR NURSES

Research on 'Factors influencing nursing research and evidence based practice among nurses in Critical Care Units at Kenyatta National Hospital, Kenya'

NOTE: This interview session will be taped for retrieval and clarification during data analysis stage.

1.0 Research involvement

1.1 What motivated you to take part in this research project?

1.2 Have you been involved in any other research projects?

If yes then ascertain the following
When
Whose project
Title of project
What was your role?

2.0 Research Training and knowledge

2.1 What research training have you had?
How long ago-
Level of training-
Sufficiency-

2.2 Which of the following would you say are research activities?
Reading journals
Analyzing reports/journal articles
Collecting data information
Analyzing data
Writing research proposals
Attending conferences
Presenting at conferences
Writing for publication
Leading a research project
Participating in a project
Auditing/evaluating practice
Obtaining patient/staff feedback

2.3 What support is available for nurses who wish to do a piece of research?
Scientific research committee
Ethics committee
Others

3.0 Research activities

3.1 Have you ever carried out a piece of research?

If yes ascertain;
When
How
Who

3.2 What would you like to research on?

3.3 What factors would motivate you to do a piece of research?

3.4 What research skills do you currently feel you possess?

3.5 If you had the opportunity, what percentage of your time would you devote to research?

3.6 What factors would constrain you from doing research?

4.0 Nursing practice and research

4.1 How do you keep up to date with nursing knowledge?
Books-
Journals –

Which ones?

Conferences –
Which?
When?

Colleagues –
Who?

4.2 Can you give me an example of an aspect of clinical practice in your area which is research based?

4.3 There is a drive for the nursing profession to base its practice on research evidence; what do you think about this?

Thank you

APPENDIX 4: FOCUS GROUP DISCUSSION GUIDE

Research on 'Factors influencing nursing research and evidence based practice among nurses in Critical Care Units at Kenyatta National Hospital, Kenya'

NOTE: This focus group discussion will be taped for retrieval and clarification during data analysis stage.

1. What extent of research training do our nurses have?
2. What research skills do our nurses currently possess?
3. What would we say are research activities that our nurses can / engage in?
4. What support is available for nurses who wish to do research?
5. What factors would motivate nurses to do research?
6. Which issues in nursing practice would nurses research on?
7. What factors constrain nurses from doing research?
8. How do nurses keep up to date with nursing knowledge?
9. What are examples of some aspects of clinical practice in your area which are research based?
10. There is a drive for the nursing profession to base its practice on research evidence; what do you think about this trend with regard to nursing practice in Kenya?
11. Any additional comments?

Thank you

APPENDIX 5: FOCUS GROUP ATTENDANCE CONFIRMATION LETTER

August 20, 2013

Dear _____,

Thank you for your willingness to participate in our focus group discussion. As discussed on the phone, we would like to hear your ideas and opinions about **'Factors influencing nursing research and evidence based practice among nurses in Critical Care Units at Kenyatta National Hospital, Kenya'**

The study, which will be done in three phases, addresses the gap between knowledge of nursing research/evidence based nursing practice, undertaking nursing research and utilizing the results in practice (Evidence Based Nursing Practice).

You will be in a group with 6 to 9 other participants in the discussion which will take about 1 to 1.5 hours. Your responses to the questions will be kept anonymous. You will be re-imbursed Kshs 1500/= at the end of the focus group discussion for your transport.

The date, time, and place are listed below.

DATE……

TIME…….

PLACE…….

If you will not be able to attend for any reason please call the researcher (Mutisya) on 0721 48 48 69 or the FGD coordinator (Mrs Jane Chore) on 0722792931.Otherwise we look forward to seeing you.

Sincerely yours,

MUTISYA KYALO.

APPENDIX 6: FOCUS GROUP DISCUSSION INTRODUCTION

WELCOME

Thanks for agreeing to be part of this focus group. We appreciate your willingness to participate in this discussion on **'**Factors influencing nursing research among nurses in Critical Care Units at Kenyatta National Hospital in Kenya**'**.

INTRODUCTIONS

Moderator; Note Taker

PURPOSE OF FOCUS GROUP

This FGD is part of phase one of the above research topic which involves data collection to identify factors influencing nursing research (evidence based nursing practice) among nurses. The purpose is to try and understand **nurses' knowledge and practice of nursing research/ evidence based nursing practice**.

The end result of the research work will be to build and strengthen nursing research capacity and to enhance acceptance and integration of evidence based nursing practice at the largest referral hospital in Kenya. It will also be useful as a quality improvement programme in nursing practice

We need your input and want you to share your honest and open thoughts with us.

GROUND RULES

1. WE WANT YOU TO DO THE TALKING.

We would like everyone to participate.
We want to hear many different viewpoints from everyone

2. THERE ARE NO RIGHT OR WRONG ANSWERS

Every person's experiences and opinions are important.
Speak up whether you agree or disagree.
We want to hear a wide range of opinions.

3. WHAT IS SAID IN THIS ROOM STAYS HERE

We want you to feel free and comfortable when sharing whatever your views/opinions.
We request you to be honest even when your responses are not in agreement with the rest of the group.
In respect for each other, we ask that only one individual speak at a time in the group and that responses made by all participants be kept confidential.

4. WE WILL BE TAPE RECORDING THE DISCUSSION

We want to capture everything you have to say.
We don't identify anyone by name in our report. You will remain anonymous.

Thank you

APPENDIX 7: AUTHORIZATION FROM NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2241349, 20-267 3550,
0713 788 787, 0735 404 245
Fax: +254-20-2213215

Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke

9th Floor Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

When replying please quote

Our Ref: **NCST/RCD/12A/013/141**

Date:

19th September, 2013

Albanus Kyalo Mutisya
University of Nairobi
P.O.Box 30197-00100
Nairobi.

RE: RESEARCH AUTHORIZATION

Following your application dated ***21st August, 2013*** for authority to carry out research on "***Factors influencing nursing research among nurses in Critical Care Unitsat Kenyatta National Hospital in Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for a period ending **31st December, 2014.**

You are advised to report to **the Chief Executive Officer, Kenyatta National Hospital** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

SAID HUSSEIN
FOR: SECRETARY/CEO
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Copy to:

The Chief Executive Officer
Kenyatta National Hospital.

APPENDIX 8: RESEARCH CLEARANCE PERMIT FROM NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

PAGE 2

THIS IS TO CERTIFY THAT:
Prof./Dr./Mr./Mrs./Miss/Institution
Albanus Kyalo Mutisya
of (Address) University of Nairobi
P.O.Box 30197-00100, Nairobi.
has been permitted to conduct research in
Location
Nairobi
District
County
On the topic: Factors influencing nursing research Among nurses in Critical Care Unitsat Kenyatta National Hospital in Kenya.
for a period ending: 31st December, 2014.

PAGE 3

Research Permit No. *NCST/RCD/12A/013/141*
Date of issue *19th September, 2013*
Fee received *KSH. 2000*

Applicant's Signature

For: Secretary
National Commission for Science
Technology & Innovation

APPENDIX 9: APPROVAL FROM KNH/UON ETHICS AND RESEARCH COMMITTEE

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
(254-020) 2726300 Ext 44355

KNH/UON-ERC
Email: uonknh_erc@uonbi.ac.ke
Website: www.uonbi.ac.ke
Link:www.uonbi.ac.ke/activities/KNHUoN

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/ MOD/432

5th November 2012

Mutisya A. Kyalo
School of Nursing Sciences
College of Health Sciences
University of Nairobi

Dear Mr. Kyalo

Re: Approval of modifications study titled "Factors influencing nursing research among Nurses in Critical Care Unit at Kenyatta National Hospital in Kenya" (P119/04/2011)

Refer your communication of October 12, 2012.

Your request to drop Aga Khan University Hospital as a study site and retain only Kenyatta National Hospital has been reviewed and granted.
The revised proposal version: September 2012 has also been reviewed and approved.
The revised title has been noted.

Note that you will be guided by the conditions set out in the KNH/UoN-ERC approval letter Ref. KNH/ERC/R/112 of 24th September 2012.

Yours sincerely

PROF.A.N. GUANTAI
SECRETARY, KNH/UON-ERC

c.c. The Deputy Director CS, KNH
The Principal, College of Health Sciences, UoN
The Director, School of Nursing Sciences, UoN

"Protect to discover"

APPENDIX 10: APPROVAL OF ANNUAL RENEWAL FROM KNH/UON ETHICS & RESEARCH COMMITTEE

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
(254-020) 2726300 Ext 44355

KNH/UON-ERC
Email: uonknh_erc@uonbi.ac.ke
Website: www.uonbi.ac.ke
Link:uonbi.ac.ke/activities/KNHUoN

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref. No.KNH/ERC/R/117

16th September 2014

Mutisya A. Kyalo
School of Nursing Sciences
College of Health Sciences
University of Nairobi

Dear Mr. Kyalo

Re: Approval of annual renewal Factors influencing nursing research among nurses in critical Care units at Kenyatta National Hospital in Kenya" (P119/04/2011)

Refer your communication of September 2, 2014.

This is to acknowledge receipt of the study progress report and hereby grant you annual extension of approval for ethical research Protocol **P119/04/2011.**

The study renewal dates are 15th September 2014 to 14th September 2015.

This approval is subject to compliance with the following requirements:

a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN- ERC within 72 hours of notification.
d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
f) Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.

g) Submission of an *executive summary* report within 90 days upon completion of the study
This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN -ERC website **www.uonbi.ac.ke/activities/KNHUoN**

Kindly forward the informed consent documents for endorsement with updated stamp.

Yours sincerely

PROF. M.L. CHINDIA
SECRETARY, KNH/UON-ERC

c.c. The Principal, College of Health Sciences, UoN
The Deputy Director, CS, KNH
The Chairperson, KNH/UoN-ERC

APPENDIX 11: PERMISSION FROM RESEARCH AND PROGRAMS OFFICE, KNH

34

KENYATTA NATIONAL HOSPITAL
Hospital Rd. along, Ngong Rd.
P.O. Box 20723, Nairobi.
Tel: 2726300-9Fax: 2725272
Research &Programs: Ext. 44705
Email: k.research@knh.or.ke

Study Registration Certificate

1. Name of the PI MUTISYA ALBANUS KYALO
2. Email address: MaKXKyalo@yahoo.com Tel No. 0721 484869
3. Contact person (if different from PI).....
4. Email address: ..... Tel No. .....
5. Study Title
   FACTORS INFLUENCING NURSING RESEARCH AMONG NURSES IN CRITICAL CARE UNITS AT KNH
6. Department where the study will be conducted NURSING - ED, ICU, OR, RENAL, BURNS UNIT
7. Endorsed by Head of Department where study conducted
   Signature PwMaina - DDNC Date 20/05/2013
8. KNH UoN Ethics Research Committee approval number P119/04/2011
   (Please attach copy of ERC approval)
9. I MUTISYA ALBANUS KYALO commit to submit a report of my study findings to the Department where the study will be conducted and to the Department of Research and Programs.
   Signature [signature] Date 20TH MAY 2013
   Endorsed by Chair Department (only for students) of N/A
   Signature N/A Date N/A
10. Study Registration number (Dept/Number/Year) NURSING / 01 / 013
11. Research and Program Stamp

KENYATTA NATIONAL HOSPITAL
H. O. D.
RESEARCH & PROGRAMS
20 MAY 2013
P.O. BOX 20723 NAIROBI

All studies conducted at Kenyatta National Hospital **must** be registered with the Department of Research and Programs and investigators **must commit** to share results with the hospital.

APPENDIX 12: REQUEST FOR RELEASE OF NURSES TO ATTEND TRAINING

Mutisya Albanus Kyalo

C/O School of Nursing Sciences, UON

P.O. BOX 423 – 00202, **Nairobi.**

4th April, 2014.

The Deputy Director,

Nursing Services,

Kenyatta National Hospital,

Nairobi.

Dear Madam,

RE: TRAINING OF NURSES:

I am very grateful to the hospital management for the great support that I have continued to receive during my research project. Following a baseline survey conducted among 180 nurses from some specialized care units between July and September 2013, a gap was found in their involvement in research activities and utilization of research results in nursing practice. According to 'Scope of Nursing Practice' by the Nursing Council of Kenya (2012), nurses at different levels of educational preparation are expected to participate in nursing research in various ways and/or utilize nursing research results to improve nursing practice.

As a continuation of the project, nurses will be exposed to sensitization training on '**Nursing research and Evidence Based Nursing Practice**'. Evidence Based Nursing Practice has been shown to improve quality of care and increase satisfaction of care providers.

This is therefore to kindly request you to release the nurses, who were sampled randomly from the study areas to attend training on the dates scheduled as shown on the attached list**.** Also find attached copies of letters of ethical approval and authorization letter from National Council for Science and Technology.

Yours faithfully,

MUTISYA A. KYALO

TEL 0721 484869.

NB: This is a CPD approved training by the Nursing Council of Kenya.

APPENDIX 13: TRAINING CURRICULUM ON NURSING RESEARCH AND EVIDENCE BASED PRACTICE

TRAINING CURRICULUM

FOR NURSES

ON

NURSING RESEARCH AND EVIDENCE BASED NURSING PRACTICE

MUTISYA KYALO

(MScN, BScN,CEN)

PREPARED FOR A CAPACITY BUILDING PROGRAMME FOR PHASE 2 OF A RESEARCH CONDUCTED IN FULFILLMENT OF THE REQUIREMENTS FOR AWARD OF DOCTOR OF PHILOSOPHY IN NURSING OF THE UNIVERSITY OF NAIROBI

JANUARY 2014

Table of contents

PREAMBLE

A baseline survey was conducted at Kenyatta National Hospital among 180 randomly sampled nurses working in critical care areas (intensive care unit, emergency department, operating theatres, renal, burns and cardiology units). The specific objectives were to:

- Determine nurses' level of involvement in research activities
- Establish the factors that facilitate/inhibit undertaking of research
- Determine the extent of utilization of nursing research results to inform practice.

The findings established that the level of nurses' involvement in research activities was low (21%). Nursing qualification, relevant short courses and work station were shown to have a significant positive association with doing research ($P < 0.05$). The main factors that were cited as inhibiting nursing research were inadequate knowledge/skills and mentorship in research methods, nurses' attitudes towards nursing research in which they view it as difficult and lack of support/motivation. Most respondents (71%) were still relying on knowledge gained from nursing training school as the source of evidence for their practice. Few (25%) indicated using research findings as their source of evidence for practice. This is despite the research knowledge gained during their training and the benefits of evidence based practice that have been shown in practice and the emphasis that the health care fraternity places on evidence based practice.

RATIONALE

The findings from phase one of the study indicated that, few nurses were involved in research activities and little research was being used to inform nursing practice because:

- Nurses had inadequate knowledge/skills and lacked mentorship in nursing research
- Nurses viewed nursing research as difficult and for other professionals
- There was no support/motivation for nurses who wished to undertake research in order to improve nursing practice
- Research reports were not available and there was lack of dissemination of findings from locally conducted researches

It is on this basis that this curriculum is developed in order to train and sensitize nurses on practical research methods/evidence based practice to equip them with knowledge/skills and change their attitudes towards research. It is also aimed at providing mentorship in nursing research and evidence based nursing practice and equipping nurses with information to motivate and empower them to know various research resources available.

PHILOSOPHY

This continuing education programme is developed on the premise that;

- Nursing plays an important role in preventive, promotive, curative and rehabilitative health care
- Quality and client-centered health care require it to be based on scientific evidence
- Research utilization is part of the nurses' professional role and responsibility which has been intertwined with concepts of efficiency, effectiveness and quality improvement in health care
- Evidence based practice is the conscientious integration of best research evidence with clinical expertise and client values and needs
- Evidence generated by nursing research provides support for the quality and cost-effectiveness of nursing interventions

PROGRAMME GOAL

To equip nurses with relevant knowledge, skills and attitudes on research methods and evidence based nursing practice so as to function effectively in provision of quality health care to clients in a dynamic society.

LEARNING OUTCOMES

Upon completion of training, the participant will be able to:

- Carry out research and utilize the findings in different health care settings to improve nursing practice
- Apply research methods knowledge and skills in evidence based nursing practice

- Demonstrate change of attitude towards research
- Participate in research activities/evidence based practice aimed at improving quality of nursing practice

TEACHING/LEARNING METHODS

Lectures/Discussions, Presentations

Tutorials and seminars

Self-directed/Independent study/problem based learning

TEACHING/LEARNING RESOURCES

Lecture theatres/tutorial rooms/seminar rooms/ faculty with relevant qualifications

MODE OF LEARNING

The training will involve a pretest for all participants before the learning process. This will be followed by lectures, discussions, assignments, individual/group presentations and tutorial sessions. It will be culminated with a post-test.

TRAINEE SELECTION CRITERIA

Out of 180 nurses who participated in phase 1 of the research, 90 of them will be randomly sampled proportionately from the six critical care areas. They will be taken through a rigorous training exercise and thereafter released to clinical areas to put their learning into practice.

COURSE DURATION

The training shall take five full working days from 8AM to 5PM from Monday to Friday (40 Hours)

MODE OF EVALUATION

Written pretest (before training)

Written post-test (Same examination given for pretest)

Submission of a draft research proposal by groups

CERTIFICATION

A certificate shall be awarded to candidates on successful completion of the prescribed training. This certificate will be CPD accredited by the Nursing Council of Kenya.

COURSE STRUCTURE

Nursing research contents

- The meaning of research
- Nursing research /Role of nurses in research
- The research process
- Types of researches/Research designs
- Research problems, Purposes, Variables and Hypothesis
- Reviewing relevant literature
- Sampling methods
- Data collection methods
- Data analysis, interpretation and dissemination
- Ethical issues in research
- Utilization of research results (Research Utilization)

Evidence based nursing practice contents

- The meaning of Evidence Based Practice /Evidence Based Nursing Practice (EBNP)
- Importance of Evidence Based Practice
- Levels of Evidence/Types of Evidence
- Promoting Evidence Based Best Practices
- Nursing Research and Evidence Based Practice

COURSE DESCRIPTION

RESEARCH METHODS AND EVIDENCE BASED NURSING PRACTICE (40 HOURS)

UNIT 1: MEANING OF RESEARCH

Specific objective	Content	Instructional Methodology	Hours	Resources
By the end of the lesson, the participant will be able to: 1. Describe the meaning of research and its significance in the nursing profession 2. Describe the scientific research method	- Definition of: - Research - Nursing research - Importance of research in nursing - Characteristic/steps of scientific research	- Lecture - Discussion	2	Books Handouts
3. Describe the role of the nurse in research 4. Identify the different types of researches and research designs	- Roles of the nurse in research - Classification/ - Types of researches/designs	- Lecture - Discussion - Assignment	3	Books Handouts Journals

UNIT 2: RESEARCH PROBLEM, PURPOSES AND HYPOTHESIS

Specific objective	Content	Instructional Methodology	Hours	Resources
By the end of the lesson, the participant will be able to: 5. Identify and formulate a good research problem	- Statement of research problem, Variables - Criteria for selecting a research problem - Characteristics/components of a research problem	- Lecture - Group discussion - Assignment	3	Books Journals Handouts
6. Formulate objectives and hypothesis/research	- Research objectives - Research hypothesis - Types	- Lecture - Discussion	2	Books Notes

questions in relation to the research problem	- Characteristics - Research questions	- Assignments		Journals
7. Identify and analyze literature related to the research problem	- Literature review ✓ Purpose ✓ Sources of literature ✓ Referencing systems - APA - Harvard	- Lecture - Discussion - Assignments	2	Books Journals Handouts

UNIT 3: SAMPLING AND DATA COLLECTION

Specific objective	**Content**	**Instructional Methodology**	**Hours**	**Resources**
By the end of the lesson, the participant will be able to: 8. Describe sampling methods and related concepts	✓ Definition of terms: sample, sampling, population, subject ✓ Purpose of sampling ✓ Determination of sample size ✓ Sampling techniques (probability and non probability sampling)	- Lecture - Discussion - Assignments	3	Books Journals Handouts
9. Describe the various methods of data collection 10. Describe ethical issues in research	- Data ▪ Sources of data ▪ Types of data (quantitative and qualitative) ▪ Data collection tools ▪ Methods of data collection - Ethical issues in research	- Lecture - Discussion - Assignment	3 1	Books Journals Handouts

UNIT 4: BASIC STASTISTICS

11. Describe basic statistics in data analysis	▪ Statistics in research - Measures of central tendency - Measures of dispersion	- Lecture - Discussion - Assignments	3	Books Journals Handouts

UNIT 5: DATA ANALYSIS AND INTERPRETATION

Specific objectives	**Content**	**Instructional Methodology**	**Hours**	**Resources**
By the end of the lesson, the participant will be able to: 12. Describe processing and summarization of collected data	- Data processing ✓ Editing ✓ Coding ✓ Classification ✓ Tabulation	- Lecture - Discussion - Assignments	2	Books Handouts
13. Use the tools of statistics in analysis of summarized data	Types of data analysis ▪ Quantitative ▪ Qualitative	- Lecture - Discussion	2	Books Journals
14. Discuss the process interpreting the information collected	- Interpretation of data ▪ Utilization of research results, Dissemination /Evidence for practice	- Lecture - Discussion	2	Books Journals

UNIT 6: PROPOSAL DEVELOPMENT AND REPORT WRITING

15. Describe the contents of a research proposal	- Proposal development ▪ Features of a good proposal ▪ Guidelines to proposal development	- Lecture - Discussion - Assignment	4	Books Handouts Journals
16. Describe the contents of a research report	- Report writing ▪ Steps in writing research report ▪ Critiquing a research article	- Lecture - Discussion - Assignment	2	Books Handouts Journals

UNIT 7: EVIDENCE BASED NURSING PRACTICE

Specific objective	Content	Instructional Methodology	Hours	Resources
By the end of the lesson, the participant will be able to: 17. Describe the meaning of evidence based practice/EBNP	- Meaning of: - Evidence Based Practice - Evidence Based Nursing Practice -EBP Steps	- Lecture - Discussion	1	Books Handouts
18. Describe the importance of EBP and the role of Nurses	- Importance of EBP - Roles of nurses in EBP/ Nurses getting started	- Lecture - Discussion - Assignment	2	Books Handouts Journals
19. Identify the different types/levels of evidence	- Levels / types of evidence	- Lecture - Discussion - Assignment	2	Books Handouts
20. Describe the different ways of promoting evidence based best practices	- Promoting evidence based best practices	-Lecture - Discussion	2	Books Handouts

Required Textbook

1. Boswell C and Cannon S. (2007). *Introduction to Nursing Research*: *Incorporating Evidence Based Practice*. Jones & Bartlett Publishers.

Further Reading

2. Couchman Wendy and Danson Jane (1990); *Nursing and Health care Research;* Scutari Press.
3. BT Basavanthappa (2007); *Nursing Research*; 2nd edition; Jaypee Brothers Medical Publishers Ltd; New Delhi.
4. Bergman Rebecca (1990); *Nursing Research for Nursing Practice*: An international Perspective; Chapman and Hall Publishers; Great Britain.

5. Cormack F.S.D and McFarlane of Llandaff Barones (1992); *The Research Process in Nursing*; Blackwell Scientific Publication; London .
6. Mateo Magdalene and Kirchhoff Karin (1991); *Conducting and Using Nursing Research in the Clinical Setting*; Williams and Wilkins; Baltimore, Maryland.
7. Burns and Grove (2007); *Understanding Nursing Research: Building an Evidence-Based Practice*; 4th Edition; Saunders; ST. Louis.
8. Polit and Beck (2010); *Essentials of Nursing Research; Appraising Evidence for Nursing Practice*; 7th Edition; Lippincott Williams and Wilkins; Sydney.
9. Kelly Patricia (2012); *Nursing Leadership and Management*; International Edition; Delmar Cengage Learning.

APPENDIX 14: PRETEST/POSTTEST FOR TRAINING PARTICIPANTS

NURSING RESEARCH & EVIDENCE BASED NURSING PRACTICE COURSE

PRETEST/POSTTEST

INSTRUCTIONS:

1. Answer **ALL** the questions in sections A and B
2. Choose the correct options to the best of your knowledge by writing **T** for **TRUE** against each of the CORRECT option(s)
3. Some questions may have more than one CORRECT option

SECTION A: ESSENTIALS OF NURSING RESEARCH

1. Research means;

a) A process of collecting and analyzing data for some purpose
b) A systematic method of enquiry that seeks to explain a phenomena
c) A systematic inquiry designed to develop knowledge about issues of importance to the nursing profession
d) Searching for useful information only
e) An abstract logical structure of meaning

2. Purposes of research in nursing include;

a) Extent knowledge
b) Solve practically identified problems
c) Help explain phenomena
d) Build a body of nursing knowledge
e) Provide avenues for promotion

3. Most research studies begin with;

a) An investigation of social injustices
b) An examination of National Institute of Nursing Research funding priorities
c) A problem the researcher would like to solve
d) An interest in health disparities
e) Data collection

4. Steps of the scientific research include;

a) Identifying the research problem
b) Defining the problem in clear and specific terms
c) Development of hypothesis
d) Development of techniques and measuring instruments to provide objective data
e) Collection and analysis of data and drawing of conclusions

5. The roles of the nurse in research include;

a) Assisting in the collection of research information
b) Reviewing a proposed research plan with respect to its feasibility
c) Collaborating in the development of an idea for a clinical research project
d) Evaluating completed research for its possible use in practice, and using it when appropriate
e) Attending research presentations at professional conferences

6. Qualitative research examines which of the following characteristics of a phenomenon?

a) Frequency
b) Quantity
c) Quality
d) Intensity
e) Currency

7. The type of research which involves following up of subjects over a time period is referred to as;

a) Long study
b) Time series/Longitudinal study
c) Experimental study
d) Non experimental study
e) Case study

8. Basic research is defined as research to gain knowledge for;

a) Use in academia
b) Use in clinical practice
c) Promotion purposes
d) Use in the laboratory
e) Modifying current practice

9. Applied research builds a body of knowledge for nursing practice because it is the basis of;

a) Evidence based practice
b) Clinical pathways
c) Nursing process
d) Nursing diagnosis
e) Funding opportunities

10. A quasi-experimental design is one in which ;

a) The dependent variable is manipulated with randomization and a control group
b) The independent variable is manipulated with randomization and a control group
c) The independent variable is manipulated with no randomization and no control group
d) The dependent variable is manipulated with no randomization and no control group
e) The dependent variable is manipulated with randomization and no control group

11. Sources of research problems in humanities include;

a) People
b) Problems
c) Programs
d) Phenomena
e) Physique

12. To be considered researchable, a problem

a) Should include an ethical dimension
b) Must deal with patient outcomes rather than social issues
c) Has to be clearly visible and defined
d) Must be able to study by collecting and analyzing data
e) Must have obvious answers

13. In this hypothesis: "Nursing home residents aged 65-90 years who have Alzheimer's disease die at an earlier age than those who do not have Alzheimer's disease", the independent variable is;

a) Age at death
b) Having Alzheimer's disease
c) Dying at an early age
d) Living in a nursing home
e) Age 65-90 years

14. From the hypothesis "In the hospital setting, the presence of social support from family affects the pain perception of patients with spinal cord injury", the dependent variable is;

a) Type of spinal cord injury
b) Social support from family and pain perception
c) Social support from family
d) Pain perception
e) Type of spinal injury and social support

15. In a research question "Does music therapy increase satisfaction during cesarean delivery?", a null hypothesis is best represented by;

a) Music therapy affects satisfaction during cesarean delivery
b) Music therapy is not related to satisfaction during cesarean delivery
c) Music therapy increases satisfaction during cesarean delivery
d) Music therapy decreases satisfaction during cesarean delivery
e) Cesarean delivery is affected by music therapy

16. The purpose of literature review in research is to;

a) Identify a problem that has not been resolved
b) Clarify the importance of a research problem
c) Identify gaps in the literature
d) All of the above
e) None of the above

17. A database differs from a search engine in that;

a) A database stores the information
b) A search engine takes you to the information
c) Databases are specialized by area of knowledge
d) All of the above
e) None of the above

18. In probability sampling methods;

a) Representativeness is ensured
b) Each individual has an equal chance of being selected
c) Each individual has no equal chance of being selected
d) Representativeness is not assured
e) Open biasness is not preventable

19. Randomization helps to eliminate;

a) Confounding data
b) Ethics
c) Subjects
d) Bias
e) Attrition

20. Open ended questions primarily provide which type of data;

a) Confirmatory
b) Exhaustive data
c) Qualitative
d) Quantitative
e) Secondary

21. Which of the following terms best describes data compiled for another reason and applied in a different manner;

a) Primary
b) Secondary
c) Novice
d) Experimental
e) Triangular

22. Research questions have to be developed carefully because;

a) Wrong questions for the study means the wrong answer
b) Well developed and refined questions focus the research project
c) If not well developed, the research results will be meaningless
d) It is unethical not to develop questions carefully
e) Most participants are ignorant

23. Reliability is defined as the case in which an instrument;

a) Consistently measures the same thing
b) Measures what it is supposed to measure
c) Measures demographic data

d) Consistently measures the same sample
e) Is simple

24. Validity is defined as the case in which an instrument;

a) Consistently measures the same thing
b) Measures what it is supposed to measure
c) Measures demographic data
d) Consistently measures the same sample
e) Is simple

25. A confounding variable is one that;

a) Describes the characteristics of the study subjects
b) Can take on a wide range of values
c) Is restricted to whole- number values
d) Is an extraneous variable that cannot be controlled
e) Combines research findings

26. What do statistically significant findings imply;

a) The results are very important
b) Results are not very important
c) Results are likely due to chance differences among groups
d) Results are due to real differences among groups
e) Results should be discarded

27. When developing a nursing research project, it is important to consider ethical issues because;

a) The study will not be approved by the institutional review board
b) The protection of human subjects underlies all human research projects
c) The results will not be trustworthy and replicable
d) The researcher will not qualify for funding for the project
e) The results will not be generalizable

28. Informed consent is a crucial issue in research projects because;

a) Research results will be more meaningful
b) The researcher adheres to international codes of ethics where regulations are drawn
c) The project will be rejected by the review board if subjects are not informed
d) The subject will understand what the research is about and have the choice to or not to participate
e) It helps to eliminate bias

SECTION B: EVIDENCE BASED NURSING PRACTICE

29. Evidence based practice (EBP) means;

a) Integration of the best evidence available, nursing expertise and the values and preferences of clients
b) Practice based on how skills have been carried over time

c) Bridging the gap between the best evidence available and most appropriate nursing care of clients
d) Providing care based on nurses' intuitions
e) Practice based on knowledge taught during nursing school training

30. Importance of evidence based nursing practice include;

a) Clinical interventions are is linked to clinical outcomes
b) Uses evidence from research and other relevant literature for direct application to patient care
c) Leads to state-of- the art integration of available knowledge and evidence in a particular clinical area
d) Results in effectiveness, efficiency and safety in health care outcomes
e) Decreases satisfaction of health care workers

31. Ways of promoting evidence based best practice by nurses include;

a) Partnering with staff and other health care professionals on EBP
b) Collaborating with researchers at their hospitals or local universities
c) Starting a journal club for discussion of EBP articles
d) Incorporating EBP guidelines into revision of procedures and practice guidelines as they are reviewed
e) Paying attention to the latest news, research and standards

32. Best practice in nursing can be defined as;

a) A well written plan of nursing care
b) A systems approach to nursing care
c) Nursing actions that produce desirable patient outcomes
d) A way for nurses to justify their care
e) Practice that satisfies the interest of the nurses

33. Nurses must assess research studies to;

a) Understand that all research is scientifically sound
b) Determine the applicability of their findings to practice
c) Know that all studies are perfect
d) Identify a negative approach to research utilization
e) Identify potential benefits for practitioners

34. Nurses have a responsibility to use research because;

a) Doctors order it to be done
b) Administrators do not have time for research
c) It is nice to know
d) It is the hallmark of a profession
e) This leads to provision of quality care

35. Many nurses do not understand research because;

a) It is not necessary for their practice
b) They are too old
c) Of the complexity with which it is taught/presented

d) Patients do not expect them to use research
e) Of their negative attitude towards it

36. Using research in practice requires the nurse to be most aware of;

a) Limited funding
b) Generalizability of the results to current practice
c) Exclusion of subjects
d) The credentials of the researcher
e) Payments to the subjects

37. Obstacles to using nursing research in practice include;

a) Inadequate education, beliefs/attitudes and lack of support/resources
b) Inadequate trainers, knowledge and cost
c) Consumer tastes, values and lack of motivation
d) Poor outcomes and cost
e) Time and consumer preferences

38. An important aspect of data when making good decisions in evidence based practice is;

a) Confirmability
b) Trustworthiness
c) Independence
d) Timing
e) Quantity

39. The best method for improving a nurses' ability to incorporate research results into practice is;

a) Planning a monthly session to complete a literature
b) Completing a critique of a single research project
c) Assessing at least one research report on a weekly basis
d) Reviewing abstracts from selected research projects
e) Using contradictory evidence without reconciling them

40. The definition of a research critique implies;

a) Analytical examination or commentary of a research report
b) A negative assessment related to the weakness of a research report
c) An analytical evaluation of the literature review
d) A positive assessment of the research design
e) Criticizing research findings

APPENDIX 15: PARTICIPANTS' TRAINING EVALUATION FORM

Nursing Research & Evidence Based Nursing Course

Course Evaluation Form

1. Give the rating of the **USEFULNESS** of the following topics in the course using the **KEY** given below by circling the corresponding number:

1 – Very useful 2 – Useful 3 – Not useful

Topic	Rating		
Meaning of research & its significance	1	2	3
Roles of a nurse in research	1	2	3
Steps of scientific research	1	2	3
Types of research researches/designs	1	2	3
Research problem, Objectives , Variables & Hypothesis	1	2	3
Literature review	1	2	3
Sampling	1	2	3
Data collection methods	1	2	3
Data processing/Analysis	1	2	3
Ethical issues	1	2	3
Proposal development /report writing	1	2	3
Research Utilization	1	2	3
Meaning of Evidence Based Practice, Importance & Levels of Evidence	1	2	3
Group discussions/presentations	1	2	3

2. Give the rating of the **PRESENTATION SKILLS** of the following topics using the KEY given below by circling the corresponding number:

1. Very well presented 2. Well-presented 3. Fairly well presented 4. Need Improvement

Topic	Rating			
Meaning of research & its significance	1	2	3	4
Roles of a nurse in research	1	2	3	4
Steps of scientific research	1	2	3	4
Types of research researches/designs	1	2	3	4
Research problem, Objectives , Variables & Hypothesis	1	2	3	4
Literature review	1	2	3	4
Sampling	1	2	3	4
Data collection methods	1	2	3	4
Data processing/Analysis	1	2	3	4
Ethical issues	1	2	3	4
Proposal development /report writing	1	2	3	4
Research Utilization	1	2	3	4
Meaning of Evidence Based Practice, Importance & Levels of Evidence	1	2	3	4

3. To What extent were the topics covered?

i) Below Average ii) A ge iii) Above Av ☐ ☐

4. According to you have the objectives of the course been met?

i) Yes No ☐ ☐

5. Were all the topics relevant to the course included?

i) Yes ii) No ☐ ☐

If **No**, list the ones left out:……..

6. Give recommendations on how this course can be improved:

APPENDIX 16: CERTIFICATE OF APPROVAL FOR CPD TRAINING BY NURSING COUNCIL OF KENYA

License No. 0004

Expiry Date. APRIL 2015

NURSING COUNCIL OF KENYA

CONTINUING PROFESSIONAL DEVELOPMENT PROVIDERS CERTIFICATE

This is to certify that ALBANUS KYALO MUTISYA

has fulfilled the requirements for **Continuing Professional Development CPD)** pursuant to the Nurses Act Cap 257 Part III Section 11 and 14 and is hereby approved to offer **Continuing Professional Development as a Provider.**

Elizabeth Ogwari — Name and Signature
REGISTRAR NCK

7th April, 2014 — Date

APPENDIX 17: LETTER OF SPONSORSHIP AWARD TO PRESENT FINDINGS AT UNESCO-MERCK AFRICA RESEARCH SUMMIT

Dear Researcher – Albanus Mutisya

Greetings from Merck!

We are glad to inform you that your abstract has been selected by UNESCO MARS Scientific Committee! We are pleased to sponsor you for attending UNESCO- Merck Africa Research Summit (MARS) on 19th and 20th October 2015 in Geneva, Switzerland.

This summit aims to bring together researchers from across Africa to discuss the generation, sharing and dissemination of research data and to prepare for the road ahead in Africa's development as an international hub for research excellence and scientific innovation. UNESCO-MARS will entail a diverse set of speakers from Academia, Research institutes, major funding Organizations of Health/Medical Research, Chairs of Biology and Medical Research Councils, NGOs, Industry, Policy makers and editors of Scientific / Medical Journals.

UNESCO-MARS 2015 will be scientifically supported by UNESCO, The University of Cambridge (UK), and University of Rome (Italy).

You are requested to immediately apply for your Schengen Visa (in case you don't have a valid Schengen visa). A formal invitation letter would be send to you shortly.

Please note that all expenses related to this trip are covered by Merck (Hotel accommodation, Air Ticket to Geneva from African countries, breakfast, lunch and dinner meals at the summit)

We are very excited about this event and look forward to welcoming you to Geneva in October.

Our event management Meridiano, Frederica Russetti (f.russetti@merckgroup.com), will follow up regarding the other requirement for applying for your visa, such as hotel booking and air ticket. So please communicate with her and copy, Venu Nair(venu.nair@merckgroup.com), Russell Febrero (russell.febrero@merckgroup.com) in all your future communication regarding the logistics.

www.mars2015summit.org

We shall be communicating the updates on summit at our Twitter and Facebook account. The winners of the UNESCO-MARS Award winners would be announced shortly.

So please do not forget to join and follow us on:

@Merck_MARS

Merck Africa Research Summit

Best Regards,

Rasha Kelej
Vice President
Head of Global Business Responsibility and Market Development, Merck Serono.

APPENDIX 18: PUBLICATION 1

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Research Utilization among Nurses at a Teaching Hospital in Kenya

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ABSTRACT

Introduction: In the era of evidence based practice (EBP), health care delivery should be grounded on new or validated knowledge and evidence from research. The aim of the study was to assess research utilization by nurses and the influencing factors at Kenyatta National Hospital (KNH), the largest teaching hospital in Kenya.

Methods: The study employed a descriptive design that utilized both quantitative and qualitative methods of data collection. It incorporated the Barriers to Research Utilization Scale. It was conducted in six specialized care areas at KNH. Data was collected using questionnaires, Focus Group Discussion and in-depth interviews. Data was analyzed using SPSS version 13 and qualitative data analyzed using themes.

Results: The study found that 20.6% of the nurses were participating in research related to their work and 53.6% of these were implementing research findings to practice. Over $^2/_3$ (70.5%) of the respondents were basing their evidence for practice on the knowledge gained during their nursing school. The three greatest barriers to research utilization were that research reports are not readily available (68.7%), unclear implications for practice (66.5%) and inadequate facilities for implementation (66.4%).

Conclusion: It is recommended that sensitization trainings on nursing research/ utilization of findings in nursing practice be established to create awareness, motivate and enhance nurses' abilities and also facilities should be provided to enable implementation.

Introduction

The current health care practices require evidence in order to justify actions. Knowledge gained from undertaking nursing research is used to provide evidence besides leading to improvement in the quality of care. Nurses need to devise ways of making nursing interventions cost-effective. Evidence Based Practice (EBP), which is the deliberate use of available evidence when making decisions about the care of individual patients, has proved very useful in nursing practice. It combines information about research results, clinical expertise, patient concerns and patient preferences.[1]

Regulatory authorities and many health care institutions have realized EBP as the best way to the provision of quality, cost-effective, safe and compassionate health care.[2]

In order to meet the changing needs of both consumers and providers of health care, nurses need to shift from traditional practices to evidence-driven health care services.[3] The International Council of Nurses has been in the forefront in supporting use of research findings by nurses to inform evidence-based practice.[4]

Studies done in United Kingdom, United States of America and other developed countries have found mixed results about nurses' utilization of research findings in practice. However, great advances have been made in these countries. In Sweden, nurses are required to perform care based on

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research findings and best experiences.[5] Many health care institutions in different countries have adopted evidence-based practice and developed initiatives to advance provision of health care based on best evidence rather than on tradition.[2] Several studies have been done that utilized the Barriers Scale and investigating nurses' utilization of research results in nursing practice. Some of the identified determinants include beliefs and attitudes, involvement in research activities, information seeking, professional characteristics, education and other socioeconomic factors.[1]

Participatory management, an academic degree, education, availability of relevant research, time, positive attitudes and mentorship have also been shown to have a positive relationship with nurses' likelihood to undertake and use research in practice.[6, 7,8] Literature shows gaps in knowledge, conduct of nursing research and use of research findings to improve patient care practices. Varied reasons are cited for non-utilization of research findings in practice.[1]

Some of the reported barriers to research utilization in the studies that have utilized the barriers scale include lack of resources, time, inadequate authority to change practice, results not being generalizable to own setting and unavailability of research findings.[9-11]

Despite the emphasis and benefits associated with nursing research and EBP, few nurses utilize research findings to inform nursing practice and especially in developing countries. This is especially important in specialized care units owing to the special nature of the care provided which needs to be based on evidence. Use of research in practice remains poor.[12] Little is known about the basis of evidence for nursing practice.

According to WHO,[13] most research activities in Africa are linked to educational or academic programmers and it is not known how much nursing research is being utilized to improve nursing practice in order to ensure high quality of health care delivery to improve standards and quality of life.

Studies recommend assessment of research utilization and the influencing factors so that barriers can be effectively addressed and the concepts incorporated into practice. In Kenya, utilization of research in nursing practice has not been studied despite its prescription in the scope of practice for nurses by Nursing Council of Kenya.[14] There is knowledge gap as to why this is happening despite the advancement in nursing education. Without utilizing nursing research findings, nursing knowledge will stagnate. Modalities to improve standards of nursing practice in Kenya need to be identified and especially in the largest teaching hospital. The study therefore set to assess research utilization and the influencing factors at this teaching hospital in Kenya so as to devise measures of strengthening and enhancing evidence based nursing practice.

Materials and methods

The study employed a descriptive design and utilized mixed methods of data collection. The study utilized the Barriers' Scale to identify barriers to research utilization.

These included six specialized care units: Intensive care unit, Burns unit, Renal unit, Cardiology unit, Operating Theatres and Emergency Department at Kenyatta National Hospital which is the largest referral and teaching hospital in Kenya. Many nurses undergo their training in this institution after which they are deployed to other parts of the country where they replicate their knowledge and skills.

This involved all nurses working as clinicians, administrator's oras clinical instructors or tutors with an experience of at least one year post nursing school training.

The hospital has 1600 nurses in total with 340 deployed to the specialized care units. The formula by Fischer's et al., was used to arrive at a sample of 180 nurses. Simple random sampling method was used to obtain

the proportionate sample from each specialized care unit (ICU–56; Burns unit–16; Renal unit–16; Cardiology unit–5; Operating room–42; Emergency department - 48)

The included all nurses whether male or female working in either of the specialized care units with a minimum nursing experience of at least one year. Those on leave during the time of study were excluded.

The main tool of data collection was a self-administered questionnaire. The question naire sought information on nurses' demographic characteristics and their use of research findings in practice. It incorporated the 29-item Barriers Scale.[15] Participants completed the questionnaire at work. A Focus Group Discussion and in-depth interviews were also carried out to obtain qualitative data.

The completed questionnaires were examined daily for completeness and properly completed questionnaires were entered into computer and analyzed using SPSS version 13. Frequencies were obtained for nurses' demographic characteristics, use of research in practice and Barriers Scale ratings. The strength of relationships between variables was determined using bivariate correlations. Results were then presented in form of tables, figures and narrative.

Approval was sought from the Ethics and Research Committee of KNH and University of Nairobi and a clearance permit obtained from the National Commission for Science, Technology and Innovation. Permission to use the barriers scale was obtained from Sandra G. Funk by submitting a signed form that is available online. Permission was obtained from KNH Research and Programs Department. Participation was voluntary and a written consent was obtained from each participant. The questionnaires were serialized and the respondents were not required to write their names or any other identification numbers. Information provided was treated with utmost confidentiality and this was communicated to all the respondents.

Results

In total, 183 nurses from the specialized care units were involved in filling the questionnaires. All of them returned the questionnaires representing a 100% response rate. However, 6 questionnaires were incompletely filled.

Table 1 (Part A and B) shows the participants' characteristics. Females were more (74%) than males (26%). The mean age was 39 years (range 28 – 57 years). Majority (40%, 73) was in the age bracket of 32–43 years. Seventy four percent of the respondents were Kenya Registered Community Health Nurses. Most (30.6%, 56) of the respondents came from ICU, with 25.7%, (47) from Accident & Emergency department and 21.9%, (40) from Operating theatres. More than half (64.5%, 118) had a nursing experience of between 10 and 20 years. Over three quarters (76.5%, 140) were either nursing officer 1 or senior nursing officers.

Only 37 (20.6%) indicated having done a research other than the one they did at nursing school while 20.8% were participating in research related to their work (Table 2). More than half (53.6%) of those respondents participating in research related to their work indicated implementing research findings to practice. Forty percent of these researches were local surveys and their application led to improvements in practice or solved an existing problem. A minority (11.9%) read journals weekly or fortnightly while a majority (67.8%) took more than a month to read one. Twenty percent rarely or never read journals at all.

The main reasons given for not implementing research findings in practice were that no researches done and /or no feedback are given after doing research. More than three quarters (77%) appreciated that researches add value to practice.

Asked to indicate their basis of evidence for nursing practice, 70.7% cited knowledge gained during nursing school training while 65.2% relied on experience gained at the work place. About a quarter or less were relying on knowledge from either doing research or reading research findings from journals (Figure 1). Accessibility to journals or journal articles was indicated as a major barrier to using findings is practice owing to low or no subscription (70%, 128).

Table 1. (Part A) Demographic characteristics of the respondents (n=183)

Variable	N (%)
Age (years)	
Median (min, max)	37 (28, 57)
Mean (SD)	39 (8.4)
Sex	
Female	135 (74)
Nursing qualification	
Enrolled nurse	18 (10)
Kenya registered nurse/midwife	6 (3.3)
Kenya Registered Community Health Nurse	136(75.6)
Bachelor of science nurse	17 (9.4)
Master of science in nursing	3 (1.7)
Nursing experience (years)	
2-4	6 (3.3)
5-9	31 (16.9)
10-15	83 (45.4)
16-20	35 (19.1)
21-25	18 (9.8)
Over 25	10 (5.5)
Position	
Senior nursing officer	9 (4.9)
Nursing officer 1	131 (71.6)
Nursing officer 2	24 (13.1)
Nursing officer 3	19 (10.4)

Table 1. (Part B) Demographic characteristics cont

Variable	N (%)
Major role	
Direct patient care	158 (86.3)
Administration/nursing policy	57 (31.1)
Implementation	
Clinical instruction/teaching	20 (10.9)
Infection control	27 (14.8)
Health promotion	30 (16.4)
Research	8 (4.4)
Work station	
Intensive care unit	56 (30.6)
Accident and emergency	47 (25.7)
Renal unit	18 (9.8)
Burns unit	17 (9.3)
Cardiac unit	5 (2.7)
Operating theatres	40 (21.9)
Other courses done	
Specialized 1 yr course	53 (29.5)
Short courses	69 (37.7)
None	60 (32.8)

Table 2. Research activities and utilization

Variable	Frequency	%
Done research		
Yes	37	20.6
No	143	79.4
Total	180	
Frequency of participating in research related to your work		
Very often	6	3.3
Often	32	17.5
Rarely	116	63.4
Not at all	27	14.8
Total	181	
Frequency of reading journals		
>Monthly	120	67.8
Weekly & fortnightly	21	11.9
Rarely	15	8.4
Never	21	11.9
Total	177	
Implementing research findings at work place		
Yes	98	53.6
No	61	33.3
No response	24	13.1
Total	183	
Whether researches add value to practice		
Yes	141	77
No	20	10.9
No response	22	12
Total	183	

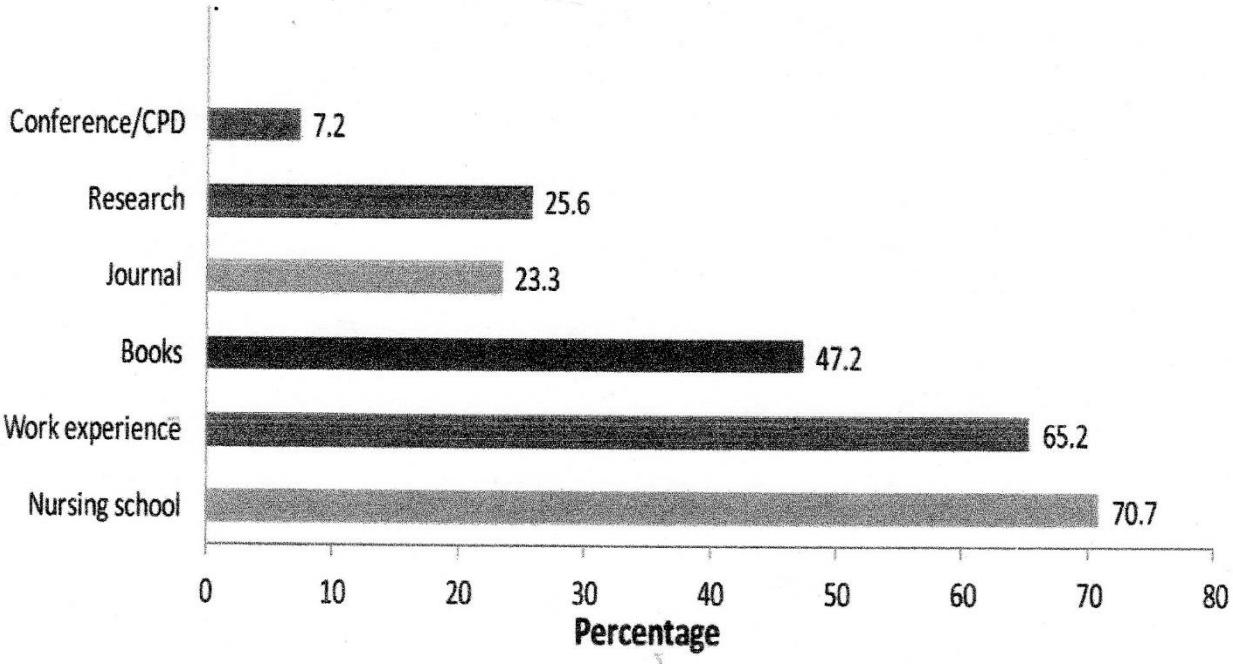

Figure1. Evidence basis for nursing practice

Professional qualification, having undertaken a post basic training or a short course and work station were shown to have a significant positive association with utilizing research findings in practice ($P < 0.05$). Also, being in an administrative position or clinical instruction role showed significant positive association with research utilization. However, sex, years of nursing experience, position held and even the level of research knowledge had no significant association with utilizing research findings in practice.

The greatest barriers to research utilization according to the ratings in the Barriers Scale were those related to accessibility and communication/presentation of the research 2.84 (1.05) with three of the top six barriers falling in this category (Table 3). The major barrier cited was unavailability of research reports (68.7%), followed by implications for practice not being clear (66.5%) and facilities being inadequate for implementation (66.4%). Characteristics of the organization featured prominently encompassing lack of time, support, authority to change practice and generalizability of results 2.99 (1.19).

Table 3. Barriers to Research Utilization Scale Ratings (Adapted from Sandra Funk et al, 1991; Scale: 1-no extent 2-little extent 3-moderate extent 4-great extent)

Barriers scale items	N	N (%)*	Mean (SD)	Overall item rank
Factor 1: Characteristics of the adopter (The nurse's research values, skills, awareness)			**2.70**	
The nurse is unwilling to change/try new ideas.	177	99 (56)	2.81 (1.17)	11
The nurse is unaware of the research.	179	97 (54.2)	2.86 (1.24)	13
The nurse feels the benefits of changing practice will be minimal.	175	95 (54.3)	2.74 (1.20)	12
The nurse sees little benefit for self.	178	93 (52.3)	2.76 (1.25)	15
The nurse does not feel capable of evaluating the quality of the research.	176	86 (48.9)	2.73 (1.24)	18
The nurse is isolated from knowledgeable colleagues with whom to discuss the research.	176	83 (47.2)	2.65 (1.25)	20
There is not a documented need to change practice.	177	77 (43.5)	2.71 (1.30)	23
The nurse does not see the value of research for practice.	177	64 (36.1)	2.35 (1.21)	27
Factor 2: Characteristics of the organization (Setting, barriers, limitations)			2.99 (1.19)	
The facilities are inadequate for implementation.	176	117 (66.4)	3.23 (1.11)	3
The nurse does not feel she/he has enough authority to change patient care procedures.	174	113 (65)	3.09 (1.20)	4
The nurse feels results are not generalizable to own setting.	177	108 (61)	2.93 (1.09)	7
The nurse does not have time to read research.	177	105 (59.3)	2.93 (1.13)	8
Other staffs are not supportive of implementation.	176	102 (58)	3.01 (1.20)	9
Physicians will not cooperate with implementation.	176	99 (56.3)	3.18 (1.27)	10
There is insufficient time on the job to implement new ideas.	175	94 (53.7)	2.91 (1.25)	14
Administration will not allow implementation.	174	80 (46)	2.67 (1.28)	22
Factor 3: Characteristics of the innovation (Qualities of the research)			**2.80**	
Research reports/articles are not published fast enough.	176	112 (63.7)	3.17 (1.17)	5
The research has not been replicated.	176	89 (50.6)	2.95 (1.28)	17
The research has methodological inadequacies	178	85 (47.8)	2.82 (1.25)	19
The nurse is uncertain whether to believe the results of the research.	177	81 (45.8)	2.63 (1.22)	21
The literature reports conflicting results.	177	74 (41.8)	2.72 (1.35)	24
The conclusions drawn from the research are not justified.	176	67 (38)	2.53 (1.26)	26
Factor 4: Characteristics of the communication (Presentation and accessibility of the research)			2.84 (1.05)	
Research reports/articles are not readily available.	179	123 (68.7)	3.21 (1.06)	1
Implications for practice are not made clear.	179	119 (66.5)	3.23 (1.08)	2
Statistical analyses are not understandable.	179	112 (62.5)	3.08 (1.12	6
The amount of research information is overwhelming	176	90 (51.1)	2.78 (1.23)	16
The relevant literature is not compiled in one place.	176	86 (48.9)	2.85 (1.27)	18
The research is not reported clearly and readably.	178	71 (39.9)	2.51 (1.28)	25
The research is not relevant to the nurse's practice.	176	47 (26.7)	2.20 (1.34)	28

*Reporting item as moderate/great barrier

Respondents in the in-depth interviews mentioned inconsistent knowledge/skills of research and information search and indicated the need for creating awareness among the nurses. Lack of mentorship and motivation also emerged as major setbacks. Participant No 7: "Nurses need to be informed or updated with knowledge to know how to start off and also made aware of research opportunities." Participant No 13: "Nurses lack training in research." Participant No 9: "Nurses need extra training." Participant No 1: "Give nurses knowledge /Trainings showing them it is not difficult. Simplify it for them. Let them know they can do it."

Carrying out research/utilizing findings is not emphasized in the work place. It is not considered as part of the job description. Participant No 13 and 14: "There is no support for nurses to do research. Participants No 3 and 4: "There is lack of team approach. Nurses generally don't have interest to do things together.

There is lack of support from fellow nurses." Following feedback given to the management of this hospital after this survey, a program has already been started in the institution to support research by availing research funds and training researchers.

Nurses showed a lot of enthusiasm to base their practice on research findings. However, few nurses were motivated to do research. Also, there are no mentors in nursing research. Participant No 14:"There is no mentoring for nurses who wish to do research." Nurses are overwhelmed by the much work that they have to do owing to shortage of staff. Time factor was identified by almost all the participants in the in-depth interviews. Participant No 7 and No 10: "The kind of work is demanding. There is no time as you are fatigued at end of the day."

All respondents appreciated the importance of utilizing research findings in practice and especially for evidence based practice which lead to improvement in the care of patients and provision of rationales for nursing care interventions. Almost all participants (n =12) indicated the need for appropriate mentoring and an organized approach in creating a research culture among the nurses.

Discussion

The study found that, 20.6% of the respondents had done a research other than the one they did at nursing school and 20.8% were participating in research related to their work. About half (53.6%) of these had implemented research findings in practice and this led to improvements in practice or solved an existing problem. This concurs with the emphasis by Mehrdad and Salsali,[16] that utilizing research results in practice translates into efficiency, effectiveness and quality improvement in health care.

Over 70% of the respondents were basing their evidence for practice on knowledge gained during nursing school training while 65.2% relied on experience gained at the work place. While useful experiences are good for replication, this may sometimes lead to practices steeped in tradition which may not be useful to recipients of care. About a quarter or less were basing their evidence for practice on their own research findings or reading journal articles. It is apparent that if nurses do not use research findings in practice, then the benefits associated with it will be denied to the clients seeking health services.

The results show the greatest barriers to research utilization were related to the accessibility and availability of research results, unclear implications for practice and inadequate facilities. In fact respondents cited that few nurses engage in research and the findings of those few are not made available. The results are in agreement with previously published researches regarding utilization of research

findings by nurses and factors that act as barriers. Yaya et al.,[9] found the most important barriers in Turkey as inadequate authority, lack of time and insufficient facilities. Patiraki et al.,[10] in Greece found the two key barriers were related to the availability of research findings while Carrion et al.,[11] in Spain reported barriers related to the applicability of research results to own settings besides characteristics of the organizations where nurses worked and characteristics of the nurses themselves.

In UK, Closs et al.,[17] found time, facilities and cooperation from colleagues as the greatest areas of concern. In the same country, Garish and Lacey[18] found engaging nurses in research or utilizing findings in practice an extremely difficult concept in the initial stages but these were gradually adopted. In China, Sing-Ling Tsai[19] found low participation in research but nearly half of the nurses had utilized research to change practice in the preceding 3 years. The main barriers were lack of time and staff.

In this study, respondents showed significant understanding of the importance of research in nursing practice and especially for evidence based practice. Nurses also reported lack of adequate knowledge, time, mentorship, and administrative support as other barriers to their research activities. These findings are similar to those found by Mehrdad and Salsali,[16] in Iran and by Kuupelomaki and Tuomi in Finland.[20] Majority (over 80%) of respondents indicated the need to be sensitized on and supported in research activities and utilization of research findings in practice.

Conclusion

The study established the proportion of nurses utilizing research findings in practice and the evidence that they based their practice on. It also identified various barriers to utilization of research findings in practice. The findings from some of the researches done were utilized in practice and this led to improvements. The respondents showed great understanding of the importance of research in nursing practice and more so for evidence based practice. They expressed great interest to be facilitated to carry out research and/or use findings in practice. There was a significant positive association between utilizing research findings in practice and nursing qualification, post basic training and work station. However, nurses cited the major barriers to utilizing findings in practice as the unavailability of research reports, unclear implications for practice and inadequate facilities. Also, inconsistent knowledge or skills, lack of time, support, motivation and results that are not generalizable to local setting were other barriers cited. These need to be addressed and especially for nurses in developing countries where 84% of the worlds' population live and which account for 93% of the word wide burden of disease.[19]

There is need to design strategies to support nurses' involvement in research and utilization of research findings in practice so as to enhance evidence based practice in health care systems in Kenya.The significance of nursing research and utilization of findings in practice needs to be emphasized during nurses' training period and incorporated in nurses' induction programs. Sensitization trainings on nursing research or utilization of findings in nursing practice are established to create awareness, motivate and enhance nurses' abilities and improve practice.

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Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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APPENDIX 19: PUBLICATION 2

RESEARCH ACTIVITIES AMONG NURSES IN A TEACHING AND REFERRAL HOSPITAL IN A DEVELOPING COUNTRY, KENYA

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Abstract

Introduction: In this era of evidence based practice and knowledge-driven health care, nurses are constantly challenged to discover new and better ways of delivering care that is grounded in new knowledge and evidence derived through research. Ndune (1995) as reported by Mukthar (2006) asserts that very little scientific nursing research has been done in Kenya except those linked to academic requirements. There is knowledge gap as to why the proportion of nurses who undertake nursing research is still minimal and little is known as to how much nursing research is being used to improve nursing practice. Objective: The study was done to determine the research activities and identify factors influencing the same among nurses in critical care units of the largest teaching and referral hospital in Kenya (i.e. Kenyatta National Hospital). Materials and Methods: It was a descriptive cross-sectional study that utilized both quantitative and qualitative methods of data collection. It was conducted at the six critical care units in KNH. Questionnaires were distributed to a random sample of 183 nurses. A focus group discussion of 8 members and in-depth interviews with 15 participants was also carried out. Qualitative content analysis, frequencies and correlations were used for analysis that employed SPSS version 16.0. Results: The research found that, about 93% of the nurses indicated having undergone the NCK-prescribed training in basic research during their training and over ¾ rated their knowledge as adequate to carry out basic research to improve practice. Only 20.6% of the nurses had carried out a research and a similar percentage were involved in research activities related to their work. The role played in the work setting, short improvement courses done and work station had significant positive association with doing research ($P<0.005$). Nurses cited several factors as barriers to their research activities and expressed need for sensitization trainings, support and mentorship on the research process. It is Recommended that, a capacity building programme on nursing research/evidence based nursing practice be established to create awareness, motivate and enhance nurses' research/practice potentials.

Introduction

Nursing research is a systematic enquiry that seeks to add new nursing knowledge to benefit patients, families and communities. It encompasses all aspects of health that are of interest to nursing, including promotion of health, prevention of illness, care of people of all ages during illness and recovery or towards a peaceful and dignified death. (ICN, 1998). The knowledge generated through nursing research is used to develop evidence-based practice, improve the quality of care and to maximize health outcomes and cost-effectiveness of nursing interventions. The insatiable need for quality and cost effectiveness in health care has brought evidence based practice (EBP) and nursing research into focus. EBP is the deliberate use of available evidence when making decisions about the care of individual patients, and it combines information about research results, clinical expertise, patient concerns and patient preferences (Sackett et al., 1996 as reported by Birgitta, 2010). It has been regarded by healthcare providers and regulating authorities, as the gold standard for the provision of high quality, safe and compassionate health care.

The International Council of Nurses (ICN) has demonstrated a commitment to both nurses' active participation in nursing research (ICN 2006) and the 'use of research to inform evidence-based practice' (ICN 2007). Globally, many governments have embraced evidence-based practice and developed initiatives to advance provision of health care based on best evidence rather than on tradition (Parahoo, 2000, Retsas 2000, Glacken & Chaney 2004 as reported by Brown et al., 2009).

Some countries like Sweden require nurses to perform care based on research findings and best experiences (Socialstyrelsen, 2005; as reported by Birgitta, 2010). Several studies have been done investigating nurses' research activities and attitudes as well as facilitators and barriers to involvement in research activities and the utilization of research results in nursing practice. Some of the identified determinants include beliefs and attitudes, involvement in research activities, information seeking, professional characteristics, education and other socioeconomic factors (Estabrooks, et al., 2003 as reported by Birgitta, 2010).

Also, participatory management, an academic degree, education, availability of relevant research, time, positive attitudes and mentorship have shown a positive relationship with nurses' likelihood to undertake and use research in practice (Estabrooks et al., 2003, Hutchinson & Johnston 2004, Kajermo et al., 2008).

Statement of the problem The principles and methods of nursing research were introduced 25 years ago in Kenya in the post basic nursing curricula (Karani et al., 2003). According to the 'Scope of Practice for Nurses in Kenya' by Nursing Council of Kenya (2012), Nurses in Kenya are trained at different levels from certificate to PhD. More recently, most nurses are being trained at the baccalaureate level and the pool of highly trained nurses has continued to build up. In all these training programmes, nursing research is incorporated as part of the learning content and the scope of practice prescribes various activities for nurses' involvement in research.

Despite the increase in the availability of basic scientific knowledge, many nurses do not undertake or utilize nursing research. Research knowledge among nurses and use of research in practice remains poor (Ndune, 1995). In addition, utilization of research evidence by nurses in clinical settings is still not perceived favorably or used proactively by the majority of nurses. This is especially important in critical care units owing to the special nature of the care provided which needs to be based on evidence. According to WHO (2001), most research activities in Africa are linked to educational or academic programmes. The same applies to the Kenyan situation.One of the biggest challenges of the Ministry of Health and regulatory authorities like the Nursing Council of Kenya is to ensure high quality of health care delivery to improve standards and quality of life. This calls for professionals to develop better and more efficient methods of health care delivery (Karani, 2001).

Mangera (1999) expressed concern over the falling standards of nursing care and recommended research to be strengthened in order to find new ways of uplifting nursing standards. It is impossible to provide health services that are consistent with the current professional knowledge without research undertaking and utilization of the results (Schoonover, 2009). Nurses provide 24-hour bed side care and thus have a great opportunity to undertake research and apply their knowledge to meet patients' holistic needs (Garbutt, 2006)

Ndune (1995) as reported by Mukthar (2006) asserts that very little scientific nursing research has been done in Kenya and even where it is done; it has not translated to improve nursing practice. There is knowledge gap as to why the proportion of nurses who undertake nursing research is still minimal and little is known as to how much nursing research is being used to improve nursing practice and especially in the critical care units. If nurses do not undertake and utilize nursing research, they will continue using knowledge acquired during their years in training and nursing knowledge will remain stagnant.

Okoko (1999) observed that nursing standards have gone down and nurses need re-teaching (as reported by Karani, 2001). Okoko further noted that there is serious need to find new ways of thinking through research.

It is important that the research activities of nurses at this referral hospital in Kenya be identified so as to devise measures of strengthening the research capacity and enhancing evidence based nursing practice.

Research Questions:

1.What research activities do nurses in the major teaching and referral hospital in Kenya engage in?

2.Which factors influence undertaking of research among nurses in the major teaching and referral hospital in Kenya?

Research Hypothesis:

1.There is no relationship between nurses' demographic/professional characteristics and doing research

Specific Objectives

1. Identify the research activities among nurses in critical care units
2. Establish the factors that facilitate or inhibit research activities
3. To determine the relationship between nurses' demographic/professional characteristics and carrying out research

Literature review

Research is a systematic enquiry that seeks to add new nursing knowledge to benefit patients, families and communities. Nursing research, both qualitative and quantitative, is critical for quality, cost-effective health care. It is needed to generate new knowledge, evaluate existing practice and services, and provide evidence that will inform nursing education, practice, research and management. The main goal of nursing research is to improve care outcomes by advancing nursing knowledge and practice and to inform health policy (ICN, 1999). ICN identifies Health and Illness and Delivery of Care Services as the two broad areas of nursing research priorities.Research-based practice will lead to the improvement of the nursing profession. It is important that nurses demonstrate that, their practice is effective, efficient and worthwhile, and that it is appropriate and justifiable. In spite of the increase in nursing research education, research knowledge among nurses and use of research in practice remains poor (Jolley, 2002 as reported by Mahvash and .Mehrdad, 2009). Many researchers have identified both barriers and facilitators to the undertaking of research in nursing. Some consistently reported barriers are: lack of time, organizational cultures rewarding routine, task-based practice; lack of administrative support; lack of mentorship; lack of access to resources; poor understanding of statistics; unclear workplace expectations; and inconsistent basic knowledge and experience with research (Funk et al., 1991a, DiCenso et al., 1998, Newman et al., 1998, Parahoo 2000, Retsas 2000, Estabrooks et al., 2003, Fink et al., 2005, Kajermo et al., 2008 as reported by Brown et al.,2009).

The attitudes of nurse practitioners to research, the importance they attach to it, the rewards for doing it and the willingness of employers to provide financial and other resources needed to undertake research have been cited as important motivators (Chapman, 1996). It has also been observed that, researchers do not develop the necessary programmes needed to encourage acceptance and integration of their research findings (Hunt, 1991). Lack of positive research culture within wards also play a role in inhibiting research undertaking (Nelson, 1995). Engaging nurses in research and creating knowledge offer opportunity for them to progress (Winter, 1990). Opportunities should be made available for practicing nurses to engage in research. However, creating a clinical research culture and increasing nursing research capacity is not easy. Factors influencing this range from individual attributes to organizational difficulties (Bryar et al., 2003).

Materials and Methods

Study design

It was a descriptive cross-sectional study that was done between May and October, 2013.

Study areas

These included six critical care units (ICU, Burns Unit, Renal Unit, Cardiology Unit and Emergency Department (ED) of Kenyatta National Hospital which is the largest referral and teaching hospital in Kenya. Many nurses undergo their training in this institution after which they are deployed in other parts of the country where they replicate their knowledge and skills.

Study population

The study population involved all nurses deployed in clinical work environments, administration or in training sections with an experience of at least one year post nursing school training.

Sampling method

KNH has 1600 nurses in total with about 340 being deployed to the critical care units. The Formula by Fischer's et al (1999) was used to arrive at a sample of 183 nurses. Simple random sampling method was used to obtain the proportionate sample from each critical care unit (ICU–56; Burns unit–16; Renal unit–16; Cardiology unit–5; Operating room–42; A&E-48)

Inclusion / Exclusion criteria

For inclusion in the study, one was required to be a nurse, male or female working in either of the critical care units with a minimum nursing experience of at least one year.

Data collection tools

The main tool of data collection was a self administered questionnaire.

The questionnaire sought information on nurses' demographic/professional characteristics and their research activities.

Participants completed the questionnaire at work. A Focus Group Discussion and in-depth interviews were also carried out to obtain qualitative data.

Data management

The completed questionnaires were examined daily for completeness and properly completed questionnaires were entered into computer and analyzed using SPSS version 16.0. Frequencies were obtained including those of nurses' demographic and professional characteristics. The strength of relationships between variables was determined using bivariate correlations. Results were then presented in form of Tables, Figures and descriptions.

Ethical considerations:

1. Approval was sought from the Ethics and Research Committee of KNH/UON (Ref P119/04/2011) and a clearance permit obtained from the National Council for Science and Technology (Ref NCST/RCD/12A/013/141).
2. Permission was obtained from KNH administration (Research and Programs Ref NURSING/01/013)
3. Participation was voluntary and a written consent was obtained from each participant.
4. The questionnaires were serialized and the respondents were not required to write their names or any other identification numbers.
5. Information provided was treated with utmost confidentiality and this was communicated to the respondents.

Results

Demographic/professional characteristics of the nurses

In total, 183 nurses from the critical care units at KNH were involved in filling the questionnaires. All of them returned the questionnaires representing a 100% response rate though 6 questionnaires were incompletely filled. Table 1a shows the demographic/professional characteristics of the respondents. Females were more (74%) than males. The mean age was 39 years (range 28 – 52 years).Majority (40%) were in the age bracket of 32 – 43 years. Seventy four percent of the respondents were KRCHN. Most (30.6%, 56) of the respondents came from ICU, followed by 25.7%, (47) from Accident & Emergency department and 21.9%, (40) from Operating Theatres. More than half (64.5%) had a nursing experience of between 10 and 20 years. Over three quarters (76.5%) were either nursing officer 1 or senior nursing officers.

Table 1a: Nurses' demographic and professional characteristics (n=183)

Median age (min, max)	37 (28, 52) Mean 39		
Sex Female	135	(74%)	
Nursing qualification	**Frequency (n= 180)**	**Percentage**	
ECN, KRN	24		13.3
KRN	6		3.3
KRCHN	136		75.6
BScN	17	9.4	
Masters	3	1.7	
Years of experience	**Frequency (n = 183)**	**Percentage**	
5-9 yrs	31	16.9	
10-15 yrs	83	45.4	
16-20 yrs	35	19.1	
Position	**Frequency (n = 183)**	**Percentage**	
SNO	9	4.9	
NO1	131	71.6	
NO2	24	13.1	
NO3	19	10.4	
Major role	**Frequency (n = 183)**	**Percentage**	
Direct patient care	158	86.3	
Nursing administration	57	31.1	
Work station	**Frequency (n = 183)**	**Percentage**	
ICU	56	30.6	
A & E	47	25.7	
Operating Theatres	40	21.9	
Burns unit	17	9.3	
Renal unit	18	9.8	
Cardiac unit	5	2.7	
Other courses done	**Frequency (n = 183)**	**Percentage**	
Specialized 1 yr course	53	29	
Short courses	69	37.7	
None	60	33.3	

Research Knowledge and activities

About 93% of the nurses indicated having undergone basic training in research during their college course as prescribed by the Nursing Council of Kenya. More than ¾ indicated that this knowledge was adequate to enable them carry out basic researches. One hundred and eighteen (64.5%), rated their research knowledge as either good or excellent. Only 37 (20.6%) indicated having done a research other than the one they did for academic qualification while 78.2% rarely or did not participate in research related to their work (Table 1b). A minority (11.9%) read journals weekly or fortnightly while a majority (67.8%) read them at least monthly.

Table 1b: Nurses' research activities

Research taught during training	**Frequency (n= 183)**	**Percentage**
Yes	170	92.9
No	13	7.1
Adequacy of research taught to enable conduction of R.	**Frequency (n= 170)**	**Percentage**
To no extent	4	2.3
To a little extent	41	24.1
To a moderate extent	94	55.4
To a great extent	31	18.2
Rating level of research knowledge	**Frequency (n = 183)**	**Percentage**
Excellent	4	2.2
Good	114	62.3
Fair	59	32.2
Poor	6	3.3
Done research	**Frequency (n = 180)**	**Percentage**
Yes	37	20.6
No	143	79.4
Frequency of participating in research related to your work	**Frequency (n = 181)**	**Percentage**
Very often	6	3.3
Often	32	17.5
Rarely	116	63.4
Not at all	27	14.8
Frequency of reading Journals	**Frequency (n = 177)**	**Percentage**
>Monthly	120	67.8
Weekly & Fortnightly	21	11.9
Rarely	15	8.4
Never	21	11.9

Relationshipbetweennurses' demographic/professional characteristics and doing research

Professional qualification, having undertaken a post basic training or a short course and work station were shown to have a significant positive association with doing research $P < 0.05$).

Sex, years of nursing experience, position held and even the level of research knowledge had no significant association with doing research (Table 2). Also, being in an administrative position or clinical instruction role showed significant positive association with doing research.

Table 2: Association of nurses' demographic /professional characteristics and doing research

Demographic/ Professional characteristic	**Doing research**		
	Yes	**No**	**P Value**
ECN	1	10	
KRN	4	2	
KRCHN	4	3	
BScN	23	116	
Masters	8	12	
Total	37	143	0.05
Other training/Short courses			
Specialized 1 yr course	14	39	
Short courses	16	52	
None	7	51	
Total	37	142	0.05
Work station			
ICU	16	40	
Renal unit	4	14	
Burns unit	0	16	
Cardiology unit	3	2	
A and E	8	39	
Operating theatres	6	32	
Total	37	143	0.034
Major roles			**P Value**
Nursing administration			
Yes	9	16	
No	27	127	
Total	36	143	0.033
Teaching/clinical instruction			
Yes	8	12	
No	28	130	
Total	36	142	0.019
Research			
Yes	5	3	
No	31	139	
Total	36	142	0.002

Thematic analysis of qualitative data

Barriers to carrying out research or being involved in research activities that came up during the focus group discussion and in-depth interviews are as outlined in Table 3:

Table 3: Main themes emerging about barriers to carrying out research

No	Main Themes
2	Nurses' attitudes
4	Motivation and mentorship

Inconsistent/insufficient knowledge/skills on research and awareness:

It emerged that the knowledge and skills that nurses have on research is insufficient or inconsistent. Moreover, many of them do not know that research is part of their responsibilities. This is despite many of them indicating that, research brings about evidence in practice besides helping to improve and solve problems in practice.

Participant No 7: "Nurses need to be informed or updated with knowledge to know how to start off and also made aware of research opportunities." Participant No 13: "Nurses lack training in research." Participant No 9: "Nurses need extra training." Participant No 1: "Give nurses knowledge /Trainings showing them it is not difficult. Simplifying it for them. Let them know they can do it."

Nurses' attitude towards research:

Most nurses think research is difficult or is for others who are well trained. They look at it as difficult and too complex to understand. This is despite the fact that many appreciate it importance. Others are happy with status quo and resist change. Generally, research culture is lacking. Participant No 3 and No 5: "Nurses view research as a very complicated discipline. Are afraid of research. They think research is for others who are well trained. They are happy to be data collectors."

Support from institutions/colleagues:

Carrying out research is not emphasized in the work place. It is not considered as part of the job description. Also, there is not much support with regard to resource availability and accesibility. Innovation is not encouraged.

It is only recently that a program was instituted to support research by availing research funds. Participant No 13 and 14: "There is no support for nurses to do research. No much support from administration. Cooperation and support from colleagues is also lacking. Mostly, those wishing to do research do it alone. There are few or no collaborative efforts among nurses. Participant No 3 and 4: "There is lack of team approach. Nurses generally don't have interest to do things together. There is lack of support from fellow nurses."

Motivation and Mentorship:

Few nurses are motivated to do research. Internal motivation is lacking and this is accentuated by lack of incentives to do research.

Also, there are no mentors in nursing research. Participant No 14:"There is no mentoring for nurses who wish to do research."

Workload/Time factor:

Nurses are overwhelmed by the much work that they have to do owing to shortage of staff. They thus get no time to do research. Time factor was identified by almost all the participants in the in-depth interview. Participant No 7 and No 10: "The kind of work is demanding. There is no time as you are fatigued at end of the day."

The most outstanding finding of this study was the significance that participants gave to the need for `sensitization/re-training sessions on the research process'. Five of the seven items that loaded onto this factor were reported as moderate or great barriers (Likert score 3 or 4, respectively)

Nurses were shown to view research as a very difficult subject to understand. This was so even though they indicated it is important to improve the care of patients and in provision of rationales for nursing care interventions. The importance of providing support and resources by organizations as well as incentives in order for nurses to carry out research in their practice was also confirmed in the qualitative statements made by participants. Almost all participants (12) indicated the need for appropriate mentoring and an organized approach in creating a research culture among the nurses.

Discussion

This study found that, although nurses undergo training in basic research as prescribed by the Nursing Council of Kenya, and are expected to carry out basic researches, few of them are conducting them or are involved in research activities.

The results are in agreement with previously published works regarding nurses' research activities. Gerrish and Lacey (2006) found engaging nurses in research in UK difficult. Also in China, a study done by Sing-Ling Tsai (2000) and by Eui-Geum Oh (2007) in Korea found low participation in research by nurses.

The respondents showed significant understanding of the importance of research in nursing practice and especially for evidence based practice. Nurses reported lack of adequate knowledge, time, mentorship, and administrative support as being the main barriers to their research activities. These findings are similar to those found by Mahvash and Neda (2009) in Iran and by Kuupelomaki and Tuomi (2005) in Finland.

Majority (over 80%) of respondents indicated the need for re-training/sensitization seminars on the research process. Areas identified for these included the research process, proposal development, literature review, data collection and analysis, report writing, dissemination and utilization of findings.

The results are in agreement with previously published works regarding factors that influence nurses' research activities (Retsas A., 2000; Fitzpatricks J., 2007; Brown C.E. et al, 2008).

Conclusions

The study identified various research activities in which nurses were involved. Some had carried out researches and utilized findings in practice. The respondents showed great understanding of importance of research in nursing practice and more so for evidence based practice. They expressed great interest to be facilitated to carry out research or be involved in it. There was a significant

positive association between doing research and nursing qualification, post basic training and work station.

However, nurses cited inconsistent knowledge/skills, attitude towards research and lack of support from institutions and colleagues as the main barriers to research conduction/involvement and expressed dire need sensitization, mentorship and support.

Recommendations

There is need to develop a structured approach to enhance nursing research capacity and incorporate EBNP in health care systems in Kenya.

1. There is need to establish a support and coordination agency that will help develop nursing research capacity and incorporate EBNP in health care systems in Kenya through development of short sensitization trainings/sessions on research process/evidence based nursing practice.
2. To ensure sustainability, these sensitization trainings need collaboration from stakeholders like Nursing Council of Kenya and National Nurses' Association of Kenya.
3. Future selection of best health care institutions for awards/recognition should take into consideration the use and support for nursing research and evidence based

nursing practice as a criteria.

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