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Knowledge, attitudes and practices regarding trading intensive care nurses on evidence-based practice at an academic hospital in Gauteng.

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CHAPTER ONE

OVERVIEW OF THE STUDY

1.0 INTRODUCTION

This chapter will provide an overview of the study which will include: background of the study, the problem statement, the research questions, the purpose and specific objectives, the importance of the study, the researcher's assumptions, definition of terms, a brief outline of the research methods, validity and reliability, ethical considerations and finally the chapter summary.

1.1 BACKGROUND OF THE STUDY

This study is an investigation of trained Intensive Care Unit (ICU) nurses knowledge, attitudes and practices on evidence-based practice (EBP) at an academic hospital in South Africa. The definition of EBP encompasses the integration of best available scientific research with individual clinical expertise in making decisions about the care of individual patients (Hansen & Severinsson, 2009).

It is the mechanism that is advocated within the health care system both worldwide and in South Africa. It is supported by the nursing regulatory bodies both internationally (ICN, 2009) and nationally such that the South African Nursing Council (SANC, 2008) broadened its requirements for trained registered nurses to provide care that is evidence-based to improve outcomes in fulfilling their professional nursing role.

Evidence-based practice therefore, has been equated to effective decision making, prevention of harmful habits and enhanced clinical performance thereby favoring the current nursing profession standards of practice for trained, advanced and specialist nurses (Nolan & Bradley, 2008). With its use, nurses have been enabled to remain up-to-date with health care trends as well as enhancing their critical thinking abilities which is ideal to ICU nurses because of the nature of their work requiring quick, constant critical decision making. This in turn results into provision of care that is of high quality to critically ill patients (Hansen & Severinsson, 2009).

Unfortunately, two recent studies raised a concern of ICU nurses lacking in knowledge or perhaps understanding of EBP in relation to EBP guidelines (Gomes, 2010; Perrie, 2006). This study will try to explore this fact. In addition, Eccles, Grimshaw, Walker, Johnston & Pitts (2005) concluded that 30.0 - 40.0% of patients do not receive care that is evidence-based and that 20.0 - 25.0% of the care that the patients receive is not needed or can potentially harm the patient.

Furthermore, even though some international studies on EBP may have concluded that nurses have positive attitudes regarding EBP (Koehn & Lehman, 2008; Lai, Teng & Lee, 2010; Melnyk, Fineout-Overholt, Feinstein, Li, Small et al, 2004) a percentage of 20.0 - 40.0% in some studies was found to have negative attitudes thereby signifying the inconsistent views on EBP by the nurses (Koehn & Lehman, 2008; Lai, Teng & Lee, 2010; Pravikoff, Tanner & Pierce, 2005). Similarly, those studies that looked at barriers and implications, portrays different attitudes by nurses towards EBP for example closed minds and resistance to practice (Koehn & Lehman, 2008; Melnyk et al, 2004).

Van Achterberg, Schoonhoven & Grol (2008) points out that nurses are not a uniform target group but are professionals with various educational levels, specializations, work settings and patient populations to be served. All these variations are potentially relevant to determining knowledge, attitudes and practices. In spite of this, limited data about trained ICU nurses' knowledge, attitudes and practices regarding EBP exists.

This also correlates with the author's finding that there was no meta-analysis of studies on trained ICU nurses knowledge, attitudes and practices on EBP. Those studies identified were also limited by the nature of the sample where there was no distinction between trained or untrained nurses or ICU nurses mixed with other general ward nurses or there were mixed study setting: academic and public hospitals (Brown, Wickline, Ecoff & Graser, 2009; Egerod, 2004; Koehn & Lehman, 2008; Lai, Teng & Lee, 2010; Melynk et al, 2004).

This poses weakness to the evidence or knowledge produced as might be too abstract or too general for direct application to specific local situations or contexts thereby raising questions to the generalization of the data (Polit & Beck, 2008). Secondly, the lack of specifying the nurses by specialty areas and their specialization can rather produce

evidence that is not of high quality and not taking into account individual patients cared for. Therefore, the nature of this study sample being specific to trained ICU nurses allows for the discovery of their specific knowledge, attitudes and practices towards EBP.

Finally, studies continue to prove that nursing practice is still not based on best available evidence (Gomes, 2010; Perrie, 2006; Pravikoff, Tanner & Pierce, 2005**).** This call for a need to specifically research further hence in trying to address the problems raised, the researcher will use a mixed method approach with the hope of providing better understanding of the research problem.

1.2 PROBLEM STATEMENT

Despite many published articles and advances on EBP, nursing practice is still not based on evidence. The provision of care in the ICU is widely demanding and requires high level critical thinking and decision making skills inherent in the nursing profession there by demanding the use of EBP for nursing. Trained ICU nurses are the key to EBP for nursing as are advanced practitioners with high qualifications, skills, competences and advanced roles (ICN, 2009).

As has been noted earlier, previous studies on nurses towards EBP shows lack of specificity as well as varying levels of knowledge and attitudes (60.0 - 80.0%). The studies tend to focus very largely on general nurses. Consequently what evidence that best describes trained ICU nurses knowledge, attitudes and practices on EBP is as of yet un-known. Furthermore, few published studies exists in South Africa on EBP and those identified (published) only focused on EBP guidelines as opposed to trained ICU nurses knowledge, attitudes and practices on EBP.

This study was motivated by the need to produce high quality evidence and intends to explore whether the knowledge gap and positive attitudes regarding EBP for nursing applies to trained ICU nurses and whether the inability to use best available evidence is due to the trained ICU nurses' lack of knowledge or negative attitudes regarding EBP hence clarify the situation by describing their knowledge, attitudes and practices regarding EBP.

Therefore, the problem addressed was to find out:

- What is the level of knowledge, attitudes and practices of trained ICU nurses regarding EBP?
- Is the study questionnaire valid in the South African context?
- Are the local results similar to the international results?
- How is EBP perceived and implemented by trained ICU nurses?
- How will the qualitative data help explain the quantitative data, are there any similarities?

1.3 PURPOSE OF THE STUDY

The purpose of this study was therefore; to describe trained ICU nurses knowledge, attitudes and practices on evidence-based practice for nursing at an academic hospital in Gauteng.

1.4 RESEARCH OBJECTIVES

To meet the purpose of the study the following objectives were outlined;

- To describe trained ICU nurses' knowledge, attitudes and practices regarding EBP.
- To establish reliability and validity of the questionnaire in South African setting.
- To compare local results from questionnaire to international data published.
- To understand fully the perceptions of trained ICU nurses on EBP in South Africa.
- To explain the quantitative results using the qualitative data.

1.5 SIGNIFICANCE OF THE STUDY

Knowledge is needed to make an accurate decision. Therefore, this study will facilitate decisions regarding EBP in the ICU. Thus, the study will try to add knowledge to the nursing profession by establishing an empirical foundation for the current knowledge, attitudes and practices of trained ICU nurses on EBP. Quantification of this knowledge will facilitate recommendation for appropriate education programmes to ensure successful

implementation of EBP hence resulting in improved and cost effective patient care provision in the ICU.

Furthermore, it is stated in the health care act as well as in the SANC curriculum of ICU course that this information is needed. The nature of the study being specific to trained ICU nurses facilitates the production of high quality specific results necessary for addressing the specific needs of trained ICU nurses in the context of EBP.

The study made use of two approaches: quantitative and qualitative. Quantitative approach was used to collect quantitative data in form of numbers using a questionnaire. Qualitative approach was used to collect qualitative data in form of words using focus groups discussions. Deeper understanding was elicited from the focus groups which added value to the quantitative results obtained hence giving a broader picture of the problem.

Finally, this research builds on the foundation of two descriptive studies that preceded it. The first was that of Perrie (2006) who evaluated the knowledge of ICU nurses specifically on pain, glycemic control protocols. The second was by Gomes (2010) who specifically evaluated the protocols on prevention of ventilator associated pneumonia.

They both found out that the ICU nurses were lacking knowledge in the protocols. Hence this study endeavored to explore this fact and also to establish whether the knowledge gap and positive attitudes regarding EBP for nursing applies to trained ICU nurses.

1.6 RESEARCHERS ASSUMPTIONS

The study was based on the following researcher's assumptions;

1.6.1 Meta – Theoretical Assumptions

Meta - theoretical assumptions relates to philosophical beliefs. The researcher's meta-theoretical assumptions were influenced by the Synergy model founded by the American association of critical - care nurses (Alspach, 2006). In this regard the following assumptions were made on the four major concepts of nursing, in the context of intensive care nursing:

- **Person**

In the study, a person was referred to as the ICU patient, the patient's family, the ICU nurse and other health care team members. The ICU patient was central on this concept and was the person with a critical or life threatening condition requiring highly patient centered specialized care to meet his or her health care needs. The ICU patient might be highly sedated, delirious or in a compromised state to communicate. The ICU patient was therefore viewed as a unified irreducible whole (biologic, physiologic, psychological, social and spiritual) having own distinctive characteristics shaping his or her needs (Alspach, 2006).

The family was referred to the entire patient's significant others affected with the patient's illness and supporting the patient during the time of illness in the ICU.

The ICU trained nurse was the central focus for the study functioning as an inter-professional team member (collaborative care, not working in isolation), equipped with updated skills and scientific knowledge, providing care that was evidence-based and patient centered 'thus engaging the patients' to meet the patients complex health care needs in a highly technological intensive care environment. The characteristics of the patients and families influence and drive the competences of the nurse (Alspach, 2006).

- **Environment**

According to this model, environment was described as both physical and social. The physical characteristics were determined by their complexity requiring continuous vigilance. The social characteristics were determined by the organizational culture that supports, the dominance of patient values, practice based in research and driven by outcomes, collaboration and respect for diversion (Alspach, 2006).

In this respect, an ICU environment was selected as a sample setting as it consisted of complex characteristics for example critically ill patients, complex technical machines requiring continuous vigilance to meet the demands of the critically ill patients. The organizational culture was such that physicians and nurses work collaboratively and the practice was driven by outcomes.

Trained ICU nurses influence the physical and social environments of the patients, as are with patients 24 hours and are entrusted with specialized skills to help patients meet their health needs. The ICU environment challenged trained ICU nurses to provide care that was evidence-based for efficient, effective, efficacy outcomes on person and environment.

- **Health and Illness**

In the synergy model health was defined by the person's pattern of living which was in harmony with the environment thereby determining the person's health status (Alspach, 2006). When there was no harmony, the person became ill. The ICU patient was at a state where his or her interaction with the environment had reached a state of little potential to maintain health on his or her own hence was critically ill.

Health in this critically ill patient was restored by use of complex technological resources and specialized knowledge and skills of trained ICU nurses in collaboration with other health inter-professional members for instance physicians or nutritionists. This was to say, health in the context of intensive care patient was not necessarily the absence of illness but rather a state at which the patient had gained minimum potential to function independent of the specialized intensive equipments and personnel, even though further nursing care was needed for instance in surgical or medical wards.

- **Nursing**

Assumptions regarding nursing were derived from the synergy model. According to this model, nurses are described on a number of characteristics for example clinical inquiry, clinical judgement, collaboration and facilitation of learning. These characteristics are interrelated and are considered competences necessary for effective patient care. Nursing care therefore, reflected an integration of knowledge, skills, experience and attitudes needed to meet the needs of patients and families.

Synergy was used as a framework to establish interactions between the patient characteristics for example resiliency and the nurse competence-characteristics for example clinical judgement. The end result was a mutually exclusive outcome between the nurse, patient and system (Alspach, 2006).

The nurse therefore used her characteristics as a ground for the production of knowledge which focused on patient-centered approach to holistically care for the patient and achieve optimal care. The safe practice of intensive care nursing depended on the nature and amount of scientific nursing knowledge the nurse brought to practice as well as the intellectual and clinical judgment coupled with patient-centered care in order to deal with patient and the patients' family responses to life threatening problems.

1.6.2 Theoretical Assumptions

The following statements from the synergy model by the American Association of Critical - Care Nurses (Alspach, 2006) were applicable to this study:

The central statement was that mutually exclusive outcomes results when nurse characteristics (competence) and patients characteristics synergize for example the trained ICU nurse using her clinical judgement based on evidence-based guidelines aligning individualized patient-centred care driven by patient characteristics like complexity to achieve optimal results (Alspach, 2006).

This recognized that each patient was unique and therefore had varying capacity for health and vulnerability to illness. The nurse therefore provided care that was an integration of scientific knowledge (evidence-based), skills, attitudes and expertise to meet patients and family needs. Patient and family all contributed to providing a context for effective nurse-patient relationship. All patients are biologic, psychologic, social and spiritual entities therefore the whole patient was considered.

Nursing practice in critical areas, nurses' knowledge of EBP, as well as collaboration with other health care providers was crucial in ensuring positive patient outcomes. The higher the nurses are knowledgeable and specialized, the better the outcomes both to the patient, nurse and system.

The model was developed for critical care nurses to act as a framework for advanced practice critical care nurses. The trained ICU nurses were critical care nurses who were advanced practitioners and exposed to, up-to-date information through constant interaction

with academicians. This ensured a higher level perspective of EBP in ICU which resulted in guiding the selection of the sample to be; academic trained ICU nurses.

1.6.3 Methodological Assumptions

The methodological assumptions arose from the pragmatic worldview. This allowed use of multiple methods and respect for both objective and subjective knowledge in a single study (Creswell & Plano Clark, 2011). A mixed method approach comprising of both quantitative and qualitative approaches was adhered to in the study.

The qualitative results were used to elaborate the understanding and insight reached by the quantitative results. Hence subjective values and meanings were integrated with the numerical evidence. The researcher based the inquiry on the assumption that collecting diverse types of data best provides an understanding of a research problem which was 'why nursing practice is still not based on evidence with respect to trained ICU nurses level of knowledge, attitudes and practices on EBP' (see **3.3** and **3.4**for a full detailed description).

Secondly the previous studies included the trained and the untrained nurses. It is not clear on what the trained ICU nurse's knowledge, attitudes and practices towards EBP are. Hence it was proposed to know the understanding of EBP in the context of trained ICU nurses.

1.6.4 Definition of Terms

- **Knowledge:** This was the incorporation of facts, information or skills and judgment (Polit & Beck, 2008). The Oxford dictionary (2010) defined it as the information, understanding and skills that was gained through education or experience for example practical, medical and scientific knowledge. In this context it portrayed a person's understanding of EBP.

- **Attitude:** A mental state organized through experience, exerting a directive influence upon the individual's response to all situations to which it was related (Van Achterberg, Schoonhoven & Grol, 2008). According to Oxford dictionary

(2010), attitude referred to the way that one behaves towards somebody that showed how that person was thinking or feeling. In the study, attitude referred to the trained ICU nurses thoughts or feelings regarding EBP.

- **Practice:** Practice referred to the actual application or use of an idea, belief or method. A way of doing something that was the usual or expected way in a particular organization or situation (Oxford dictionary, 2010). For the purpose of the research, practice referred to the trained ICU nurses' direct participation, application and observation of EBP in the ICU.

- **Intensive Care Unit:** Setting where the study took place designed with specialized technology and personnel where patients with unstable and life threatening conditions were cared for (Urden, Stacy & Lough, 2010). For the purpose of this research five ICUs were used.

- **ICU trained nurse:** A registered nurse who had undergone an accredited course in critical care nursing and who was registered with the South African Nursing Council (SANC, 2008) and was able to critically think and to provide specialized nursing care to critically ill patients.

- **Academic Hospital:** A hospital generally providing secondary or tertiary care in a major city, affiliated to a medical school with a reputation for excellence in research, managing patients with complex illness and exposed to highly specialized care also serving as a practical educational site for students and health care providers in addition to the daily patient care (Brown et al, 2009). The study was conducted at a level-3 tertiary hospital.

1.7 RESEARCH METHODS OVERVIEW

1.7.1 Research Design

A sequential explanatory mixed method research design (QUAN - qual) was used utilizing both the quantitative and qualitative data in a single study (Creswell, 2009). A non

experimental, descriptive, contextual, cross sectional survey design was used for the quantitative phase (phase one), to obtain the respondent's opinions on EBP. A descriptive, contextual qualitative research design was used for the qualitative phase (phase two), to supplement or expand on the findings from the first phase for in depth understanding of the trained ICU nurses knowledge, attitudes and practices on EBP. Thus, the qualitative results assisted in explaining and interpreting the findings of the quantitative phase.

1.7.2 Research Method

The study was conducted at Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) in five ICUs of the hospital, situated in Gauteng - South Africa. The target population was all trained ICU registered nurses working in the five ICUs at CMJAH.

A non-probability purposive sampling was used in phase one to select the 100 trained ICU registered nurses. Purposive sampling was also used in phase two to select 12 trained ICU nurses who participated in the focus group discussions. A validated tool by Upton and Upton (2006) with Cronbach's alpha of **0.87** was used to collect data from the 100 trained ICU nurses in phase one. Two focus group discussions with expert trained ICU nurses were conducted in phase two.

Data for phase one were analyzed quantitatively using descriptive and analytical statistics. A biostatistician was consulted to assist in analyzing the data. Data for phase two were analyzed qualitatively using thematic content analysis (De Vos, Strydom, Fouche' & Delport, 2005). Then both quantitative and qualitative data were merged during interpretation for comprehensive understanding of the research problem. **Table 1.1** below shows the research methods that were undertaken in summary.

Table 1.1: Research Methods in Summary

Population	**Sample**	**Data Collection**	**Data Analysis**	**Data Integration**
Trained ICU registered nurses from 5 ICUs at CMJAH	**Phase One**			Mixing both phase one and phase two (quantitative and qualitative) data
	Purposive sampling	Questionnaire	Numbers	
	100 trained ICU nurses	Face validity	Biostatistician	
		Content validity	Descriptive: Means, SD	
		Pretest	Analytical: Fisher's exact	
			Analysed data: development of phase two.	
	Phase Two			
	Purposive sampling	Focus groups	Words, stories	
	12 trained ICU nurses	Pilot study	Content analysis	
	Experts	1st Focus group	Categories	
		2nd Focus group	Sub- categories	

- **Ethical Considerations**

Ethical guidelines were adhered to according to University of Witwatersrand guidelines. In this regard, peer review was done at the department of nursing education. Approval to conduct the study was obtained from the University postgraduate committee. Clearance on human subjects was obtained from the university ethics committee (**number: M120330**). Permission from the department of health and hospital management was also obtained. Furthermore, ethical issues like informed consent, confidentiality and anonymity to protect human subjects were observed.

1.7.3 Reliability, Validity and Trustworthiness

Reliability for phase one was checked using Cronbach's alpha to evaluate the internal consistency of the tool as it was testing a different sample (Polit & Beck, 2008). In

addition a group of ICU experts were utilized to evaluate and document the content validity according to Lynn model (1986) as well as the face validity. A pretest study was also undertaken to evaluate the validity of the instrument as it was measuring a different sample.

Trustworthiness for phase two was achieved using five criteria's according to Lincoln and Guba: credibility, dependability, confirmability, transferability and authenticity**.** These were established as follows:

Credibility: Credibility is the confidence in the truth of the data and interpretations (Polit & Beck, 2008:539). To ensure credibility an independent facilitator was used and field notes of the focus groups were stored safely for audit checks. **Dependability:** Dependability refers to the stability of data over time and over conditions (Polit & Beck, 2008:539). Dependability was achieved through person triangulation by combining males and females in the focus groups and also by repeated review of data and independent analysis by an experienced analyst from the faculty. **Confirmability:** Confirmability refers to objectivity thus potential for congruence between two or more people about the data's accuracy, relevance or meaning (Polit & Beck, 2008:539). Confirmability was achieved through thick description and data triangulation. **Transferability:** Transferability refers to the applicability of the data (Polit & Beck, 2008). This was adhered to through thick description of the study. **Authenticity:** Authenticity refers to the extent to which the researcher fairly and faithfully shows a range of different realities (Polit & Beck, 2008). The study adhered to the University of Witwatersrand procedures for carrying out research like obtaining approval from the postgraduate committee and ethics committee to ensure that the study was conducted in an approved and ethically acceptable manner (Polit & Beck, 2008). These were explained on **3.11.2**

1.8 PLAN OF RESEARCH

This was the outline of the research report:

- Chapter One: Overview of the study
- Chapter Two: Literature review
- Chapter Three: Research design and research methods

- Chapter Four: Results and discussion of results
- Chapter Five: Summary, conclusion and recommendations

1.9 SUMMARY

This chapter of the research report introduced the reader to the study. The background, the problem statement, the purpose and specific objectives as well as the importance of the study were stated. The researcher's assumptions, research methods, validity and reliability and the ethical considerations and plan of research were also mentioned. In the next chapter, chapter two, a detailed discussion of the literature review on EBP guided by the objectives will be presented.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Modern critical care is provided to patients by a multidisciplinary team of health care professionals specialized in critical care for example trained ICU nurses, intensivists, respiratory therapists etc. It is strongly believed that if practices are based on evidence, it will improve nursing care in a number of different ways. In the first place, it will support shared decision making which is advocated increasingly as ideal model for decision making in nursing care.

It will then simultaneously provide confidence to the nurses through their participation in decision making at inter professional level. At the same time, it will allow nurses to be up-to-date, to enhance their nurse-patient relationship as well as clinical judgement. As a result, nurses will be enabled to provide quality care that will lead to good patient outcomes.

In chapter one, according to the synergy model, nursing was crucial in ensuring positive patient outcomes where the nurses actions were supposed to be advanced and vigilant in order to act on the life threatening conditions of the ICU patients. Correspondingly, trained ICU nurses are therefore required to use EBP and remain up-to-date because of their advanced skills and knowledge (SANC, 2008) as such ideal to an ICU environment due to the nature of the complex patients and equipment, coupled with changing faces of diseases (Huggins, 2004).

A literature review was therefore conducted to critically summarize previous research on EBP so as to put the research problem in context (Polit & Beck, 2008). The chapter reviewed the literature on EBP from different perspectives and utilizing both objective and subjective information (pragmatic approach) in order to give more depth to the research problem. The review consisted of the concept of EBP, overview of EBP in nursing, EBP in ICU, the global, African and South African overview of EBP and implementation challenges on EBP.

The last part of the review identified themes that were emerging under nurses' knowledge, attitudes and practices studies regarding EBP. The review ended with a chapter summary. Information pertaining to the reliability and validity of the questionnaire (EBPQ) was discussed in chapter three under the research instrument.

2.2 CONCEPTUALISATION OF EBP

2.2.1 Definition

Evidence-based practice (EBP) was seen as a new way of clinical decision making emphasizing on the use of scientific research and best practices, sound judgement, patient and family preferences, clinical context and expertise with the aim of providing favorable outcomes that are both observable and non observable on the patient, family, nurse, the system and the community (Hansen & Severinsson, 2009).

The addition of the patient values was further elaborated by the synergy model where the patient was also seen as a unique entity thereby having varying capacity of vulnerability to illness worthy to be noted when making decisions (refer to **1.6.2**)

Being evidence-based therefore signified an interconnection of scientifically generated evidence, patient values with knowledge, according to the situation at hand, based on the clinical judgement / expertise of the provider. It did not only focus on the ability of nurses to critically access, appraise and use research per se, but also for the nurses to articulate their knowledge with expertise either professionally or interprofessionally whilst understanding and observing patient's values.

With this in mind, it was not restricted to randomized trials but rather involved finding best external validated evidence so as to answer clinical questions (Fulbrook, 2003). The author continued to say that applying for example, skills of nursing training which are evidence-based was also ideal in nursing. With this view, ICU nurses could use for instance basic sciences in particular, pathophysiology to interpret and apply the results of clinical research for complex patients in ICU or aged patients.

This would enable the clinician to better judge whether the results are applicable to the patient at hand. Likewise, the evidence needed to be relevant to the context of the investigation for example ICU 'trained nurses' in academic hospitals in South Africa, so that appropriate generalizations could be made to a population like that of trained ICU nurses (Brown et al, 2008).

Just to sum up; without clinical expertise, practice risks patients as, even though evidence might be excellent, it might be in-applicable to an individual patient, conversely, without current best evidence, practice risks patients as it would be out dated due to changing faces of diseases and complex technology especially in ICU (Eccles et al, 2005).

Similarly, without patient values (patient centred approach), fundamental to nursing practice (holistic caring), practice risks patients as is neither ethical nor holistic (SANC, 2008) hence leaving out crucial issues that negatively impacted on patients' response to care. When the patients were at risk, the nurse and system were also negatively affected leading to poor outcomes. This was to say therefore, neither alone was complete and when done in totality, EBP was achieved (Eccles et al, 2005). The three main components of EBP: research evidence, clinical expertise and patient preferences are explained in detail as follows:

2.2.2 Research Evidence

Primarily EBP involved accessing evidence. Literature showed similar perspectives in accessing research evidence using the EBP approach. Some indicated 4 steps (Dontje, 2007) others 5 steps (Dawes, Summerskill, Glasziou, Cartabellotta, Martin et al, 2005; Polit & Beck, 2008) and others 6 steps (Holleman, Eliens, Vliet & Van Achterberg, 2006).

Despite the differences between the numbers of steps, the purposes were the same: to guide users for example nurses on how to obtain information for EBP. This study showed the 4 steps according to Dontje because the writer explained the steps aiming at guiding nurses.

- **Step 1**: Involved identifying a problem in current practice which would represent a trigger for change in practice. In other studies (Dawes et al, 2005) it

was also referred to as the question formulation step. It was emphasized that the question should be directly related to the problem at hand.

- **Step 2**: Involved the search, review and critiquing of relevant literature. This was done to check for validity, clinical relevance and applicability. Critical appraisal has been added to the curriculum content under research to many nursing schools and several continuing professional development programmes have been funded to provide further training. The main goal being EBP. In the process, providers searching and presentation skills are improved as well as updated in their practice.
- **Step 3**: Involved identifying the research evidence that supports the change in clinical practice. This made use of the hierarchies of evidence as explained below.
- **Step 4**: Involved implementing the change into practice and monitoring the outcomes. This was based on clinical judgement, expertise and patient concerns. And also monitoring the outcomes as an evaluatory step to assess the effectiveness of the decision or intervention.

As already pointed out on step 3, identifying the research evidence involved looking at strength or validity of evidence with respect to their freedom from biases. Hierarchies of evidence have been developed and the focus since the 1980's as cited by Evans (2003) was on effectiveness of an intervention.

In spite of this, issues of feasibility, methodological quality of individual studies and decision making becomes relevant in practice and was notably led to different opinions on the hierarchy of evidence (Evans, 2003; Mantzoukas, 2007; Polit & Beck, 2008). Even though such was the case, findings from rigorous research were still paramount and provided the strongest evidence (Polit & Beck, 2008). The levels of evidence according to Mantzoukas (2007) are listed below;

- Level 1: Evidence obtained from Meta-analysis of randomised controlled trials.
- Level 2: Evidence obtained from well-designed controlled non randomized trials.
- Level 3: Evidence obtained from controlled research without randomization.

- Level 4: Evidence obtained from non-experimental studies.
- Level 5: Evidence obtained from opinions of respected authorities.

Further developments were made on the hierarchy of evidence which incorporated the use of evidence-based guidelines. Systems were made to include the recommendations for EBP guidelines. The grading of recommendations assessment, development and evaluation (GRADE) system was one such development. It was an international approach for standardizing the graduation of evidence and recommendation in EBP guidelines. This approach took into account more dimensions including methodological quality of individual studies for example observational studies.

It also dealt with the applicability of the evidence to the population rather than just looking at the quality of evidence (Guyatt, Gutterman, Baumann, Adrizzo-Harris, Hylek et al, 2006). Similarly, even though there were differences between grading systems, the purposes were the same: to guide users of clinical research information on which studies were likely to be most valid, based on critical appraisal of the studies.

2.2.3 Clinical Expertise

Hardy, Titchen, Manley & Mc Cormack (2006) noted that when there was an artistic integration of a variety of sources of knowledge into one's practice so as to make effective patient-centred and evidence-based decisions, clinical expertise was at play. Different knowledge sources existed in the nursing profession for example theories, books but with evidence-based practice, the dominant knowledge source was research evidence.

The expertise in the ICU was not limited to the practitioner but also involved expertise from other disciplines as knowledge was shared (SANC, 2008). It was the responsibility of the trained ICU nurses to articulate their knowledge with the expertise from other disciplines so as to make effective evidence-based clinical decisions regarding patient care. Through this expertise therefore, an integration of research evidence and patient's preferences based on the situation at hand resulted into provision of care that was evidence-based.

2.2.4 Patient Preferences

In the EBP approach, patient views are greatly considered. As Timmins & Astin (2009) points out, it involves respect for persons and deep commitment for understanding persons as human beings. This requires engaging or knowing more about the patient, enlisting, educating, and empathising with the patient in the care provided.

In their positional statement; Cullen, DiCenso, Griffiths, Mc Cormack & Rycroft-Malone (2008) pointed out that, patients' views vary depending on condition, experiences, values and beliefs, resources, availability of information and family influences. When these issues are taken into account by the nurse, the decisions that are made are patient-centered. Patients in the ICU are critically ill hence have difficulties with communication. Both patients and family preferences are therefore, utilised in the provision of care.

2.3 OVERVIEW OF EBP IN NURSING

Historically, nursing practice has evolved remarkably in the past three decades. Notably, Nightingale era in the 19th century still shines in the nursing profession with her contribution to scientific research as a basis for decision making (Polit & Beck, 2008). Her data collection and application of the new information during the Crimean war led to changes in care of military patients there by reducing morbidity and mortality (Polit & Beck, 2008).

The fundamental basis of holistic care in the nursing profession could also be attributed to the rapid uptake of positive changes impacting patients as individuals and the type of care provided for instance specialization programs like intensive care nursing to better care for patients. Coupled with quality assurance, cost containment also contributed to rapid changes in nursing (Urden, Stacy & Lough, 2010).

EBP was one such development which arguably been seen in nursing for over 30 years. The research based practice in nursing was further evident in 1960s plus nursing education transition from diploma to higher learning (Tweed, Sauers, Valovich McLeod, Guo, Trahan et al, 2007). This was to say, as nursing became involved in EBP, more developments were done on research, policy and education so as to advance theory and

application of EBP. As observed by Cullen et al (2008) rapid developments were seen from the 1970s with more programs funding research.

More EBP publications as well as establishment of data bases for accessibility of published articles on scientific evidence were also seen. Developed countries like Australia, Canada and England were advanced in EBP with regards to number of centers for EBP as well as resources produced for EBP for example; the Joanna Briggs Institute which focuses on EBP in nursing; Evidence-based nursing centre at University of York as well as centre for evidence-based nursing in United Kingdom (UK) respectively (Tweed et al, 2007). Also seen in America were academic centers on EBP manned by nurses for instance the University of Iowa hospitals and clinics.

2.4 INTENSIVE CARE NURSING AND EBP

In the ICU, EBP was a necessity. Nurses in the ICU in modern nursing are faced with more different and difficult situations requiring quick and constant decision making (Hansen & Severinsson, 2009). The nature of their work could be challenging in that most of the time the patients are unconscious and with severe conditions there by making ICU nursing care, delicate and expensive. Trained ICU nurses therefore, had an additional responsibility to promote up-to-date, cost-effective care.

In an academic hospital whose other objective was clinical teaching, the roles of trained ICU nurses were expanded from teaching and supervising nursing students as well as new qualified staff including medical doctors. Trained ICU nurses were patient's first point of reference in ICU with nursing services thus receiving patients first in ICU for admission. They provided on-going (24 hours) comprehensive care to the patients and were pivotal to the coordination of care in the ICU.

Within the broad and complex environments of intensive care units, trained ICU nurses made many clinical decisions about patients response to therapy, observation of critical changes (in the absence of the physician) and administration and monitoring of complex treatments. They were expected to act competently and as role models as they are advanced: skilled and knowledgeable in ICU patient care and also act collaboratively due to the complexity of ICU patient's conditions. In fulfilling their professional nursing role,

trained registered ICU nurses were expected to provide care that was evidence-based (SANC, 2008).

Evidence-based practice was equated to effective decision making, prevention of harmful habits and enhanced clinical performance thereby favoring the current nursing profession standards of practice for trained, advanced and specialist nurses (Nolan & Bradley, 2008).With its use, nurses were enabled to remain up-to-date with health care trends as well as enhancing their critical thinking abilities which was ideal to ICU nurses because of the nature of their work requiring quick, constant critical decision making.

This in turn resulted into provision of care that was of high quality to critically ill patients (Hansen & Severinsson, 2009). This provided the need to find out more about their knowledge, attitudes and practices regarding EBP.

2.5 CURRENT STATUS OF EVIDENCE-BASED PRACTICE

2.5.1 Global Perspective

The past two decades has seen EBP widely emerging as an accepted paradigm of contemporary professional nursing practice (Nolan & Bradley, 2008). Currently more and more developments are being advocated and more international organizations are fostering the need of incorporating EBP. EBP is the theme in most nursing conferences both nationally and internationally and more continuing professional development programs targeting EBP are being developed (Tweed et al, 2007). The ICU advanced diploma course has a research component and in higher institutions it is more developed with developing research skills and EBP as the main themes.

Its importance has been highlighted in maximizing patient care in this era where there is technological advances coupled with changing faces of diseases and patient centred care. All in all, ineffective practices are replaced with effective ones leading to desired patient, nurse and hospital outcomes (Hansen & Severinsson, 2009). The need for EBP has been emphasized by the nursing regulatory bodies internationally (ICN, 2009).

However, several studies on EBP have concluded that clinical decisions are rarely based on the best available evidence (Egerod, 2004; Pravikoff, Tanner & Pierce, 2005) but rather on opinions, experience, tradition, routines, preferences or intuition (Estabrooks, Chong, Brigidear, Profetto-McGrath, 2005).

Even though such is the case, there is a general agreement that research findings from rigorous studies provide especially strong evidence for informing nurse's decisions and actions (Mantzouks, 2007). Nurses are accepting the need to base their decisions on evidence (Urden, Stacy & Lough, 2010). On the same note, previous evidence needs to be evaluated and validated to suit practice contexts (Evans, 2003).

2.5.2 African Perspective

Across Africa (for example South Africa, Botswana, Kenya, Malawi, Nigeria), EBP is being advocated for nurses. EBP is also being emphasized in Africa but, Africa lags behind in research as fewer nurses are available who are sufficiently prepared at higher level to enable them to conduct research because of few higher institutions and exodus of nurses to developed countries for greener pastures. Lack of funding is also another obstacle for the nurses to conduct research regardless of having research knowledge. Only a small number of nurses seem to engage in research (Edejer, 2000; Mclnerney, 2004; Swan, Al-Gasseer & Lang, 2003).

A few southern African countries are engaged in collaborative research with western countries for example, South Africa (Mclnerney, 2004). Nursing involvement in EBP in most of the African countries is through participation in conferences, workshops and research collaboration (Edejer, 2000; Mclnerney, 2004; Swan, Al-Gasseer & Lang, 2003**)**.

The magnitude of the problem becomes clear when one considers that junior nurses in hospitals are afraid to participate in research as they have not been exposed to research. Edejer (2000) also writes that the visibility of research from developing countries is limited. The writer continues to say that the ratio for a woman in a developing country to access internet in Africa is 1:5000.

Even though such is the case, EBP is an important part of the present government plans in South Africa for the new national health programs for instance national health insurance and the 2009-2014 strategic plan of the national department of health which is aimed at creating a well functioning health system capable of producing improved health outcomes (National Department Of Health 'NDOH' Strategic Plan, 2010/11-2012/13:20).

The 10 point plan consists of priorities in which priority number 3 and 10 are to improve the quality of health services and to strengthen research and development respectively (NDOH Strategic Plan, 2010/11-2012/13:21-25). Driven by the 2011 statistics of more costs being encountered on health thus R200 billion spent on health budgets, quality care is being advocated by the South African government and is among the 10 plans on health made through the department of health of South Africa (South African Health Review, 2011:18). Also the government has adopted the outcome-based approach to accelerate the attainment of the 10 point plan (NDOH Strategic Plan, 2010/11-2012/13: 21).

In addition more specialization programs are being made on nurses in South Africa. The training at this stage is focused on research as well as EBP in accordance with the 10 point plan (NDOH Strategic Plan, 2010/11-2012/13). Nursing education has adopted the outcome-based education and Learner-centred problem-based learning in direct response to current health policy.

Problem-based learning has the capacity for developing strategies based on reflective decision making and development of critical thinking which allows learners to effect change and cope with diversity in a more creative way (South African Health Review, 2000:275-280). The South African nursing council (SANC, 2008) also broadened its requirements for trained registered nurses to provide care that is evidence-based to improve outcomes in fulfilling their professional nursing role.

Efforts are also being made by other EBP institutions like the Joanna Briggs institute which collaborates with the University of KwaZulu-Natal to conduct systematic reviews (Mclnerney, 2004). Lastly, Edejer (2000) indicated that efforts were also being made by the World Bank to increase research programs in 30 African countries.

2.6 EBP IMPLEMENTATION CHALLENGES/BARRIERS IN NURSING

As noted by Van Achterberg, Schoonhoven & Grol (2008), the root of successful implementation of programs is embedded in knowing the challenges. Whilst nurses have strong beliefs about EBP, many researchers have found out that nurses do not use EBP in their practice (Egerod, 2004; Pravikoff, Tanner & Pierce, 2005).

This follows the idea that EBP is not without challenges in nursing. Hence, in trying to understand fully the experiences of trained ICU nurses regarding EBP using focus groups, it was assumed that the experiences of trained ICU nurses regarding EBP was not without challenges hence the need for literature review on challenges.

As noted by Van Achterberg, Schoonhoven & Grol (2008:302) numerous contextual factors influence successful implementation of EBP which include but are not limited to: nursing culture and leadership, staffing support, organizational innovativeness, access to resources, provision of education, access to research findings, availability of knowledge and skills within organizations, inter-organizational collaboration, money, work load, resistance to change, and time (Davies et al in Van Achterberg, Schoonhoven & Grol, 2008:302**)**.

Barriers to implementation of EBP by nurses have been studied overtime. Kajermo, Bostrom, Thompson, Hutchinson, Estabrooks & Wallin (2010) reviewed 63 studies from Medline, cumulative index to nursing and allied health literature (CINAHL) databases from 1991-2009. The main barriers reported were related to the setting (in sufficient time, not enough authority to change patient care, in adequate facilities) and the presentation of research (un-awareness of research, lack of research skills and difficulty in understanding statistical analysis).

Overall, identified barriers were consistent over time and across geographic locations despite varying sample size, response rate, study setting and assessment of study quality. Similar barriers seem to appear from 2010 to 2011 encompassing the areas outlined by Van Achterberg, Schoonhoven & Grol (2008). For example in a cross sectional study by Lai, Teng & Lee (2010) 144 health care workers (medical, nursing and allied practitioners)

in Malaysia reported that, poor facilities for accessing evidence, poor awareness of evidence and time constraints were some of the barriers to EBP they were encountering.

Eizenberg (2010) found out that knowledge on research, research skills and administrative support were some of the barriers that the nurses were lacking and these barriers were more pronounced in nurses without a degree. This was a cross-sectional survey with a convenience sample of 243 nurses from northern Israel who worked in hospitals or in the community.

Similarly in a South African pilot study on 23 academic health care lecturers conducted by Mclnerney & Suleman (2010) it was found out that lack of knowledge pertaining to EBP, lack of access to research findings, insufficient evidence and time were barriers to EBP.

Additionally Solomons & Spross (2011) study focused on EBP barriers as an integrative review with the aim of examining the barriers and facilitators to EBP using Shortell's framework for continuous quality improvement. They found out that across the articles, the most common barriers were lack of time and lack of autonomy to change practice which falls within the strategic and cultural dimensions in Shortell's framework.

Most recently, Sciarra (2011) conducted a pilot study in USA on evidence-based education with the aim of determining the educational needs of intensive care unit nurses regarding EBP and to implement a strategy to meet those needs. The author identified top four barriers which were lack of skills to critique and or synthesize the literature. Difficulty understanding research articles was the second barrier. Lack of understanding of the organization of electronic data bases and lack of search skills n=8 (38.1%) were the third and fourth barriers identified respectively.

The challenges appear to remain consistent overtime and geographical areas with the most frequent challenge encountered being time management (lack of time to read on job), lack of knowledge (lacked awareness to research, lacked education to the research process), lack of skills on EBP especially on research as well as lack of autonomy (lack of authority to change practice). **Table 2.1** below show the challenges in descending order that were frequently mentioned in the 12 articles reviewed under the barriers category.

Table 2.1: The frequency (F) of barriers to evidence-based practice in descending order (n =12 articles)

BARRIER	F	AUTHORS (YEARS)
Lack of time	7	Solomons & Spross, 2011; Van Achterberg et al 2010; Kajermo et al 2010; Mclnerney & Suleman, 2010; Brown et al 2008; Koehn & Lehman, 2008; Fink, Thompson & Bonnes, 2005.
Lack of Knowledge	7	Sciarra, 2011; Kajermo et al 2010; Eizenberg, 2010; Mclnerney & Suleman, 2010; Koehn & Lehman, 2008; Fink, Thompson & Bonnes, 2005; Melynk et al 2004.
Lack of research skills	5	Sciarra, 2011; Kajermo et al 2010; Eizenberg, 2010; Brown et al 2008; Fink, Thompson & Bonnes, 2005.
Lack of autonomy	4	Solomons & Spross, 2011; Kajermo et al 2010; Brown et al 2008; Fink, Thompson & Bonnes, 2005.
Lack of Resources	3	Kajermo et al 2010; Mclnerney & Suleman, 2010; Brown et al 2008.
Lack of administrative support	2	Eizenberg, 2010; Fink, Thompson & Bonnes, 2005.
Nature of work	2	Urden, Stacy & Lough, 2010; Tweed, 2007.
Lack of Mentorship	2	Fink, Thompson & Bonnes, 2005, Brown et al 2008.
Closed minds resistance to practice	1	Melynk et al 2004.

2.7 KNOWLEDGE, ATTITUDES AND PRACTICES ON EBP

2.7.1 Knowledge towards EBP

The nature of an ICU environment (highly complex and advanced) requires the health care team like nurses and doctors to be highly knowledgeable and skilful as well as to be up-to-

date in order to provide care that is evidence-based (Watson & Taylor in Huggins, 2004:38). Knowledge is defined as the information, understanding and skills that are gained through education or experience for example practical, medical and scientific knowledge (The Oxford dictionary, 2010).

Education for ICU nurses starts with attaining a degree or diploma following a four year comprehensive course at a university or college respectively. This makes the nurse to be registered with a basic qualification in general nursing, psychiatry, community health and midwifery (SANC, 1985; South African Health Review, 2000). The ICU nursing course is undertaken as a post-basic course at diploma level offered at a nursing college and at diploma or degree level at a university (SANC, 1985). The nurses are enrolled in the ICU courses after at least six months of ICU experience. The majority of ICU qualifications are at diploma level; however either of the qualification (ICU diploma or masters) enables the nurse to function at an advanced level superior to that of general nurse (Perrie, 2006:20).

The discussion on knowledge towards EBP centres around different categories of nurses either registered or enrolled with or without ICU or critical care qualification trained at a college or a university with additions to academic health lecturers and pre-registration final year students. Lack of knowledge on EBP was a consistent finding in most of the studies on EBP by nurses as well as other health care providers. Three themes were identified regarding the nurses lack of knowledge.

- **Lack of Knowledge: - Types of information used**

Lack of knowledge has been explained in view of the type of information that the nurses use. Egerod's study (2004) explained the lack of knowledge of critical care nurses in Denmark by describing the types of information used by the respondents in making clinical decisions. The result indicated critical care nurses lack of knowledge on EBP through their use of experience as a primary source as compared to research-based journals which was the least commonly used source of knowledge. 47 ICU nurses were conveniently selected through e-mail: 5.0% head nurses, 24.0% bedside nurses, 71.0% nurses with special functions. 96.0% of the respondents had a critical care certificate.

Four years later, Thiel & Ghosh (2008) found similar results in United States of America (USA) also by looking at types of information used. 72.5% indicated that they consulted colleagues, peers rather than using books, journals when they needed information. Only 24.0% said they use CINAHL data base. Knowledge on EBP was perceived as moderate (mean = 9.84, SD = 2.2). Their aim was to assess registered nurses' readiness for EBP using a descriptive cross sectional survey. The sample consisted of 121 registered nurses of which 77.2% were (staff) professional nurses.

Mills, Field & Cant (2009) in Australia also found similar results when they examined general practice nurses' sources of practice knowledge, the barriers, facilitators of evidence utilization and skills in obtaining the evidence. 590 nurses in Victoria (community-based) participated in the survey by which 3 of every 4 nurses worked part time. Experiential learning, interaction with peers and medical practitioners' were ranked as very important sources as compared to research journals. In addition, skills and sourcing of evidence plus translating evidence were ranked as low.

Estabrooks et al (2005) in their study on Canadian nurse's preferred knowledge sources for clinical practice reported that across all (seven surgical) units, nurses preferred to use knowledge gained through personal experience and interactions with co-workers and with individual patients rather than journal articles or textbooks. The sample consisted of 230 nurses from five adult and two pediatric surgical units from four hospitals in the Canadian provinces of Alberta and Ontario.

In contrast, when Mclnerney & Suleman in their 2010 pilot study on EBP applied the same principle of information use with the aim of determining the extent to which academic health care practitioners use EBP in their teaching in a SA university; more than half reported using journals, textbooks, internet, colleagues and the Cochrane data base to improve their teaching. The sample consisted of 23 academic health care lecturers which participated on an online survey.

- **Lack of Knowledge:- EBP protocols**

Perrie (2006) and Gomes (2010) looked at nurses' knowledge using protocols in ICU which are one way of EBP. The studies were both conducted in South Africa. In the later,

the aim was to determine the knowledge of nurses working in ICU with respect to evidence-based guidelines for prevention of ventilator associated pneumonia. The former study aimed at determining the knowledge of nurses working in the ICU with respect to pain management, glycemic control and weaning from mechanical ventilation. Eighty three nurses from three (two private and one public) and 136 ICU nurses from five (three public and two private) hospitals in Gauteng were used respectively.

Perrie's (2006) study compared ICU trained and non ICU trained nurses and correlated their knowledge levels with years of ICU experience. She found out that both the ICU trained and non- ICU trained nurses lacked knowledge on the selected protocols. The mean score obtained was 47.56 (SD 11.61). The ICU trained participants obtained 50.11 (SD 11.96) and non- ICU trained obtained 45.01 (SD 10.75).

This difference although small, was statistically significant ($p = 0.0099$). In addition, a weak correlation was found between level of knowledge and years of experience. Similarly, Gomes (2010) using a non experimental, descriptive correlational and contextual two phase study also found out that only 19.3% knew that suctioning systems should be changed after every patient as it was proven to reduce occurrence of ventilator associated pneumonia.

- **Lack of Knowledge: - Evidence-based skills.**

Nurses were found to be lacking in skills of EBP. In 2008, 3 studies from USA provided evidence that nurses were lacking knowledge on evidence- based skills. Brown et al (2008) used a descriptive cross sectional study with a convenience sample of 458 nurses from all departments to describe nurses' practices, attitudes and knowledge related to EBP in California. The majority had Bachelor of Science in nursing (65.9%). A questionnaire was administered through a secured website. They found out that 62.1% had 1- 4 ranking of EBP 'on converting information needs into a question' and was more to the negative side.

Likewise, Koehn & Lehman (2008) investigated registered nurses' perceptions, attitudes and knowledge of skills associated with EBP using a descriptive cross-sectional survey. They included 422 registered nurses from all departments such as ICU, medical and surgical wards. The sample was conveniently selected and comprised of 328 staff nurses,

53 unit managers, clinical advisors and 41 others such as clinical nurse specialists, educators, administrators and other non direct care personnel. The results indicated lower mean scores regarding knowledge of evidence-based skills (4.67).

Hart, Eaton, Buckner, Morrow, Barrett et al (2008) also used a descriptive–quasi experimental design pre and post interventional survey method. A convenience sample of 744 nurses working in integrated health care systems, the majority were registered nurses (87.9%). Half of them had bachelors degree and one third had associate degrees. The results showed gaps in EBP knowledge 'even after learning' for instance retrieving research, evaluating evidence and incorporating evidence into practice. Nevertheless, significant differences in knowledge level were observed pre and post test.

Similarly, Waters, Crisp, Rychetnik & Barratt (2009) observed that it is incorrect to assume that even recent graduates have a level of knowledge and skill that is sufficient to permit direct engagement in evidence implementation. They surveyed 677 post-registration clinical nurses and 1134 pre-registration final year nursing students to determine their current knowledge and attitudes towards EBP in New South Wales, Australia. They found out that pre-registration nurses expressed more confidence in their EBP skills **but** self-rated knowledge and skills were low to moderate in both groups.

Finally a recent study by Linton & Prasun (2012) in USA has found that only 50.0% of the participants reported an ability to determine the validity of evidence and 58.0% rated an ability to apply findings to individual cases positively. Their aim was to examine practicing nurses' attitudes and knowledge of EBP by using a retrospective descriptive survey which was administered to 286 practicing nurses in 2007. Experience over 15 years in ICU was reported by 37.0% of the nurses.

2.7.2 Attitudes towards EBP

Attitude is defined as a mental state organized through experience, exerting a directive influence upon the individual's response to all situations to which it is related (Van Achterberg, Schoonhoven & Grol, 2008). In this study, attitude refers to perceptions or feelings of the respondents about EBP. Van Achterberg, Schoonhoven & Grol (2008) continues to say that attitudes can be a facilitating or a delimiting factor in the

dissemination or implementation of new technologies for instance EBP. Attitudes are influenced by individual provider characteristics hence they vary from individual to individual. The success of EBP in an ICU depends on determining the attitudes and practices of trained ICU nurses as their roles enables them to engage in modeling behaviour which is advanced and evidence-based in nature (SANC, 2008).

In spite of this, limited data about **trained** ICU nurses' attitudes regarding EBP exists. Studies that looked at nurses' attitudes towards EBP are generally sub-categorized into two themes namely positive and negative attitudes towards EBP. Out of the twelve studies that were reviewed, seven studies reported positive attitudes by the nurses towards EBP and five reported negative attitudes by the nurses towards EBP.

- **Positive attitudes towards EBP**

In a study conducted by Egerod's in Denmark (2004) critical care nurses (n=47 critical care nurses) displayed a positive attitude towards EBP. 88.0% said EBP is relevant to nursing and 96.0% had a perception that it promotes the profession of nursing. Similar results were also reported in USA the same year in a study conducted by Melynk et al (2004) where practicing nurses and lecturers portrayed high beliefs of EBP leading to good outcomes.

Hansen & Severinsson (2007) conducted a study on 24 (16 trained in ICU and the rest untrained) in Norway. Their aim was to identify intensive care nurses perceptions of protocol-directed weaning, by means of focus group interviews and qualitative content analysis. The results showed that nurses perceived the protocol as useful thereby presenting a way for them to act in the absence of the physician. In essence, it saved time, was easy to use and led to a feeling of safety and continuity in the weaning process. The study showed the need for interdisciplinary approach. Experience in ICU ranged from 26 to 60 years.

Nurses attitudes were also found to be positive (mean= 41.7± SD=6.95) in a study by Thiel & Ghosh (2008) where they were determining registered nurses' readiness for EBP in USA (n=122 registered nurses). Likewise in Hart et al (2008) study USA (n=744 nurses), 93.9% of the nurses displayed positive attitude on EBP. Significant differences in

attitudes were observed pre and post test. Similarly, Adib-Hajbaghery (2009) also reported nurses' positive attitudes towards EBP using semi-structured interviews on 21 different groups of nurses at Kashan University of medical sciences. Finally, Waters et al (2009) also reported a welcoming attitude by Australian nurses for EBP pre and post registration (n=677 post-registration clinical nurses and 1134 pre-registration final year nursing students respectively).

- **Negative attitudes towards EBP**

On the other hand, negative attitudes towards EBP have been reported as early as 2001. In their descriptive study on readiness on EBP Bucknall, Copnell, Shannon & McKinley found out that 42.0 % of critical care nurses believed that they were not prepared adequately to evaluate research and less than a third believed they were sufficiently skilled to conduct valid scientific studies. 274 critical care nurses from public and private hospitals as well as rural and metropolitan hospitals in Australia participated by completing a questionnaire that was mailed to them.

Pravikoff, Tanner & Pierce (2005) also showed nurses negative attitudes towards EBP in USA. Nurses indicated that they do not understand or value research and have received little or no training in the use of tools that would help them find evidence on which to base their practice. The aim of the study was to examine nurses' perceptions of their access to tools with which to obtain evidence and whether they had the skills to do so. Only 760 nurses participated.

Correspondingly, nurses displayed lower ranking on EBP under the attitudes section which had paired questions in a study by Brown et al (2008) in USA. 57.7% had 1-4 ranking of EBP as causing workload to their practice (n=458 nurses from all departments). Thus the lower ranking showed that more respondents agreed that EBP causes work load as a negative attitude versus making time for new evidence in ones work schedule as a positive attitude. Also in a study by Lai, Teng & Lee (2010) nurses in Malaysia reported lower confidence on EBP. Moreover, 61.0% nurses and allied staff said that the importance of EBP in patient care is slightly exaggerated and 46.2% said EBP is too impractical (n=144 nurses, doctors and allied staff).

Equally, even though 80.0 % of South Africa academic health care practitioners agreed to incorporate EBP into their teaching, 60.9% said EBP imposes another demand on their academic calendar (n=29) as reported by Mclnerney & Suleman (2010).

2.7.3 Practices towards EBP

Studies have shown correlation between practice and knowledge or attitudes of the nurses on EBP. Poor or moderate practices on EBP were correlated to lack of knowledge or negative attitudes for example on evidence-based protocols and sources of knowledge. Both positive and negative practices on EBP has been reported with some making a conclusion after lack of knowledge in 'evidence based protocols' and 'the nurses preferred knowledge sources used' whilst others report directly on the negative, moderate or positive EBP.

- **Evidence–based protocols**

Evidence-based protocols are the key to the implementation of EBP. In Perrie's study (2006), nurses (n=83) in South African ICUs did not follow the current evidence-based protocols on pain assessment, glycemic control and ventilator management. Gomes (2010) found similar results when she assessed ICU nurses (n=136) on prevention of ventilator associated pneumonia protocols. These two studies indicated poor or moderate EBP by the nurses in ICU.

- **EBP based on sources of Knowledge**

Several studies have reported nurses mainly relying on personal experiences and communication with colleagues to inform their practice hence showing poor EBP (Egerod, 2004; Estabrooks et al, 2005; Mills, Field & Cant, 2009; Thiel & Ghosh, 2008). Similar results were also reported by Gerrish, Ashworth, Lacey & Bailey (2008) who compared factors influencing the development of EBP identified by junior and senior nurses. They used a cross-sectional survey at two hospitals in England (n=598 registered nurses). Whilst junior nurses reported poor EBP, senior nurses were more confident in accessing all sources of evidence including published sources and the internet and also felt able to initiate change. In contrast Profetto-McGrath, Smith, Hugo, Taylor & El-Hajj (2007) pilot

study found out that clinical nurse specialist primarily used evidence from research literature (statement starting with research……removed as was repetition). Peers and experience were also important sources of evidence. Extensive use of internet was also reported to consult research data bases, online sources of evidence and to contact peers about current practice.

Their purpose was to develop an understanding of the sources, nature and application of evidence used by clinical nurse specialists in practice and to investigate the feasibility of conducting a qualitative study focused on the clinical nurse specialist role in relation to evidence use in practice. Descriptive exploratory design in the qualitative paradigm was used on a sample of 7 clinical nurse specialists from a large western Canadian health region. Similar results were also reported in the main study by Profetto-McGrath, Negrin, Hugo & Smith, 2010 where 94 clinical nurse specialists were purposively selected in a telephone survey.

Likewise Mclnerney and Suleman (2010) also found out that lecturers in an academic setting reported frequent use of internet and research evidence as compared to relying on their personal experiences. Recently Squires, Hutchinson, Bostrom, O'Rourke, Cobban & Estabrooks (2011) conducted a systematic review on nurses use of research in clinical practice with the aim of systematically identifying and analyzing the available evidence related to the extent to which nurses use research findings in practice.

Published and grey literature was used in which 13 online bibliographic databases such as Cochrane, Medline, CINAHL and dissertation were consulted. The results included 55 reports: 51 cross-sectional / survey and 4 quasi– experimental designs. They found out that in the majority of the articles identified (n = 38, 69.0%), nurses reported moderate-high research use.

- **Negative EBP**

Negative EBP practice was reported in the study by Adib-Hajbaghery (2009). Participants stated that their nursing practice was not based on scientific evidence (n=21nurses).

- **Moderate EBP**

Moderate scores on practice towards EBP such as 5.21 were reported in the study by Koehn & Lehman (2008) in USA. Thus, items on a questionnaire and subscales were scored on a scale of 1 to 7 by calculating the mean to describe the distribution of responses of 422 registered nurses from different departments. Higher scores were indicative of more EBP and lower scores poor EBP. A descriptive cross sectional survey was used.

- **Positive EBP**

Positive EBP was noted in Melynk et al (2004) study in USA where 46.0% of the nurses reported that their practices were based on evidence (n=130 clinical nurses, lecturers). Also significant relationships between extent of EBP and nurses beliefs about the benefits of EBP were identified. Similar results were also noted by Linton & Prasun (2012) who conducted a retrospective study on 286 practicing nurses in USA with the aim of examining their attitudes and knowledge of EBP. The results revealed that 43.0% reported '61.0 - 100.0% of their practice' being evidence-based.

In order to avoid repetition, the following was done pertaining to objective two, three, four and five, refer to **1.4**. The international results already reported on knowledge, attitudes and practices of the nurses on EBP were also used as reference to the literature for objective number three which was to compare the local results to the published international results.

Furthermore, in order to fully understand the trained ICU nurses perceptions on EBP (objective four), a qualitative study was selected and hence the literature review conducted also assisted to provide a review on the qualitative studies under knowledge, attitudes and practices of nurses regarding EBP.

Finally, the reason for mixing the data including literature on mixed methods studies was fully explained under the research methods pertaining to objective number five which was to explain the quantitative results using the qualitative results.

2.8 SUMMARY

In conclusion, although provider knowledge of EBP for nurses in critical care areas has received attention in recent years, provider knowledge, attitudes and practices of trained ICU nurses on EBP has been less well researched. In addition, the majority of the studies that were reviewed were from the developed countries and only a few from South Africa.

This chapter reviewed the definition of EBP under the heading of 'conceptualization of EBP' which can be summarized as the practice that makes use of scientific evidence, patient preferences and expertise of the health care providers. It was noted that in nursing being evidence-based does not only focus on the ability of the nurses to critically access, appraise and use research only but also for the nurses to articulate their knowledge with expertise interprofessionally whilst understanding and observing the patients values or needs.

Hence it was summarized from the definition above that all the concepts mentioned are required for EBP to be achieved and that neither alone is complete. Also noted was the research evidence which was grouped into five levels according to Mantzoukas and applicable to nursing, with some modification on level 2, 3 and 4. The GRADE approach was seen to have complimented the Mantzoukas levels which take into account more dimensions including methodological quality of individual studies rather than just the quality of evidence.

The clinical expertise in the ICU was found not to be limited to the ICU individual practitioner (expert) but also to expertise from other disciplines. Finally this part also looked at the patients' preferences which emphasized on engaging, enlisting, educating and empathising with the patient when making the decisions hence providing patient-centred care.

EBP in nursing was found to have started developing as early as the 19th century during the Nightingale era after the Crimean war. Evidence-based practice was also seen as a very important component in ICU, placing the need for the trained ICU nurses to be knowledgeable about EBP. Globally EBP was seen to be developing quickly and it was being advocated in most health care professions including the nursing profession by the

regulatory bodies. In South Africa, higher institutions had EBP embedded in their curricula even though in general, Africa lagged behind in EBP due lack of resources.

Evidence-based practice was found to be a necessity in the intensive care units where the trained ICU nurses were expected to provide care that is updated and cost effective. The nature of the ICU patients, who are mostly unconscious and critically ill in addition to the changing faces of diseases and advanced technology, required the trained ICU nurses to be vigilant in their clinical decision making hence providing care that was evidence-based. Being professional nurses, the regulatory bodies for South African Nursing Council required them to provide advanced and evidence-based care.

Frequent challenges encountered regarding EBP implementation in nursing were found to include lack of time and knowledge on EBP, lack of skills such as research skills and lack of autonomy. Furthermore, the barriers were found to be consistent overtime and geographical areas.

Previous studies regarding knowledge, attitudes and practices of nurses on EBP had been conducted. As outlined in the background, the studies had so many limitations including mixed study settings; mixed sample etc which provided a need for a specific study for the trained ICU nurses. Studies on knowledge towards EBP had consistently shown lack of knowledge by nurses as well as other health care providers.

Three themes were identified regarding the lack of knowledge to describe the area that the nurses reported to be lacking. Lack of knowledge was mainly on types of information used, EBP skills and lack of knowledge on EBP protocols. On the types of information used, the majority of the studies reported that nurses were lacking knowledge on EBP through their use of experience as their primary source of evidence. Lack of knowledge was also reported regarding evidence-based skills such as converting information needs into a question, retrieving evidence, evaluating evidence and incorporating evidence into practice.

Protocols were another area that explained the nurses' lack of knowledge on EBP. Two studies reported that nurses were lacking knowledge in the following protocols: pain

management, glycemic control, weaning from ventilation and prevention of ventilator associated pneumonia.

Mixed attitudes towards EBP have been reported in different studies which were either positive or negative. However in general, the majority of the nurses were reported to have positive attitudes towards EBP. Thus, nurses in the seven out of twelve studies that were reviewed were reported to have positive attitudes towards EBP.

Finally, the review also revealed studies on EBP practices which showed correlation between practice and knowledge or attitudes. Poor or moderate practices on EBP were correlated to lack of knowledge or negative attitudes for example on evidence-based protocols and sources of knowledge. In addition moderately EBP was reported in other studies which were followed by reports on negative and positive EBP by the nurses. However, the reports on positive EBP were less than 50.0% in most studies.

In short, this chapter discussed the literature review based on the concept of EBP, overview of EBP in nursing, EBP in ICU, the global, African and South African overview of EBP, EBP implementation challenges including themes on nurses' knowledge, attitudes and practices studies regarding EBP and finally the chapter summary.

Chapter three will proceed with the research methods that were employed to achieve the purpose.

CHAPTER THREE

RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

Polit and Beck (2008:765) defines research methods as the techniques used to structure a study and to gather and analyse information in a systematic fashion. The research design refers to the overall plan for addressing a research question including specifications for enhancing the study's integrity also referred to as "the architectural backbone of the study". This chapter extends from chapter two which looked at the literature review on the research problem. In this chapter, the techniques that were employed to address the research problem will be explained.

It will start by providing a historical overview of the research design as it is a newer approach. The sections that follows highlight and explains the research setting, population, sample and sampling approach including inclusion criteria, research instruments used, how reliability and validity was achieved, data collection process involving pretest and main study, reliability and validity of the study, ethical considerations and chapter summary.

3.2 PURPOSE AND OBJECTIVES OF THE STUDY

For consistency, the purpose and objectives of this study are repeated. The purpose of this study was to describe trained ICU nurses knowledge, attitudes and practices on evidence-based practice for nursing at an academic hospital in Gauteng.

Specifically the following objectives were raised in order to achieve the purpose;

- To describe trained ICU nurses' knowledge, attitudes and practices regarding EBP.
- To establish reliability and validity of the questionnaire in South African setting.
- To compare local results from questionnaire to international data published.
- To understand fully the perceptions of trained ICU nurses on EBP in South Africa.
- To explain the quantitative results using the qualitative data.

3.3 RESEARCH PARADIGM

A paradigm or worldview refers to a set of assumptions, beliefs or values of a community of specialists for example researchers. In chapter one, it was seen that the researcher's worldview regarding the method of the study arose from pragmatic worldview. Pragmatic approach uses a set of assumptions that draws on many ideas including employing what works, using diverse approaches and valuing both objective and subjective knowledge (Creswell & Plano Clark, 2011). The focus on pragmatic assumptions is on the consequences of research, on the primary importance of the question asked rather than the methods, and on the use of multiple methods of data collection to inform the problem understudy (Creswell, 2009).

Pragmatists believe that multiple worldviews can be used to address research problems. Hence they are open to multiple methods and different worldviews. As noted by Creswell & Plano Clark (2011) pragmatism is typically associated with mixed methods research. The researcher accepted some of the pragmatic assumptions allowing the mixing of methods and valuing both subjective and objective knowledge. This was done to clarify the knowledge, attitudes and practices of trained ICU nurses in order to gain diverse forms of knowledge on the research problem. This in turn provided complementary perspectives on research results and evidence-based practice in the ICU. These assumptions therefore, led to the adoption of the mixed methods approach whose description follows in the next section.

3.4 MIXED METHODS APPROACH

In order to answer the research questions, a mixed methods approach was used. Tashakkori and Creswell, (2007:4) defines mixed methods research as a type of research in which the researcher collects and analyzes data, integrates the findings and draws conclusions using both quantitative and qualitative methods in a single study. Creswell & Plano Clark (2011:5) adopts a more descriptive way of defining mixed methods research. Thus, they point out that mixed methods incorporate the characteristics which include:-

- Rigorous quantitative and qualitative data collection and analysis;

- Mixing of the two forms of data either concurrently ‘by combining them’ or sequentially ‘by having one build on the other’ or embedding one within the other;
- Priority giving to one or both forms of data (in terms of what the research emphasizes);
- Use of these procedures in a single study involving one or more phases;
- Framing of these procedures within philosophical worldviews and theoretical lenses;
- Combining of the procedures into specific research designs that direct the plan for conducting the study.

In this study, the rationale for mixing both types of data was that neither quantitative nor qualitative approach was sufficient by itself to capture the details of the complex issue of EBP. Also there was limited data in existence in this area specific to the trained ICU nurses thereby requiring multiple methods to understand fully the problem. The use of both of these methods complemented each other and allowed the research problem to be viewed comprehensively.

- **Historical Overview of Mixed Methods Approach**

Historically, mixed method research evolved from the need to use more than one source of data to answer research questions comprehensively (Teddlie & Tashakkori, 2003). Advantages that were mentioned included: addition of more breadth and scope to a study as well as exploration of contradictions in findings (Greene, Caracelli & Graham, 1989). Later on Teddlie & Tashakkori (2003) also observed that stronger conclusions are made when mixed methods are used as well as improvement of scientific rigor through the integration of the data.

One of the disadvantages of mixed methods mentioned was that it was time consuming (Jones & Bugge, 2006). Currently, mixed method publications are increasing interprofessionally like nursing or medicine, nationally and internationally (O’Cathain, Murphy & Nicholl, 2007). More current books have been written on mixed methods approach including Research design by Creswell (Creswell & Garrett, 2008; Creswell, 2009).

Additional developments included conferences focusing on mixed methods as well as specific courses on mixed methods. Funding agencies as well as nursing masters programs incorporating mixed methods research alongside traditional quantitative and qualitative research methods were also some notable developments. The effective use of this approach has been noted in several studies regarding EBP issues (Hrisos, Eccles, Francis, Bosch, Johnstron & Grol, 2009). The focus of this study involved describing the trained ICU nurses knowledge, attitudes and experiences regarding EBP.

3.5 SEQUENTIAL EXPLANATORY MIXED METHOD

From the mixed methods approach, sequential explanatory mixed method was chosen for the study. Creswell (2009) defines this type of method (sequential explanatory mixed method) as one in which the researcher elaborates or expands the findings of one method with another method hence meeting the pragmatic assumption of using multiple methods.

According to Creswell & Plano Clark (2011) the sequential explanatory mixed method consists of two distinctive interactive phases: quantitative phase (phase one) followed by qualitative phase (phase two). Hence priority is given to the quantitative phase. The researcher first collects and analyses the quantitative data (numbers). Then the researcher collects and analyses the qualitative data (words) in the sequence which helps explain or elaborate on the quantitative data obtained in phase one thereby, valuing both the subjective and objective knowledge as assumed by pragmatists (refer to **3.3**).

The qualitative phase (phase two) builds on the quantitative phase (phase one) and are both connected during interpretation of the data or discussion of results. The rationale for using this method is that a general understanding of the research problem is provided by the quantitative phase. The qualitative data then explains and in the process refines the quantitative results by exploring participants' views on the research problem in more depth (Creswell & Plano Clark, 2011).

Two phase sequential explanatory mixed method was therefore used to gain comprehensive understanding of the phenomenon by using the qualitative findings which assisted in explaining and interpreting the findings of the quantitative phase. It was also

used to add scope to the findings of the study as well as to achieve convergence of the results.

Even though priority was given to the quantitative method, each method contributed a unique perspective in understanding trained ICU nurses knowledge, attitudes and practices towards EBP as the researcher sought to understand more on the quantitative data aspect on EBP. Integration of the two types of the data occurred in the process of the research at data interpretation. The sequential explanatory steps are shown in the flow diagram (**figure 3.1**) below:

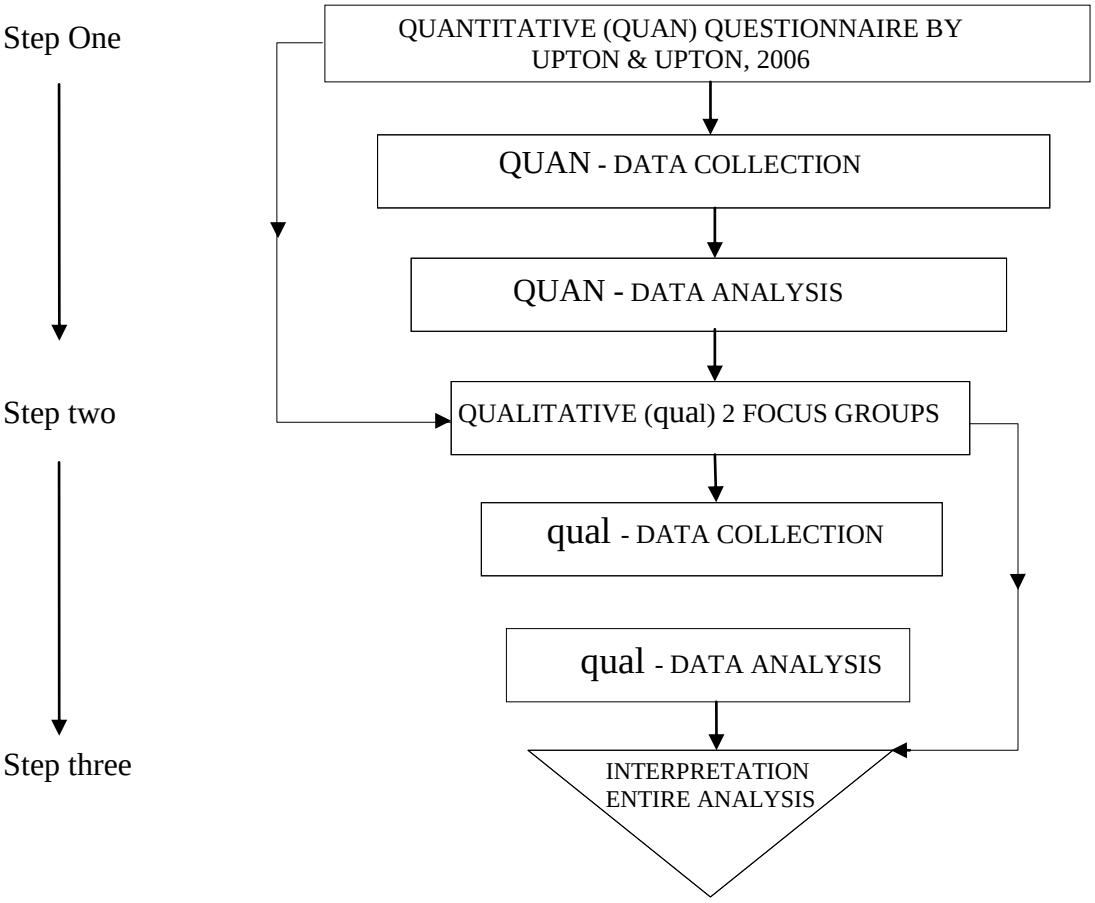


Figure 3.1: Flow diagram showing the steps in the sequential explanatory design (Adapted from Creswell, 2009)

In the figure above, QUAN means quantitative method and is in capital letters as it is the research method that carried more weight, qual means qualitative method and is in small

letters as it carried less weight and also helped narrow the problem. The steps show how the research progressed.

Quantitative Phase (Phase one)

Phase one of the study used a non experimental, quantitative, descriptive and contextual survey design (to obtain the respondent's opinions on EBP) which was cross-sectional (data was collected at one point in time) in nature to meet the study objectives quantitatively for statistical analysis (Polit & Beck, 2008).

It was also chosen because it captured data in a way that was objective, relevant, credible and accurate, in a clear and direct way. As it was non experimental, there was no intervention or manipulation to the dependent variable. The descriptive part of the design was employed to observe and document aspects of the phenomena of interest as they naturally existed (Polit & Beck, 2008). The study was bound within the context of trained ICU nurses at CMJAH.

Qualitative Phase (Phase two)

Phase two made use of a qualitative, descriptive, contextual research design. Polit and Beck (2008) defines descriptive research as research that has as its main aim the accurate portrayal of characteristics of persons, situations, or groups. This study described the trained ICU nurses knowledge, attitudes and practices on EBP to solicit their accurate feelings on EBP in their natural setting within the context of intensive care nursing.

Focus group interviews were used to explore the phenomena as it existed for in depth understanding as well as because of its ability to provide quick results. Open ended questions were posed to participants. This brought attention to the researcher, the various dimensions of the situation. The research method is illustrated in **figure 3.2** below.

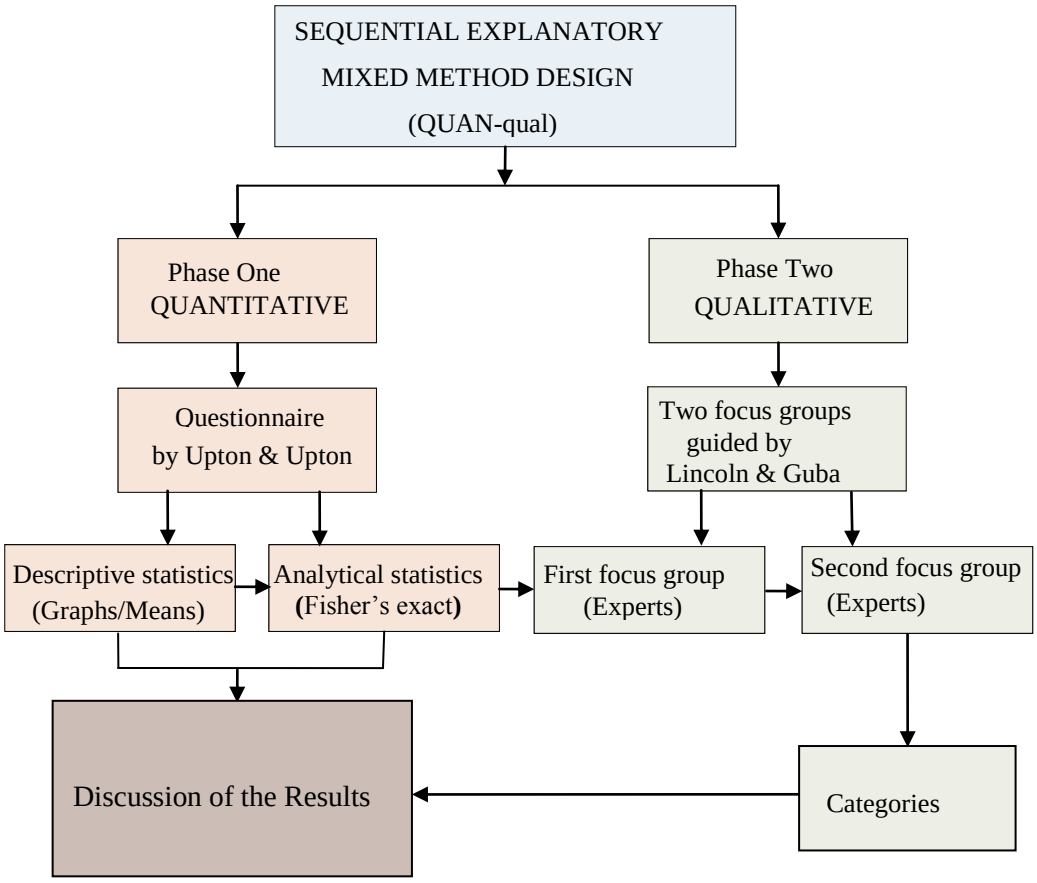


Figure 3.2: Visualisation of the Sequential explanatory mixed method design in the study

3.6 RESEARCH SETTING

The research setting in this study required careful selection as both quantitative and qualitative approaches were used. Therefore, the researcher chose a research setting that was natural and not controlled hence there was no interference or manipulation of the environment. The study was thus conducted at Charlotte Maxeke Johannesburg academic hospital (CMJAH) in five ICUs of the hospital, situated in Gauteng - South Africa.

The hospital is a tertiary level academic public hospital with more than six ICUs. The ICUs were considered to be the same as were both caring for medical and surgical patients. The number of beds ranged from 4-16 per unit. Trained ICU nurses were present in all the ICUs with a minimum number of 20 trained ICU nurses per ICU. The nurse patient ratio was one to one. The ICUs in the hospital were both headed by intensivists: specialists in

intensive care. Approximately 60.0% of the nursing staff was ICU trained. These also worked together with preceptors (experienced shift leaders) hence were exposed to specialized professional care on daily basis.

The first ICU was the Trauma unit which admits patients with head injuries, multiple fractures and gunshot wounds as well as burns. The second ICU was the Cardio-thoracic which admits patients with open heart surgery like coronary artery by-pass grafts, heart valves repair and other defects of the heart.

The third ICU was the Multidisciplinary which admits patients with different kinds of medical conditions like acute respiratory distress syndrome and some elective surgical conditions. The fourth ICU was the Neurosurgical unit which admits patients with neurosurgeries such as craniotomies and spinal cord conditions. The fifth ICU was the Coronary care which admits different kinds of cardiac patients for example acute chest pain.

Patients in these ICUs had an average length of stay of 5-7 days, and then were discharged to the wards. Paediatric ICU was not included because of consent issues which would have caused some discrepancies in the way care was provided as compared to the other ICUs. Similarly, private ICUs were not included as they had combined patients thus adults and paediatric.

The focus group interviews were conducted in the cardiothoracic ICU boardroom which was easy to find as well as for visual and audio (external) privacy hence enhancing participant's comfortability. It was also chosen as it had chairs and tables that were arranged with participants facing each other to maintain eye contact and facilitate maximum input and interaction from the participants.

3.7 RESEARCH POPULATION

In order to reach the required number of respondents / participants and elicit relevant information for the study, the researcher targeted all trained ICU registered nurses (N=110) working in five ICUs at CMJAH in Gauteng - South Africa.

3.8 RESEARCH SAMPLE AND SAMPLING PROCEDURE

3.8.1 Research Sample

From the research population a research sample was selected. De Vos, Strydom, Fouche' & Delport (2005) defines a sample as a subset of measurements that can be drawn from a population that the researcher is interested in. In chapter one, the synergy model described advanced nurses as critical care nurses who are able to recognize patients characteristics with life threatening conditions. The centrality of the patient's values was also demonstrated in chapter two on EBP which was ideal to ICU nursing and a prerequisite for advanced nursing. Trained registered Intensive care nurses were therefore selected as were advanced and appropriate for the problem under study.

The sample for phase one of the study therefore comprised of registered intensive care nurses from five adult ICUs at an academic hospital in Gauteng - South Africa. A biostatistician decided on a sample size of 100 (adjusted to 105 for non response) participants. This was taken into consideration as using a population of 110 trained ICU nurses; a 95% confidence level (alpha level 0.05) would be achieved. The proportion was estimated at 0.47 based on previously reported studies in ICU (Egerod, 2004). The final sample size consisted of 100 participants. This assisted in determining the minimum number of participants that were needed for the study so as to have a representative sample.

Phase two of the study comprised of two focus groups, 12 trained ICU nurses: 7 in the first group and 5 in the second group consisting of senior trained ICU nurses respectively to ensure homogeneity among the participants hence maximizing disclosure and reducing inhibitions among focus group participants (De Vos et al, 2005). The gender and age was mixed as the topic was not sensitive and discussing it did not make the participants to feel uncomfortable.

3.8.2 Inclusion Criteria

Both phase one and phase two included respondents or participants that were willing to participate in the study and permanently employed at the hospital. The sample also

included both male and female nurses with neither age nor ethnic background restriction. In addition the focus groups included senior trained ICU nurses only.

The trained ICU nurses in the five ICUs were chosen because they were active practicing nurses who were caring for similar patients i.e. those with critical conditions hence similar research setting i.e. academic ICU setting. (Last sentence removed …similar standards)

3.8.3 Sampling Procedure

In order to obtain the required sample, a sampling procedure was employed to select the respondents / participants from the population. Sampling procedure is the process of selecting a group of people for study (De Vos et al, 2005).

A non probability purposive sampling method was used according to the set criteria (refer to **3.8.2**) to select the sample until the desired sample size (quantitative) was reached. De Vos et al (2005) notes that this type of sampling entirely depends on the researcher's judgement regarding the typical attributes the respondents or participants are believed to possess. This sampling method was used because it was quick, convenient and was fit to select the trained ICU registered nurses based on the researcher's judgement for their advanced level practice (expertise) in intensive care nursing.

The researcher obtained a list of trained ICU nurses from the unit manager prior to selection so as to separate the trained from the un-trained ICU nurses. This was crosschecked with the help of the unit manager for eligibility i.e. whether they were permanent. The researcher then met the respondents / participants individually who agreed to participate. Then, consent was obtained and the procedure was carried out as on data collection section.

Focus group discussions also made use of purposive sampling. Only senior trained ICU nurses were purposely selected. The recruitment of participants was done based on De Vos et al (2005:305) suggestions. Firstly 10 participants were recruited for each focus group to cover those who do not turn up. The participants were recruited in person by the researcher if they were able to attend within the set time, venue and date. Informed consent (refer to

appendix M) was also sourced at this point whereby their agreement to participate ensured consent to participate in the study.

Two weeks before the focus group, the researcher reminded the participants of the focus group telephonically. One week before, a confirmation letter was issued to each participant on their attendance including venue, time and date. On the day of the focus group, a follow up phone call was made to every participant as a reminder. Again data collection section explains how the focus group was conducted.

3.9 DATA COLLECTION

3.9.1 Research Instruments / Tools

Quantitative Phase (Phase one)

The instrument for phase one was a structured questionnaire requiring about 20 minute for completion. It had a 7 point Likert scale: ranging from never and poor to frequently and best in a scale of 1 to 7. The instrument was developed in the UK (Upton & Upton, 2006) with the aim of reporting the development and validation of a self report measure of knowledge, practice and attitudes towards EBP. Nurses (n=751) were randomly selected from across Wales. Reliability was established using Cronbach's alpha. Validity was established using construct and discriminant validity.

The final questionnaire comprised of 24-items with three sub-scales (attitudes towards, knowledge of EBP and use of EBP). The scale was found to be reliable and had good, construct and discriminant validity. Construct validity was supported by positive correlations ranging from 0.3 - 0.4 ($p<0.001$) between the measure and an independent measure of awareness of EBP. Discriminant validity was assessed by comparing those nurses who were knowledgeable about a local EBP initiative with those who were not.

Those nurses who were knowledgeable of the initiative had a better attitude ($t [332] = 2.5$, $p <.001$), more frequent use of EBP ($t [360] = 3.2$, $p <0.02$), and better knowledge of EBP ($t [360] = 5.2$, $p <0.001$) than individuals without knowledge of the local EBP initiative. Cronbach's alpha for attitudes scale yielded an alpha of **0.79**; an alpha of **0.91** was found for knowledge scale and an alpha of **0.85** for use of EBP. The overall alpha was **0.87** for

the entire questionnaire. They concluded that the tool could be used to measure the implementation of EBP (Upton & Upton, 2006).

The instrument had 4 sections and a built in check list. The first section assessed the evidence-based practices comprising of 6 questions. The second section assessed the ICU nurses attitudes towards EBP comprising of 4 paired questions. The third section assessed their knowledge on EBP comprising of 14 questions on a 7 point scale and the fourth section had space for comments. The checklist assessed demographic data for example education level and age.

The instrument had further been used in Australia on medical students. It was also extensively used in USA (studies grouped) as follows: - by Koehn & Lehman (2008) with 422 registered nurses at a large medical hospital; on 458 nurses (Brown et al, 2009); on 286 practicing nurses in a retrospective study by Linton & Prasun (2012); on 33 ICU nurses by Sciarra (2011) where a recommendation for the tool to be revised for future studies was made.

Finally, Rice, Hwang, Abrefa-Gyan & Powell (2010) also conducted a study on 167 social workers to determine whether the EBPQ could be used as a reliable and valid tool, hence help to validate the tool across professional disciplines. The results revealed Cronbach's alphas of 0.93 for knowledge, 0.90 for the use of EBP. The overall scale yielded an alpha of 0.93 however; the attitudes scale yielded a Cronbach's alpha of 0.64. This led to removal of one item on attitude scale "my work load is too great for me to keep up to date with all the new evidence" as it fell below the recommended 0.70 alphas.

Removal of this item resulted in significant improvement ($p < 0.001$, using chi-square difference test) with an alpha of 0.69 suggesting this item did not fit well with the other three items on this subscale. The study supported a 23-item scale, three subscale structure of the EBPQ with acceptable 3-factor model fit indices ($X^2 = 469.04$; RMSEA = 0.081; SRMR = 0.068; CFI = 0.900). They recommended a slightly modified EBPQ to assess social workers' attitudes, knowledge and use of EBP.

They also pointed out that the item may not have fitted due to the sample differences between the study (consisting of social work practioners) and Upton and Upton's (2006) study that surveyed nurses. Since these studies were conducted in USA, UK and Australia,

a pre test was done to see if the instrument was understandable to a different context i.e. South Africa. The instrument was deemed to be appropriate as it captured data in line with the objectives and was designed for nurses. Permission was sourced from the researcher to use the instrument refer **appendix B** (Upton & Upton, 2006).

Qualitative Phase (Phase two)

In this phase, focus groups were used to explore a multitude of perceptions on EBP by trained ICU nurses so as to supplement the findings from the quantitative data. A group consensus regarding focus group definition revolves around the following distinct characteristics: focus groups are carefully planned discussions, the topics are focused and multiple participants' perceptions are obtained from group interactions.

In addition to advocating for comfortable, non threatening environment, participants have common / similar characteristics for effective participation. The group number ranges from 4 to 12 with smaller groups favouring in depth understanding of phenomena as is fitting to this study (De Vos et al, 2005; Polit & Beck, 2008).

Furthermore, De Vos et al (2005) adds on to say, a facilitator and note taker are necessary; the former to listen, observe and direct the discussion, the latter to take notes, record and handle logistics (Polit & Beck, 2008). Certain qualities of a facilitator are needed. These qualities include: clear communication, paraphrasing, elaboration, probing, directing discussion and encouraging active participation. This is done to encourage participants to express different opinions so that they can be more specific in their responses leading to self disclosure (De Vos et al, 2005). In addition, the facilitators must be knowledgeable on the subject content.

This study made use of an experienced 48 old female investigator with a Master of Science degree in nursing - Intensive care. She was actively practicing (part time) in one of the ICU hence was well known by most of the participants. She was also a lecturer at a university in intensive care hence had extensive knowledge in research, experienced in group dynamics, previous history of focus group interviews facilitation. The interviewer was fully informed of the study. She was involved in the pilot study of the focus group questions.

A female nurse note taker was used. She was 32 years old, had a background of writing clearly, concisely and with speed in her class and for that reason she was chosen for the part. She had 5 years of tutoring experience in one of the nursing colleges. At the moment she was studying Masters in ICU and was in her second year already familiar with the concept of evidence-based practice and had already started her clinical experience. She was also briefed about the research and how to capture the relevant information.

Following which an interview guide and information sheet was provided before the study to the interviewer and note taker to use during the interview so that questions asked were directed to the topic as well as to get familiar with the questions respectively. The focus group was flexible and issues were explored as they were emerging.

The un-structured interview guide (refer **appendix M**) comprised of open ended questions based on the purpose of the study to gain more views from the participants. This was designed to take approximately 60 - 70 minutes. The questions were formulated in a clear and conversational manner and were used after being amended from the pilot study guided by the quantitative results. Major concepts included knowledge on EBP, attitudes on EBP and current practices regarding EBP with examples of some of the probes used.

3.9.2 Pretest and Pilot Study

A smaller version of the study was conducted before the intended respondents in order to check the tool's flow, timing and if questions were understandable (Polit & Beck, 2008), using similar respondents in the same setting. The pretest was done on five trained nurses working in the ICU which were not included in the study sample.

A non probability purposive sampling technique was used in order to select the nurses from the identified non participating ICU at CMJAH so that the sample had the desired characteristics. The data were collected by the researcher in June 2012 and analyzed by the researcher, supervisor and one senior trained ICU nurse.

Soon after the analysis of phase one results, an interview guide was developed following which a pilot study was conducted in an ICU boardroom at Charlotte Maxeke hospital in August, 2012 for the first focus group discussion (phase two) for the same reasons as in the

pretest study in phase one. The pilot study participants comprised of: one research team member (facilitator), two senior trained ICU nurses and two potential participants which did not form part of the sample. These were selected purposively for their maximum input in developing the interview guide.

The second focus group almost maintained the same questions which needed more depth. Qualitative techniques were employed to analyse the data. Both the researcher and supervisor analysed the data. The analysis was done using content analysis which was explained on **section 3.10.** This was done to see if the questions were understandable as well as to check the feasibility of the planned time of the main focus group (70minutes). The ICU boardroom was used as a venue.

In both studies, the participants felt that the items in the scale as well as interview guide were clear. The participants however, suggested on the comment section that more clarifications be made to the respondents on the attitudes section as the approach was slightly new for the participants.

This led to more explanation upon administration of the questionnaire to the respondents and thereafter they were left alone to fill in the questionnaires to prevent biases. The participants for the focus group also felt that the interview guide' last question needed to be asked only when necessary. As some felt it could be answered earlier so as to be within the required time of 70 minutes. This was noted and observed in both focus groups.

3.9.3 The Main Study

Data was collected sequentially in phases (QUAN $\rightarrow$ qual). Quantitative phase (phase one) was conducted first to understand the problem numerically and for statistical analysis. It was followed by qualitative phase (phase two) comprising of data from participants' views in focus group discussions. This was designed to obtain their specific language on the research problem and also to explain the quantitative results (Creswell, 2009).

Phase one involved use of a questionnaire and after ethical, institutional and ward in-charge's approval, full disclosure to the respondents was done to individual nurses on duty

(during the day) in the nurses' office or tea room following the process of informed consent to ensure voluntary participation, privacy and confidentiality.

The researcher explained briefly about the study and administered the information letter individually for the respondents to read and upon agreeing the respondents were provided with a consent form to sign together with a questionnaire. They were left alone to answer on their own (self administered questionnaire) to prevent bias. The respondents were asked to put the questionnaires in the envelope upon completion, with no name then seal the envelope for confidentiality and anonymity.

The researcher with the help of the ward in-charge identified the in-charge's office as a safe place to put the completed questionnaires in a large sealed box open on top only to allow the filled questionnaires for daily collection (during the day) by the researcher to maintain confidentiality. Information as to where to find the researcher was provided (on information letter) to answer any questions or address any concerns from the respondents. The data collection was done by the researcher for 3 months from June, 2012 to August, 2012.

Phase two involved use of two focus groups which were held at the CMJAH hospital as a supplemental method to assist in interpretation of the quantitative data. The first focus group was conducted soon after analyzing the quantitative data. This guided the sequence and the type of questions to be asked or probed more for the first focus group.

Similarly after analyzing the first focus group, the second focus group was conducted based on the results of the first focus group. This also guided the focus of the discussions and added more depth to the results of the first focus group. The questioning sequence was maintained thus open ended with probes.

The un-structured, in-person, directive way of collecting information from the group was used so as to get more views from the participants. The groups were conducted by two moderators: one to ask the questions, direct the conversation, probe more on specific topics and the other to take field notes and observe group behavior.

Probes were used for in-depth answers and the researcher listened attentively. Forms of data included: conversation including tone of voice, silences, words and body language. Consent to participate and use tape recorder was obtained prior to starting the focus group discussions. However, some participants refused to give consent for tape recording hence the focus groups were not tape recorded. A third person was added to take notes as well.

Field notes were therefore taken by the note taker, the researcher and the facilitator. General discussion guidelines or rules were read during introduction. Open ended questions were used which addressed: knowledge, attitudes and practices on EBP (see **appendix M**). It took approximately 90 minutes and 70 minutes for focus group one and two respectively. There was only one session per focus group.

3.10 DATA ANALYSIS

Data analyses were conducted to reduce, organise and give meaning to the data that was collected (Polit & Beck, 2008). This was done to extract useful information and develop conclusions to address the research questions and more so done to show how the qualitative data helped to explain the quantitative results.

A sequential explanatory mixed method approach was employed hence linking the data of the quantitative with the qualitative was also done using objective methods as stated by Creswell and Plano Clark (2011). They recommended data analysis procedure which includes first collecting the quantitative data, analysing the data and using the results to inform the follow-up qualitative data collection (Creswell & Plano Clark, 2011).

Data in **phase one** which made use of a questionnaire were analyzed quantitatively. This analysis involved section one, two and three of the questionnaire plus the checklist or the demographic data. The analysis was done using the computer package 'STATA' version 10.0. Data were entered directly once and then verified twice by the researcher at two different times.

Descriptive and analytical statistics were used to achieve the study objectives. The descriptive statistics included summary statistics in form of frequency, percentage, mean,

range, standard deviation (SD) and total scores. In addition visual forms like tables and graphs were used to aid in describing the results.

The categories on the Likert scale were subcategorized into three groups to minimize variation of feedback from respondents. Category 1 and 2 were grouped to form rarely or poor category. Category 3 and 4 were grouped to form moderate category. Category 5, 6 and 7 were grouped to form frequently or best category. Furthermore, the rarely or poor category were analysed as lack of knowledge, negative attitude or not EBP.

The frequently or best category were analysed as high knowledge, positive attitude or practice based on evidence. The moderate category were analysed as being moderate (neither positive nor negative). This was done to describe whether self reported responses showed that the respondents had positive or negative attitudes on EBP or whether they were knowledgeable on EBP as well as whether their practices were based on evidence. In brief, the higher the score, the more positive the attitude or knowledge or practice towards EBP.

The researcher also attempted to describe what would be a good total score with the various variables (practices, attitudes and knowledge). This was done in consultation with clinical facilitators at CMJAH. It was agreed that for clinical assessment (thus the documented process for nurses to evaluate, diagnose and treat patients) 60.0% is the minimum score and 80.0% is the minimum score for practical procedures (thus the ability or skill to perform nursing activities). The final score indicators were between the two with more scores allocated to the practice and knowledge variable as the trained ICU nurses were considered advanced and efficient in their practice and knowledge.

Therefore, for practice score (n=42) the desired maximum score was 32 to show at least a 75.0% minimum level of practice. The desired score for attitudes (n=28) was 20 to show at least a minimum attitude level of 70.0%. The desired level of knowledge (n=98) was 74 to show at least a minimum knowledge level of 75.0%.

Analytical analysis ensured that the associations between the main variables (knowledge, attitudes and practices) and the demographic were calculated. This strengthened the conclusions made of the quantitative data. Fisher's exact test was therefore chosen to

examine the significant association between two classifications thus the demographic variables and the main variables (knowledge, attitudes and practices). This test was chosen as most of the cells were less than five; hence the exact p-value was calculated. The p-value of ≤ 0.05 was considered as being statistically significant and ensured a power of at least 90.0% accuracy in the findings.

The comment section was analysed using qualitative techniques by grouping the comments into meaningful categories. Content analysis was used.

Data in **phase two** were analyzed qualitatively using content analysis (De Vos et al, 2005). It was driven by the underlying research questions. Words spoken by participants and not numbers were used. The analysis started with reading and re-reading each written narratives to get sense of the whole story. Researcher notes were made directly from the field notes and observations.

Major concepts that recurrently appeared or repeated were highlighted using different colours. Concepts that were repeated and written differently were noted and highlighted. Concepts that appeared in the same narrative were considered important. Those concepts that were emphatic in their use were underlined and categorized as being forceful. A pattern of analysis was then established to get a sense of a whole.

This approach was used to get a sense of each narrative allowing each story to develop. From each story the meaning was noted as it emerged through deductive reasoning. Second level of analysis included an attempt to develop an emerging story from the collection of the stories. This was done to bring the sense of whole to develop categories and sub- categories (Polit & Beck, 2008).

3.11 RELIABILITY, VALIDITY AND TRUSTWORTHINESS

3.11.1 Reliability and Validity of the Instrument

Reliability referred to the consistence and stability of an instrument overtime and conditions expressed as a form of correlation coefficient with 1.00 indicating a perfect reliability and 0.00 indicating no reliability. Reliability was checked using a Cronbach's

alpha to evaluate the internal consistency of the tool as it was testing a different sample (Polit & Beck, 2008). Using this criterion, for an instrument that was demonstrating high reliability, it showed that the amount of error in the obtained scores was low.

Thus, Cronbach's alpha was calculated for each item in the whole instrument as well as for the items in the subscales for instance knowledge, attitudes, practices. A correlation coefficient was computed and summed up to indicate the magnitude and direction of a relationship between two variables then an overall score was obtained.

A reliability of 0.80 is considered as the lowest acceptable coefficient for a well developed instrument where as a reliability of 0.70 is considered lowest acceptable coefficient for a newly developed instrument (Polit & Beck, 2008). As noted by Polit and Beck (2008:453), depending on how important or crucial the decisions are, higher alphas of about 0.80 are required. The rule is the higher the Cronbach's alpha, the more reliable the tool.

The findings in the international studies showed that the instrument (EBPQ) was well developed and hence the coefficient of this instrument was measured at 0.80. This showed that there was 80% fairly strong relationship between the items in the instrument (practice, attitudes and knowledge) and the attribute that it was measuring (EBP).

Validity referred to the ability of the instrument to measure accurately what it was supposed to measure (Polit & Beck, 2008). Validity was checked using face and content validity for appropriateness of sample of items versus the construct being measured**.** This also increased the validity of the tool refer to **appendix H & J**.

A group of five ICU experts were purposively selected to evaluate and document the content validity refer to **appendix I**. These experts included three registered trained ICU nurses currently working in ICU who were familiar with EBP with a minimum of five years of ICU experience. For the lecturers, two lecturers who were actively involved in the ICU formal or informal education were included.

This was determined as an appropriate number as Lynn (1986) states that a minimum of three and a maximum of ten is appropriate. In discussion with the supervisor a number of five was decided upon. Firstly, to ensure face validity, it was discussed in the group of the

ICU experts if the questionnaire was correctly worded, well explained and if it addressed what it was supposed to address thus knowledge, attitudes and practices of the trained ICU nurses on EBP.

Secondly to ensure validity of the instrument, content validity index (CVI) was used to rate the relevance of each item comprising of a four point scale: from 1= irrelevant to 4= relevant and very important (Lynn, 1986). The content validity of the entire questionnaire was the percentage or proportion of the whole items judged as content valid by the experts to which a minimum of 80.0 was desired also known as the quantification stage (Lynn, 1986). The content validity for the whole questionnaire was determined as the percentages of questions rated either 3 or 4 using the CVI. In addition, three of the five participants had to rate the item as 3 or 4 to ensure that the item was content valid.

3.11.2 Trustworthiness of the Qualitative data

Trustworthiness in qualitative research refers to the steps that are taken to ensure accuracy and openness of the qualitative data. Trustworthiness of the qualitative data was achieved through the rigor process according to Lincoln and Guba's model of trustworthiness (Polit & Beck, 2008:539). The model identifies four criteria plus a newer criterion for establishing trustworthiness of a qualitative research. These were established as follows:

- **Credibility**

According to Lincoln and Guba, credibility is the confidence in the truth of the data and interpretations (Polit & Beck, 2008:539). They further notes that credibility can be accomplished in two ways: a researcher carries a study in a way that enhances believability of the results and takes steps to demonstrate credibility to the outside readers; this is also known as thick descriptions.

An independent facilitator was used in the study. The research was conducted in collaboration with an experienced supervisor (more than 10 years) in ICU. Field notes of the focus groups were stored safely for audit checks. Peer review was done from data collection, analysis and interpretation of the findings and finally the methods used were adhered to the qualitative design which is traceable.

- **Dependability**

Lincoln and Guba site this as referring to the stability (reliability) of data over time and over conditions (Polit & Beck, 2008:539). This implies that if the study were replicated with the same or similar participants in a similar context the findings will be similar or the same. Data triangulation was achieved by using different ways of capturing the data for example field notes and observations.

Person triangulation was also observed by combining males and females in the focus groups. Repeated review of data and independent analysis by an experienced analyst from the faculty were also done. There was a clear trail of data analysis so that the process was clearly documented and understood allowing another researcher to verify the findings.

- **Confirmability**

Confirmability refers to objectivity thus potential for congruence between two or more people about the data's accuracy, relevance or meaning (Polit & Beck, 2008:539). This is concerned with presenting findings that reflect participants' voice. Again, use of different facilitator, thick description, peer review, data triangulation, and repeated review of data and independent analysis of data also assisted in accomplishing this criterion.

- **Transferability**

Refers to the (generalizability removed) extent to which the findings can be transferred to other settings or groups (Polit & Beck, 2008). Lincoln and Guba note that sufficient descriptive data in the research should be provided. In so doing other researchers can evaluate the applicability of the data to other contexts. This was adhered to through thick description of the study.

- **Authenticity**

As noted by Lincoln and Guba, authenticity refers to the extent to which the researcher fairly and faithfully shows a range of different realities (Polit & Beck, 2008). The study is

reported in such a way that readers are enabled to develop a heightened sensitivity to the issues being depicted. Secondly the study conformed to the qualitative design.

The study also adhered to the University of Witwatersrand procedures for carrying out research like obtaining approval from the postgraduate committee and ethics committee (certificate: M120330) to ensure that the study was conducted in an approved and ethically acceptable manner. In addition the approvals are attached including the guides to the questions used and consent procedures followed (see **appendix C, D, E, F, J, K, L & N**).

3.12 RIGOR OF THE STUDY

Rigor of the study relates to the researchers use of rigorous or precise methods to collect, record, analyse and keep the data (Polit & Beck, 2008). This research used a qualitative process of establishing trustworthiness of the data according to Lincoln and Guba. The trustworthiness of this study was maintained by using thick description of the analysis which is replicable to prevent biases.

An independent interviewer, methodological triangulation and safe storage of the data were also observed. Data were to be kept locked up until after 6 years after which it was to be destroyed (Polit & Beck, 2008). Thirdly, a biostatistician was involved in calculation of the sample and all the statistical procedures.

The use of a valid instrument thus EBPQ for nurses' also ensured rigor of the study which can be replicated (Upton & Upton, 2006). This was used consistently on all the respondents. The quantitative data were collected by the researcher alone and was collected independently without any influence. The qualitative data were collected by three people to ensure that data were replicable and in addition the collected data was supported by the supervisor.

3.13 ETHICAL CONSIDERATIONS

Ethical guidelines were considered based on University of Witwatersrand which originates from ICH Harmonized Tripartite guidelines of good clinical practice, South Africa

National department of health guidelines for good clinical practice (2006) and Declaration of Helsinki (2008). www.witshealth.co.za/.../Ethics%20Committee%20 Members.rtf

In this regard, peer review was done at the department of nursing education. A presentation was made to the University postgraduate committee for permission to conduct the study to which an approval was granted (see **appendix C**). Ethics certificate (number: M120330) was obtained from the university ethics committee for clearance on human subjects (see **appendix D**).

Permission from the Department of health to conduct the study in Gauteng hospital was also obtained (see **appendix E**). Permission to conduct the study and access the nurses at CMJAH in the five ICUs was also obtained through the chief executive officer (see **appendix F**) as well as permission from the managers in the respective ICUs for the actual access of the nurses and the resources like boardroom was obtained.

Observation of ethical issues like informed consent, confidentiality and anonymity to protect human subjects were followed. For example, patients' names were not used in the questionnaire, instead codes were used. The data was stored in a secured place. The consent forms were kept separate from the questionnaire to prevent any associations with the data. The participants were reminded to observe confidentiality during the focus group discussions.

Information was provided both verbally and in writing. The participants /respondents were told about the voluntary nature of the study and that they were free to withdraw without any consequences at any time from the study (see **appendix J, K & N**).

3.14 DISSEMINATION OF FINDINGS

Copies of the final report will be submitted to the University of Witwatersrand library. A copy will be sent to the participating hospital and another one to the Department of health in South Africa. The researcher plans to publish the results in a journal of evidence-based practice or critical care nurses. The researcher also plans to disseminate the results in critical care conferences.

3.15 SUMMARY

This chapter outlined the research methodology as well as the process and historical overview of the research design. Reliability and validity was established using Cronbach's alpha, face and content validity as well as trustworthiness according to Lincoln and Guba for phase one and two. The tools were subjected to pretest and pilot study in phase one and two respectively. The following chapter will discuss the data analysis and the study results.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

This chapter presents the approach to data analysis, the results and discussion of the results. This was done in two phases. Phase one involved quantitative data analysis which were done through descriptive and analytical statistics. In phase two the qualitative data were analysed through content analysis. This was soon followed by combining and discussing the results from both quantitative and qualitative analysis so as to fully understand the trained ICU nurses knowledge, attitudes and practices on EBP. The presentation of these phases is as in the subsequent sections.

4.2 APPROACHES TO DATA ANALYSIS

Figure 4.1 presents the summary of the approach to data analysis for phase one and two of the study. In **phase one** descriptive analysis ensured that the data was summarised and presented in an organised way. Means, standard deviations (SD), ranges and percentages (calculated to one decimal place) were presented in either tables or graphs to enhance its presentation. Standard deviation was calculated to indicate how the variables deviated from the mean (Polit & Beck, 2008).

Further categorisation was done on the Likert scale to minimize variation (scales were reduced from the initial 1-7 to 1-3 by combining scales 1 and 2, 3 and 4 and 5, 6 and 7) as presented in chapter three **section 3.10**. Analytical analysis ensured that the associations between the demographic variables and the main variables (knowledge, attitudes and practices) were examined using Fisher's exact test and the p-value of **≤ 0.05** was considered as being statistically significant. Only significant results plus those considered clinically important by the researcher were presented so as to enhance the understanding of the main findings.

In order to establish the tool's validity and reliability in South African setting, Cronbach's alpha was calculated for the entire questionnaire. Face validity was decided upon the

agreement of the experts. Content validity index was calculated and presented in a graph. Comments made by the participants were analysed qualitatively using content analysis. In **phase two**, content analysis was used to analyse the qualitative data obtained from the participants. The field notes were thereafter read and re-read to get a sense of the story, patterns were formed and categories and related sub- categories were extrapolated as presented in **section 4.4.**

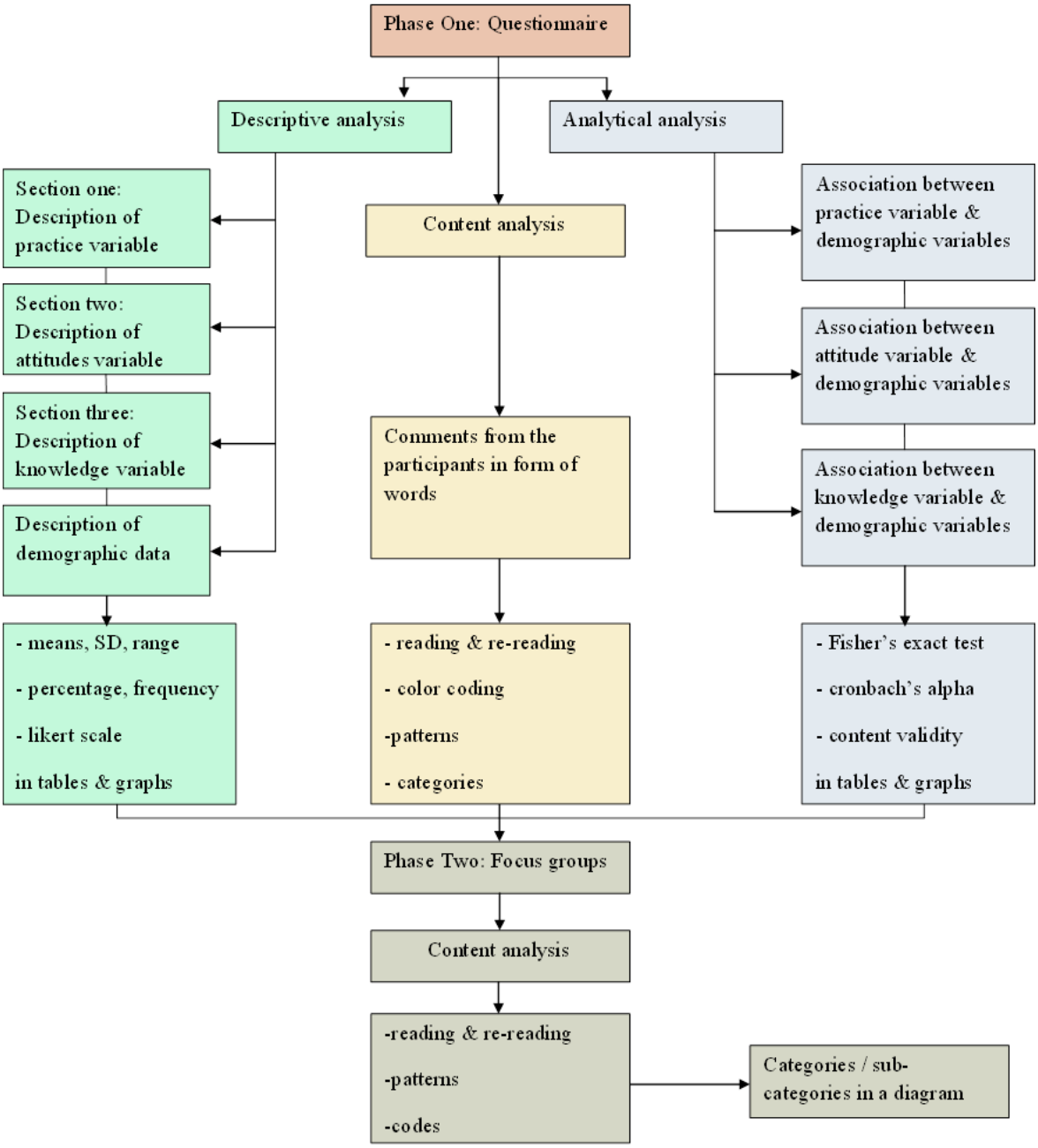


Figure 4.1: Summary of the approach to data analysis for phase one and two of the study.

The following section presents the results and discussion of phase one of the study. Following which, phase two findings and its interpretation will be provided. Soon after which the combination of the results from the two phases will be conducted.

4.3 RESULTS OF PHASE ONE (QUANTITATIVE PHASE)

4.3.1 Demographics of the Participants

Table 4.1 presents the summary of the demographic information of nurse participants (n= 100) in phase one. **Table 4.2** provides the summary statistics for age and experience.

Table 4.1: Demographic profile of trained ICU nurses (n-100)

Demographic variables		n=100	Percentage %
Age (years)	< 35	24	24.0%
	36-50	58	58.0%
	> 50	18	18.0%
Gender	Male	8	8.0%
	Female	92	92.0%
Level of education	Advanced diploma	74	74.0%
	Bachelor of Science (Bcur)	22	22.0%
	Masters degree	4	4.0%
Highest qualification	Post registration diploma	74	74.0%
	Degree (Masters/Bachelors)	26	26.0%
Position	Staff nurse	73	73.0%
	Shift Leader	16	16.0%
	Manager (operational/unit)	11	11.0%
ICU Experience (years)	< 5	53	53.0%
	> 6	47	47.0%

Table 4.2: Summary statistics for categories of age and experience

Variable	**Males (n=8)**			**Females (n=92)**			**Total (n=10)**		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Age	40.75	6.39	27-48	42.75	8.56	26-58	42.59	8.40	26-58
Experience	5.75	6.86	1-19	7.27	6.11	1-32	7.15	6.15	1-32

The mean **age** of the total participants was 42.59 (SD ±8.40). Their ages ranged from 26 – 58 years. The majority 58.0% (n=58) were aged between 36 and 50. Female trained ICU nurses dominated in the study (92.0%; n=92) with a higher mean age of 42.75; SD±8.56 ranging from 26 - 58 years. This also indicated that females were on average older than the male participants, refer **table 4.1** and **4.2**.

In terms of **education** the majority of the nurses had an advanced diploma (74.0%; n=74) indicating more trained ICU nurses with diploma than Bachelors degree or masters. The highest **qualification** held by the majority of the participants was post registration diploma (74.0%; n=74). The minority (26.0%; n=26) had a degree, refer **table 4.1**.

Positions held by most of the participants in the discussion were staff nurses (73.0%; n=73) followed by shift leaders (16.0%; n=16) and then managers (11.0%; n=11), refer **table 4.1**.

The years of **experience** of the participants were essential and further categorization was done for better discussion. The majority (53.0%; n=53) of the ICU trained nurses had less than 5 years of ICU experience, with only 47.0% (n=47) having more than 6 years of ICU experience**.** The overall ICU experience mean was 7.15 years (SD ±6.15) ranging from 1 - 32 years, refer **table 4.1** and **4.2**.

4.3.2 Practices of Trained ICU nurses towards EBP

Figure 4.2 below summarises the results of the trained ICU nurses practices towards EBP using six items on a scale of 1 to 7 which were further sub categorised into a scale of 1 to 3 (rarely, moderately and frequently). In general, the practices of the trained ICU nurses

towards EBP were frequent. The most percentage of trained ICU nurses that frequently practiced EBP approaches ranged from (42.0%; n=41) to (75.0%; n=73) with 'sharing of information' being the most frequent practice.

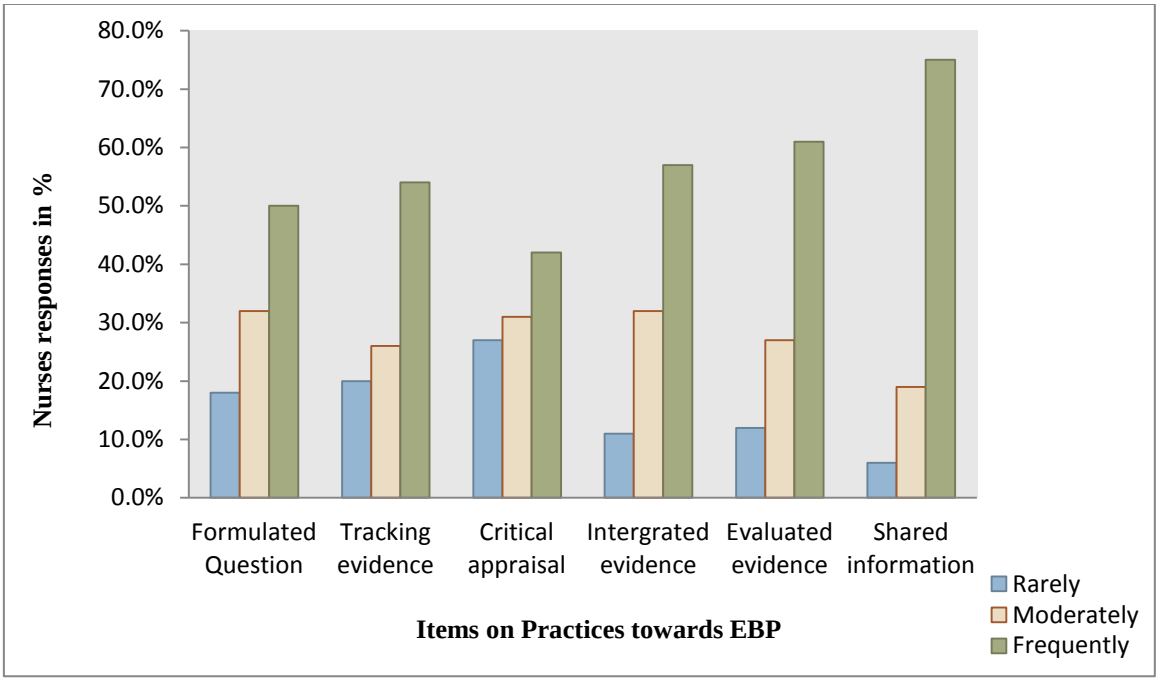


Figure 4.2: Practices of trained ICU nurses towards EBP (n=100)

4.3.3 Attitudes of Trained ICU nurses towards EBP

The trained ICU nurses overall attitudes towards EBP are presented in **figure 4.3** below consisting of their responses on section two of the questionnaire. This section had four items and requested the trained ICU nurses to rate their responses using a pair of questions on a scale of 1 to 7 which were further sub categorised into poor, moderate and best.

The majority of the trained ICU nurses selected the best category with the minimum difference of 42.0% from the moderate group. The highest attitude score was 75.0% (n=74) which was on 'fundamental to nursing'. The lowest attitude score (7.0%; n=7) was on resentment of EBP. The poor category under time waster was selected by 15.0% (n=15) of the trained ICU nurses. A clear demarcation between higher scores and lower scores was observed.

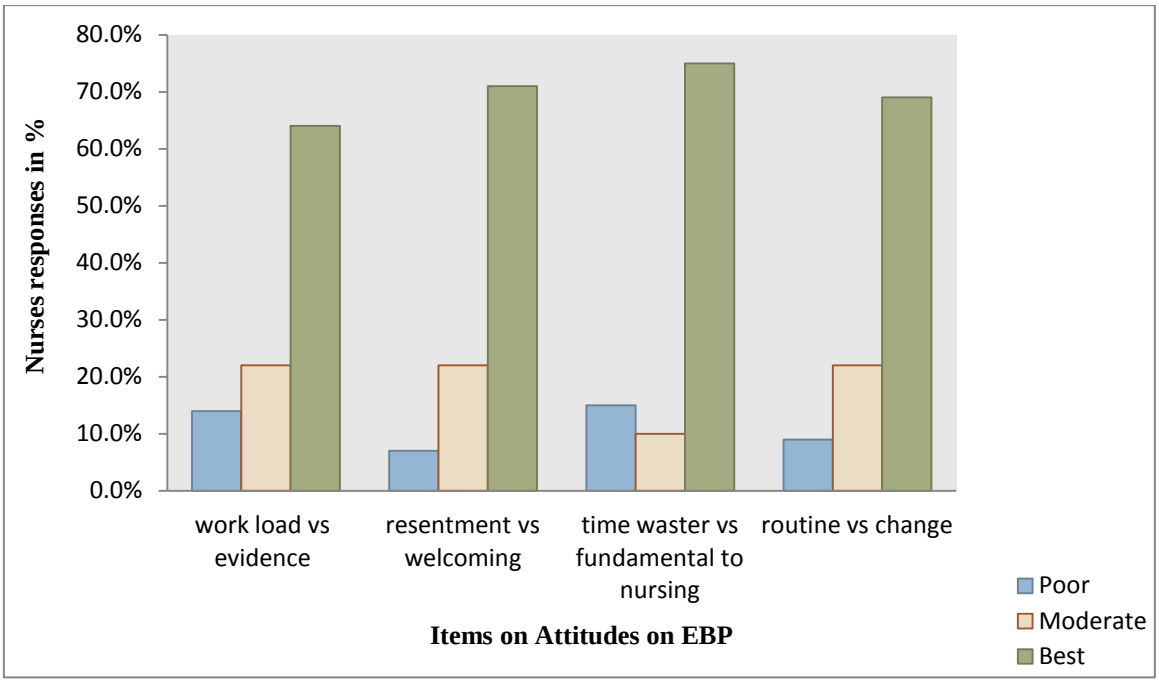


Figure 4.3: Attitudes of trained ICU nurses towards EBP (n=100)

4.3.4 Knowledge of Trained ICU nurses on EBP

Trained ICU nurses were asked to rate their knowledge towards EBP on a scale of 1 to 7 which was also further sub-categorised into poor, moderate and best. Fourteen items were used and are presented in **figure 4.4** below. The highest knowledge percentage was under the best category (81.0%; n=81) which was on sharing of ideas. Fewer percentages were obtained on the skills part under the best category for instance information and technology (IT), research skills and converting skills (33.0%; n=33, 36.0%; n=36 and 40.0%; n=40) respectively. More-lower scores were obtained in these areas with higher moderate scores reaching as far as 48.0% (n=48).

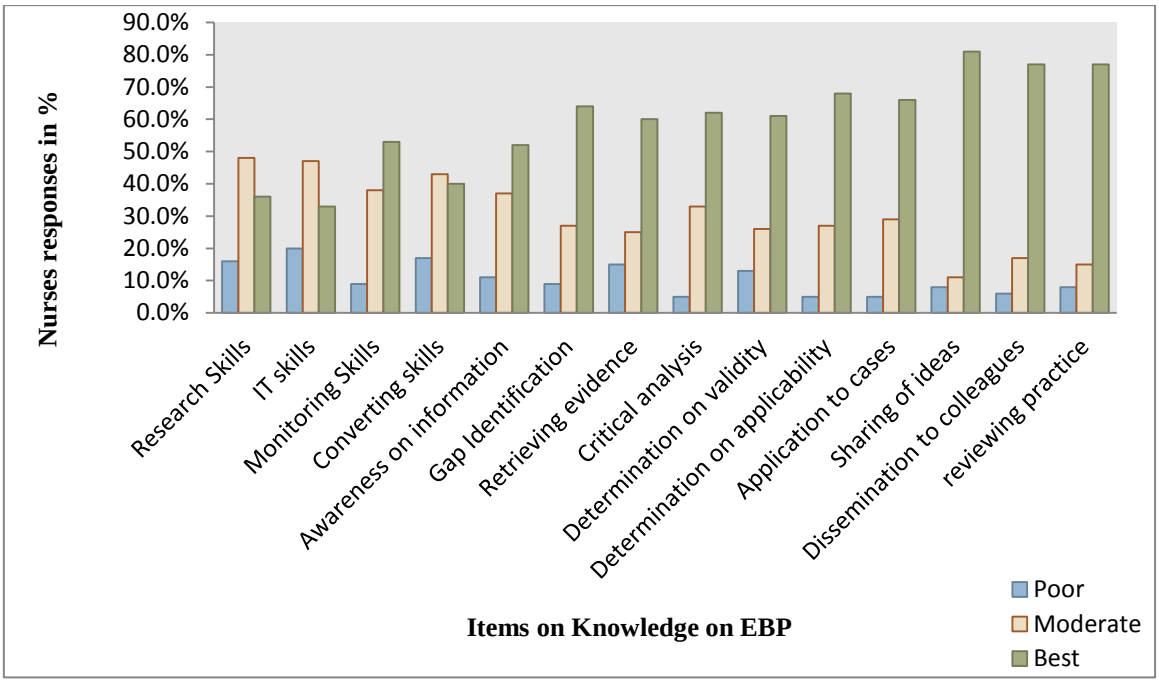


Figure 4.4: Knowledge levels of trained ICU nurses towards EBP (n = 100)

4.3.5 Association between Practices of trained ICU nurses and the Demographics

The associations between practices of the trained ICU nurses on EBP and the demographic variables were mostly not statistically significant using Fisher's exact test. Six items were used for the practice variable and were compared with the demographic data: gender, age, education, qualification, position and ICU experience.

The association between **practice** and **gender / age** was not statistically significant as all the questions scored above the set significant p-value of 0.05. Even though the differences in practices of both males and females towards EBP were not statistically significant, overall; males reported more EBP than females. Also noted was the general report of frequent practice on EBP for all the trained ICU nurses irrespective of age with more frequent practice from the trained ICU nurses who were over 50 years old.

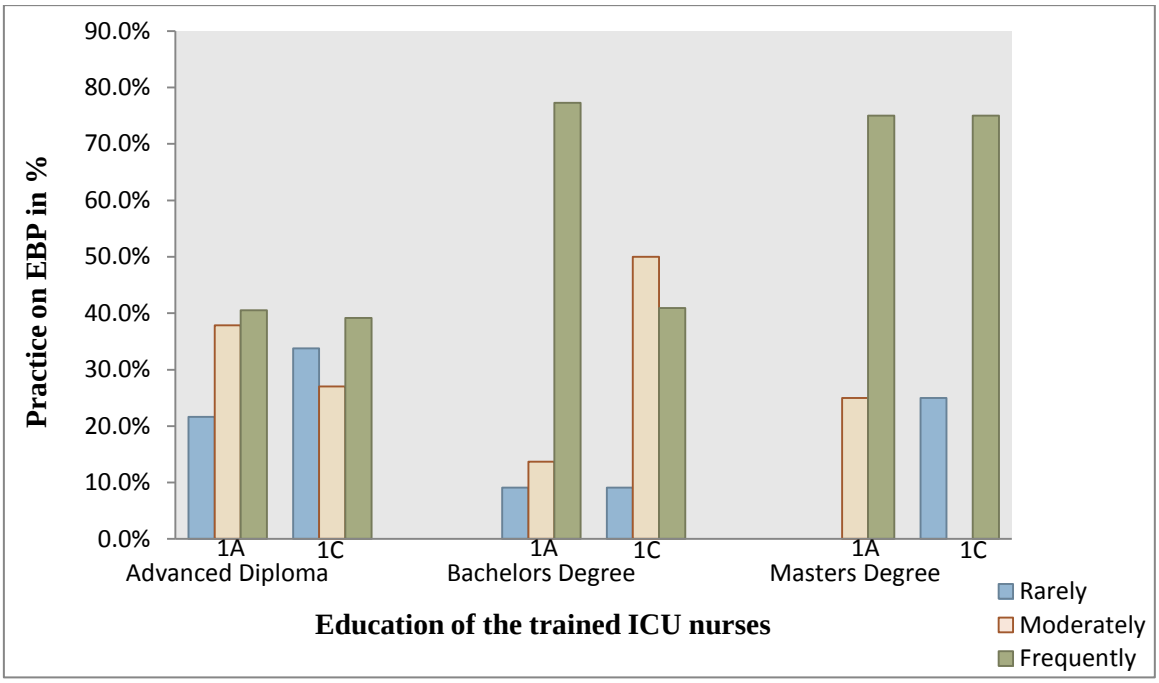
The association between **practice** and **position / experience** variable association was also not statistically significant using Fishers exact test. However, only one question on practice variable was statistically significant with position/experience variables. These items are subsequently presented.

Practices of trained ICU nurses in relation to position were explained using item 1C [P= 0.028] which was on critical appraisal. The majority (68.8%; n=11) of the shift leaders reported the most frequent EBP. Only 36.4% (n=4) of the managers selected the frequently practiced category whereas 54.6% (n=6) of them selected moderately practiced category. The majority (35.6%; n=26) of the staff nurses also reported frequently EBP. Moderately practiced category was selected by 32.9% (n=24) and rarely practiced category was selected by 31.5% (n=23) of the professional nurses.

Practices of the trained ICU nurses in relation to experience were also explained using one item (1A) which was statistically significant with experience [P= 0.013*] out of the six items. This item was on formulating a clearly answerable question. The majority (70.8%; n=17) of the trained ICU nurses with more than 10 years of ICU experience selected the frequently practiced category seconded by (69.6%; n=16) of the trained ICU nurses from 6-10 years. The ICU nurses between 3 and 5 years also reported frequently EBP (46.7%; n=14). The practices were lower scored for the trained ICU nurses with less than 2 years of ICU experience with the highest lower rank of "rarely" (30.4%; n=7) coming from this group.

The association between **practice** and **education / qualification** was not statistically significant in general. However, two questions on the practice variable were statistically significant with education and qualification variables and are summarised below.

Figure 4.5 illustrates practices of the trained ICU nurses with their level of education using items IA (formulating a clearly answerable question) and 1C (critical appraisal). The majority of the trained ICU nurses with bachelors' degree reported frequently EBP with the highest score of 77.3% (n=17) for both items followed by the trained ICU nurses with masters' degree (75.0%; n=3). Also the majority of the trained ICU nurses with diploma reported frequently EBP (40.5%; n=30) on item 1A. Their highest score on rarely practiced category was 33.8% (n=25) also on item 1A. A similar trend was noted for all the six items, but fewer of these differences were statistically significant.

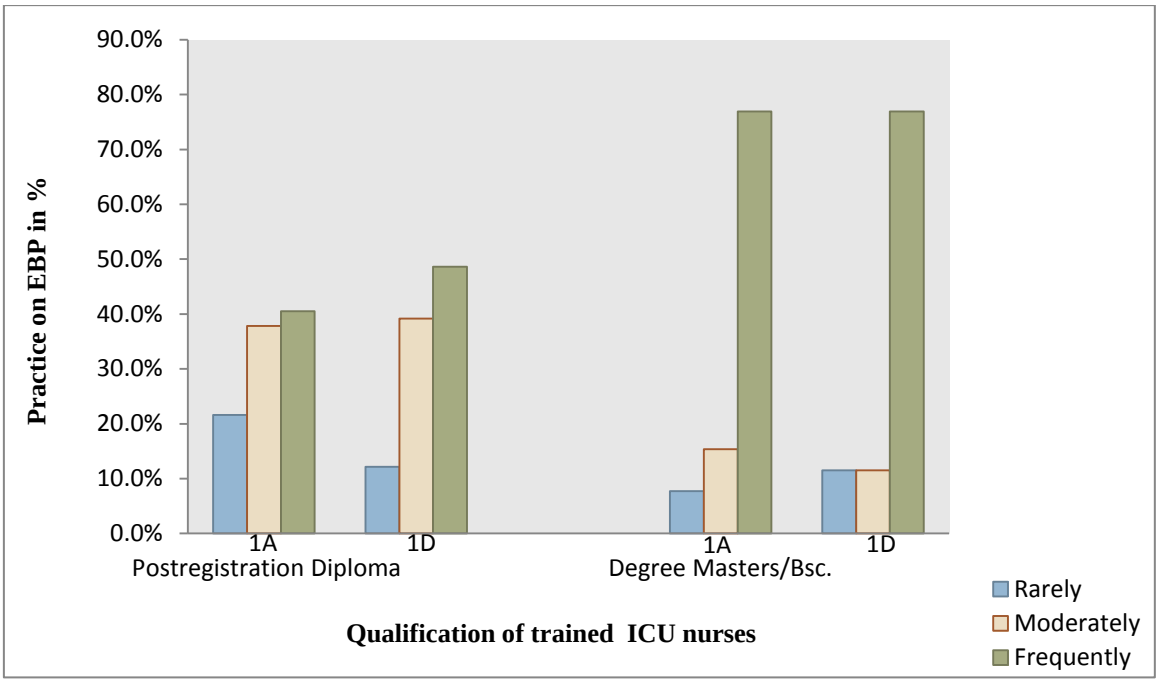


P=0.027*, 0.039*

Figure 4.5: Practices of trained ICU nurses on EBP according to their nursing education using item 1A & 1C.

Practices of the trained ICU nurses with their **highest qualification** are summarised in **figure 4.6** using two items. Item IA (formulating a clearly answerable question) and 1D (integration of evidence to practice) were found to be statistically significant out of the six items. The majority (76.9%: n=20) of the trained ICU nurses with degree reported frequently EBP by selecting the frequently practiced category for both item 1A and 1D. A few (7.7%; n=2 & 11.5%; n=3) selected the rarely practiced category for item 1A & 1D respectively.

The majority (48.7%; n=36) of the trained ICU nurses with post registration diploma selected the frequently practiced category for item IA seconded by 40.5% (n=30) for item 1D. The moderately practiced category was selected by 39.2% (n=29) and 37.8% (n=28) of the trained ICU nurses with diploma for item 1D and 1A respectively. A few (21.6%; n=16 & 12.2%; n=9) selected the rarely practiced category for item 1D and 1A respectively.



P= 0.008* & 0.019*

Figure 4.6: Practices of trained ICU nurses against level of qualification using item 1A & 1D

4.3.6 Association between Attitudes of trained ICU nurses and the Demographics

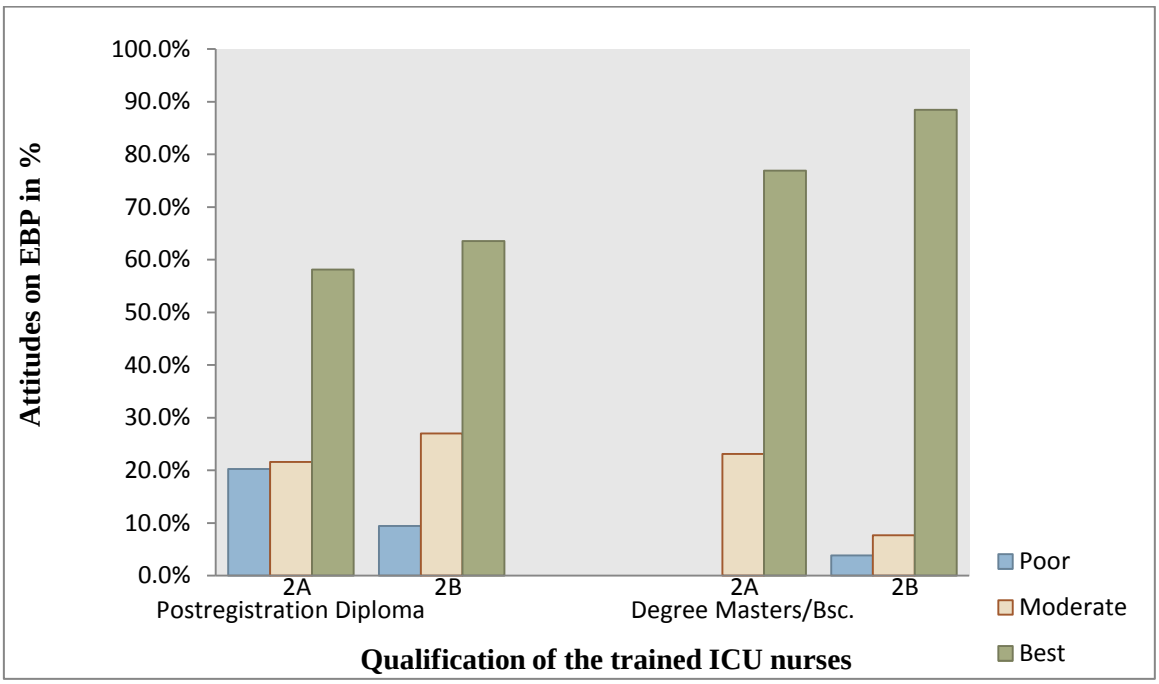
The attitudes of the trained ICU nurses towards EBP were examined to note whether gender, age, education, qualification, position and experience had any significant association with the trained ICU nurses attitudes towards EBP. In overall, there was no statistical significance using Fisher's exact test as most of the items scored above the set significant p-value of 0.05. However, one item out of the four was found to be statistically significant with two demographic variables: qualification/position. The results of the relationship between attitudes and the demographic data are subsequently presented.

Despite the results not being statistically significant, both **male** and **female** trained ICU nurses had high positive attitudes regarding EBP with more positive attitudes coming from the males than the females. Similarly, general positive attitudes regarding EBP according to **age** were displayed with more positive attitudes arising from the trained ICU nurses aged 50 and above.

The trained ICU nurses with masters' degree demonstrated more positive attitudes than the ones with bachelors or diploma on **education**. Similarly, it was also observed that the higher the **experience** in ICU, the higher the positive attitude towards EBP.

As illustrated in **figure 4.7** below, statistical significance was found for only item 2A (my workload is too great versus new evidence is so important [P=0.024]) on **attitudes** and **qualification**. Borderline association was found for only item 2B (I resent having clinical practice questioned versus I welcome questions on my practice).

In overall, the majority (88.5%; n=23 & 76.9%; n=20) of the trained ICU nurses with a degree selected the best category for item 2B and 2A respectively. Only 3.9% (n=1) of the degree group selected poor category for both items. Similarly, the highest rank for the diploma nurses was the best category with 63.5% (n=47) and 58.1% (n=43) for item 2B and 2A respectively. The poor category was selected by 20.3% (n=15) and 9.5% (n=7) of the diploma nurses for item 2A and 2B respectively.

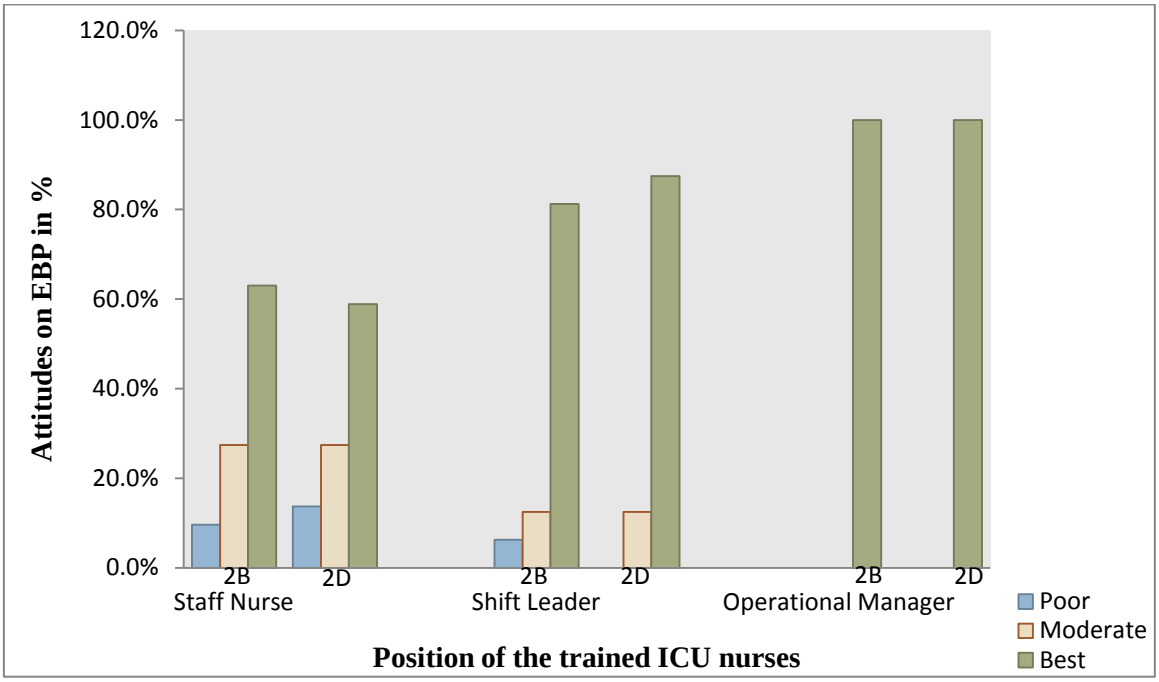


P=0.024*, 0.054

Figure 4.7: An association of attitudes and qualification of trained ICU nurses on EBP using item 2A & 2B.

In terms of **attitudes** and **position** as indicated in **figure 4.8** only item 2D (I stick to tried and trusted methods versus my practice has changed because of EBP) was statistically

significant (p=0.028). In general, managers displayed more positive attitudes towards EBP with 100.0% (n=11) falling on the best category seconded by shift leaders 87.5% (n=14) and 81.3% (n=13) for item 2B (I resent having clinical practice questioned versus I welcome questions on my practice) and 2D, followed by the staff nurses 63.0% (n=46) and (58.9%) n=43 for item 2B & 2D respectively).



P=0.126, 0.028*

Figure 4.8: Trained ICU nurses attitudes according to position for items 2B & 2D

4.3.7 Association between Knowledge of trained ICU nurses and the Demographics

The association between knowledge and the demographic variables: gender, age, education, qualification, position and experience were also tested using Fisher's exact test to see if the differences in knowledge of the trained ICU nurses towards EBP according to the demographic variables were statistically significant. Fourteen questions were used on the knowledge variable. Knowledge was found to be statistically significant with qualification and position. **Table 4.3** provides the summary of these associations.

Table 4.3: The association of knowledge of the trained ICU nurses on EBP with qualification and position (n=100)

Items on Knowledge of EBP	**Responses on EBP**	**Qualification**		**P-values**	**Position**			**P-values**
		Diploma [n=74]	**Degree [n=26]**		**Staff nurses [n=73]**	**Shift leaders [n=16]**	**Managers [n=11]**	
		F (%)	F (%)		F (%)	F (%)	F (%)	
3A: Research skills	Poor Moderate Best	15 (20.3) 38 (**51.4**) 21 (28.4)	1 (3.9) 10 (38.5) 15 (**57.7**)	0.017*	16 (21.9) 35 (**48.0**) 22 (30.1)	0 (0.0) 8 (**50.0**) 8 (**50.0**)	0 (0.0) 5 (45.5) 6 (**54.6**)	0.067
3B: Information Technology (IT) skills	Poor Moderate Best	19 (25.7) 34 (**46.0**) 21 (28.4)	1 (3.9) 13 (**50.0**) 12 (46.2)	0.030*	20 (27.4) 34 (**46.6**) 19 (26.1)	0 (0.0) 8 (**50.0**) 8 (**50.0**)	0 (0.0) 5 (45.5) 6 (**54.6**)	0.013*
3C: Monitoring of practice skills	Poor Moderate Best	8 (10.8) 32 (43.2) 34 (**46.0**)	1 (3.9) 6 (23.1) 19 (**73.1**)	0.065	9 (12.3) 30 (41.1) 34 (**46.6**)	0 (0.0) 6 (37.5) 10 (**62.5**)	0 (0.0) 2 (18.2) 9 (**81.8**)	0.174
3D: Converting information needs into a research question	Poor Moderate Best	15 (20.3) 33 (**44.6**) 26 (35.1)	2 (7.7) 10 (38.5) 14 (**53.9**)	0.176	17 (23.3) 29 (**39.7**) 27 (37.0)	0 (0.0) 8 (**50.0**) 8 (**50.0**)	0 (0.0) 6 (**54.6**) 5 (45.5)	0.086
3E: Awareness of major information types and sources	Poor Moderate Best	10 (13.5) 31 (41.9) 33 (**44.6**)	1 (3.9) 6 (23.1) 19 (**73.1**)	0.047*	11 (15.1) 30 (41.1) 32 (**43.8**)	0 (0.0) 6 (37.5) 10 (**62.5**)	0 (0.0) 1 (9.1) 10 (**90.9**)	0.030*
3F: Ability to identify gaps in your practice	Poor Moderate Best	8 (10.8) 25 (33.8) 41 (**55.4**)	1 (3.9) 2 (7.7) 23 (**88.5**)	0.008*	9 (12.3) 25 (34.3) 39 (**53.4**)	0 (0.0) 1 (6.3) 15 (**93.8**)	0 (0.0) 1 (9.1) 10 (**90.9**)	0.011*

3G: Knowledge of how to retrieve evidence	Poor Moderate Best	15 (20.3) 18 (24.3) 41 (**55.4**)	0 (0.0) 7 (26.9) 19 (**73.1**)	0.022*	15 (20.6) 18 (24.7) 40 (**54.8**)	0 (0.0) 4 (25.0) 12 (**75.0**)	0 (0.0) 3 (27.3) 8 (**72.7**)	0.148
3H: Ability to analyze critically evidence against set standards	Poor Moderate Best	5 (6.7) 26 (35.1) 43 (**58.1**)	0 (0.0) 7 (26.9) 19 (**73.1**)	0.327	5 (5.9) 27 (37.0) 41 (**56.2**)	0 (0.0) 2 (12.5) 14 (**87.5**)	0 (0.0) 4 (36.4) 7 (**63.6**)	0.208
3I: Ability to determine how valid the material is	Poor Moderate Best	13 (17.6) 21 (28.4) 40 (**54.1**)	1 (3.9) 5 (19.2) 20 (**76.9**)	0.091	14 (19.2) 22 (30.1) 37 (**50.7**)	0 (0.0) 2 (12.5) 14 (**87.5**)	0 (0.0) 2 (18.2) 9 (**81.8**)	0.030*
3J: Ability to determine how useful the material is	Poor Moderate Best	5 (6.7) 25 (33.8) 44 (**59.5**)	1 (3.9) 2 (7.7) 23 (**88.5**)	0.016*	6 (8.2) 26 (35.6) 41 (**56.2**)	0 (0.0) 1 (6.3) 15 (**93.8**)	0 (0.0) 0 (0.0) 11 (**100.0**)	0.005*
3K: Ability to apply information to individual cases	Poor Moderate Best	5 (6.7) 25 (33.8) 44 (**59.5**)	0 (0.0) 4 (15.4) 22 (**84.6**)	0.07	5 (6.9) 27 (37.0) 41 (**56.2**)	0 (0.0) 0 (0.0) 16 (**100.0**)	0 (0.0) 2 (18.2) 9 (**81.8**)	0.007*
3L: Sharing of ideas and information with colleagues	Poor Moderate Best	7 (9.5) 11 (14.9) 56 (**75.7**)	1 (3.9) 0 (0.0) 25 (**96.2**)	0.047*	8 (11.0) 11 (15.1) 54 (**74.0**)	0 (0.0) 0 (0.0) 16 (**100.0**)	0 (0.0) 0 (0.0) 11 (**100.0**)	0.121
3M: Dissemination of new ideas about care to colleagues	Poor Moderate Best	5 (6.7) 17 (23.0) 52 (**70.3**)	1 (3.9) 0 (0.0) 25 (**96.2**)	0.008*	6 (8.2) 16 (21.9) 51 (**69.9**)	0 (0.0) 1 (6.3) 15 (**93.8**)	0 (0.0) 0 (0.0) 11 (**100.0**)	0.132
3N: Ability to review your own practice	Poor Moderate Best	8 (10.8) 14 (18.9) 52 (**70.3**)	0 (0.0) 1 (3.9) 25 (**96.2**)	0.026*	8 (11.0) 15 (20.6) 50 (**68.5**)	0 (0.0) 0 (0.0) 16 (**100.0**)	0 (0.0) 0 (0.0) 11 (**100.0**)	0.031*

* Level of statistical significance ($p \leq 0.05$)

Nine out of the fourteen items were statistically significant ($p<0.05$) depicting more statistically significant differences of the respondents' knowledge on EBP according to **qualification**. Trained ICU nurses with degrees showed an increased level in knowledge with the best category being the most frequent score (96.2%; n=25) obtained on items looking at sharing of ideas and information to colleagues, dissemination of new ideas about care to colleagues and ability to renew own practice. More moderate than best scores were obtained for instance (50.0%; n=13 & 46.2%; n=12 [p=0.030] respectively) on IT skills.

The majority (75.7%; n=56 [p=0.047]) of post registration trained ICU nurses with diploma also selected the best category which was on sharing of ideas and information with colleagues followed by 70.3% (n=52 [p=0.008]) on dissemination of new ideas about care to colleagues and ability to renew own practice. The minority selected the poor category, the highest being 25.7% (n=19 [p=0.030]) which was on IT skills followed by 20.3% (n=15 [p=0.017]) which was on research skills, converting information needs into a research question and knowledge of how to retrieve evidence refer **table 4.3**.

Seven out of fourteen items scored below the set p-value of 0.05 indicating that 50.0% of the differences in knowledge were statistically significant according to **position**. This association is summarised in **table 4.3** above. In overall, the majority of the trained ICU nurses selected the best category irrespective of position. The highest score being 100.0% (n=11) for managers seconded by the shift leaders (100.0%; n=16) and then the staff nurses (74.0%; n=54 [p=0.121]).

However, lower significant scores especially on the best category were obtained under IT skills for the staff nurses (30.1%; n=22), shift leaders (50.0%; n=8) and managers (54.6%; n=6). A similar trend was also observed for item 3B and 3D which was asking about research skills and converting information into a research question.

The association between knowledge and gender, age, education and experience were not statistically significant ($p<05$. These associations are also summarised below.
In terms of **knowledge** and **age**, p was significant [p=0.001] and on a borderline [p=0.059] for item 3C and 3F "monitoring of practice skills and ability to identify gaps in your practice" respectively. More moderate scores (58.3%; n=14 [p=0.001]) were obtained for

the trained ICU nurses who were less than 35 years old than best scores (37.5%, n=9). Poor scores were not reported for the trained ICU nurses with more than 50 years.

One item, 3F (ability to identify gaps in your practice) was statistically significant on **knowledge** and **experience** [p=0.019]. However, trained ICU nurses displayed higher levels in knowledge about EBP even as the level of experience was increasing. Higher scores on the poor category were reported by 15.1% (n=8) of trained ICU nurses in the less than 5 years experience category.

Knowledge and **education**: Border line associations were observed for three items: 3A, 3F and 3M. These items were on 'research skills, ability to identify gaps in your practice and dissemination of new ideas about care to colleagues respectively'. Higher knowledge levels for the masters group (100.0%; n=4 [p=0.053]) and the bachelors group (95.5%; n=21 [p=0.057]) and the diploma group (70.3%; n=52 [p=0.057]) were reported even though p was not statistically significant. This pattern was also evident in the association of the rest of the items under knowledge (n=14) with education.

Knowledge and **gender**: The males' self reported knowledge was as high as 100.0% (n=8 [p=0.087]) where as the females self reported knowledge on EBP was as low as 56.5% (n=52 [p=0.087]) for item 3I even though not statistically significant.

4.3.8 Summary statistics on practice, attitudes and knowledge on EBP

Data were also analysed to determine the total scores for the main variables: practice, attitudes and knowledge. The results are summarised in **table 4.4** below.

Table 4.4: Total scores of practice, knowledge and attitudes on EBP

Variable	N	Mean	SD	Range
Practice Score	42	27.28	9.07	4-42
Attitude Score	28	20.79	6.43	0-28
Knowledge Scores	98	66.04	17.77	25-96
Total Score	168	114.11	28.2	42-163

Table 4.4 above provides a summary of the total scores of the practice, attitudes and knowledge of the trained ICU nurses on EBP. The mean total score was 114.11 (SD±28.32) suggesting moderate practices, attitudes and knowledge on EBP. The difference between the mean and the SD was very high in all the scores obtained suggesting that this was not normally distributed.

4.3.9 Results of the Reliability and Validity of the Questionnaire in South Africa

The **reliability** of the questionnaire was calculated using Cronbach's alpha in order to establish whether the questionnaire was reliable in the South African context. This was a measure of internal consistency that was employed to show the degree or accuracy of the items in the EBPQ in measuring the attribute 'EBP' (Polit & Beck, 2008). The Cronbach's alpha for the instrument was measured at 0.80 (refer to **section 3.10.1**). The results are summarised in **table 4.5**.

Table: 4.5: Cronbach's reliability coefficient for the entire questionnaire and the three variables: practice, attitudes and knowledge.

Questionnaire Items	**Reliability coefficient (3 sub-categories)**
Entire questionnaire	0.94
Practice variable: question 1-6	0.86
Attitudes variable: question 7-10	0.85
Knowledge variable: question 11-24	0.92

In the **table 4.5** above, a positive correlation with cronbach's alpha of **0.94** for the entire questionnaire using the 3 sub-categories (poor, moderate and best) was found. In addition, an alpha of **0.86** for practice variable, **0.85** for attitude variable and **0.92** for the knowledge variable was found hence showing the existence of a positive strong relationship.

Validity of the instrument was checked using face and content validity to establish the instrument's validity in the South African setting. First the demographic data of the ICU experts was analysed using descriptive statistics and thereafter the face and content validity of each item in the instrument and the instrument as a whole was determined using

statistical method CVI described by Lynn (1986 [refer **section 3.10.1]**) and the outcome thereof is described.

Trained ICU expert nurses (n=5) participated in the validation of the tool. The majority (n=3) were expert trained ICU nurses working in ICU: one unit manager, one operational manager and one clinical facilitator. Lecturers (n=2) were in minority. Masters degree in ICU was held by three experts: two lecturers and one clinical facilitator. Diploma in ICU was held by two experts: unit manager and operational manager. The minimum ICU experience was 14 years and the maximum was 31 years with a mean of 18.6 years (refer appendix I**, table I.1**).

The results of the face and content validity indicated that the questionnaire was face and content valid to which no revisions were made determined at a proportion of 80.0. All the participants said that the questionnaire was clearly worded and questions were well explained. Only one out of the five participants selected a score below 3 on item 3M under knowledge subscale which was on dissemination of new ideas about care to colleagues. This was not altered based on the agreement of the experts. The final questionnaire maintained the 24 questions which were found valid. **Figure 4.9** displays these results.

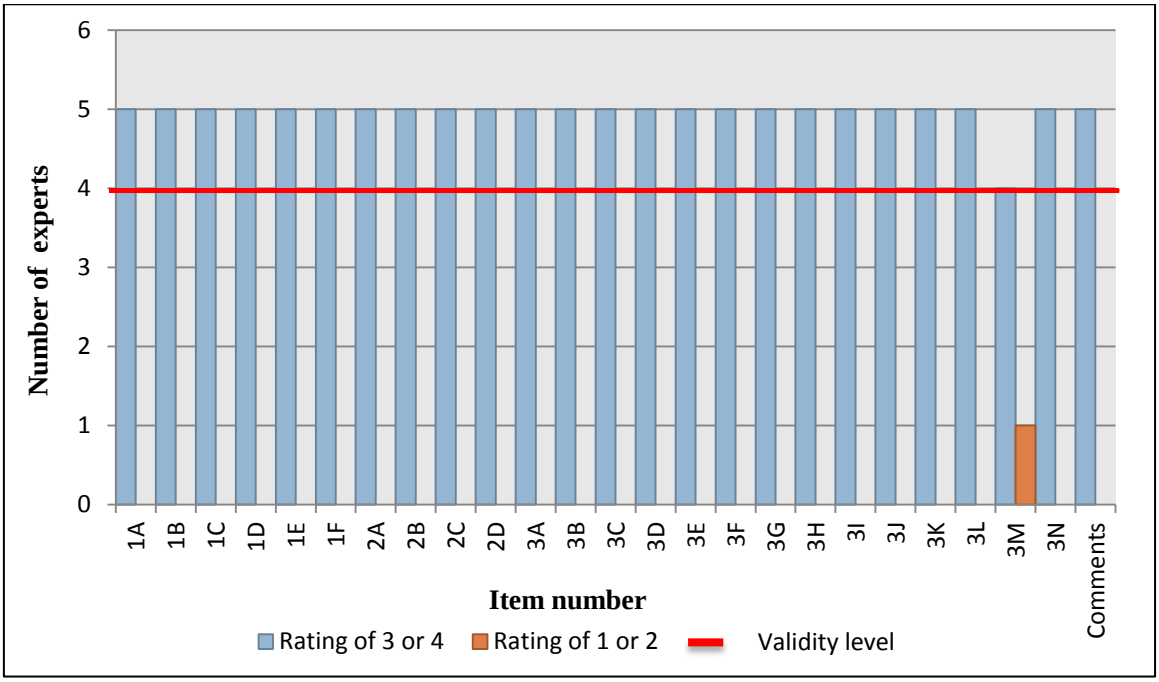


Figure 4.9: Determination of content validity for practice, attitudes & knowledge on EBP.

4.3.10 The Results on the Comments Section

The respondents were asked to complete the comment section on the questionnaire which was not compulsory as their expressions towards the study. Twenty four percent (n=24) of the respondents commented in this section of the questionnaire. The written comments were then analysed qualitatively using content analysis which followed through the process of understanding the story, then forming main categories.

The comments were grouped into categories and most of these were a repetition of the themes which have been discussed in depth under the focus groups results. The frequency of the appearance of the categories makes it a necessity to mention them here so that their importance in terms of appearance can be noted. The categories were: challenges of EBP, positive attitudes towards EBP, difficulty of the questionnaire and also recommendations.

The recommendations have thoroughly been discussed under the focus groups as well as the barriers to EBP. However, one junior nurse mentioned one challenge that she had no knowledge of how to use the computer and following this a recommendation of training all the clinical nurses on how to use the computers was made. Also, another junior nurse said she still needs to do research as she did only basic research during the ICU course (see chapter 5).

Additionally, another recommendation was made which indicated need to continue conducting research to improve nursing with new evidence due to the dynamic life of ICU patients. On the other hand, three nurses felt positive about EBP. One felt that EBP is a requirement for nurses to provide better patient care and achieve better patient outcomes and job satisfaction. Another one said that she was glad that she had participated in the research. Another one said:

> "*Knowledge on EBP in ICU is available. I have sufficient time to give information or to support the colleagues and share ideas. It is high time we need to practice care based on evidence*".

Finally four trained ICU nurses felt that the questionnaire was difficult to answer. Three of them had similar concerns for section one on practice towards EBP. One of them said the

questions were a challenge to respond to and that they were not clearly stated. Another one said:

> "*I do not understand on the gaps under the section of practice. They need to be specified*".

Another one felt that section one was very confusing. Furthermore, one respondent felt the questions were too tricky.

All in all, the comment section provided more insight to the questionnaire contribution as well as added more focus on the second phase. Recommendations on the study concerning the questionnaire were also made regarding the difficulty part that the respondents felt the questionnaire had. The barriers and the recommendations that were mentioned also assisted in providing the focus for the focus group discussions which included the experiences, an elaboration on whether practice was based on EBP and the question on the changes they would like to see for them to benefit more from EBP.

In order to answer **objective number three** and to avoid repetition, comparing the local results of the questionnaire to the international data was combined in the discussion on **section 4.5.** However the results were found to be similar and consistent with most of the previous studies and in addition more clarification on the results was made through triangulation of the data by explaining the quantitative results using the qualitative data.

Objective number four was to fully understand the trained ICU nurses' perceptions on EBP; the findings are subsequently presented in the following section.

4.4 FINDINGS OF PHASE TWO OF THE STUDY (QUALITATIVE PHASE)

Two focus groups were carried out comprising of twelve trained senior intensive care nurses. The first focus group had seven participants whilst the second had five participants. The focus groups were all conducted in English and field notes were taken by three different individuals as some of the participants refused to give consent for audio recording. The findings for the two focus groups are reported in the following sections starting with the participants demographic data summarised in **table 4.6**. Thereafter the categories and sub- categories that emerged from the focus groups are reported.

Table 4.6: Demographic profile of trained ICU nurses (n-12)

Demographic data		**Frequency**	**Percentage (%)**
Gender	Male	2	17.0
	Female	10	83.0
Age category (years)	35	2	17.0
	36-50	8	66.0
	>50	2	17.0
ICU Experience (years)	5-10	3	25.0
	>10	9	75.0

The majority of the participants in the study were females (83.0%; n=10) whereas male participants only accounted to 17.0% (n=2). The ages of the participants ranged from 35 to more than 50 years**.** Senior trained intensive care nurses who had more than 5 years of ICU experience were included.

Three categories were identified from the two focus group discussions. These included: perceptions, challenges and suggestions on EBP in ICU.

Sub-categories were also identified under the main categories (refer **figure 4.10** below for summary of the categories and sub-categories) following which, each category was presented as follows: definition, description of the category in the study, perceptions of the nurses and summary statement.

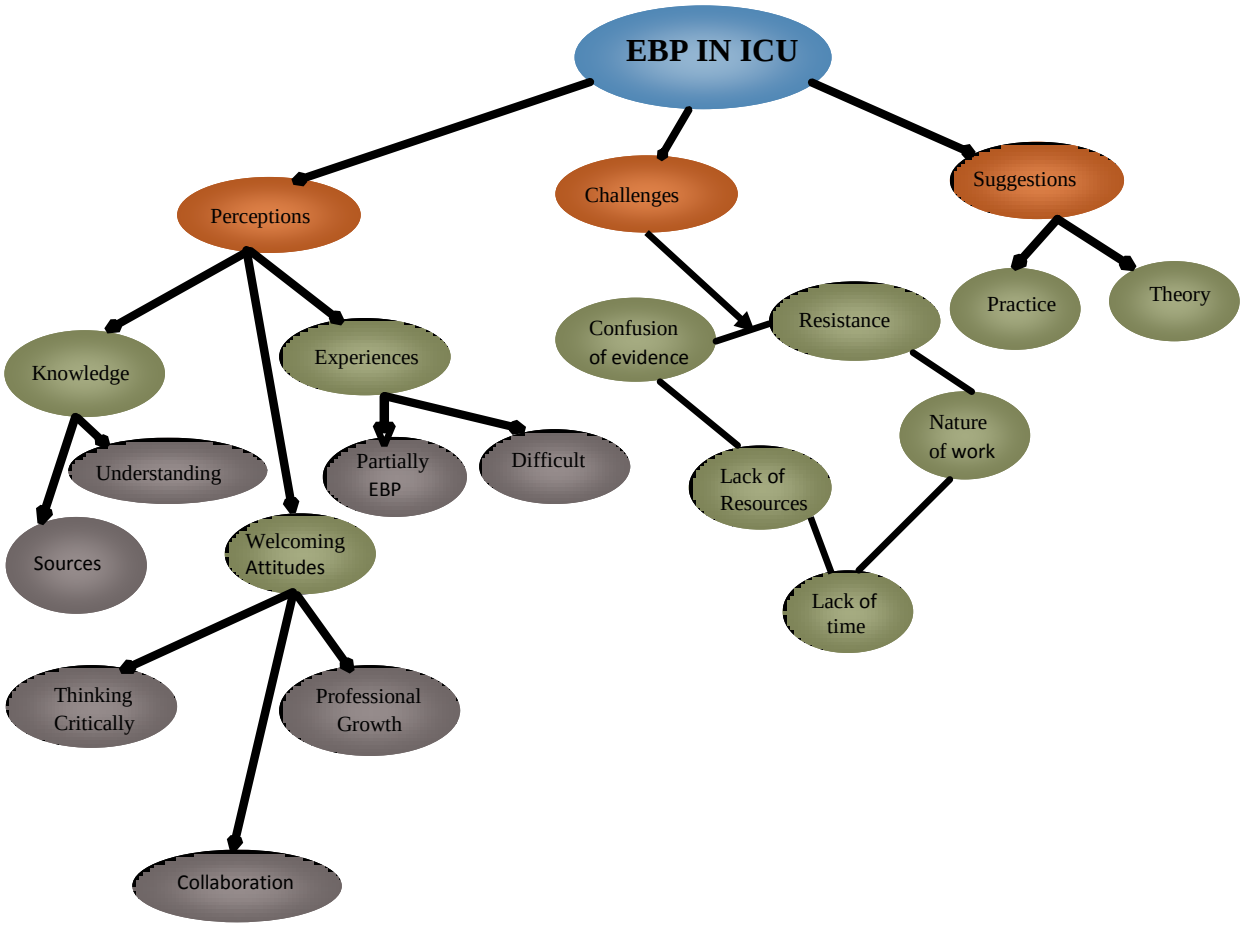


Figure 4.10: Major categories and its related sub- categories from the two focus groups on EBP

4.4.1 Category 1: Perceptions

The first category to be discussed is 'perceptions'. Perceptions towards EBP relate to the participants awareness of EBP. Its related sub- categories includes: knowledge, attitudes and experiences of EBP. Whilst the study revealed that all the participants held positive perceptions regarding their own knowledge, skills and attitudes on EBP, it also showed some negative perceptions (like experiencing problems) regarding the application of EBP.

4.4.1.1 Sub- category: Knowledge regarding EBP

Understanding

The findings revealed that the participants were fairly knowledgeable about EBP in relation to ICU nursing. The participants felt that EBP is a new practice requiring them to use the best available evidence to provide care. Some of the participants felt that it needs clinical judgement. Others felt that it needs skills to understand the patient needs / values, to know what and how to apply on the patient and also skills to research further on the evidence. The following passages provide some illustrations of this knowledge:

> *"EBP is a new practice and not old practice....one that uses research or current information."* (fgA1)

> *"....we really need to know our patients....and know how to assist them through proper assessment and use of best available information and also through our judgement...."* (fgA2)

> *"....research is specific….I do not have to apply everything that was said in the congress. One should look at the topic and relate it to the type of patients that he/she cares for, for instance cardio or neuro patients.... If the doctor says no, ask why…. nurses and the doctors can come up with research or new aspects on how to provide best care to the patients. If in the congresses they say antibiotics should not be used on every patient, it should not just end there at the congress, find out why it is being said like that and why they are using it that way…."* (fgA3)

Sources of Knowledge

The findings revealed a variety of sources of knowledge that trained ICU nurses use to make their decisions. The trained ICU nurses said they use protocols, policies, in-service education, ward rounds, conferences and workshops, to gain information. The following are some of the examples of the sources of evidence used by the trained ICU nurses:

"I get information from different sources which include refresher courses, internet; I think nowadays, when you do not know, you google for information as it is always easy and fast. Journals like intensive and critical care nursing journal I also read." (fgA3)

"Every thursday when we have departmental meetings or talks, you can pick and see what to practice as mostly are from evidence-based perspective. We gain knowledge all the time in many units based on EBP on top of attending conferences." (fgB4)

While it was mentioned on three occasions that experience is used as a source of knowledge, the majority mentioned research evidence as the main source of their decisions. In particular, most of the participants in both focus groups mentioned participation in congresses, conferences as their main source of getting new evidence. In addition using internet to search for information like from google, refworks and journals such as critical care journals was also another source of evidence that was mentioned.

Also mentioned was receiving information from colleagues. These were cited as known experts in the ICU for example nurses or doctors to which much information is solicited during ward rounds or in-service education. One of the study participants stated:

"In addition, we all conduct or attend in-service education or training in our units by colleagues or doctors." (fgA4)

4.4.1.2 Sub- category: Welcoming attitudes towards EBP

Attitudes were expressed as a feeling by the participants regarding EBP. The findings indicate a welcoming attitude towards EBP. The participants perceived their own participation in EBP positively. They felt that EBP had added a boost to their careers and development.

In some cases EBP made them to be confident and hence feel empowered with what they were doing and in other cases it made them to be more knowledgeable, more critical and to experience improved clinical judgement. In essence, collaboration through interaction with

colleagues, critical thinking and professional growth were mostly felt by the participants. Also mentioned were advocating for patients, and confidence to take responsibility for the patients. The following illustrations support the welcoming attitude:

> *"Knowing that you are doing EBP probably improves the care and....intellectually you gain something from an individual point. Knowledge is evolving….um....you grow professionally. You are able to accumulate knowledge and share it….you build confidence and makes you to be able to make decisions from an EBP point of view and be able to challenge some issues for example on extubation, you have a say whether to or not to extubate."* (fgA3)

Some participants perceived EBP to improve collaboration. This is exemplified in the following remark:

> *"It also boosts your morale….and staff members as well as junior nurses will want to be with you or around you to learn more from you."* (fgA6)

4.4.1.3 Sub-category: Experiences with EBP

This category relates to the perceptions regarding the trained ICU nurses' reflection on direct participation and observation of EBP in the ICU. The study revealed that the participants in both groups had positive perceptions regarding EBP implementation.

Although a few participants indicated that bringing EBP is not easy, the majority of the participants mentioned that they were working towards fully practicing EBP and that currently their practice was partially evidence-based with some listing the limitations which has further been discussed under the theme 'challenges'. The following excerpt illustrates this statement:

> *"I think the main point is your reflection of your practice....whether it is evidence-based or not….it is more to do with you taking the responsibility and not just doing things because 'we are used to doing it this way'. (All: nodding to this statement).... my practice is not all the time evidence-based. There are times when I do not know things and I do not have even time to sit down and be on a computer*

let alone go to the library to search for information. In that instance, I do what I have to do and mostly is not evidence-based; I sometimes make use of the ward rounds to ask for information from the doctors or other colleagues." (fgB4)

Some of the participants felt very confident in implementing EBP for example:

"I usually discuss the information that I have obtained from workshops or trainings or congresses or conferences with doctors. We have these meetings every Wednesday where you can bring up the issues and see what solutions you can come up with as a team….I find it easy when I discuss it in the meetings….um....for example studies on drugs keep on changing and so you are able to reason together in these meetings." (fgA4)

"I challenge people when I come back from the conference….I would probably suggest we go back and find out more on internet why we do not use saline." (fgA3)

With some citing examples of the studies that were conducted that they base their decisions on, for example;

"Previously we used to routinely turn patients every 2 hours, there is now new evidence that patient turning frequency should be done based on patient condition depending on priority instead of just focusing on pressure sores, like in cardiac patients, turning might strain the heart, the frequency is then reduced. Again there is evidence that microorganisms are mostly carried in the hands and can be effectively removed by following hand washing guidelines to prevent cross infection." (fgB2)

"....we know that there is evidence that we should not use normal saline when suctioning. " (fgA4)

A lot of clinical judgement was displayed by the majority of the participants for example:

"Well, I do use puffs before suctioning instead of using normal saline...." (fgA2)

"We usually assess the patient first and see the secretions thickness. If they are very thick, can pour in, about 2 to 3 millilitres of saline to soften the secretions so that they can come out easily and if they are not thick anymore you stop using the saline hence it depends on the type of secretions…I had a patient who had very thick and too much secretions which could not be dry suctioned. He nearly arrested….the secretions were blocking even the catheter….we had to use normal saline, which was when the suctioning was effective. I think much of the problem comes in when people pour in too much....um....normal saline….20 millilitres or more, this is too much." (fgA6)

"….Cardiac patients are different and you cannot do the chest compressions because of the risk of further damaging the heart and also dry suctioning is promoted to reduce causing pressure to the heart which can further complicate the condition." (fgA7)

Summary statement

The findings revealed that trained ICU nurses are knowledgeable about EBP in their understanding and particularly with what source of knowledge to use when making clinical decisions. It also indicated that the trained ICU nurses have a welcoming attitude towards EBP. Furthermore, the findings revealed that there are problems with EBP implementation in the ICU faced by the trained nurses. Most participants' practices are partially evidence-based.

4.4.2 Category 2: Challenges

Challenges relates to the limitations that were halting the participants from practicing EBP fully. The challenges were subdivided into five sub- categories which included: confusion of evidence, lack of time, lack of resources, resistance to change and lack of autonomy.

4.4.2.1 Sub- category: Confusion of evidence

Participants expressed some concerns / confusion regarding EBP implementation.

These concerns were experienced with the other team members of the health care professionals or the other ICU nurses. The confusion was said to occur due to lack of implementation of the current evidence as compared to the actual practice or due to frequent changing of evidence or due to different people implementing the evidence.

The participants felt that EBP was an important part which was to be taken seriously by all the professions in the ICU. Lack of implementation of the current evidence was expressed by one participant as follows:

> *"….when I attend the training and come back with new information I share with colleagues but you find that the new information contradicts with what the doctors are practicing for example doctors uses mono therapy antibiotics where as new evidence suggest that neuro patients need to be given antibiotics for 14 days…."* (fgA4)

Frequent changing of evidence was another area that was also cited as causing confusion to EBP implementation one participant said:

> *"….conferences, present on new evidence and then you find that the information has changed which is also proven, it causes a lot of confusion and it can also put off people to do new research for example dry suctioning versus normal saline suctioning. It has been three years talking about this over and over again but still there is no change. And we practically suction with physiotherapists who pour saline first before percussions…."* (fgA4)

The participants also felt that different people implementing the evidence also was causing confusion to EBP implementation. The participants felt that when they attend conferences what was discussed was not being implemented by the same people as a result causing confusion as they were not the ones practicing it. This was expressed in one of the following statement:

> *"….when we attend conferences, the presenters just give the information but they do not practice and this causes a lot of confusion…."* (fgA4)

4.4.2.2 Sub- category: Lack of time

Four of the participants felt that they were limited to practicing EBP fully because of lack of time. The findings revealed that lack of time was an inhibiting factor to EBP implementation as they were worried about leaving the patient alone due to the nature of one to one nurse-patient care in ICU as depicted in the following statement:

> *"….where is the patient when you are doing the research?….and also time to search for the information is not enough as you worry about who will be taking care of the patient when you are busy searching for information."* (fgA1)

The others felt that searching for information or to have the evidence needs more time which they felt they lack most of the time. For instance one said:

> *"….the creation of evidence itself is laborious thereby limiting its implementation."* (fgB5)

Two participants said:

> *"….not always evidence based… time to search for information."* (fgA4)

> *"….I do not have even time to sit down and be on a computer let alone go to the library to search for information…."* (fgB4)

4.4.2.3 Sub- category: Lack of resources

The study revealed that the majority of the participants felt that they are limited to practicing EBP fully because of lack of material resources. While others felt that they were lacking access to internet or the ideal services to retrieve or practice EBP respectively, others felt that they were lacking the funds or sponsorship to create the evidence according to the problems at hand. Those that were lacking access to services or practice ideal EBP had this to say:

"I do not always practice EBP because there are no materials to practice on, for example, no access to internet…." (fgA1)

"….it is also difficult to implement because of lack of resources to use for example elevating the bed to 30 degrees, we just make an estimation to those patients that need it instead of putting into practice what is really supposed to be practiced." (fgB2)

In addition, lack of funds or sponsorship was expressed in the following excerpt:

"It's really a challenge. Interesting thing is, if you look at the first world….they are far better in EBP because they have resources and funds to do research and promote EBP….S....get us sponsors, to do research and get our minds occupied and to change things". (fgA2)

4.4.2.4 Sub- category: Resistance to change

Most of the participants felt that their practice of EBP was also being hindered by resistance to change or poor reception to new things. They felt that this resistance was coming from both nurses and other health care providers like doctors. Those who mentioned resistance from nurses were noted in some of the statements:

"....sometimes the attitudes by the fellow nurses who do not want to change practice is also a problem. Also resistance is high to research or to change....I also think the bottom line....is that there is resistance to change from the nurses which makes it difficult to implement new information." (fgA2)

"I have at times been demotivated when I had evidence and some suggestions but no one took my suggestions. I end up doing it on my own especially when it is effective and I have the evidence." (fgB4)

Whilst those who expressed the resistance from other health care providers had this to say:

"Sometimes doctors' attitude "my ward" is worrying….and they do not want nurses to change things….even if you might have evidence based information, they would want to stick to what they know or are used to, thereby making it difficult to practice using evidence." (fgA5)

"….the implementation part of EBP is difficult sometimes because of new un experienced doctors....for example we had a critical patient with a cardiac problem who needed potassium from our expert knowledge and experience of effects of low potassium which is evidence-based. The doctor insisted on giving other drugs when it was obvious that the patient needed potassium….we gave the potassium dose and the patient stabilised…." (fgB1)

"I have attended a conference where they discouraged suctioning with saline but you find that we still use saline with different amounts varying from 3-5 mls and others even too much amount especially the physiotherapists…." (fgB2)

4.4.2.5 Sub- category: Lack of autonomy.

A few (two) participants expressed lack of autonomy in the illustrations below. They felt that they are challenged by the implementation when it comes to who decides to apply or what to apply. One participant said:

"….doctors have got their own congress which they attend and they discuss their own issues on new evidence and it goes back to….what to apply….in evidence based practice….It becomes confusing on who decides on what to implement." (fgA4)

The other one said:

"….When you go back after you are taught at the conference, practicing what you have learnt is a challenge. Unless if it is done by seniors or doctors." (fgA5)

Summary statement

Findings reveal that more challenges are encountered by the trained ICU nurses with resistance to change being the frequently encountered by the majority of the participants.

4.4.3 Category 3: Suggestions

Suggestions relate to the recommendations that the participants felt were necessary to be addressed to ensure successful evidence-based practice in ICU. Two sub- categories were identified regarding the suggestions that the participants made. These were: practice and theory and are presented below.

4.4.3.1 Sub- category: Practice

The participants felt the following suggestions would assist to improve the implementation of EBP in the ICU. The study revealed that most of the participants felt that even though they had positive attitudes towards EBP, they still needed to work on their attitudes to be perfect role models to the juniors which can improve their attitudes towards new things hence improve implementation of EBP. One of the three participants with similar ideas said:

> *"....I think we should work on our perception and attitudes towards research through workshops on research….and on how the nurses can do EBP….it must start with those that are going to use the EBP*." (fgA2)

Also the participants felt that the attitudes from the junior nurses can be improved by sharing the information on EBP with them. Thus other participants felt that the senior nurses were still lacking in their sharing of evidence-based information and that much effort was needed to improve the implementation of EBP. This is supported by the following statements:

> *"The bottom line is to bring up EBP with colleagues.... this is what makes others not to participate in the EBP as they do not know and you do not share the information".* (fgB3)

Others also added that apart from sharing the information there was need to relate well with other nurses for successful information. One of the participants said:

> *"….you also need to relate well with others in order to share the information and ensure successful implementation."* (fgB4)

Whilst others felt that trained ICU nurses should be encouraged to participate in a lot of research, others felt that the researchers need to be part of the practice as illustrated in the following statements:

> *"We need to encourage trained ICU staff to participate in a lot of research like the one that is being done here so that they can learn and appreciate the need for EBP."* (fgB4)

> *"The researchers need to be part of the practice. They should come back to the system in the clinical areas and put to practice or implement the EBP."* (fgB4)

4.4.3.2 Sub- category: Theory

Most importantly it was suggested that EBP should be added to the nursing curricula as well as dialogue with other health care providers should be sought.

> *"I think EBP should be added to the nursing curriculum and be practiced on nursing care and on the treatments and drugs prescribed by doctors."* (fgA5)

> *"I think it is time we sit down together with doctors and see what to do."* (fgA2)

Summary statement

The study revealed more recommendations on practice than theory. The recommendations were on change of attitudes on EBP by both the junior and senior nurses, improvement on sharing of evidence-based information, participation in research and addition of EBP to the nursing curricula.

Objective five was to explain the quantitative results using the qualitative data. The results are presented in the following section under the discussion of the results.

4.5 DISCUSSION OF PHASE ONE AND PHASE TWO RESULTS

Chapter three presented the pragmatic approach as the worldview allowing multiple methods and valuing both subjective and objective knowledge. The assumption was that one method alone was not enough to provide diverse perspectives of EBP in ICU. A mixed method approach was therefore adopted comprising of quantitative and qualitative approaches. The purpose of the mixed method sequential explanatory study was to describe trained ICU nurses knowledge, attitudes and practices towards EBP at an academic hospital in Gauteng by using the two research approaches. Five ICUs participated in the study which resulted to a sample of 100 trained ICU nurses for phase one (quantitative phase) and 12 trained ICU nurses for phase two (qualitative phase).

This section involved the linking and selection of the quantitative and qualitative data, the interpretation of the results as well as the comparing the local results with the international literature. This was done to show how the qualitative data helped to explain the quantitative data in trying to address the last research question that was looking at how will the qualitative results explain the quantitative results; are there similarities between the quantitative and qualitative results? The discussion starts from the demographic data, and then discussion of the main variables: knowledge, attitudes and practices of the trained ICU nurses on EBP and finally on the reliability and validity of the questionnaire.

Demographic Data

The female participants dominated in the study (92.0%) which was also similar to the focus group discussion results. These results are thought to be consistent with the previous studies which found similar results indicating more female than male nurses in ICU for instance, 28 males and 243 females were reported by Bucknall et al (2001). Similarly in a recent study by Profetto-McGrath et al (2010), 97.9% were females. The results on gender are quite similar to the international results especially in the nursing profession where more females are reported than males hence thought to be a representation of the ICU nurses.

The mean age of the participants was 42.59 (SD ±8.40) and the majority 58.0% were aged between 36 and 50, and 24.0% were less than 35. These results are thought to be representative of the trained ICU nurses working in ICU and are similar to other international studies which found out that 90.0% of the participants were aged between 25 and 44 (Bucknall et al, 2001). Additionally, participants in a study by Egerod (2004) had a mean age of 45. This shows that most of the participants are not aged in ICU hence (statement removed) a good target for evidence-based activities.

Only 26.0% (n=26) of the participants had degrees as compared to 74.0% (n=74) with advanced diploma. This is not consistent with Bucknall et al (2001) study which found out that the majority 47.0% (n=129) held a graduate degree. Similarly, the results by Profetto-McGrath et al (2010) showed that 75.6% of the participants held a university degree. However, this study when compared to a study by Perrie (2006) thus after 6 years, shows that the number of trained ICU nurses with diploma are slightly decreasing in South Africa. This author found out that 82.4% (n=56) of the trained ICU nurses held a diploma in general nursing as compared to the 74.0% of this study who had a diploma. Even though there could be many plausible reasons for this cause such as migration of the diploma nurses to other institutions, on the other hand the other reason could be that more nurses upgraded into a degree. This study showed some significant differences between diploma and degree nurses on EBP (refer, **table 4.3)**, perhaps the better perception displayed by the degree nurses could motivate the nurses to pursue further nursing studies leading to a recommendation of considering further upgrading into a degree.

Paragraph removed…..the majority...(73%)were junior nurses…(also Examiner2 recomm)

Over half of the participants (53.0%) had less than 5 years of ICU experience, with only 47.0% having more than 6 years of ICU experience (mean = 7.15 years, SD ±6.15years, range 1-32 years). The results are similar to those of Bucknall et al (2001) study in which the experience in critical care was between 1.5 years and 25 years with a median of 9 years. Profetto-McGrath et al (2010) also found similar results with the mean years of experience for the participants at 10.24±7.28 ranging from 0 to 34 years.

Worth noting are the results for this study that the majority had less than 5 years of ICU experience even though the mean was 7.15 years, thus for the former less experience in

ICU was portrayed and for the latter those with more than 6 years were experienced enough in intensive care however were few. On the other hand, this depicts an increase in the training programs of ICU nurses which is relevant to the caring of the critical patients in ICU. (statement removed)

Knowledge of the trained ICU nurses towards EBP

The respondents were moderately knowledgeable about EBP. The mean total knowledge score was 66.04 (SD±17.77) showing an average percentage of 67.3%. The lowest score was 25 out of 98 showing a minimum knowledge level of 25.5%. This was less than the desired minimum knowledge score which was 75.0%. The highest score was 96 out of 98 showing the maximum knowledge level of 98.0%. Even though nurses' higher responses were obtained on the best category (81.0%; n=81), fewer responses were obtained on the skills part there by affecting the overall average percentage responses.

This also indicated that even though most of the trained ICU nurses' responses were falling under the best category, knowledge was lacking relating to EBP skills for instance information technology (IT), research skills and converting of information into a research question skills. As depicted on the results the scores for the best category were more where the focus was on identifying the problem and sharing of information with colleagues rather than the actual skills of obtaining the evidence.

Statistical significant differences ($p<0.05$) were found between the respondents' knowledge on EBP and qualification. Even though the trained ICU nurses with post graduate degrees showed an increased level in knowledge by mostly selecting the best category than the post registration diploma nurses who had very low scores on the best category in other items, lower scores were obtained in both groups for skills' items like research skills, IT skills and converting of information into a research question skill than on sharing of information items.

Additionally, there were more significant differences ($p<0.05$) in knowledge by position where more knowledge levels were displayed by managers and shift leaders than the

professional nurses. A similar trend in lower scores for research skills item than sharing of information was observed for the professional, shift leaders and managers.

This knowledge was further explained by nurse participants during the focus group discussions when asked about their understanding of EBP and the sources of knowledge that they use. The participants understood that EBP is a new way of clinical decision making which requires accessing and using current evidence, clinical judgement as well as valuing patient views. In addition it requires skills in its application to practice and also skills to research further on the evidence.

Hansen and Severinsson (2009) support the view in their study that EBP is the new way of clinical decision making. They emphasize on the use of scientific research sound judgement and patient preferences in respective clinical contexts using various expertise. Likewise as noted by Brown et al (2008), the evidence needs to be relevant to the context of the investigation for example neurology patients or cardiac patients.

The understanding of EBP is complemented in the holistic nature of nursing care whereby, without patient values, practice risks patients as the patient is not seen in totality 'sense of whole' which can result to negligence which can harm the patient, hence not ethical (SANC, 2008). This was also seen in chapter one where according to the synergy model nursing care incorporated the nurse's knowledge of the patients' needs.

This understanding was further illustrated when the participants were asked about the sources of knowledge that they use. The participants displayed a variety of sources of knowledge that they use to make their decisions in the clinical setting. These were mentioned by the majority of the participants and included use of protocols, ward rounds, conferences, colleagues, patients, refresher courses, workshops, Journals like critical care nursing and internet. One participant was quoted saying nowadays, when you do not know, you google for information as it is always easy and fast.

Based on the qualitative analysis, different sources of knowledge were displayed. Research evidence was strongly felt as the trained ICU nurses' main source of knowledge than experience even though when probed further on how to get the evidence, the skills or the process was not coming out clearly. The trained ICU nurses particularly participated in

congresses and conferences in addition to using internet to get information that was evidence-based.

Hardy et al (2006) points out that when there is an artistic integration of a variety of sources of knowledge, effective evidence-based decisions are made displaying clinical expertise. Previous studies documented that nurses rely heavily on the knowledge gained through their personal experiences or colleagues when making decisions and as such, nurses have been reported to be lacking in knowledge on EBP (Estabrooks et al, 2005; Mills, Field & Cant, 2009; Thiel & Ghosh, 2008).

The trained ICU nurses also received information from colleagues who are ICU experts as their source of knowledge (statements on junior nurses/competence removed from pg 98/99). When probed further one of the study participants stated the trained ICU nurses conducts or attends in-service education or training in the units by senior colleagues or doctors.

This is in line with Profetto-McGrath et al (2010) study who found out that clinical nurse specialists primarily used evidence from research literature in decision-making. Peers and experience were also important sources of evidence. Extensive use of internet was also reported to consult research data bases and online sources of evidence.

However, one participant said google search was one way of getting information. Whilst this is a fast way of getting information, on the other hand evidence-based practice is much more concerned with the **quality** of the evidence which is not guaranteed by using google search (for instance google Wikipedia) but rather by using recommended data bases such as CINAHL, Pub med or journals such as critical care nurses journal.

As noted by Mantzoukas (2007) different levels of evidence exist where opinions from respective authorities' forms level 5 of evidence. Quality studies which are either randomised and controlled or non randomised but controlled are desired and form level 2 and 3 of evidence respectively whereas level 4 is evidence obtained from research without experimental study (refer **chapter 2**). Nurses are cautioned to use evidence that has been evaluated and validated to suit practice contexts.

Despite previous studies not being specific to trained ICU nurses, nurses were also found to be lacking in skills of EBP. Brown et al (2008) found out that 62.1% of the registered nurses who were mostly graduates with degrees had 1 - 4 ranking of EBP on converting information needs into a question and was more to the negative side.

Similar results were also reported by Koehn & Lehman (2008) where the results indicated lower mean scores of knowledge skills (4.67). A recent study by Linton & Prasun (2012) also found that only 50.0% of the participants reported an ability to determine the validity of evidence and 58.0% rated an ability to apply findings to individual cases positively.

This study revealed that trained ICU nurses are knowledgeable about EBP in their understanding and particularly with what source of knowledge to use when making clinical decisions. More significant differences were observed between knowledge and level of qualification and also knowledge and position.

Through the focus groups, this study revealed that trained ICU nurses are exposed to different sources which when targeted as sources of teaching and implementing EBP can help improve their skills in EBP for example, during ward rounds. However, the trained ICU nurses need to take more responsibility in their continuing education such as on appropriate skills of accessing evidence perhaps during or as one of the in-service education. This is supported by the synergy model where facilitation of learning is one of the competences for the advanced nurses.

Attitudes of trained ICU nurses towards EBP

The mean total attitude score was 20.79 (SD±6.43) ranging from 0 to 28. The desired minimum attitude score was 20(70%) and from the results, the minimum of 0.0% to 100% was observed with an average score of 75%. This showed that the attitudes of the trained ICU nurses were positive and the minimum score of zero would be due to the difficulty part of the questionnaire which was suggested by some participants in the comments section. The majority of the trained ICU nurses selected the best category and the highest attitude score was 75.0% as fundamental to the nursing practice. Few trained ICU nurses selected the poor category which was on resentment of EBP.

Using Fisher's exact test, the relationship between attitudes and the demographic data were not statically significant. Thus, from the quantitative data, the trained ICU nurses reported more positive attitudes than the negative attitudes with a few showing resentment towards EBP and more (15.0%) showing that EBP is a waste of time.

The results were further explained in the focus group discussions where the category of 'welcoming attitudes" converged these two results as the majority of the participants felt that EBP added a boost to their careers and development, allowed them to provide quality care to patients and also to be autonomous. In other words feelings of empowerment, skills and more confidence as senior nurses were verbalised. In essence, confidence and collaboration through interaction with colleagues, critical thinking and professional growth were cited as the most contributors to the positive attitude by the participants.

The participants in the focus groups were mostly positive about EBP. This could be attributed to the fact that they were experts. In this study, it is very clear that the expert trained ICU nurses had positive attitudes towards EBP.

Similarly, even though there was no distinction in the previous study participants (Brown et al, 2008; Egerod, 2004; Hart et al, 2008; Thiel & Ghosh, 2008), the results show some similarities in the positive and negative attitudes that were reported in the previous studies. These results show some agreement with the study by Egerod in Denmark (2004) in which critical care nurses displayed positive attitudes towards EBP. Eighty eight percent said EBP is relevant to nursing and had a perception that it promotes the profession of nursing. Ninety six percent said EBP promotes nursing profession.

Likewise in a study by Hart et al (2008), 93.9% of the nurses displayed positive attitude on EBP. The reported positive attitudes from the previous studies however were very high as compared to this study.

On the other hand, trained ICU nurses were found to display some negative attitudes towards EBP especially for the quantitative data. Thus, the trained ICU nurses reported time waster as the highest negative attitude towards EBP.

Similarly, some previous studies revealed nurses not valuing research; others attribute it to causing workload whilst others say it is too impractical and slightly exaggerated. For instance in the study by Mclnerney & Suleman (2010), 48.0% of the participants said EBP is another perspective, 60.9% said it imposes another demand on their academic calendar (n=29 academic health care lecturers).

Correspondingly, 57.7% nurses had 1- 4 ranking of EBP as causing workload to their practice in a study by Brown et al (2008). Also in a study by Lai, Teng & Lee (2010) 61.0% nurses and allied staff said EBP is slightly exaggerated and 46.2% said EBP is too impractical. The lower ranking on the negative attitudes of the nurses towards EBP however were high as compared to this study's results which were as low as 15.0%.

The mixed method study revealed that both the quantitative and qualitative data were similar in that the trained ICU nurses had positive attitudes towards EBP. As noted by Van Achterberg, Schoonhoven & Grol (2008) the first step to successful EBP in ICU is the display of the welcoming attitudes.

In this study the attitudes of the trained ICU nurses are well defined that they value EBP as it assist them in collaboration with colleagues as well as boosting their morale. As Van Achterberg, Schoonhoven & Grol (2008) observed, this allows for better strategies pertaining to EBP dissemination and implementation in the ICU. This is also supported by the SANC (2008) which stipulates that care provided by advanced nurses should be based on evidence.

In summary, the results indicated that the trained ICU nurses had a welcoming attitude towards EBP. Strategies towards EBP implementation in the ICU could make use of the senior trained ICU nurses to impart knowledge on EBP to the rest of the nurses in ICU.

Practices of trained ICU nurses towards EBP

Quantitatively, the practices of the trained ICU nurses on EBP were fair. The mean total practice score was 27.28 (SD±9.07) ranging from 4 to 42 scores (n=42). The desired minimum practice score was 32 (75.0%). This showed that the practices of the trained ICU nurses were moderate. Most of the trained ICU nurses selected that they frequently

formulate evidence-based questions, track evidence, critically appraise evidence, integrate evidence, and evaluate evidence and share information with colleagues. Thus, 75.0% (n=73) of the trained ICU nurses selected 'sharing of information with colleagues' as the most frequently used practice. Only a few said they never share their information with colleagues.

Even though most of the trained ICU nurses selected the frequently EBP category, critical appraisal of evidence had a score below 50.0% (n=50). Critical appraisal is the most significant step in the EBP process for validity as indicated in the literature review under nature of evidence **section 2.2.2** (Dontje, 2007). Twenty seven percent (n=27) of the trained ICU nurses reported that they rarely appraise evidence critically. In addition, the two areas which had the highest percentage on practice were evaluating evidence (61.0%; n=60) and sharing of information with colleagues (75.0%; n=73) which comes later in the EBP process (**section 2.2.2**).

Despite the results on practice and the demographic data not being statistically significant, using Fisher's exact test; by gender, males expressed that they used EBP protocols more frequently than females. However few males participated in the study (n=8) limiting the conclusions made on this finding. Secondly by age, trained ICU nurses with more than 50 years of age expressed more EBP than the rest. Thirdly by education, trained ICU nurses with masters' degree reported more EBP than the bachelors or diploma group. Finally by position, the shift leaders reported frequently EBP than the managers or the professional nurses and the trained ICU nurses with more than 6 years ICU experience reported more EBP than the trained ICU nurses with less than 5 years of ICU experience.

The focus group discussions revealed that EBP was not being completely practiced by the trained ICU nurses. The majority of the participants expressed that they were facing more challenges which were limiting them from practicing EBP fully. The challenges included: confusion of evidence, lack of time, lack of resources, resistance to change and lack of autonomy.

Confusion of evidence was strongly felt by the trained ICU nurses as causing them not to practice EBP fully. Confusion was listed as arising from contradiction of what is known or proved, to what is being practiced for example one participant was quoted saying 'new

information contradicts with what the doctors are practicing'. Perhaps, considerations of teaching and practical session to be incorporated so that conferences cannot just be a source of evidence but also a tool to evidence practice. This should motivate the nurses to practice EBP and not be confused.

Frequent changing of evidence was another area that was also cited as causing confusion to EBP implementation as well as the use of different people to implement the evidence. Lack of time was also inhibiting the participants from practicing EBP fully as they were worried about leaving the patient alone due to the nature of 'one to one' nurse-patient care in ICU. The others felt that searching for information or to have the evidence needs more time which they felt they lacked most of the time.

Lack of resources was also mentioned by the participants with regard to lack of access to internet or the ideal services to retrieve or practice EBP respectively in addition to lack of funds or sponsorship to create the evidence.

Resistance to change was also a major challenge with reference to poor reception to new things. The resistance to change was expressed as arising from both the nurses and the doctors with the nurses poor reception to new things and the doctors attitudes of "my ward or am a doctor" (s/he has the final say regarding patient care as s/he is the doctor) being the most significant as observed in the statement by one of the participant who said that the doctors attitudes were worrying as they do not want nurses to change things even though the nurses might have evidence-based information.

Even though only mentioned by a few participants, lack of autonomy was a challenge especially on 'who decides to apply or what to apply' that was also preventing the trained ICU nurses from fully practicing EBP.

The participants finally, suggested some recommendations which they hoped would improve their practice on EBP. These recommendations were on nursing practice and theory and are as follows: being perfect role models to the juniors to improve the junior nurses attitudes towards new things; sharing of evidence-based information; good relation among the nurses; more participation in research; researchers to be part of the practice and most importantly addition of EBP to the nursing curricula as well as dialogue with other

health care providers. The recommendations outlined concur with some of the synergy model assumptions in chapter one about the trained ICU nurses such as clinical inquiry and collaboration.

Application of EBP remains a challenge to nursing (Pravikoff, Tanner & Pierce, 2005). Studies have shown correlation between knowledge and attitudes on EBP, to practice. In contrast to this study, lack of knowledge and poor attitudes on EBP in the previous studies was correlated to moderate or poor EBP (Gomes, 2010; Mills, Field & Cant, 2009; Perrie, 2006; Thiel & Ghosh, 2008). Whilst in this study even though the trained ICU nurses were knowledgeable and had positive attitudes towards EBP, their practices were still not fully evidence-based.

These findings were also not consistent with the negative practices on EBP that were reported in the study by Adib-Hajbaghery (2009). Participants stated that their nursing practice was not based on scientific evidence (n=21 Iranian nurses). On the other hand, in a study by Melnyk et al (2004), 46.0% of the nurses reported that their practices were based on evidence. Also significant relationships between extent of EBP and nurses beliefs about the benefits of EBP were identified.

However, these findings were partially consistent with those by Linton & Prasun (2012) which revealed that 43.0% of the nurses reported '61.0-100.0% of their practice' being evidence-based hence showing that their practice was partially evidence-based. Similarly moderate scores on practice towards EBP such as 5.21 were reported in the study by Koehn & Lehman (2008) using a descriptive cross sectional survey.

Similar results were reported in the previous studies on challenges. Kajermo et al (2010) reviewed 63 studies from Medline, cumulative index to nursing and allied health literature (CINAHL) databases from 1991-2009. The challenges ranged from lack of time, lack of resources, lack of support, resistance to change etc.

Using Shortell's framework for continuous quality improvement, Solomons & Spross (2011) found out that across the articles, the most common barriers were lack of time and lack of autonomy to change practice. Sciarra (2011) revealed that the ICU nurses were lacking skills to critique or synthesize the literature. They had difficulty in understanding

research articles. They were also lacking understanding of the organization of electronic data bases and lacking search skills.

In summary, the results revealed that there are problems with EBP implementation in the ICU by the senior trained ICU nurses. A reflection on why practice is not fully EBP brought out some challenges which included: confusion of evidence, lack of time, lack of resources, resistance to change and lack of autonomy.

This study added and explained the challenge of confusion of the evidence as being due to different people implementing as well as being due to lack of consistency in implementation and also due to lack of consistency in the evidence itself. It also explained the resistance to change which was arising from both the nurses and the doctors. The trained ICU nurses displayed concerns over this and that they were working towards delivering fully evidence-based care.

Reliability and Validity of the Questionnaire in the South African setting.

The results for the Cronbach's alpha showed that a positive strong relationship existed. As the values were greater than 0.80, it showed that the EBPQ had greater reliability, hence it is a reliable instrument that can be used in South African ICU settings.

This concurs with the international results that were reported on the reliability of the instrument using Cronbach's alpha. In comparison to the international results, a study by Rice et al (2010) found a cronbach's alpha of **0.93** for the entire questionnaire, 0.93 for knowledge, 0.90 for practice and 0.69 for attitudes after collapsing one item. In a study conducted by Upton and Upton (2006) Cronbach's alpha was found to be: **0.87** for the entire questionnaire, 0.85 for practice, 0.79 for attitudes and 0.91 for knowledge.

These results shows less variations after repeated measure or use on the Cronbach's alpha calculated for both studies and with the current results. Secondly, the current 'Cronbach's alpha for the entire questionnaire: 0.94' measure had greater true score component (e.g. 94.0%) than the error score component (16.0%). It was slightly higher than the previous Cronbach's alpha. Hence it can be concluded that the instrument has higher internal consistency or is highly reliable.

Only one out of the five participants selected a score below three on knowledge subscale which was on dissemination of new ideas about care to colleagues. This was not altered based on the agreement of the experts. The final questionnaire maintained the 24 questions which were found valid and consistent with the results on validity of the questionnaire. This is supported by Upton & Upton (2006) who found the tool valid with good construct validity ranging 0.3 - 0.4 ($p<0.001$) and discriminant validity for attitude ($t [332] = 2.5$, $p <.001$), for frequent use of EBP ($t [360] = 3.2$, $p <0.02$) and better knowledge of EBP ($t [360] = 5.2$, $p <0.001$) which led to maintenance of the 24-items of the questionnaire.

However, Sciarra (2011) recommended that the tool be revised for future studies and did not include the attitude scale. Whilst alternative explanations exists (lack of established methods, differing procedures and samples) this discrepancy may be the result of important differences among the trained ICU nurses responses to EBP.

In the comment section, it was suggested by some of the participants that the questionnaire was difficult and the questions were too tricky, however during the face and content validity the expert trained ICU nurses found the tool valid with only one selecting a score below two. In addition the responses of the participants on EBP were clarified during the focus group discussions as already explained above.

The results in the study by Rice et al (2010) indicated support for a 23-item scale and three subscale structure of the EBPQ with acceptable 3-factor model fit indices ($X^2 = 469.04$; RMSEA = 0.081; SRMR = 0.068; CFI = 0.900). They recommended a slightly modified EBPQ to assess other professional like the social workers.

Thus, the study tool was found reliable and valid for trained ICU nurses in South African setting using Cronbach's alpha, face and content validity and the results were similar to the published international results.

4.6 SUMMARY

This chapter has given a detailed account of the results and the descriptive and analytical statistics employed to analyse the quantitative and qualitative data. The results for phase

one and phase two were integrated and also discussed with reference to the findings from the literature. Overall, in phase one, trained ICU nurses displayed fair knowledge, positive attitudes and fair practices towards evidence-based practice.

The follow-up qualitative focus groups (phase two) provided some in depth revelations on the nurses knowledge, attitudes and practices towards EBP. Nurses were knowledgeable in their understanding of EBP and the particular sources of accessing evidence but lacked knowledge in the skills of accessing evidence. Welcoming attitudes towards EBP were displayed by the nurses but they admitted to their practice being partly evidence-based due to challenges encountered such as resistance to change and lack of time. The trained ICU nurses made some suggestions which were looking at nursing practice and theory in order to improve EBP in intensive care units. The results were similar and consistent with most of the published studies in the literature.

The instrument was validated by the ICU nursing experts and was found valid using face and content validity. The Cronbach's alpha coefficient obtained for internal consistency was slightly higher for the entire questionnaire (0.94).

The final chapter will therefore provide the summary, recommendations, conclusion and limitations pertaining to the study.

CHAPTER FIVE

SUMMARY AND CONCLUSIONS

5.1 INTRODUCTION

The final chapter of this research report presents the summary and conclusions of the study, followed by recommendations on nursing education, practice and further research. This is followed by a discussion of the limitations and conclusion of the study.

5.2 SUMMARY OF THE STUDY

Evidence-based practice is important for the care of critically ill patients in an intensive care unit. Trained intensive care unit nurses are challenged to its knowledge as well as practices as are advanced and role models hence required to promote up-to-date cost effective care. Within the broad and complex environments of intensive care units, trained intensive care nurses make many clinical decisions about patients' response to therapy or observation of critical changes in the patients, in the absence of physicians as are available 24 hours by the patients' side.

However, current clinical practice indicated that nurses' decisions are rarely evidence-based. And that 20.0 - 25.0% of the care that was provided to patients was not needed or could potentially harm the patient. This could also lead to prolonged hospitalization due to mismanagement and also lead to irreversible complications. It was seen that EBP allowed nurses to provide optimal cost effective care, with articulation of their knowledge and critical thinking when making decisions versus trial and error or practices based on traditions or routine.

Purpose of the Study

The purpose of this study was to describe the knowledge, attitudes and practices of trained ICU nurses on EBP at an academic hospital in Gauteng in order to make recommendations for strategies targeting EBP implementation in nursing.

Objectives of the study

The following objectives were outlined to meet the study purpose;

- To describe trained intensive care unit nurses' knowledge, attitudes and practices regarding evidence-based practice.
- To establish reliability and validity of the questionnaire in South African setting.
- To compare local results from questionnaire to international data published.
- To understand fully the perceptions of trained intensive care unit nurses on evidence-based practice in South Africa.
- To explain the quantitative results using the qualitative data.

Research Method

The study made use of a sequential explanatory mixed method research design (QUAN - qual). Both quantitative and qualitative methods were used in a single study. Non experimental, descriptive, contextual, cross sectional survey design using a validated tool was employed in phase one (quantitative phase) to obtain the respondent's opinions on EBP.

A descriptive, contextual qualitative research design using two focus groups was employed in phase two to supplement or expand on the findings from phase one. Following which the findings of phase one and phase two were integrated in the process of the research at data interpretation or discussion of results. This also provided in-depth understanding of the trained ICU nurses' knowledge, attitudes and practices on EBP.

Non probability purposive sampling was employed in both phases to select 100 trained ICU nurses for phase one and 12 trained ICU nurses for phase two who were working permanently at Charlotte Maxeke Johannesburg academic hospital (CMJAH). Data collection was conducted for a period of three months from June to August, 2012 starting with the quantitative and then the qualitative phase. Statistical consultation was sourced throughout which resulted in the use of descriptive and analytical statistics to analyse the

data in phase one. The study was ethically approved (certificate number: **M120330**) and relevant permissions were also obtained to conduct the study.

5.3 MAIN FINDINGS

In this study knowledge, attitudes and practices of the trained ICU nurses regarding EBP was elicited from 100 trained ICU nurses at CMJAH in five intensive care units in phase one. Then two focus groups were conducted in phase two to supplement the quantitative results and also to see if there were similarities in the data. The data were merged at the discussion of the results with the focus group results explaining the quantitative results.

The study revealed that the trained ICU nurses were knowledgeable on EBP in particular on sources of evidence but lacked knowledge on the skills for EBP such as retrieving evidence and critical appraisal of evidence. This was clarified during the focus groups interviews where the majority of the nurses expressed several sources of evidence that inform their practice for instance: information obtained from congresses, departmental meetings, journals, internet and colleagues.

This creates a gap in EBP as besides having the knowledge, implementation of EBP needs the nurses to know how to retrieve the evidence so as to be able to appraise the evidence that they obtain for example from conferences to see whether it is applicable to their patients.

The nurses displayed positive attitudes towards EBP and a percentage of 75.0% was obtained as the highest attitude score using the quantitative results. And these were explained using the qualitative findings where the nurses felt that EBP was a welcoming development. They felt that it improved collaboration through interaction with colleagues, critical thinking and professional growth as well as empowering them.

The attitudes that were displayed by the trained ICU nurses showed that the senior trained ICU nurses could be targeted for EBP implementation in the ICU to ensure its successful implementation. This also correlates with Van Achterberg et al (2008) ideas about attitudes. The authors advocate to first of all knowing the attitudes of individuals before coming up with implementation strategies. The authors write that knowledge of the

providers' attitudes is necessary for determining the success of a program for example EBP in ICU.

The nurses showed moderate EBP. The quantitative results showed that the most frequently used practice was sharing of information with colleagues which had a percentage of 75.0%. Most of the responses were distributed closely between poor, moderate and frequently on formulating evidence-based question, tracking evidence and critical appraisal. In addition, their report on evidence-based skills for example, ability to retrieve or critically appraise evidence was poor to moderate.

This was further explained in the focus group discussions which revealed that the trained ICU nurses' practices were partially evidence-based as they were meeting a lot of challenges. The following challenges were mentioned: lack of resources, lack of time to search for information, confusion of the evidence, nature of work and also resistance to change by both doctors and ICU nurses.

The Fishers exact test was also used to test if there were significant associations between the demographic results (gender, age, education, qualification, position and experience) and the results of the main variables (knowledge, attitudes and practices). Knowledge was statistically significant with qualification as most of the items scored below the set p-value of 0.05. Thus in general, the trained ICU nurses were fairly knowledgeable on EBP with more knowledge being reported among the trained ICU nurses with degrees than post registration diploma and these differences were statistically significant.

Knowledge and position was also found to be statistically significant as 50% of the items had a p-value of less than 0.05. This showed that, the differences in knowledge towards EBP between the professional nurses, shift leaders and managers were statistically significant. As most of the trained ICU nurses selected the best category, they were knowledgeable on EBP regardless of position.

However, more high scores for knowledge were obtained for the shift leaders and managers as compared to the staff nurses. This meant that the managers and shift leaders were more knowledgeable than the staff nurses and the difference in the knowledge by the managers, shift leaders and staff nurses was statistically significant.

The associations between knowledge and age; gender; education and experience were not statistically significant. However, worth noting was that the trained ICU nurses displayed higher levels of knowledge on EBP even as the level of experience was increasing. Hence more trained ICU nurses with more than 6 years of ICU experience and above were more knowledgeable than those with less than 5 years of ICU experience even though the difference was not statistically significant.

Attitudes were another variable that was tested against the demographic variables: age, gender, education, qualification, position and experience. The results revealed no statistical significant associations in the majority of the items when compared with the demographic data.

Only two items for attitudes were found to be statistically significant (p=0.024* & 0.028*) with qualification and position with few borderline associations respectively. However, even though the associations between attitudes and the demographic data were not statistically significant, high scores under best category were obtained with more (100.0%) scores for the best categories. Thus, the attitudes of the trained ICU nurses were positive regarding EBP regardless of gender, age, education, qualification, position and experience.

Finally the association between practice and the demographic variables: age, gender, education, qualification, position and experience were also not statistically significant as most of the items scored above the set p-value of 0.05. However, the trained ICU nurses under the age of 36 reported more EBP than the rest of the ages. The trained ICU nurses with masters' degree reported more EBP. Shift leaders reported more EBP than the managers and staff nurses. The trained ICU nurses with more than 6 years of ICU experience reported more EBP than those with less than 5 years of ICU experience. In general, the EBP was found to be fairly practiced even though the differences were not statistically significant.

The results also indicated that the questionnaire was reliable and valid to use in South African setting on trained ICU nurses. A positive correlation with a Cronbach's alpha for the entire questionnaire of **0.94** using the three sub-categories (poor/rarely, moderate and best/frequently) was found. The Cronbach's alpha under the practice variable was 0.86,

attitude variable had an alpha of 0.85 and knowledge had an alpha of 0.92. The values were greater than the set value of 0.80 to show that the instrument had greater reliability.

Using the content validity index almost all the questions were found to be relevant (scores between 3 and 4) as evaluated by the ICU experts and the tool was declared content valid. Also few minor suggestions were made during the pilot study which did not lead to any alterations in the questionnaire. The majority of the trained ICU nurses were able to complete the questionnaire on their own.

5.4 LIMITATIONS OF THE STUDY

The findings of the study cannot be generalized to other populations as the study was conducted at one academic hospital in one province. More hospitals were needed for proper generalization with a bigger sample size.

The study did not use any recording as some of the participants did not consent to its use. This was a limitation as some of the data may have been missed when taking notes. However, the study made use of three people to take notes following which a discussion was conducted whilst comparing the notes so that important issues were quoted and well rephrased.

The study was conducted in English; especially for the focus groups it would have been better if it was carried out in the local languages of the participants so that they would express themselves even more. However the questionnaire was pre-tested by potential participants who felt that it was understandable. And also for the focus groups, the fact that experts were the ones that were used who mostly were managers and shift leaders and so were more exposed to English language.

The focus groups were conducted only with the experts (senior trained ICU nurses) due to lack of time. It would have been better if focus groups were also conducted with the other trained ICU nurses so that a comparison would have been made in the responses so as to strengthen the conclusions made.

5.5 RECOMMENDATIONS

As technology is increasing and more complex management for the patients in the ICU is needed, the new approach to clinical decision making known as evidence-based practice (EBP) allows the trained ICU nurses to make decisions that are evidence-based by using proved information instead of trial and error. For the trained ICU nurses to be knowledgeable on EBP and also improve on their EBP, the following recommendations are made relating to nursing education, practice and research.

5.5.1Nursing Education

The valuing of research and EBP needs to begin in foundational courses in educational programs such as first year of the generic program instead of introducing it at fourth year in bachelors and masters programs to become a lifelong approach to the delivery of care. EBP should therefore be intensified.

In addition ICU training programs at diploma and degree levels should emphasize more on the skills of EBP and also motivate the nurses to participate in research activities like journal clubs.

Capacity building of trained ICU nurses is required so as to relieve the shortages and hence allow the trained ICU nurses to have more time to search for information.

From the results, there is also need for an education program on EBP which should be made to the trained ICU nurses that are in ICU regarding the EBP skills including use of protocols followed by good ways of reminders. This should also be followed up with short courses on EBP to be organized by the academic university to equip the trained ICU nurses with skills and theory for EBP in nursing which can be evaluated using pre and post tests every year using different strategies to see if they are updated. Also election of chairpersons to watch over the EBP implementation with weekly updates on EBP is required.

5.5.2 Nursing Practice

The findings suggest that role modelling and collaboration of nurse managers and educators will promote transition of evidence into clinical practice. Trained ICU nurses must model EBP to ensure the success of EBP in both clinical and education setting.

Close collaboration between the academic institutions for example intensive care unit experts at the university and the trained ICU nurses in the clinical areas is required to follow up on their EBP. Lecturers (Intensive care) in academic institutions should take an upper hand in facilitating a culture of EBP in the ICU. They should intensify use of performance appraisals so that specific needs for the nurses can be identified and applied during the continuing professional development programs.

A culture of EBP needs to be created that includes adequate and appropriate resources for example access to computers and enough time to devote to EBP process and the use of mentors (ICU experts, lecturers) to assist nurses in delivering evidence-based care. Also the resources should be available at the point of care plus frequent workshops on EBP process. This should also be supported by the administration from the hospital management.

There is need to empower nurses in ICU to change practice through interdisciplinary team work. The nurse leaders should motivate the nurses to take part in the interdisciplinary team meetings and also participate and contribute more during ward rounds.

5.5.3 Nursing Research

Further research is recommended pertaining to the areas that were identified from this study for example EBP skills such as information technology, research, retrieving of evidence, critical appraisal.

Replication of this study involving other hospitals in other provinces is recommended. More clarifications need to be made on the gaps and the attitudes section of the questionnaire on how to fill it so that the participants do not find the questions tricky or confusing.

Qualitative research in naturalized settings that investigates the role of trained ICU nurses in relation to the dissemination of evidence in nursing practice also is recommended.
Qualitative research regarding bedside empowerment nursing issues by the trained ICU nurses (Are the trained ICU nurses empowered?) is also recommended. This should build on this study as this study found out that there are many issues that nurses at bedside undergo for them to provide care and that they receive so many pressures in order to make decisions even though they may have the knowledge or skill. For instance others during the focus groups highlighted that colleagues and other health care professionals influence the way they make decisions for example "some said other doctors say 'this is my ward and you will do as I say' or who are you to tell me this even though what they are saying is not evidence-based".

A Delphi study regarding the continuing professional needs of the ICU nurses on EBP which should be followed by an education intervention is also recommended.

5.6 CONCLUSION

In conclusion the purpose of the study was to describe the trained ICU nurses knowledge, attitudes and practices on evidence-based practice at an academic hospital in order to make some recommendations for proper evidence-based practice implementation strategies in the ICU. To achieve this purpose, a mixed method was used which made use of the sequential explanatory approach. The approach made use of two phases: quantitative and qualitative phases. Priority was given to the quantitative phase. The results of the two methods were merged during the discussion of the results with the qualitative results explaining the quantitative results.

The study found out that the trained ICU nurses were knowledgeable particularly on what source of knowledge to use when making clinical decisions but were lacking knowledge on the skills of EBP like information technology skills, research skills and converting evidence skills. Furthermore, emphasis was made on 'the sharing of information with colleagues' rather than 'tracking of evidence or critical appraisal of evidence' under practices.

This was followed by their admission that they were not fully practicing EBP due to some challenges which included lack of time, resources and autonomy, resistance to change and confusion of evidence. The results also indicated that the trained ICU nurses had a welcoming attitude towards EBP where they felt that EBP added a boost to their careers and professional development.

This study indicates that although trained ICU nurses were knowledgeable about EBP and that they use evidence from a variety of sources, there is need for further development of their capacity to retrieve and critically appraise evidence so that they can advocate more on EBP to the junior nurses and colleagues as well as their management.

Furthermore, strategies to promote evidence-based practice in the ICU need to address the different needs of the trained ICU nurses and focus on a range of sources of evidence. The strategies also need to make use of the trained ICU nurses to impact knowledge on EBP to the rest of the nurses after addressing their EBP needs that this study identified.

The questionnaire can assist in assessing the specific evidencing tendencies of any given group of nurses. More clarifications need to be made on the gaps and the attitudes section on how to fill it so that the participants do not find the questions tricky or confusing.

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APPENDIX A

Evidence-Based Practice Questionnaire (EBPQ).

This questionnaire is designed to gather information and opinions on the use of evidence based practice amongst health professionals. There is no right or wrong answers for we are interested in *your* opinions and *your* own use of evidence in *your* practice.

SECTION ONE: PRACTICE ON EVIDENCE-BASED PRACTICE

1. Considering your practice in relation to an individual patient's care over the *past* year, how often have you done the following in response to a gap in your knowledge (please √ or X):

a. Formulated a clearly answerable question at the beginning of the process towards filling this gap:

Never ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Frequently**

b. Tracked down the relevant evidence once you have formulated the question:

Never ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Frequently**

c. Critically appraised, against set criteria, any literature you have discovered:

Never ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Frequently**

d. Integrated the evidence you have found with your expertise:

Never ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Frequently**

e. Evaluated the outcomes of your practice:

Never ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Frequently**

f. Shared this information with colleagues:

Never ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Frequently**

SECTION TWO: ATTITUDES ON EVIDENCE- BASED PRACTICE

2. Please indicate (by √ or X) where on the scale you would place yourself for each of the following pairs of statements:

a. My workload is too great for me to keep up to date with all the new evidence ☐ ☐ ☐ ☐ ☐ ☐ ☐ New evidence is so important that I make the time in my work schedule

b. I resent having my clinical practice questioned ☐ ☐ ☐ ☐ ☐ ☐ ☐ I welcome questions on my practice

c. Evidence based practice is a waste of time ☐ ☐ ☐ ☐ ☐ ☐ ☐ Evidence based practice is fundamental to professional practice

d. I stick to tried and trusted methods rather than changing to anything new ☐ ☐ ☐ ☐ ☐ ☐ ☐ My practice has changed because of evidence I have found

SECTION THREE: KNOWLEDGE ON EVIDENCE-BASED PRACTICE

3. On a scale of 1 to 7 (with 7 being the best) how would you rate your:

Please circle one number for each statement

	Poor						**Best**
a. Research skills	1	2	3	4	5	6	7
b. IT skills	1	2	3	4	5	6	7
c. Monitoring and reviewing of practice skills	1	2	3	4	5	6	7
d. Converting your information needs into a research question	1	2	3	4	5	6	7
e. Awareness of major information types and sources	1	2	3	4	5	6	7
f. Ability to identify gaps in your professional practice	1	2	3	4	5	6	7
g. Knowledge of how to retrieve evidence	1	2	3	4	5	6	7
h. Ability to analyze critically evidence against set standards	1	2	3	4	5	6	7
i. Ability to determine how valid (close to the truth)	1	2	3	4	5	6	7

the material is							
j. Ability to determine how useful (clinically applicable) the material is	1	2	3	4	5	6	7
k. Ability to apply information to individual cases	1	2	3	4	5	6	7
l. Sharing of ideas and information with colleagues	1	2	3	4	5	6	7
m. Dissemination of new ideas about care to colleagues	1	2	3	4	5	6	7
n. Ability to review your own practice	1	2	3	4	5	6	7

Please use this space to write any comments you wish.

CHECKLIST: DEMOGRAPHIC DATA

4. Finally, some information about you:

Your age:_____

Your level of Education:_____

Your highest nursing qualification: post graduate Diploma or Degree _____

Your current position / role:_____

Years of experience as trained ICU nurse:_____

Please circle the most appropriate answer as it concerns you:

Your gender: Male Female

Please return your questionnaire in the Freepost envelope provided.

All information will be treated as confidential and will not be traceable to individuals.

APPENDIX B

PERMISSION TO USE THE QUESTIONNAIRE

Dear Wezzie,

You're welcome. Professor Upton and Dr. Upton are happy to provide you with a copy of the measure and grant permission to use it in your research, with the proviso that as authors they are acknowledged in any communication, including publication, in which the questionnaire is used.

I have attached a copy of the questionnaire and the paper sent previously contains details of its development and construction. In accordance with UK copyright law we would be grateful if you would refer anyone else interested in using the EBPQ to us, rather than distribute copies of the questionnaires to third parties yourself. This will also help the authors gauge the level of interest in the questionnaire and its application in the clinical/research setting.

Also, please could you tell us a little more about the research you are planning to conduct? We would be extremely interested.

Many thanks for your interest in the EBPQ and good luck with your research. Please feel free to contact me if you require any further information.

Yours sincerely,

Laura.

Laura Scurlock-Evans BSc, PGD PRM (Open), MBPsS

PsychologyTechnician,

PhDstudentandsessionallecturer

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APPENDIX C

Approval Post Graduate Committee

Faculty of Health Sciences
Medical School, 7 York Road, Parktown, 2193
Fax: (011) 717-2119
Tel: (011) 717-2076

Reference: Ms Salamina Segole
E-mail: salamina.segole@wits.ac.za
09 May 2012
Person No: 556676
PAG

Miss WM Kumwenda
C/O Mr Tosh Mwafulirwa
Reserve Bank of Malawi
P O Box 565
Blantyre 265
0000
Malawi

Dear Miss Kumwenda

Master of Science in Nursing: Approval of Title

We have pleasure in advising that your proposal entitled "*Knowledge, attitudes and practices of trained intensive care nurses on evidence based practice in two academic hospitals in Gauteng*" has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

APPENDIX D

Ethics Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Ms Wezzie M Kumwenda

CLEARANCE CERTIFICATE	**M120330**
PROJECT	Knowledge, Attitudes and Practices of Trained Intensive Care Unit (ICU) Nurses on Evidence Based Practice at Two Academic Hospitals in Gauteng
INVESTIGATORS	Ms Wezzie M Kumwenda.
DEPARTMENT	Department of Nursing Education
DATE CONSIDERED	30/03/2012
+DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 17/05/2012 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Shelley Schmollgruber

DECLARATION OF INVESTIGATOR(S)
To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

APPENDIX E

Approval from the Department of Health Gauteng Province

GAUTENG PROVINCE

REPUBLIC OF SOUTH AFRICA

POLICY, PLANNING AND RESEARCH (PPR)
Enquiries: Dr B Ikalafeng
Tel: +2711 355 3500
Fax: +2711 355 3675 Email:bridget.ikalafeng@gauteng.gov.za

CONTACT DETAILS OF THE RESEARCHER	
Date	13 June 2012
Contact number	0712479152
Email	*wmwafulirwa@gmail.com*
Researcher /Principal investigator (PI)	Wezzie M Kumwenda
Supervisor	Shelley Schmollgruber
Institution	University of the Witwatersrand, Faculty of Health Sciences, Department of nursing Education
Research title	Knowledge, attitudes and practices of trained Intensive Care Nurses on evidence based practice in 2 academic hospitals in Gauteng

This approval is granted only for a research proposal submitted to GDH by Wezzie M Kumwenda entitled "Knowledge, attitudes and practices of trained Intensive Care Nurses on evidence based practice in 2 academic hospitals in Gauteng."

Methodology

A questionnaire survey will be conducted amongst, ICU trained registered nurses in the 10 ICUs of Charlotte Maxeke Johannesburg (CMJ) and Chris Hani Baragwanath (CHB) hospital (5 Intensive Care Units of each hospital).One hundred (100) trained ICU nurses will be selected using non probability purposive sampling technique method for the survey and 10 trained ICU nurses for the focus group discussions. A Biostatistician will be employed to assist with data analysis.

REVIEWER'S FINAL CONCLUSION

The study will improve the department's understanding regarding Evidence Based Practice for trained ICU nurses and is therefore recommended.

Reviewed and Recommended by

Dr Bridget Ikalafeng, Research and Epidemiology
Date: 13/06/2012

Approved / not approved

S. le Roux, Director PPR
Date: 14/06/2012

APPENDIX F

Approval from Charlotte Maxeke Hospital

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

CHARLOTTE MAXEKE JOHANNESBURG ACADEMIC HOSPITAL

Office of the CEO
Enquiries:
Ms. L. Mngomezulu
(011): 488-3793
(011) 488-3753
25th June 2012

Wezzie Kumwenda
MSc (Nursing) Student
University of the Witwatersrand

Dear Ms. Kumwenda

RE: "Knowledeg, attitude and practices of trained ICU nurses on evidence based practice"

Permission is granted for you to conduct the above research as described in your request provided:

1. Charlotte Maxeke Johannesburg Academic hospital will not in anyway incur or inherit costs as a result of the said study.
2. Your study shall not disrupt services at the study sites.
3. Strict confidentiality shall be observed at all times.
4. Informed consent shall be solicited from patients participating in your study.

Please liaise with the Head of Department and Unit Manager or Sister in Charge to agree on the dates and time that would suit all parties.

Kindly forward this office with the results of your study on completion of the research.

Yours sincerely

Dr. T.E. Selebano
Chief Executive Officer

APPENDIX G

University of Witwatersrand
West Campus Village
Block D, room 18.
2nd May, 2012.

The CEO
Charlotte Maxeke Hospital
Private Bag X39
Johannesburg, 2000.

Re: Permission to Conduct Research at Charlotte Maxeke Hospital

Dear Sir/Madam,

My name is Wezzie Kumwenda and I am currently a post graduate masters' student in Intensive care nursing at the Witwatersrand University. I would like to conduct a research project on "Knowledge, attitudes and practices of trained ICU nurses on evidence based practice".

The aim of this study to describe trained ICU nurses knowledge, attitudes and practices on evidence based practice for nursing at an academic hospital in Gauteng with the hope of providing knowledge as base line data necessary for evidence based practice implementation strategies, targeting trained ICU nurses in Gauteng. Informed consent will be obtained from participants and confidentiality will be observed throughout. With your permission the participants will be asked to fill in the questionnaire and participate in a focus group discussion. There will be no costs arising as a result of this study to this organization.

I hereby apply for permission to undertake research at Charlotte Maxeke Hospital adult intensive care nurses. Before collecting data, permission will be obtained from the University ethics committee, the hospital management and nursing management at ward level as well as the department of health. Thank you for taking time to consider this request.

Yours faithfully,

Wezzie Kumwenda.

APPENDIX H

QUESTIONNAIRE FOR VALIDATION OF DATA COLLECTION INSTRUMENT

This questionnaire is designed to gather information and opinions on the evidence-based practice questionnaire attached using the rating scale which has been provided. The rating scale uses a four point ordinal scale where 1 indicates an irrelevant item and 4 indicates a relevant and very important item. Any changes and additions to the questionnaire will be discussed in the meeting. Please complete the following demographic data below.

1. Your profession _____

2. Your qualifications _____

3. Years of ICU experience _____

4. Your present role in ICU _____

Please have a look at the questionnaire and answer the following questions by ticking (√) the correct answer.

Face Validity

Is the questionnaire clearly worded? Yes / No

Are the questions well explained? Yes / No

Does the questionnaire address the issues that it is supposed to address? Yes / No

Content Validity

Please evaluate the knowledge attitudes and practices of the trained ICU nurses using the 24 items on a scale of 1 to 4 and indicate your answer by a tick (√). Below are the ratings:

1 = irrelevant

2 = relevant but not important

3 = relevant and important

4 = relevant and very important

Item in the Evidence-based Practice Questionnaire	1	2	3	4
Section One (Practices)				
1.A				
1.B				
1.C				
1.D				
1.E				
1.F				
Section Two (Attitudes)				
2.A				
2.B				
2.C				
2.D				
Section Three (Knowledge)				
3.A				
3.B				
3.C				
3.D				
3.E				
3.F				
3.G				
3.H				
3.I				
3.J				
3.K				
3.L				
3.M				
3.N				
Comments				

APPENDIX I

Table I.1: Demographic Data of the ICU Experts

Demographic data	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
Present role	Unit manager	Lecturer	Operational manager	Clinical facilitator	Lecturer
Academic Qualification	Diploma in ICU	Masters in ICU	Diploma in ICU	Masters in ICU	Masters in ICU
	Diploma in general nursing	Degree in general nursing	Degree in general nursing	Degree in general nursing	Bcur honors in nursing education
	Degree in community health	Diploma in nursing admin.	Diploma in midwifery	Diploma in midwifery	Diploma in Midwifery
		Diploma in education			Diploma in psych & community
		Diploma in Midwifery			
Years in ICU	14	31	20	13	15

APPENDIX J

PANEL OF ICU' EXPERTS INFORMATION LETTER

Dear colleague,

My name is Wezzie Kumwenda and I am currently registered as a student for the degree of Master of Science in nursing (Intensive care) at the Witwatersrand University. I would like to conduct a research project to describe trained ICU nurses knowledge, attitudes and practices on evidence based practice for nursing at an academic hospital in Gauteng with the hope of providing knowledge as base line data necessary for evidence based practice implementation strategies, targeting trained ICU nurses in Gauteng

I hereby invite you as an expert in the field of the study to be part of an expert panel to further develop a data collection tool. The instrument is divided into three sections. One section is designed to address practices, the second section addresses the attitudes and the third section addresses the knowledge of nurses on evidence-based practice. An additional section is included to gather the comments and the demographic data from the participants.

If you agree to participate, I will request you to attend a focus group with other expert nurses who have agreed to participate in the study on 26th May, 2012 in the Masters classroom at the department of nursing. Refreshments will be provided. Prior to the meeting, I will send you documentation pertaining to the study including a demographic questionnaire and consent forms. These will need to be completed and returned in the meeting in the envelope provided.

Participation is voluntary. At the start of the discussions, participants will be requested to maintain confidentiality of what is discussed, even though not guaranteed. In addition no identification of your name will be given when reporting to ensure anonymity. There is no direct benefit for participating in this study however I hope that the information gathered will help clarify the educational needs of nurses on evidence-based practice. The research, ethics committees and the Gauteng health department have approved of this study and its procedures. Should you wish to contact me or require any further information, please call: **07 124 79 152**. Email:***wmwafulirwa@gmail.com.*** Thank you for taking time to read this information letter.

Yours Faithfully,

Wezzie Kumwenda.

APPENDIX K

INFORMATION LETTER FOR PARTICIPANTS IN THE MAIN STUDY- questionnaire

Dear Colleague,

My name is Wezzie Kumwenda. I am a student, registered for masters' degree in nursing at University of Witwatersrand. I am inviting you to participate in my study entitled: Knowledge, attitudes and practices of trained ICU nurses on evidence based practice with the purpose of describing trained ICU nurses knowledge, attitudes and practices on evidence based practice at an academic hospital in Gauteng.

Upon your consent, you will be asked to complete a questionnaire which will take 20 minutes. I will obtain permission from your manager for you to fill in the questionnaire during duty time and I will personally bring you the instrument. Completed questionnaires will be put in sealed unmarked envelopes. Your participation is voluntary. You may choose not to participate or withdraw from the study at any time without any consequences. Only my supervisor and I will have access to the completed questionnaires.

Results of the study will be reported in general terms and no identifying information will be used. There will be no benefit from participation in this study. There are no anticipated risks. The appropriate people and research committees of the University and your health care institution have been consulted for approval. Should you wish to contact me or require any further information, please call: **07 124 79 152**. Email:***wmwafulirwa@gmail.com.*** Thank you for taking time to read this information letter.

Yours Sincerely,

Wezzie Kumwenda.

APPENDIX L

CONSENT FORM FOR QUESTIONNAIRE

I _____ (name) have read and understand the content of the information letter. I have been given the opportunity to submit/ask questions that I might have regarding the procedure and my consent to being included in the study. I may at any stage without any consequences withdraw my consent and participation in the study.

I hereby give permission, voluntarily to be included in the study by my signature below:

Participants signature……

Date…….

APPENDIX M

FOCUS GROUP DISCUSSION GUIDE ON EVIDENCE BASED PRACTICE

Total focus group time: 1hour +10 minutes

Number of Participants: 5

Moderator: _____

Note-taker: Wezzie Kumwenda

Discussion Guidelines:

- The discussion is informal, there's no need to wait for the facilitator to call on you to respond. In fact, you are encouraged to respond directly to the comments other people make. One person at a time.
- Questions included here are examples of issues that may need to be explored in the group. Questions will tend to be open.
- If you don't understand a question, please let the facilitator know. We (facilitator and note taker) are here to ask questions, listen, and make sure everyone has a chance to share.
- If we seem to be stuck on a topic, we may interrupt you and if you aren't saying much, the facilitator may call on you directly. If this is done, please don't feel bad about it; it's just a way of making sure everyone's perspective and opinion is included.
- You will be asked that you all should keep each other's identities, participation and remarks private. It is hoped that you'll feel free to speak openly and honestly.
- As discussed, we will be tape recording the discussion, because we don't want to miss any of your comments. No one outside of this room will have access to these tapes and they will be destroyed after our report is written.

Opening (5min)

Opening remarks including mentioning discussion guidelines/rules. Self introduction.

Question on Exploration on Knowledge of EBP (20 min)

1. a. Today we are here to talk about EBP. What comes to your mind when you think about EBP in your setting?

b. Can you describe some instances in which you used scientific evidence in your nursing care?

c. Have you ever acquired extra knowledge? If so, how and where did you acquire the extra knowledge? What am looking for is whether you have attended on job training or in service, or extra courses related to EBP. Is this the first time that you have heard about EBP? Where else did you hear about EBP?

d. Please describe what source of knowledge you most frequently use in your nursing practice?

Question on Exploration of Attitudes towards EBP (20 min)

2. a. Can you explain your own experiences or perceptions with EBP?

b. In your opinion is EBP important in the South African health context? Please explain your answer.

c. As a trained Intensive care nurse, do you think EBP is within the scope of the trained ICU nurse?

Question on Exploration of Practice regarding EBP (20 min)

3. a. Is your practice based on EBP? Please elaborate.

b. What does EBP allow you to do now — either physically or intellectually — that would have been impossible or more difficult to do before it was discovered?

c. What impact if any, has the use of evidence has on your decision making or nursing practice?

4. What changes would you like to see made to the current nursing practice in the ICU which would allow trained ICU nurses to benefit more from EBP?

5. Is there anything else you would like to share with us regarding EBP?

Closing (5 min)

- Closing remarks. Key issues raised summarized and key points made. Participants thanked.

APPENDIX N

INFORMATION FOR FOCUS GROUP DISCUSSION

Dear Colleague,

My name is Wezzie Kumwenda and my friend's name is _____. We are researchers affiliated to Witwatersrand University as part of master's degree program. The aim of conducting a focus group discussion is to gather information from the group interaction and conversations that will help us to understand and describe trained ICU nurses knowledge, attitudes and practices on evidence based practice at an academic hospital in Gauteng. We are therefore, inviting you to participate in the study entitled: Knowledge, attitudes and practices of trained ICU nurses on evidence based practice.

Even though confidentiality in focus groups cannot be guaranteed, you will be asked to respect each other's privacy; we will not disclose who actually participated in this focus group. Codes will be used instead of names. Completed field notes and tape records will be put in sealed unmarked box accessible to the researchers and supervisor. Our evaluation will result in a written report in general terms by 25th December. This report will be delivered to you or the hospital upon request and the Universities library.

Upon your consent to take part in the study and to use the tape records, you will be asked to sign consent form. The focus group discussion will take 70 minutes. We will obtain permission from your manager for you to participate during duty time.

Your participation is voluntary. You may choose not to participate or withdraw from the study at any time without any consequences. There is no benefit from participation in this study. There are no anticipated risks. The appropriate people and research committees of the university and your health care institution have been consulted for approval. Please find below contact information for further enquires: Cell: **07 124 79 152**. Email:***wmwafulirwa@gmail.com.*** Thanks for taking time to read this information letter.

Yours Sincerely,

Wezzie Kumwenda.

APPENDIX O

CONSENT FORM FOR FOCUS GROUP DISCUSSION

I have read and understand the content of the focus group information letter. I have been given the opportunity to submit/ask questions that I might have regarding the procedure and my consent to being included in the study. I consent to take part in a focus group about my experiences on Evidence Based Practice. I also consent (Yes / No) to be tape recorded during this focus group discussion.

I may at any stage without any consequences withdraw my consent and participation in the study. The information that I provide during the focus group will be grouped with answers from other people so that I can not be identified.

I hereby give permission, voluntarily to be included in the study by my signature below:

Participants signature……

Date…….

APPENDIX P

Statistical Reliability - Wezzie Kumwenda 26/09/2012

Test scale = mean (standardized items: Knowledge, Attitudes and practices)

```
. alpha  q1a_3  q1a_3 q1b_3 q1c_3 q1d_3 q1e_3 q1f_3, std item
```

Item	Obs	Sign	item-test correlation	item-rest correlation	a.interitem correlation	alpha
q1a_3	100	+	0.7522	0.6304	0.5141	0.8410
q1b_3	100	+	0.8007	0.6978	0.4917	0.8287
q1c_3	100	+	0.8351	0.7470	0.4759	0.8195
q1d_3	100	+	0.7603	0.6415	0.5103	0.8390
q1e_3	100	+	0.7485	0.6253	0.5158	0.8419
q1f_3	100	+	0.7085	0.5714	0.5342	0.8515
Test scale					0.5070	0.8605

```
. alpha   q2a_3 q2b_3 q2c_3 q2d_3, std item
```

Item	Obs	Sign	item-test correlation	item-rest correlation	a.interitem correlation	alpha
q2a_3	100	+	0.7646	0.5833	0.6522	0.8491
q2b_3	100	+	0.8120	0.6582	0.5998	0.8181
q2c_3	100	+	0.8939	0.7972	0.5094	0.7570
q2d_3	100	+	0.8432	0.7096	0.5654	0.7960
Test scale					0.5817	0.8476

. alpha q3a_3 q3b_3 q3c_3 q3d_3 q3e_3 q3f_3 q3g_3 q3h_3 q3i_3 q3j_3 q3k_3 q3l_3,

std item

Item	Obs	Sign	item-test correlation	item-rest correlation	a.interitem correlation	alpha
q3a_3	100	+	0.6713	0.6013	0.5052	0.9182
q3b_3	100	+	0.6219	0.5444	0.5131	0.9206
q3c_3	100	+	0.6622	0.5906	0.5067	0.9187
q3d_3	100	+	0.7438	0.6859	0.4936	0.9147
q3e_3	100	+	0.7160	0.6533	0.4981	0.9161
q3f_3	100	+	0.7390	0.6803	0.4944	0.9149
q3g_3	100	+	0.7722	0.7196	0.4891	0.9133
q3h_3	100	+	0.7503	0.6936	0.4926	0.9144
q3i_3	100	+	0.8293	0.7881	0.4800	0.9103
q3j_3	100	+	0.8345	0.7944	0.4791	0.9101
q3k_3	100	+	0.7715	0.7188	0.4892	0.9133
q3l_3	100	+	0.6851	0.6172	0.5030	0.9176
Test scale					0.4954	0.9217

. alpha q1a_3 - q3n_3, std item

Item	Obs	Sign	item-test correlation	item-rest correlation	a.interitem correlation	alpha
q1a_3	100	+	0.5089	0.4578	0.3848	0.9350
q1b_3	100	+	0.5440	0.4953	0.3827	0.9345
q1c_3	100	+	0.6073	0.5633	0.3789	0.9335
q1d_3	100	+	0.6135	0.5701	0.3785	0.9334
q1e_3	100	+	0.5838	0.5380	0.3803	0.9338
q1f_3	100	+	0.5891	0.5437	0.3800	0.9338
q2a_3	100	+	0.5495	0.5011	0.3824	0.9344
q2b_3	100	+	0.5910	0.5458	0.3799	0.9337
q2c_3	100	+	0.5854	0.5398	0.3802	0.9338
q2d_3	100	+	0.5615	0.5141	0.3817	0.9342
q3a_3	100	+	0.5678	0.5208	0.3813	0.9341
q3b_3	100	+	0.5399	0.4909	0.3830	0.9345
q3c_3	100	+	0.5494	0.5011	0.3824	0.9344
q3d_3	100	+	0.6571	0.6173	0.3759	0.9327
q3e_3	100	+	0.6508	0.6105	0.3763	0.9328
q3f_3	100	+	0.7213	0.6875	0.3721	0.9316
q3g_3	100	+	0.7402	0.7083	0.3709	0.9313
q3h_3	100	+	0.7000	0.6641	0.3733	0.9320
q3i_3	100	+	0.7984	0.7726	0.3674	0.9304
q3j_3	100	+	0.8154	0.7916	0.3664	0.9301
q3k_3	100	+	0.6889	0.6520	0.3740	0.9322
q3l_3	100	+	0.7301	0.6972	0.3715	0.9315
q3m_3	100	+	0.7080	0.6729	0.3729	0.9319
q3n_3	100	+	0.6380	0.5966	0.3771	0.9330
Test scale					0.3773	0.9356