

UNIVERSITY OF KWAZULU-NATAL

**AN EXPLORATORY DESCRIPTIVE STUDY
ON NURSES' KNOWLEDGE, ATTITUDES AND PRACTICES
REGARDING EVIDENCE BASED PRACTICE
IN A PREVENTION OF MOTHER TO CHILD TRANSMISSION OF HIV
PROGRAM AT A SELECTED PUBLIC TERTIARY HOSPITAL
IN MALAWI**

CHISOMO MULENGA

2015

**AN EXPLORATORY DESCRIPTIVE STUDY
ON NURSES' KNOWLEDGE, ATTITUDES AND PRACTICES
REGARDING EVIDENCE BASED PRACTICE
IN A PREVENTION OF MOTHER TO CHILD TRANSMISSION OF HIV
PROGRAM AT A SELECTED PUBLIC TERTIARY HOSPITAL
IN MALAWI**

By

Chisomo Mulenga

Student number: 213556471

Research dissertation submitted in partial fulfilment of Master in Nursing
(Nursing Research)

to

The School of Nursing and Public Health
University of KwaZulu-Natal

Supervisor: Dr J.R Naidoo

February 2015.

DECLARATION

I, **Chisomo Mulenga**, hereby declare that the entirety of the work contained in this thesis entitled ‘An exploratory descriptive study on nurses’ knowledge, attitudes and practices of evidence based practice in a Prevention of Mother to Child Transmission of HIV program at a selected public tertiary hospital in Malawi’ is my own work. All sources consulted have been acknowledged through complete referencing. The thesis is being submitted for the award of Master of Nursing Research at the University of KwaZulu-Natal and it has never been submitted at any university before.

Students’ signature

Supervisors’ signature

Date

Date

DEDICATION

This work is dedicated to my husband, Maurice, for the physical, emotional, spiritual and financial support that has enabled me to reach this far, and also to our daughter, Maureen. I love you both.

ACKNOWLEDGEMENTS

I would like to thank God almighty for the gift of life and the opportunity He granted me that I should further my studies.

My utmost gratitude also goes to my husband, Maurice, for his financial, physical, social and emotional support. I don't know what I could have been without you.

I am also indebted to my aunt, Mrs. Chikomoni and her family, and my sisters, Sylvia and Ethel, for taking care of my daughter while I was studying, and the rest of my family for the support. I do not take your love for granted.

I would also like to thank my supervisor, Dr J.R Naidoo, for her guidance and untiring effort that has enabled me to complete this thesis. May God continue to bless you.

My special thanks also goes to the management of Kamuzu Central Hospital for granting me permission to conduct the study there and to all the nurses that participated in the study.

I would also like to extend my gratitude to Mrs. Fikile Nkwanyana and Alexis Harerimana for their input in the data analysis process, and Mrs. Margaret Addis for editing the thesis.

Finally, my appreciation also goes to Mwiza Nyirenda, Tamara Nthengwe and all my friends for their support and encouragement.

May God Almighty richly bless you all.

ABSTRACT

HIV/AIDS continues to be a global public health concern with Malawi being among the countries worst affected by the pandemic. Women have the highest prevalence compared to men and the prevalence is also very high among pregnant women, thereby increasing the risk of mother to child transmission of the virus. Prevention of mother to child transmission of HIV is therefore a priority in the efforts to curb the HIV/AIDS pandemic. The HIV/AIDS field is rapidly evolving, however, as more research evidence continues to emerge. Studies have shown that successful implementation of evidence-based interventions from empirical research can result in remarkable reduction of Mother to child transmission of HIV. This necessitates evidence-based practice among nurses. The purpose of this study therefore was to explore and describe the knowledge, attitudes and practices of nurses regarding evidence-based practice in Prevention of mother to child transmission of HIV at a selected public tertiary hospital in Malawi.

A non-experimental exploratory descriptive quantitative design was used for the study. The study population comprised permanently employed nurses working in maternity, pediatric and gynecology departments of the selected hospital. The total population was 86 and all the nurses were invited to participate. Only 81 agreed, giving a response rate of 94%. A self-administered questionnaire was used to collect data and the data were entered and subsequently analyzed using Predictive Analytics Software (PASW) version 21.

The findings of the study revealed that nurses had average knowledge of evidence-based practice. Although their attitudes were found to be favorable, their practice of evidence-based practice was very low. Certain social-demographic variables were found to have an influence on the nurses' knowledge, attitudes and practices. Nurses indicated that evidence-based practice was mainly

hampered by insufficient resources and difficulties in accessing research articles. Mentoring, training and access to literature were the major facilitators reported by the nurses.

Based on these findings, it is recommended that for evidence-based practice to be promoted, the nurses be provided with the necessary support including education and resources.

Key terms: PMTCT, HIV/AIDS, Evidence-based practice, Nurses.

LIST OF ABBREVIATIONS

AIDS:	Acquired immune-deficiency syndrome
APN:	Advanced practice nurse
ART:	Antiretroviral therapy
ARV:	Antiretroviral
DEBPQ:	Developing evidence based practice questionnaire
EBP:	Evidence based practice
HIV:	Human immune-deficiency virus
HTC:	HIV testing and counseling
IATT:	Inter-agency task team
KCH:	Kamuzu Central hospital
MDG:	Millennium Development Goals
MTCT:	Mother to Child Transmission of HIV
NIMART:	Nurse initiated and managed antiretroviral therapy
NMT:	Nurse Midwife technician
PACTG:	Pediatric AIDS clinical trial group
PASW:	Predictive Analytics Software

PMTCT: Prevention of Mother to Child Transmission of HIV

RCTs: Randomized control trials

STI: Sexually transmitted infection

UK: United Kingdom

UKZN: University of KwaZulu-Natal

UNAIDS: Joint United Nations Programme on HIV/AIDS

UNGLASS: UN General Assembly Special session

USA: United States of America

VCT: Voluntary counseling and testing

WHO: World Health Organization

TABLE OF CONTENTS

DECLARATION	iii
DEDICATION	iv
ACKNOWLEDGEMENTS	v
ABSTRACT	vi
LIST OF ABBREVIATIONS	viii
TABLE OF CONTENTS	x
TABLE OF TABLES	xviii
TABLE OF FIGURES	xx
TABLE OF ANNEXURES	xxii
CHAPTER ONE	1
INTRODUCTION TO THE STUDY	1
1.1 INTRODUCTION	1
1.2 BACKGROUND TO THE STUDY	4
1.2.1 Evidence-based practice	6
1.2.2 Evidence-based practice and PMTCT in Africa	8
1.2.3 Overview of the PMTCT program in Malawi.....	9
1.2.4 Program changes	11
1.3 PROBLEM STATEMENT	11
1.4 PURPOSE OF THE STUDY	12

1.5 RESEARCH OBJECTIVES	12
1.6 RESEARCH QUESTIONS	13
1.7 SIGNIFICANCE OF THE STUDY	13
1.7.1 Nursing Research	14
1.7.2 Nursing Management	14
1.7.3 Nursing Education	14
1.7.4 Nursing Practice	15
1.8 OPERATIONAL DEFINITIONS.....	15
1.8.1 Knowledge	15
1.8.2 Attitudes	16
1.8.3 Practice	16
1.8.4 Nurse	16
1.8.5 Evidence-Based Practice (EBP)	17
1.8.6 PMTCT.....	17
1.9 THEORETICAL FRAMEWORK	17
1.9.1 Application of the framework to the study.....	19
1.10 OUTLINE OF THE DESSERTATION.....	22
1.11 SUMMARY OF THE CHAPTER.....	22
CHAPTER TWO	24
LITERATURE REVIEW	24
2.1 INTRODUCTION	24
2.2 OVERVIEW OF HIV/AIDS, WOMEN AND PMTCT PROGRAMS IN AFRICA	25

2.3 GLOBAL OVERVIEW OF THE EVOLUTION OF PMTCT.....	28
2.3.1 Antiretroviral therapy for PMTCT.....	28
2.3.2 Infant feeding in PMTCT.....	31
2.3.3 Intra-partum care for HIV infected women.....	33
2.4 NURSES AND THE PMTCT PROGRAM IN AFRICA.....	34
2.4.1 Nurses’ knowledge ofPMTCT.....	34
2.4.2 Nurses’ PMTCT practices.....	36
2.5 EVIDENCE-BASED PRACTICE.....	37
2.6 DETERMINANTS OF EVIDENCE-BASED PRACTICE.....	41
2.7 NURSES’ KNOWLEDGE OF EVIDENCE-BASED PRACTICE.....	43
2.8 NURSES’ ATTITUDES TOWARDS EVIDENCE BASED PRACTICE.....	47
2.9 NURSES’ PRACTICE OF EVIDENCE BASED PRACTICE.....	49
2.10 BARRIERS TO EVIDENCE BASED PRACTICE.....	50
2.11 FACILITATORS TO EVIDENCE BASED PRACTICE.....	54
2.12 SUMMARY OF THE CHAPTER.....	57
CHAPTER THREE.....	58
METHODOLOGY.....	58
3.1 INTRODUCTION.....	58
3.2 RESEARCH PARADIGM.....	58
3.3 RESEARCH APPROACH.....	59
3.4 RESEARCH DESIGN.....	59

3.5 STUDY SETTING.....	60
3.6 STUDY POPULATION, SAMPLE AND SAMPLING	61
3.6.1 Inclusion criteria.....	61
3.6.2 Exclusion criteria.....	61
3.7 DATA COLLECTION INSTRUMENT.....	61
3.8 VALIDITY AND RELIABILITY	63
3.9 DATA COLLECTION PROCEDURE.....	66
3.10 DATA ANALYSIS.....	67
3.11 DATA MANAGEMENT AND STORAGE	67
3.12 ETHICAL CONSIDERATIONS	67
3.12.1 Ethical clearance	69
3.13 DISSEMINATION OF RESEARCH FINDINGS	69
3.14 SUMMARY OF THE CHAPTER.....	69
CHAPTER FOUR.....	71
PRESENTATION OF THE FINDINGS	71
4.1 INTRODUCTION	71
4.2 SOCIAL DEMOGRAPHIC CHARACTERISTICS	72
4.2.1 Age of the participants	72
4.2.2 Gender of the participants	73
4.2.3 Category of nurse	74
4.2.4 Qualification of the participants.....	74

4.2.5 Work experience of the participants.....	75
4.2.6 Category of nurse and work experience.....	76
4.2.7 Department of work	77
4.2.8 Length of time in the department.....	78
4.2.9 Length of time in the department and nursing category.....	79
4.2.10 PMTCT training.....	79
4.2.11 PMTCT training and work experience.....	80
4.2.12 PMTCT training and department.....	81
4.2.13 PMTCT training and nursing category.....	82
4.2.14 PMTCT training and length of time in department.....	83
4.2.15 When trained in PMTCT.....	84
4.2.16 Qualification and when trained in PMTCT.....	85
4.2.17 Evidence-based practice training.....	86
4.2.18 Evidence-based practice training and qualification.....	87
4.2.19 When trained in evidence-based practice.....	88
4.2.20 Qualification and when trained in EBP.....	89
4.3 THE PARTICIPANTS LEVEL OF KNOWLEDGE REGARDING EVIDENCE BASED PRACTICE IN PMTCT.....	90
4.3.1 Overall knowledge score.....	93
4.3.2 Influence of social-demographic variables on overall knowledge.....	94
4.3.2.1 Influence of age on knowledge.....	95
4.3.2.2 Influence of nursing category on evidence-based practice knowledge.....	96
4.3.2.3 Influence of qualification on level of knowledge of EBP.....	97
4.3.2.4 Influence of work experience on level of EBP knowledge.....	98

4.3.2.5 Influence of evidence-based practice training on knowledge.....	99
4.3.3 Social-demographics and individual knowledge items	100
4.3.3.1 Qualification and research skills	100
4.3.4 Sources of knowledge for EBP	100
4.3.4.1 Social-demographics and sources of knowledge used by the participants	104
4.3.4.2 Use of information from training (college) and experience	104
4.3.4.3 Use of information from in-service and PMTCT training	105
4.3.4.4 Knowledge of EBP and source of knowledge used.....	105
4.3.4.4.1 Research skills and use of research as source of knowledge	106
4.4 ATTITUDES TOWARDS EVIDENCE BASED PRACTICE	106
4.4.1 Overall attitude scores	107
4.4.2 Relationships between items in the attitude scale	108
4.4.3 Influence of social-demographic variables on items on the attitude scale	109
4.4.3.1 Cross tabulation of age and resenting questioning	109
4.4.3.2 Nursing category, qualification and perception of workload	110
4.4.4 Influence of social-demographics on overall attitude	110
4.4.4.1 Evidence-based practice training and attitude	111
4.4.4.2 Age and attitude	111
4.5 PRACTICE OF EVIDENCE BASED PRACTICE IN PMTCT	112
4.5.1 Overall practice scores	116
4.5.2 Influence of social demographics on practice	116
4.5.3 Practice and level of knowledge.....	118
4.5.3.1 Research skills and critically appraising evidence from a study	118
4.5.3.2 Ability in reviewing own practice and evaluating the outcomes of a practice	119

4.6 INTERRELATIONSHIPS BETWEEN SOCIAL-DEMOGRAPHICS, KNOWLEDGE, ATTITUDE AND PRACTICES	120
4.6.1 Interrelationships between social-demographic variables and evidence-based practice knowledge, attitude and practices	120
4.6.2 Interrelationships between evidence-based practice knowledge, attitude and practices	122
4.7 BARRIERS TO EVIDENCE-BASED PRACTICE IN PMTCT AMONG THE NURSES .	123
4.7.1 Perception of barriers and evidence based practice knowledge	126
4.7.1.1 Knowledge of how to retrieve evidence versus I do not know how to find appropriate research reports	126
4.7.1.2 Research skills and perception of difficulties in understanding research reports....	127
4.8 FACILITATORS TO EVIDENCE BASED PRACTICE IN PMTCT	127
4.9 SUMMARY OF THE CHAPTER	129
CHAPTER FIVE	132
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS.....	132
5.1 INTRODUCTION	132
5.2 SOCIAL DEMOGRAPHIC FINDINGS	132
5.3 KNOWLEDGE OF EVIDENCE BASED PRACTICE	135
5.3.1 Sources of evidence-based practice knowledge	138
5.4 ATTITUDES TOWARDS EVIDENCE BASED PRACTICE	140
5.5 PRACTICE OF EVIDENCE BASED PRACTICE.....	142
5.6 INTERRELATIONSHIPS	144
5.7 BARRIERS TO EVIDENCE BASED PRACTICE	145

5.8 FACILITATORS TO EVIDENCE-BASED PRACTICE	146
5.9 RECOMMENDATIONS	147
5.9.1 Nursing Practice	147
5.9.2 Nursing Management	148
5.9.3 Educators	149
5.9.4 Researchers.....	149
5.9.5 Areas for further research.....	149
5.10 LIMITATIONS OF THE STUDY	150
5.11 SUMMARY OF THE CHAPTER.....	150
5.12 CONCLUSIONS.....	150
REFERENCES	153

TABLE OF TABLES

Table 2.1: Changes in PMTCT ARV therapy recommendations	29
Table 2.2: Changes in infant feeding recommendations for HIV infected women	33
Table 3.1: Content validity for the study	65
Table 4.1: Cross tabulation of nursing category and experience	77
Table 4.2: Length of time in department and nursing category	79
Table 4.3: Cross tabulation of work experience and PMTCT training	81
Table 4.4: Cross tabulation of PMTCT training and department	82
Table 4.5: PMTCT training and nursing category	83
Table 4.6: When trained in PMTCT	84
Table 4.7: Qualification and when trained in PMTCT	86
Table 4.8: Cross tabulation of evidence based practice training and qualification	88
Table 4.9: Cross tabulation of qualification and when trained in EBP	90
Table 4.10: Participants' knowledge/skills on evidence-based practice.....	93
Table 4.11: Overall knowledge scores	94
Table 4.12: Cross tabulation of age and level of knowledge	96
Table 4.13: Qualification and knowledge of EBP	98

Table 4.14: Cross tabulation of experience and level of EBP knowledge	99
Table 4.15: Sources of knowledge for PMTCT practice	103
Table 4.16: Experience and use of knowledge from training	104
Table 4.17: Attitudes towards evidence based practice	107
Table 4.18: Attitudes scores	108
Table 4.19: Influence of demographics on attitude of EBP	112
Table 4.20: The participants' practice of evidence based practice in PMTCT	115
Table 4.21 : Overall practice scores	116
Table 4.22: Cross tabulation of age and practice	117
Table 4.23: Practice and demographic variables	118
Table 4.24: Ability to review own practice and evaluating the outcomes of practice	120
Table 4.25: Correlation between knowledge, attitude and practice	122
Table 4.26: Barriers to evidence-based practice	125
Table 4.27: Cross tabulation of skill in evidence retrieval and its perception as a barrier	126
Table 4.28: Research skills and difficulties in understanding research reports barrier	127
Table 4.29: Facilitators to evidence-based practice	129

TABLE OF FIGURES

Figure 1.1: Roger’s Diffusion of Innovations theory (2003), adapted from Sahin (2006).....	21
Figure 4.1: Histogram of age	73
Figure 4.2: Gender of the participants	73
Figure 4.3: Category of nurse	74
Figure 4.4: Qualification of the participants	75
Figure 4.5: Work experience.....	76
Figure 4.6: Department	77
Figure 4.7: Length of time in department	78
Figure 4.8: PMTCT training	80
Figure 4.9: PMTCT training and length of time in department	84
Figure 4.10: Training in evidence-based practice	87
Figure 4.11: When trained in evidence-based practice	89
Figure 4.12: Nursing category and level of knowledge	97
Figure 4.13: Evidence based practice training and knowledge.....	100
Figure 4.14: Use of in-service knowledge and PMTCT training.....	105
Figure 4.15: Age and resenting clinical practice being questioned	110

Figure 4.16: Evidence-based practice training and attitudes 111

Figure 4.17: Research skills and frequency of reading and appraising research evidence 119

TABLE OF ANNEXURES

ANNEXURE 1: PARTICIPANTS' INFORMATION DOCUMENT	174
ANNEXURE 2: DECLARATION OF CONSENT TO PARTICIPATE IN THE STUDY	177
ANNEXURE 3: QUESTIONNAIRE	178
ANNEXURE 4: ETHICAL CLEARANCE FROM BIOMEDICAL ETHICS COMMITTEE...	187
ANNEXURE 5: APPLICATION LETTER TO MALAWI ETHICS COMMITTEE	188
ANNEXURE 6: MALAWI ETHICS CLEARANCE.....	189
ANNEXURE 7: LETTER REQUESTING SITE PERMISSION	190
ANNEXURE 8: SITE PERMISSION	191
ANNEXURE 9 : EDITOR'S LETTER	192

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

HIV/AIDS continues to be a global public health concern with an estimated 35.3 million people living with HIV in 2012 (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2013a). Sub-Saharan Africa, home to a third of the world population, bears 71% of all HIV infections having 25 million infected people (World Health Organization, 2013a). Women worldwide remain the most vulnerable group, with an estimated HIV prevalence of 52 % (UNAIDS, 2013a). According to UNAIDS (2013b), in 2012, sub-Saharan Africa harboured 92% of all HIV infected women and 90% of all HIV infected pregnant women. HIV prevalence among children is also high in sub-Saharan Africa. UNAIDS (2013a) estimated that in 2012, 90% of all children who had acquired HIV were from sub-Saharan Africa. It was further estimated that 2.9 million children were living with HIV and, of these, 230 000 were new infections (UNAIDS, 2013b).

Malawi, like its counterparts in sub-Saharan Africa, is also badly affected by the HIV pandemic with a national prevalence of 10.6 % among adults of 15- 49 years old (Malawi Demographic Health Survey, 2010). Women have the highest burden, with an estimated HIV prevalence of 12.9% compared to 8.1 % for men (Malawi Demographic Health Survey, 2010). HIV prevalence among pregnant women is estimated at 8.8 %, which is also high (Malawi Demographic Health Survey, 2010). Mother to child transmission of HIV (MTCT) is the second major mode of transmission and accounts for approximately 25% of all new infections (Ministry of Health, 2012). Prevention of mother to child transmission of HIV (PMTCT) is therefore considered a priority in

the global efforts to curb the HIV/AIDS pandemic and nurses are the key players in the provision of the PMTCT services (Govender & Coovadia, 2014).

As most of the healthcare in Malawi is provided by nurses and midwives, they play a crucial role in the provision of care to pregnant women and nursing mothers (Misiri, Tadesse & Muula, 2004). Similarly, in South Africa, it is estimated that nurses attend to more than 75% of all births and they are the only provider a woman will see during the course of her pregnancy and through delivery (Dohrn, Miller & Bakken, 2006). Nurses and midwives therefore perform a wide variety of HIV and PMTCT related tasks that range from HIV diagnosis, prescription of antiretroviral therapy (ART), ensuring safe obstetrics during delivery, counseling on infant feeding and management of opportunistic infections (Zachariah, Ford, Philips et al., 2009).

PMCT knowledge and guidelines, however, are rapidly changing as more research evidence emerges (Rujumba, Tumwine, Tylleskär et al., 2012). As nurses need to possess the most up to date knowledge on HIV/AIDS and PMTCT, continuous training is considered a very important factor (Oyeyemi, Oyeyemi & Bello, 2006). This, however, is a challenge in many low income countries (Rujumba et al., 2012; Labhardt, Manga, Ndam et al., 2009). Nurses are therefore expected to embrace evidence-based practice (EBP) in order to provide interventions that will help to prevent new HIV infections in children (Relf, Mekwa, Chasokela et al., 2011). Evidence-based practice is part of a global agenda and it is considered a gold standard for improving the standard of quality of health care (Wall, 2014; World Health Organization, 2011a). It is also viewed as a way to reduce research practice gap (Scott & Pollock, 2008).

However, utilization of research by nurses as part of evidence based practice has been an area of major concern over the past 30 years (Kocaman, Seren, Lash et al., 2010). A big gap exists between

research results that inform clinical practice and nurses' application thereof (Côté, Gagnon, Houme et al., 2012; Mccloskey, 2008). It has been estimated that there can be 8-30 years between publication and adoption of research findings (Hutchinson & Johnston, 2004). Studies indicate that many nurses continue to base their practice on advice of colleagues, experience, rituals and traditions, which on their own cannot improve the quality of care (Smith & Donze, 2010; Brown, Wickline, Ecoff et al., 2009). Grol & Grimshaw (2003) further contend that 30-40% of patients do not receive evidence-based health care and between 20-25% of patients receive harmful and/or inappropriate care.

A study conducted in Nigeria to explore translation of research into practice by nurses in preventing mother to child transmission of HIV echoes these findings. The study identified that although research findings were translated into policy and guidelines, the nurses' practices related to infant feeding and care of the neonate were not in accordance with the recommendations of evidence-based guidelines (Ogbolu, Iwu, Zhu et al., 2013).

Many studies have reported barriers to implementing evidence into practice, with the main barriers being lack of time to read research articles and implement their recommendations as well as lack of authority to change practice (Dalheim, Harthug, Nilsen et al., 2012; Melnyk, Fineout-Overholt, Gallagher-Ford et al., 2012; Majid, Foo, Luyt et al., 2011). There is however compelling evidence that successful implementation of evidence-based interventions from empirical research can result in remarkable reduction of MTCT of HIV. In the United Kingdom (UK) and Ireland, an overall MTCT rate of 1.2% was recorded with successful implementation of evidence based PMTCT interventions (Townsend, Cortina-Borja, Peckham et al., 2008). In sub-Saharan Africa, evidence-based PMTCT interventions have also prevented 350 000 new HIV infections in children (Govender & Coovadia, 2014).

1.2 BACKGROUND TO THE STUDY

MTCT of HIV has raised concerns over the years as it is the second major mode of HIV transmission accounting for 90% of all infections in children worldwide (World Health Organization, 2013b). MTCT of HIV can occur during pregnancy, labor and delivery, and breastfeeding (World Health Organization, 2013b). It is estimated that without interventions, transmission rates range from 15 - 45% (World Health Organization, 2013b). However, the rate can be reduced to levels below 5% with implementation of effective PMTCT interventions (World Health Organization, 2013b). PMTCT involves a sequence of steps referred to as a cascade, and these include: antenatal care, HIV counseling and testing, provision of prophylactic antiretroviral therapy, safe delivery practices, safe infant feeding, infant follow up and testing, and family planning (Ferguson, Grant, Watson-Jones et al., 2012).

Nurses are the major providers of HIV and PMTCT services in sub-Saharan Africa (Zuber, McCarthy, Verani et al., 2014). Their role in HIV and PMTCT expanded with the introduction of task shifting as a way of scaling up HIV management (Zuber et al., 2014; Zachariah et al., 2009). With task shifting, many HIV related tasks assumed by physicians are carried out by nurses and mid-wives, such as diagnosing HIV infection, initiation of ART and administration of PMTCT regimens (Zuber et al., 2014; Zachariah et al., 2009). The role of nurses in PMTCT extends from preconception, prenatal, perinatal, postnatal and gynecology periods (Ogbolu et al., 2013). During the preconception period, the nurses' role is to provide education on safer sex practices; HIV testing and counseling; and treatment. In the prenatal period, the nurse is involved in HIV testing and counseling; maternal treatment with ART, if positive; coordinating care and support for adherence; disclosure and other psychological needs; and assistance in navigating the fragmented health system for PMTCT. During the intrapartum period, the nurses' role is to ensure safe delivery

practices to prevent MTCT; intrapartum ART treatment; and immediate neonatal care. Finally, the nurse is involved in continued support; treatment and counseling on safe sexual practices; and family planning through the postnatal period (Ogbolu et al., 2013).

Relf et al. (2011), contend that nurses dealing with PMTCT should be knowledgeable of the scientific basis of MTCT of HIV to enable them to provide evidence-based interventions. A survey was conducted among senior nurse leaders from 15 African countries, including Malawi, to describe the extent of nurse initiated and managed ART (NIMART) in practice, education, policy and regulation (Zuber et al., 2014). The study established that although NIMART was widely performed in the 15 participating countries, in some of the countries it was not incorporated into the pre-service education program or reinforced through continuing education.

In Malawi, nurse-midwife technicians (NMTs) are the main providers of HIV and PMTCT services. Many nurses involved in the PMTCT program, however, are not trained (Zuber et al., 2014). Furthermore, the pre-service education of trained nurses is not standardized and their in-service training is of shorter duration than in other countries (Zuber et al., 2014). Studies have also reported that nurses in Malawi have limited opportunities for continuing their professional development, which affects the quality of care they render to their patients (Chimwaza, Chipeta, Ngwira et al., 2014; Manafâ, Mcauliffe, Maseko et al., 2009).

Rujumba et al. (2012) noted that most nurses possess outdated knowledge due to inadequate training and argue that as PMTCT is a field that is rapidly evolving, nurses need to be abreast of current developments to be able to provide evidence-based nursing care. Studies done in Kenya and Tanzania on nurses' practices regarding infant feeding in the context of HIV echo this finding. The studies identified that the nurses were facing challenges regarding infant feeding counseling

due to lack of training (Murila, Obimbo, Musoke et al., 2013; Leshabari, Blystad, De Paoli et al., 2007). In Malawi, a study by Chinkonde, Sundby, De Paoli et al. (2010) on infant feeding counseling in the context of HIV demonstrated that lack of national guidelines to inform the nurses' practice resulted in poor and haphazard care.

Similarly, a study that was conducted by Nkole (2014) in Lusaka on knowledge, attitudes and practices of health care providers at a university teaching hospital also established gaps in the nurses' performances of PMTCT related practices. The nurses performed well in areas of counseling on infant feeding and ARV prophylaxis, but performed poorly on safe obstetric practices aimed at reducing MTCT of HIV. Additionally, only a few nurses were offering HIV testing to the newborn, which was also attributed to a lack of training among the health workers and hence the need for evidence-based practice.

1.2.1 Evidence-based practice

Evidence-based practice has been defined as the integration of the best evidence from research with clinical expertise, patient preferences and the existing resources into clinical decision making about the health care of individuals (Sackett, Rosenberg, Gray et al., 1996). It has its roots in the evidence-based medicine movement, which was introduced around the 1980s as a way of teaching medicine (Jennings & Loan, 2001). Evidence-based practice is an umbrella term which incorporates several specialties, such as evidence-based nursing, evidence-based medicine, evidence-based health care and evidence-based decision making (Scott & McSherry, 2009). Evidence-based nursing has been defined as an ongoing process by which evidence, nursing theory and the practitioners' clinical expertise are critically evaluated and considered in conjunction with patient involvement to provide optimum nursing care for the individual (Scott & McSherry, 2009).

Integration of evidence-based practice into nursing has been slow due to misconceptions surrounding the evidence-based practice concept (Rudman, Gustavsson, Ehrenberg et al., 2012). There are different understandings of what constitutes evidence in evidence-based practice, with some arguing that research is the only evidence (Odom-Forren, 2013), while others consider other forms of evidence used by nurses (Mantzoukas, 2008; Estabrooks, Rutakumwa, O'Leary et al., 2005). Furthermore, some place emphasis on randomized control trials (RCTs) and other experimental studies, while opponents of this concept argue that RCTs mainly deal with issues of clinical interventions and drug effectiveness and therefore cannot address all health care needs of patients. Moreover, the context of the practice and the nature of the clinical problem also influence which type of evidence to use (Scott & McSherry, 2009; Mantzoukas, 2008).

While it has also been questioned by some whether evidence-based practice does actually improve practice (Rolfé, Segrott & Jordan, 2008; Rycroft-Malone, Seers, Titchen et al., 2004), studies have indicated that evidence-based practice has many benefits. These include improving health care quality and patient outcomes (Melnyk, Fineout-Overholt & Mays, 2008); cost effectiveness in managing health care systems (Sredl, Melnyk, Hsueh et al., 2011); eliminating outdated practices and rituals through adoption of research findings (Mantzoukas, 2008); and improving professional satisfaction and professional status of the nursing profession (Melnyk et al., 2008). Jones and Santaguida (2005) argue that evidence-based practice should be an integral part of delivering health care despite the debates. Siddiqi and Robinson (2006) further contend that implementation of evidence-based practice is much more important in resource constrained countries and settings in order to provide effective interventions that will prevent wastage of the limited resources.

Many African countries lag behind with respect to evidence-based practice (Shaibu, 2006). In Nigeria, a study was conducted on professional nurses' opinions on research and research

utilization for promoting quality care. The study established that although the majority of the nurses studied had positive attitudes towards research, only 40.8% reported that they frequently used research in practice. While the majority of the respondents (76.4%) had received basic training on research, a good number of them (46.8%) reported that they had never attended any workshops on research. Some of the barriers cited for poor research utilization included unavailability of resources, time constraints and lack of support (Ofi, Sowunmi, Edet et al., 2008). A pilot study that was conducted in South Africa on knowledge, attitudes and barriers towards the use of evidence-based practice amongst academic health practitioners in their teaching established that although 73.9% indicated use of evidence-based practice, there was a general lack of knowledge among the nurses regarding evidence-based practice (McInerney & Suleman, 2010).

1.2.2 Evidence-based practice and PMTCT in Africa

PMTCT has been considered the backbone of HIV prevention (Beltman, Fitzgerald, Buhendwa et al., 2010). Elimination of MTCT is part of a global agenda and is considered a realistic public health goal and a crucial factor in realizing the Millennium Development Goals (Ministry of Health, 2012). HIV/AIDS, however, is a field that is rapidly evolving (Wall, 2014) and research related to MTCT of HIV is constantly updating policies and guidelines for practitioners to effectively manage patients with HIV/AIDS (Ogbolu et al., 2013). Utilization of evidence-based interventions is therefore important in the elimination of MTCT of HIV and promoting the health of both the mother and the child (Ogbolu et al., 2013).

Many changes have taken place since the introduction of the PMTCT program, with the WHO PMTCT guidelines changing four times in the last ten years as more research evidence emerged (Kellerman, Ahmed, Feeley-Summerl et al., 2013). Components of the PMTCT program that have

particularly been the subject of constant change include ARVs and infant feeding options (Rujumba et al., 2012). The Prophylaxis Antiretroviral (ARV) regimen has changed from single dose Nevirapine (sdNVP) to short course Zidovudine (AZT); AZT based option A, to option B which involved triple therapy for the mother, to now option B+ which is long-term ART for the mother (Kellerman et al., 2013).

The WHO infant feeding guidelines have also evolved as new evidence emerged and, over the last quarter century, at least 16 documents have been produced on infant feeding to serve as guidelines for HIV infected women (Moland, De Paoli, Sellen et al., 2010). According to the 2001 guidelines, replacement feeding was the first choice for infant feeding, whereas the 2010 guidelines promoted exclusive breast feeding as the first choice infant feeding method in resource poor countries as evidence emerged on high risks for infant mortality with lack of breastfeeding in these settings (Moland et al., 2010). Current guidelines still promote exclusive breastfeeding as the first choice infant feeding option in low resource countries. This is complimented by introduction of complementary foods and weaning at 12 months (World Health Organization, 2013a). With the rapid changes occurring in the field of PMTCT program, it is essential for nurses to be abreast of current evidence in order to provide current, evidence-based interventions as this has proven to be effective in reducing MTCT of HIV (Govender & Coovadia, 2014; Townsend et al., 2008).

1.2.3 Overview of the PMTCT program in Malawi

PMTCT was first piloted in Malawi in 2001 and was officially launched nationally in 2003 with the aim of reducing HIV infection in children and improving the quality of life of HIV exposed infants and infected children and their parents (Van Lettow, Bedell, Landes et al., 2011; Kasenga, Byass, Emmelin et al., 2009). The PMTCT program in Malawi is underpinned by a range of global

commitments and interventions for scaling up PMTCT. These include the Millennium Development Goals (MDG 4, 5 and 6); the UN General Assembly Special Session (UNGLASS); the Gleneaglas Summit Declaration; the PMTCT high level global partners forum; the UN interagency task team (IATT); and the UNAIDS getting to zero strategy 2010-2015, which aims at eliminating new HIV infections in children and keeping their mothers alive by the year 2015. The government of Malawi is committed to eliminating MTCT, which is a key in the fight to combat HIV (Ministry of Health, 2012).

Malawi adopted the integrated model for provision of PMTCT which was recommended by the WHO whereby PMTCT services are incorporated within the maternal and child health clinics (Ministry of Health, 2012). PMTCT services are usually offered through antenatal clinics as the majority of pregnant women visit antenatal clinic at least once during pregnancy (Beltman et al., 2010). The services are also offered during labor and delivery and at all the three levels of care; primary, secondary and tertiary. However, not all centers provide PMTCT services as only 74% of the facilities provide these services (Ministry of Health, 2012). The services include pre-test counseling; HIV testing and post-test counseling; specific PMTCT counseling; infant feeding counseling and support; nutritional support; maternity services; family planning; management of sexually transmitted infections (STI); safe obstetric practices and management of ARVs (Kasenga et al., 2009). As in other resource poor countries, Malawi adopted the task shifting initiative in an attempt to scale up HIV/PMTCT services (Zuber et al., 2014). Nurses are therefore the main providers of the HIV and PMTCT services.

1.2.4 Program changes

Malawi has been keeping abreast of the changes that have been taking place in the field of PMTCT as new research findings emerge. Since the introduction of PMTCT in 2003, they have adopted changes in the ART regimen. Where the prophylaxis regimen had been single dose Nevirapine (NVP), it was later changed to combined therapy, as single dose NVP was not only associated with resistance, but also more evidence emerged on the effectiveness of using combined therapy (Weigel, Hosseinipour, Feldacker et al., 2012; Kasenga et al., 2009). At present, Malawi has adopted option B+, which involves starting lifelong ARV therapy for all HIV infected pregnant women and postnatal mothers (Fasawe, Avila, Shaffer et al., 2013; Chimbandira, Mhango, Makombe et al., 2013). Other changes include obstetric practices, infant feeding recommendations and the HTC (HIV testing and counseling) strategy, which changed from an opt-in to an opt-out strategy as research studies indicated that the opt-out strategy was a very effective approach in making sure that more pregnant women are tested for HIV and in providing appropriate care for those who are found positive (Kasenga et al., 2009). With the important role that nurses play in PMTCT, it is important that they keep up to date with the latest developments in the PMTCT program to effectively manage the HIV infected women and their children.

1.3 PROBLEM STATEMENT

HIV/AIDS is a field that is rapidly evolving as more research evidence continues to emerge on different HIV related issues (Wall, 2014). Despite numerous researches being undertaken, the HIV/AIDS pandemic remains high in sub-Saharan Africa. Although improvements have been noted over the years, Malawi is among the countries worst affected by the HIV/AIDS pandemic. The epidemiological trend in sub-Saharan Africa is that women have a higher HIV prevalence than

men. The prevalence of HIV among pregnant women is also very high, thus increasing the risk of MTCT of HIV (Ministry of Health, 2012).

Nurses are the backbone of health service provision in Malawi as it is they who render primary obstetric services in public hospitals. In many European countries, nursing education shifted from basic to degree programs to prepare nurses for the requirements of evidence-based practice (Rudman et al., 2012). In Malawi, however, NMTs are the major providers of PMTCT services, but their training does not include the evidence-based practice concept (Zuber et al., 2014). The nurses rely on pre-service education, which is not standardized (Zuber et al., 2014), and in-service education, which is not available to all the nurses and is not done on a regular basis (Chopra, Doherty, Mehatru et al., 2009). No studies have been conducted to explore evidence-based practice in PMTCT services among these nurses. The present study therefore aimed to explore and describe the knowledge, attitudes and practices of the nurses regarding evidence-based practice in PMTCT at a selected public tertiary hospital in Malawi.

1.4 PURPOSE OF THE STUDY

The purpose of this study was to explore and describe the knowledge, attitudes and practices of nurses regarding evidence-based practice in a PMTCT program at a selected public tertiary hospital in Malawi.

1.5 RESEARCH OBJECTIVES

The objectives of the study were to:

1. Explore the level of knowledge regarding evidence-based practice in PMTCT among the nurses;

2. Explore the nurses' attitudes towards evidence-based practice in PMTCT;
3. Explore the nurses' practices in relation to evidence-based practice in PMTCT;
4. Explore the inter-relationships between the nurses' social demographic variables and their knowledge, attitudes and practices of evidence-based practice in PMTCT;
5. Explore the nurses' perceptions of barriers to evidence-based practice in PMTCT; and
6. Explore the nurses' perceptions of facilitators to evidence-based practice in PMTCT.

1.6 RESEARCH QUESTIONS

The study was guided by the following research questions:

1. What is the nurses' level of knowledge regarding evidence-based practice in PMTCT?
2. What are the nurses' attitudes towards evidence-based practice in PMTCT?
3. Are the nurses practicing evidence-based practice in PMTCT?
4. Are there inter-relationships between the nurses' social demographic variables and their knowledge, attitudes and practice of evidence-based practice in PMTCT?
5. What do the nurses perceive as barriers to evidence-based practice in PMTCT?
6. What do the nurses perceive as facilitators to evidence based practice in PMTCT?

1.7 SIGNIFICANCE OF THE STUDY

The study's significance to nursing research, management, education and practice is described as follows:

1.7.1 Nursing Research

Evidence-based practice is viewed as a way to build the research-practice gap that has existed for decades (Facchiano & Hoffman Snyder, 2012). This study may therefore help advance the agenda of promoting the use of research in practice. Additionally, there are no published studies in Malawi on the extent of evidence-based practice among nurses working in the PMTCT program. The study findings may therefore contribute to knowledge on the phenomena under study and serve as a base line for future research.

1.7.2 Nursing Management

Brown et al. (2009) assert that empirical findings can be a useful organization strategic planning tool which can help organizations to move towards evidence-based practice. In its aim to try and eliminate MTCT of HIV, the Malawi government has prioritized the development of health staff capacities (Ministry of Health, 2012). Chinkonde et al. (2010) highlighted the challenge policy makers' face in keeping health care workers informed, considering the complex and evolving nature of PMTCT. The study may therefore help in identifying key areas and strategies for promoting evidence-based practice in the PMTCT program. In addition, the study may also inform policy changes which may help to equip the nurses with the skills and resources they need to keep abreast of the latest developments in PMTCT of HIV so that they can provide the best possible care.

1.7.3 Nursing Education

Zuber et al. (2014) purport that although the process of task shifting has increased nurses' involvement in PMTCT and HIV, they have not been adequately prepared to take on this role as

pre-service and in-service education is not standardized in Malawi. Findings from this study will provide empirical evidence that will illuminate whether inconsistencies exist in terms of knowledge among the different nursing categories, which may inform nurse educators at the various nursing institutions which issues need to be included and emphasized in the nursing curriculum to promote evidence-based practice in PMTCT.

1.7.4 Nursing Practice

PMTCT is a comprehensive preventive program requiring knowledgeable and competent nurses / midwives to provide evidence-based interventions to prevent new infections in children (Relf et al., 2011). According to the Ministry of Health (2012), one of the setbacks in the government's efforts to eliminate HIV in children is health care workers' general lack of competence in PMTCT. The present study will therefore highlight the nurses' current knowledge, attitudes and practices regarding evidence-based practices in PMTCT and recommendations will be made on strategies that may help to improve the nurses' knowledge, attitudes and practices. This may consequently promote implementation of evidence-based practice in the PMTCT program, which, in turn, may help in elimination of MTCT of HIV.

1.8 OPERATIONAL DEFINITIONS

1.8.1 Knowledge

Knowledge refers to what one knows, and the verb, to know, relates to perception and understanding of facts with clarity and certainty (Berragan, 1998). In this study, knowledge referred to a comprehensive understanding of evidence-based practice which informs evidence-based decision making and implementation of evidence-based interventions in PMTCT.

1.8.2 Attitudes

Attitudes refer to psychological tendencies that are expressed by evaluating a particular entity with some degree of favor or disfavor. Evaluation encompasses beliefs and thoughts, feelings and emotions, intentions and overt behavior (Eagly & Chaiken, 2007). In this study, attitudes referred to nurses' feelings and beliefs about evidence-based practice.

1.8.3 Practice

Practice refers to the regular application of medical knowledge and skill in the diagnosis and treatment of disease by a healthcare practitioner (Critchley, 1978). Practice in this study referred to the implementation of evidence-based practice in a PMTCT program.

1.8.4 Nurse

A nurse is a person who has completed a program of basic education and is qualified and authorized in his / her country to practice nursing (International Council of Nurses, 2002). For the purpose of this study, the term nurse was limited to those involved in PMTCT (maternity, gynecology and pediatric nurses) and was used interchangeably with midwife as the majority of nurses in Malawi are also midwives. The nurses involved in PMTCT services in Malawi were of different categories, as described below:

- **Professional Nurses** are nurses who have gone through a four year degree course in nursing (Nurses and Midwives Council of Malawi, 2011).
- **Registered Nurse Midwives** are nurses who have gone through a 2 year upgrading diploma course in nursing and midwifery (Nurses and Midwives Council of Malawi, 2011).

- **Nurse Midwife Technicians (NMTs)** are nurses who have completed a 3 year college integrated program in both nursing and midwifery (Nurses and Midwives Council of Malawi, 2011).

1.8.5 Evidence-Based Practice (EBP)

EBP is a process in which knowledge or specifically clinical research findings or best available evidence is supplemented by clinical expertise and patient preferences and incorporated into practice settings (Smith & Donze, 2010). In this study, evidence-based practice referred to the use of research findings and evidence-based clinical guidelines and protocols alongside clinical expertise and patient preferences to inform clinical nursing practice in a PMTCT program.

1.8.6 PMTCT

PMTCT refers to a comprehensive approach to HIV in infants and young children. PMTCT addresses a wide range of prevention, care, treatment and support services along the continuum of care from pregnancy through to childhood (Global Fund, 2010). PMTCT in this study related to all the steps in the PMTCT cascade that the nurses are involved in, including antenatal care; HIV counseling and testing; provision of antiretroviral therapy (ART); safe delivery practices; safe infant feeding practices; infant follow up and testing; and family planning.

1.9 THEORETICAL FRAMEWORK

Roger's Diffusion of Innovation model was the theoretical framework adopted for this study. The diffusion of innovation process is a process by which a new idea, knowledge or practice can be transmitted (Rogers 1983) cited in (Brown & Rodger, 1999). It is therefore the most appropriate model to guide successful and sustainable implementation of evidence-based practice in nursing

(Lekan, 2008). The theory postulates that a clinician who adopts an innovation proceeds through five stages, known as the decision process, when incorporating new knowledge into practice. The stages include knowledge, persuasion, decision, implementation and confirmation (Brown & Rodger, 1999).

The knowledge stage is when an individual learns about the existence of the innovation. It includes awareness knowledge, which is knowledge of the innovation's existence; how-to knowledge, which is information about how to use the innovation; and principles knowledge, which is an understanding of how to use the innovation and why to adopt it (Sahin, 2006). Knowledge is influenced by characteristics of the decision making unit, which include social-economic characteristics, personality variables and communication behaviour (Sahin, 2006; Brown & Rodger, 1999).

The persuasion stage is the stage at which the individual develops attitudes towards the innovation, either positive or negative, which will influence the decision of whether to adopt or reject it. This is influenced by one's perceptions of the relative advantage of the innovation, compatibility of the innovation with existing practices, complexity of the innovation, trialability and observability of the innovation (Sahin, 2006; Brown & Rodger, 1999).

The decision stage involves choosing whether to adopt or reject the innovation (Sahin, 2006); implementation is where one incorporates the innovation into daily practice (Sahin, 2006); and confirmation involves reinforcement of the decision that was made either to adopt or reject the behaviour (Sahin, 2006; Brown & Rodger, 1999).

Prior conditions, such as previous practice, felt needs/problems, innovativeness and norms of the social system influence the decision process (Sahin, 2006; Brown & Rodger, 1999).

1.9.1 Application of the framework to the study

Elements of the process in the Diffusion of Innovation framework were adapted for the purpose of this study as follows:

Knowledge: Evidence-based practice was considered the innovation to be adopted by the nurses. For the nurses to be able to implement evidence-based practice, they need to have knowledge about the concept. Knowledge in this study referred to the nurses' awareness of evidence-based practice, an understanding of how it can be applied in PMTCT, and the skills that are needed to engage with it. This include an understanding of the recommended sources of evidence for PMTCT practice, how to retrieve the evidence, the ability to critique the evidence, the ability to evaluate effectiveness of different PMTCT interventions and the ability to change practice.

Knowledge can be influenced by social-economic factors in the setting, such as availability of the necessary resources (evidence based guidelines, and computers and the internet for access to PMTCT journals), as well as a culture that promotes sharing of information with fellow nurses and health workers. Personality in this study referred to attitudes of the nurses that may promote or hinder acquisition of knowledge. Communication behaviour that was presumed to have an influence of the nurses' knowledge in this study included training on evidence-based practice and PMTCT and availability of evidence-based PMTCT materials.

Persuasion and Decision: Persuasion in this study related to the nurses' attitudes towards evidence-based practice in PMTCT, which was one of the objectives for the study. The nurses' attitudes have an influence on their decision whether or not to utilize evidence-based practice in PMTCT. Attitude is influenced by perceived relative advantage of using evidence-based practice in PMTCT; compatibility of the evidence-based practice with existing practices, such as rituals,

trial and error; complexity of implementing evidence-based practice in PMTCT; trialability of the concept; and observability of the outcomes of evidence-based practice in PMTCT.

Implementation and confirmation: Implementation in this study related to whether the nurses base their practices on evidence or not. Evidence-based practices in this study included using research findings and/or evidence-based guidelines in PMTCT practice, critically appraising PMTCT evidence, sharing PMTCT evidence with colleagues, evaluating patient care and outcomes and changing PMTCT practices.

Prior conditions: Prior conditions, such as previous exposure to evidence-based practice in PMTCT; awareness of the need to implement evidence-based practice in PMTCT; innovativeness of the nurse; norms of the social system or hospital; and practice based on rituals versus evidence based practice, constituted the facilitators or barriers to evidence-based practice in PMTCT in this study. Characteristics of the setting, the nurse and the communication identified in the framework as influencing knowledge were also identified as facilitators or barriers to evidence-based practice in PMTCT among the nurses.

The Diffusion of Innovation model, as adapted in the study

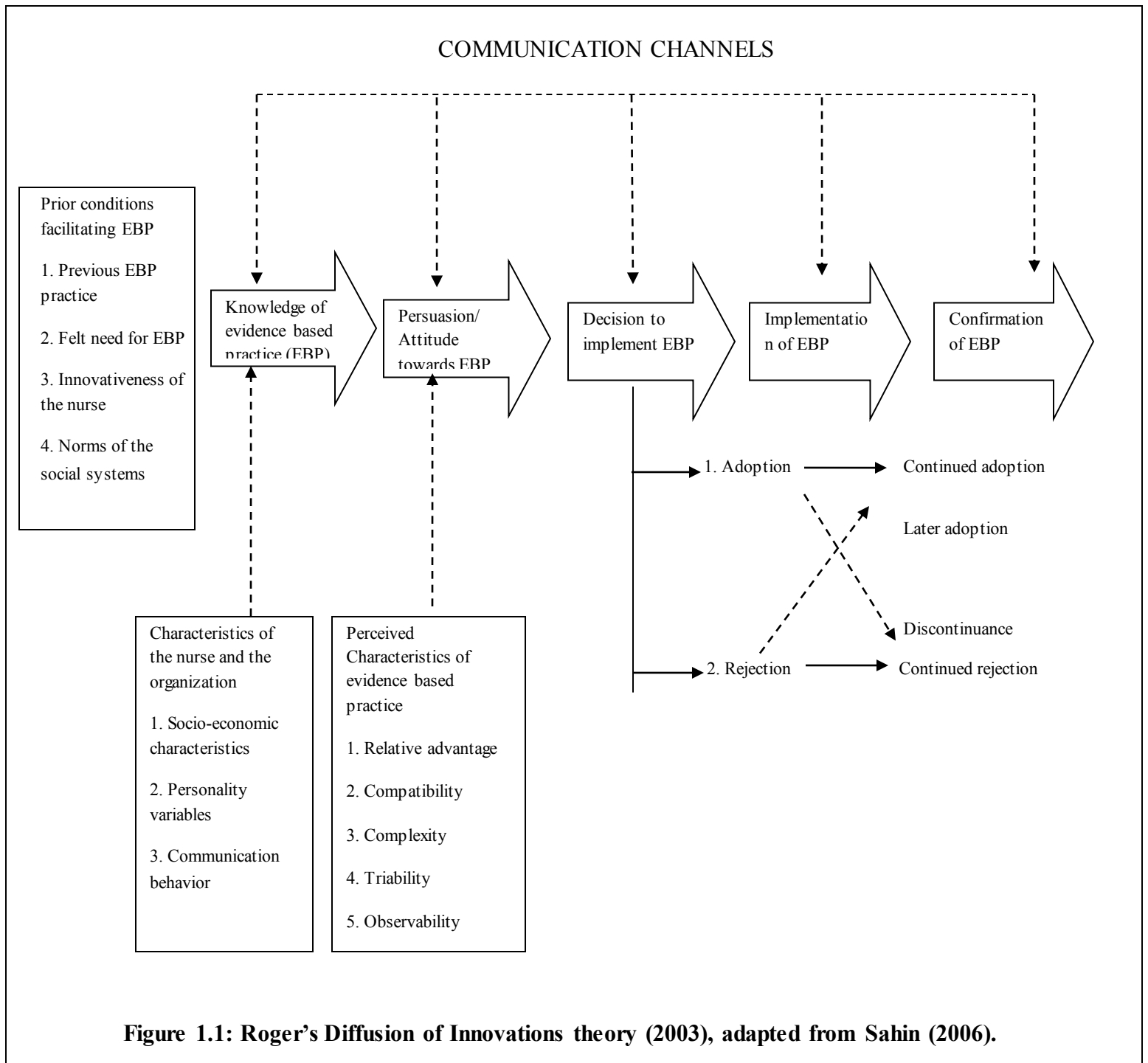


Figure 1.1: Roger's Diffusion of Innovations theory (2003), adapted from Sahin (2006).

1.10 OUTLINE OF THE DESSERTATION

Chapter one provides the introduction to the study. It covers the background, problem statement, aim, objectives, research questions, significance of the study and operational definitions. The chapter further presents the theoretical framework that underpinned the study.

Chapter two presents the literature reviewed in relation to the study. The literature review was guided by the objectives of the study and has been presented accordingly.

Chapter three highlights the methodology for the study. The areas covered include the research design, research setting, study participants, data collection instruments and a step by step data collection procedure. Ethical principles underpinning the study have also been presented in this chapter.

Chapter four provides a thorough description of the study findings, which are also in line with the study objectives.

Chapter five discusses the findings of the study in relation to the reviewed literature. The limitations of the study, recommendations and conclusions are also presented in this chapter.

1.11 SUMMARY OF THE CHAPTER

This chapter has highlighted the need for nurses' PMTCT practices to be evidence-based. The purpose and objectives of the study were highlighted, with the purpose being to explore and describe knowledge, attitudes and practices regarding evidence-based practice in PMTCT among nurses at the selected public tertiary hospital in Malawi so as to make recommendations that may inform decisions to improve clinical practice, management, education and research. The

theoretical framework that guided the study was also presented in this chapter and it wraps up with the outline of the dissertation.

The chapter that follows will present the literature that was reviewed on nurses and evidence-based practice.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents the review of literature that was undertaken on PMTCT and nurses' knowledge, attitudes and practices regarding evidence-based practice. Polit and Beck (2004) contend that researchers never conduct a study in an intellectual vacuum but their studies are usually undertaken within the context of an existing knowledge base. The review was therefore initially done with the aim of becoming more familiar with the knowledge base on the phenomena so as to build the study on a foundation of existing knowledge. Further on, it was done in order to refine the research problem, identify the relevant theoretical framework for the study and to help in interpretation of the results.

Many databases were consulted for the literature review and these included: Ebscohost (Academic search complete, Medline, Health source: Nursing/edition), Google scholar, Science direct, Pub med and Proquest. Text books and dissertations were also used.

The literature review has been organized as follows:

- Overview of HIV/AIDS, women and PMTCT programs in Africa;
- Global overview of the evolution of PMTCT;
- Nurses and the PMTCT Program in Africa;
- Evidence-based practice;
- Nurses' knowledge of evidence-based practice;
- Nurses' attitudes towards evidence-based practice;

- Nurses' practice of evidence-based practice;
- Barriers to evidence-based practice among nurses; and
- Facilitators to evidence-based practice among nurses.

2.2 OVERVIEW OF HIV/AIDS, WOMEN AND PMTCT PROGRAMS IN AFRICA

HIV/AIDS disproportionately affects women in Africa (Roxby, Unger, Slyker et al., 2014). In sub-Saharan Africa, it is estimated that women have a 60% higher risk of HIV infection compared to their male counterparts (Magadi, 2011). Similarly, Roxby et al. (2014) indicate that adolescent females (15-24 years) in Africa are infected with HIV at twice the rate of adolescent males. Many factors have been attributed to this high vulnerability, which include, but are not limited to: tradition, gender inequalities, biological makeup, inadequate coverage of health care, distance, failure to negotiate for safer sex and poverty (Magadi, 2011; Kasenga, 2010).

HIV among women is a major public health concern as it not only affects the women, but also has implications on the infant should an infected woman become pregnant. Studies indicate that HIV infected women have fertility rates similar to that of the general population (Taulo, Berry, Tsui et al., 2009) and that each year, an estimated two million HIV positive women become pregnant (Druce & Nolan, 2007). A study in Malawi on incidence of pregnancy among HIV infected women identified that HIV positive women who had been on ART for more than six months had a total fertility rate of 3.9, which was comparable to a rate of 4.2 among the urban women population. Incidence of pregnancy was 9.3/100 person years among the infected women (Tweya, Feldacker, Breeze et al., 2013). This high fertility rate in infected women increases the risk of MTCT. Interventions targeting this at-risk group will thus make an effective contribution in the efforts to curb the HIV/AIDS pandemic (Roxby et al., 2014).

HIV infected infants are prone to a myriad of problems (Druce & Nolan, 2007). A study done in Malawi identified that HIV exposure tripled the risk of mortality among infants. Additionally, the exposed and infected children were demonstrated to have developmental and functional health problems and nutritional deficits (Landes, Van Lettow, Chan et al., 2012). In 2001, at the UN general assembly special session of HIV/AIDS, national governments pledged to reduce the risk of HIV infection through mother to child transmission by at least half by 2010 by ensuring that 80% of pregnant women attending antenatal care had access to PMTCT services (UNAIDS, 2008) and since then, many PMTCT programs have been implemented throughout Africa (Msellati, 2009). UNAIDS has called for virtual elimination of MTCT by 2015 with the following targets: 90% reductions in the number of new infections and a transmission rate of under 5%; at least 90% of all infants born to women living with HIV alive and infants born to those who are not infected to survive to the age of 2 years; to ensure that at least 80% of eligible pregnant women living with HIV are receiving ART for their own health; 50% reduction in unmet needs for family planning across all women living with HIV in high- burden countries for PMTCT; and 20% reduction in HIV incidence among women aged 15-24 years (Global Fund, 2010).

In 2003, the UN adopted a comprehensive approach to HIV in infants and young children intended to address a wide range of prevention, care, treatment and support services along the continuum of care from pregnancy through to childhood (Global Fund, 2010). The World Health Organization (2011b) categorizes interventions aimed at preventing MTCT of HIV into four prongs, namely:

1. Primary prevention of HIV infections in women;
 2. Prevention of unintended pregnancy among HIV positive women;
 3. Reducing transmission from HIV infected pregnant and lactating women to their children;
- and

4. Care and support of women, infants and families infected and affected by HIV/AIDS.

Most PMTCT programs, however, focus on the third and fourth prongs (Msellati, 2009). The third prong incorporates perinatal PMTCT programs consisting of provision of ART or prophylaxis to the mother and infant, safe obstetric practices, infant feeding practices and infant feeding counseling (Tudor Car, Brusamento, Elmoniry et al., 2011). This involves the following consecutive steps: first, the pregnant woman visits an antenatal clinic during pregnancy. The woman must receive HIV counseling at the clinic and consent to be tested and if found positive, she receives post-test counseling regarding her HIV status and available PMTCT interventions. The woman receives ART, depending on country policy, and is encouraged to deliver at a hospital where interventions to reduce MTCT are followed during labor and delivery. Post-partum, the woman must apply the infant feeding option she has chosen and undergo follow-up with her baby until such a time when the child is tested, which is the ultimate goal of PMTCT. If found positive, the child is enrolled in a pediatric HIV program and if negative is discharged. The mother and child are offered complete access to treatment and support (Msellati, 2009).

The PMTCT program has reported significant progress so far, with the number of children newly infected with HIV in 2012 being 35% lower than 2009, and a 52% decline in new infections among children from 2001 to 2012 (UNAIDS, 2013a). As of December 2012, over 900 000 pregnant women received ARV prophylaxis or treatment and coverage of PMTCT program increased from 57% in 2011 to 62% in 2012. The high coverage of PMTCT has prevented more than 670 000 children from acquiring HIV from 2009 to 2012.

However, while there has been an increase in access to ARV medications, other aspects of the PMTCT program have been lagging behind. These include primary prevention of HIV in pregnant

women and prevention of unintended pregnancies. Although the unmet need for family planning declined from 15.4% in 1990 to 12.3% in 2010, the need for family planning services of more than 20% of women in East and West Africa remained unmet (UNAIDS, 2013a). Studies, however, have shown that prevention of unintended pregnancies is much more effective in PMTCT than HTC and ART (Govender & Coovadia, 2014). Moreover, in spite of the reported successes, children under the age of fifteen account for one in seven new infections (Relf et al., 2011) and at least 330 000 infants are reported to be infected with HIV each year in nearly all resource poor settings (Chi, Bolton-Moore & Holmes, 2013).

2.3 GLOBAL OVERVIEW OF THE EVOLUTION OF PMTCT

Globally, PMTCT services have evolved rapidly over the last decades with new research evidence continually emerging on the various aspects of the program, such as ARV therapy for the mother and the child, infant feeding recommendations and obstetric practices (Kellerman et al., 2013; Ogbolu et al., 2013; Moland et al., 2010).

2.3.1 Antiretroviral therapy for PMTCT

In 1994, results of pediatric AIDS clinical trials group study 076 (PACTG 076) established a two thirds reduction in perinatal transmission from HIV-infected women who received a complex regimen of AZT (Decock, Fowler, Mercier et al., 2000). Later studies, such as the KISIMU breast feeding study trial in Kenya, the BAN study in Malawi, MITRA plus in Tanzania, Kesho Bora in five African countries, the AMATA study in Rwanda and the MmaBana study in Botswana, all indicated that triple antiretroviral regimen had low transmission rates among women who chose to breast feed. In addition, it was established that the therapy was safe and feasible in resource poor settings (Thomas, Masaba, Borkowf et al., 2011). Although there is still some debate about the

long-term effects of the approach, it has also been established that lifelong ART for infected pregnant or breastfeeding women is beneficial in preventing MTCT of HIV and improving maternal health and survival (Ahmed, Kim & Abrams, 2013; Fasawe et al., 2013). These studies have informed WHO guidelines on PMTCT with changes taking place as new evidence emerged. The changes have been summarized in the Table 2.1 as follows:

Table 2.1: Changes in PMTCT ARV therapy recommendations

2006 Recommendations	2010 Recommendations	2013 Recommendations
1. ARV therapy for HIV infected women who need treatment for their own health		
Eligibility criteria		
Women in clinical stage 1 and 2 with CD4 count of <200 cells/mm All women in clinical stage 4 irrespective of CD4 cell count Women in clinical stage 3 with CD4 of < 350 cells/ mm ³ if available, if CD4 cell count not available, treat	All women with CD4 of ≤ 350 cells/mm ³ irrespective of clinical staging. All women with clinical stage 3 or 4 irrespective of CD4 cell count	Option B+ Pregnancy and breastfeeding regardless of CD4 count or clinical stage Option B CD4 count of ≤ 500 cells/ mm ³ or clinical stage 3 or 4
When to start		
As soon as feasible	As soon as feasible	As soon as feasible
Recommended first line regimen for pregnant women		
AZT + 3TC + NVP	AZT + 3TC + NVP or AZT+ 3TC+ EFV or TDF + 3TC (or FTC) + NVP or TDF +3TC (or FTC) +EFV	TDF + 3TC + (or FTC) + EFV

Prophylaxis for infants born to women on ART		
AZT for 7 days	NVP or AZT for 4-6weeks all infants regardless of feeding mode.	Breast feeding infants: NVP once daily from birth until age 6 weeks Not breast feeding: NVP once daily (or twice daily AZT) from birth until 4-6 weeks
2. ARV prophylaxis for pregnant women who do not need treatment for their own health		
When to start		
Starting at 28 weeks	As early as 14 weeks of pregnancy	As early as 14 weeks of pregnancy
Prophylaxis regimen for mother		
AZT during pregnancy plus sd-NVP + AZT+ 3TC during labor and delivery plus AZT + 3TC for 7 days postpartum	<p>Option A</p> <p>AZT twice daily from as early as 14 weeks gestation and continue through pregnancy. At onset of labor, sd-NVP and initiation of AZT + 3TC twice daily for 7 days postpartum. If AZT was provided for >4 weeks antenatally, omission of sd- NVP +AZT + 3TC tail. Continue AZT during labor and stop at delivery</p> <p>Option B</p> <p>Triple ARV prophylaxis starting as early as 14 weeks gestation and continue until 1 week after all infant exposure</p>	<p>Option B</p> <p>Triple ART throughout pregnancy and delivery. If breast feeding, continue regimen until 1 week after breastfeeding has finished. Regimen include: TDF +3TC (or FTC) or EFV</p>

	to breast feeding milk is ended. Regimen include: AZT + 3TC + LVP or AZT + 3TC + ABC or AZT + 3TC + EFV or TDF +3TC (or FTC) or EFV	
Prophylaxis for Infants born to mothers on ARV prophylaxis		
sd- NVP + AZT for 7 days	<p>Option A</p> <p>Breast feeding infants: NVP from birth until 1 week after all exposure to breast feeding</p> <p>Non- breast feeding infants: NVP or sd- NVP + AZT for 4-6 weeks</p> <p>Option B</p> <p>All infants regardless of infant feeding mode NVP or AZT for 4-6 weeks of age</p>	<p>Breast feeding infants: NVP once daily from birth until age 6 weeks</p> <p>Not breast feeding: NVP once daily (or twice daily AZT) from birth until 4-6 weeks</p>

Source: World Health Organization (2010; 2013b).

2.3.2 Infant feeding in PMTCT

Although breast feeding plays a significant role in reducing child morbidity and mortality and improving child growth and development, it is also a vector for HIV transmission in infants (Young, Mbuya, Chantry et al., 2011). It is estimated that without intervention, breast feeding carries a 5-20% risk of HIV transmission in infants in developing countries (Nduati, John, Mbari-Ngacha et al., 2000). While previous studies demonstrated that formula feeding results in a substantial decrease in HIV-1 transmission risk (Nduati et al., 2000), later studies also established

that in resource poor countries, avoidance of breastfeeding is not feasible as it may lead to other problems, such as malnutrition and respiratory tract infections, which, while reducing the chances of MTCT of HIV, increases the mortality rate among the children (Young et al., 2011). Similarly, a meta-analysis that was done by the World Health Organization (2000) cited in (Moland et al., 2010) showed that infants who were not breast fed and were on formula or other replacement feeds had a six fold increased risk of dying during the first two months of life, a fourfold increased risk between 2-3 months and a 2.5 fold increased risk between 4-5 months when compared with those who were breastfed. Studies also established that exclusive breast feeding carries a lower transmission risk than mixed feeding (WHO, 2008). These studies also influenced WHO recommendations on infant feeding in high income and resource poor countries summarized in Table 2.2.

Table 2.2: Changes in infant feeding recommendations for HIV infected women

2006 recommendations	2010 recommendations	2013 recommendations
Infant feeding recommendations for HIV infected women		
<p>Exclusive breast feeding for the first 6 months unless replacement is AFFASS. At 6 months, continue with breast feeding, add complementary food if AFFASS is not met. Wean within a period ranging from about 2-3 days to 2-3 weeks</p>	<p>National to decide whether health services will principally counsel mothers to either breastfeed and receive ARV intervention or avoid breastfeeding as a strategy most likely to give infants the greatest chance for HIV- free survival.</p> <p>When breastfeeding is the best option, exclusive breastfeeding for the first 6 months, introduce appropriate complementary food thereafter and continue breast feeding for 12 months. Wean gradually within 1 month</p>	<p>High income countries: Avoid breastfeeding and do replacement feeding except in exceptional situations</p> <p>Low and middle income countries: Exclusive breast feeding if little access to clean water, sanitation and health services. Continues breast feeding for 6 months then introduce complementary foods and wean baby at 12 months.</p>

Source: World Health Organization (2010; 2013b).

2.3.3 Intra-partum care for HIV infected women

Use of elective caesarian section before labor and before rupture of membranes has been demonstrated to be effective in PMTCT, particularly in women not on ART (Read & Newell, 2005). Elective caesarian section is presently known as one of the major interventions for prevention of mother to child transmission of HIV and is encouraged where resources warrant

doing so, but this is a challenge in resource poor countries (Read & Newell, 2005). Similarly, a study that was done in Nigeria on outcome of PMTCT services and factors affecting vertical transmission of HIV identified a high infection rate in women who delivered vaginally (87.3%) as compared to 12.7% of those who had an elective caesarian section (Abayomi, Adewum, Emokpa et al., 2011).

Studies have also indicated that the risk of intra-partum HIV transmission increases with increase in time since membrane rupture, from 3.9 % among those who had a brief period after rupture to 34.5% among those whose membranes had been ruptured for a long period of time (Magder, Mofenson, Paul et al., 2005). Use of invasive procedures, such as vacuum or forceps delivery or invasive fetal monitoring, were also found to increase rate of MTCT of HIV (Govender & Coovadia, 2014). The research evidence discouraging artificial rupture of membranes and use of invasive procedures has promoted safer obstetrics in all HIV infected women worldwide. Research is therefore a key factor in PMTCT and nurses need to be up to date with the current evidence and provide care that is evidence-based in order to reduce MTCT.

2.4 NURSES AND THE PMTCT PROGRAM IN AFRICA

This section reviews the literature on nurses' knowledge and practices of PMTCT.

2.4.1 Nurses' knowledge of PMTCT

Studies on knowledge of PMTCT among nurses have highlighted a knowledge deficit in various aspects of the PMTCT cascade. A rapid assessment of infant feeding policies and programs in four African countries (Botswana, Kenya, Malawi and Uganda) in scaling up PMTCT established knowledge deficit among nurses on risks of HIV transmission with respect to breast feeding and

infant feeding options. In addition, the nurses were not aware of any infant feeding policies to guide their practice (Chopra & Rollins, 2008). Similarly, a cross-sectional survey of 231 Nigerian nurses on translation of research into practice in PMTCT established that nurses still had a belief that avoidance of breast milk is the only option for combating MTCT and that they would therefore not recommend breast feeding to HIV infected mothers. Lack of adequate opportunities for training was cited as the reason for the knowledge gap. Only 43% of the nurses were trained in PMTCT, while the majority were not trained (Ogbolu et al., 2013).

Another Nigerian study that surveyed the knowledge and behaviors of nurses/midwives in prevention of vertical transmission of HIV established a high level of knowledge on vertical transmission of HIV. The study, however, established knowledge deficit in various other areas, such as normal CD4 count, ARV as prevention strategy, infant feeding in the context of HIV and the most recommended mode of delivery for PMTCT. The study found that experience in managing HIV pregnant women and training in PMTCT had an influence on the nurses' knowledge (Ndikom & Onibokun, 2007).

A South African study by Du-Preez, Du-Plessis and Pienaar (2006) surveyed 31 midwives on their knowledge of safe intra-partum practices and established certain inconsistencies in their knowledge. The midwives had adequate knowledge in some areas, such as CD4 count levels that increases risk for MTCT, rapid testing during labor, spontaneous rupture of membranes and risk for MTCT, and need for shorter second stage and elective caesarian section as preventive strategies. However, they demonstrated uncertainties with respect to safe intra-partum practices, such as risk of vertical transmission during labor, timing of mothers HIV infection in relation to risk for vertical transmission, effect of pre-term labor, definition of prolonged rupture of

membranes, multiple deliveries, benefits of vaginal swabbing and best birth option for delivery in developing countries (Du-Preez et al., 2006).

2.4.2 Nurses' PMTCT practices

Good obstetric services during labor and delivery limit vertical transmission of HIV (Magder et al., 2005). The South African study by Du-Preez et al. (2006) also involved an audit of 401 patient records to assess the midwives' intra-partum practices and inconsistencies in the application of safe intra-partum practices were observed. The study found that the nurses' practices were in line with PMTCT guidelines recommendations in the first, second and third stages of labor. The nurses, however, had engaged in some risky practices, such as performing artificial rupture of membranes, episiotomies, assisted deliveries and suctioning of the neonate. It also found that ARVs had not been given to some of the mothers and neonates.

The presence of STIs in pregnant women has been demonstrated to be a risk factor in MTCT (Misiri et al., 2004). Therefore, antenatal clinics that do not screen for maternal STIs have missed opportunities for PMTCT. A Malawian study that assessed public antenatal clinics in Blantyre for their readiness to provide PMTCT services established that very few nurses/midwives (37%) were conducting routine STI screening for pregnant women, especially HIV infected women (Misiri et al., 2004).

Health education is another very important factor in PMTCT as it provides patients with information to guide them in making informed decisions. A study conducted in Nigeria to examine nurses' knowledge and behavior in the prevention of vertical transmission of HIV identified that only 78% of the nurses always educated women on HIV/AIDS, 76.8% always counseled women on infant feeding practices and 37.4% offered voluntary counseling and testing (VCT) to clients.

Reasons for not following recommended practices included lack of confidence in educating clients, fear of contagion, lack of resources and support from colleagues (Ndikom & Onibokun, 2007). Similarly, in the rapid assessment of infant feeding policies and programs in four African countries (Botswana, Kenya, Malawi and Uganda) in scaling up PMTCT, only 48% of the participants were observed counseling women on infant feeding options and only 5% discussed them in detail (Chopra et al., 2009).

2.5 EVIDENCE-BASED PRACTICE

Evidence-based practice is one of the core competencies required by contemporary nurses with the present emphasis on improving quality of care, patient safety and evidence-based clinical decision making (Rudman et al., 2012). Scott and McSherry (2009) contend that for evidence-based practice to occur, nurses need to be aware of what evidence-based practice is, what it constitutes and the processes to engage with and apply the evidence. Evidence-based practice has been defined differently by different scholars. Van Achterberg, Schoonhoven and Grol (2008) defined evidence-based practice as the optimal use of research in clinical practice, while according to Melnyk et al. (2008), evidence-based practice is a problem solving approach to the delivery of care that incorporates the best evidence from well-designed studies in combination with the clinician's expertise and patients preferences within a context of care. Sackett et al. (1996) argue that evidence-based practice involves conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients, while Scott and McSherry (2009) suggest that evidence-based practice involves examining the evidence for its effectiveness before adopting or implementing it in practice and provision of individualized patient care. Evidence-based practice can also be applied at group level, where experts search and appraise literature and then translate the evidence into policies and guidelines for practice (Rudman et al., 2012).

The process of evidence-based practice involves the following five stages: formulating a research question; retrieving the most relevant evidence; critically appraising the evidence; integrating the evidence into clinical experience and patient preferences and values to make practical decisions; and evaluating the change or outcome (Melnyk, Fineout-Overholt, Fischbeck Feinstein et al., 2004). For the policy makers, however, the process requires more diverse skills, which include “translating between evidence and practice; mediating the values, preferences and working practices of multiple stakeholders; negotiating organizational complexity and the management boundaries; and managing inter-organizational and inter-agency working” (French, 2005).

Different nurse scholars have different views on what constitutes evidence for evidence-based practice for nurses. The Canadian Nurses Association (2002), cited in Earle-Foley (2011), stipulate that evidence for the nursing profession should include experimental studies, such as RCTs; meta-analysis; non-experimental research studies, such as quasi, observational studies; expert opinion in the form of consensus documents and commission reports; and historical or experiential information. Grimshaw, Eccles, Lavis et al. (2012), on the other hand, contend that systematic reviews or other synthesized evidence are useful for health care professionals as they provide sufficient evidence for practice. Rycroft-Malone et al. (2004), argue that there are four types of evidence for nurses in delivering of health care, namely: research, clinical experience, patient experience and information from the local context, all of which are complementary in informing decisions in health care. Patient preferences include asking patients’ views on their preferred treatment options, seeking consent of service users, understanding research findings and experiential writing (Rolfe et al., 2008). Earle-Foley (2011) defines evidence for nursing as that which furnishes information and knowledge and argues that in nursing, knowledge is derived from a number of paradigms that include positivism, post-positivism, critical social theory and

constructivism. All of these paradigms are important in their own right and therefore evidence from these should be used in a complementally rather than a competing manner.

Estabrooks et al. (2005) identified four sources of knowledge for nurses, namely: social interactions, experiential knowledge, documentary sources and prior knowledge. Social interactions involve interaction and sharing of information among nurses and other health care professionals, which can occur at a formal or informal level. A formal level involves official professional events meant to enhance nurses' professional skills (Estabrooks et al., 2005). Experiential knowledge is gained through observing regular practice, establishing what has or has not previously worked and, to a lesser extent, nurses' exploration and intuition (Estabrooks et al., 2005). Documentary sources are written or printed materials and unit-based documents, such as patient charts, policies and procedure manuals (Estabrooks et al., 2005). Prior knowledge is intrinsic knowledge that nurses bring to practice gained from school, common sense, prior experience and personal beliefs (Estabrooks et al., 2005).

Estabrooks et al. (2005) observed that in making decisions regarding patient care, nurses tend to prefer interactive and experiential knowledge over more formal sources of knowledge, such as journals. Similarly, in a cross-sectional survey of 407 Norwegian nurses that examined the factors influencing the development of evidence-based practice among the nurses, experiential knowledge was the most frequently used source of information. Other frequently used sources were policies and guidelines. Information from published journals received the least mean score. Use of research was associated with skills in research (Dalheim et al., 2012). On the other hand, in a survey of advanced practice nurses, Gerrish, Guillaume, Kirshbaum et al. (2011) found that the nurses mostly relied on already synthesized information. While the nurses also relied on information gained from post-registration courses and experiential knowledge, they ranked national guidelines

and policies as the most frequently used sources of knowledge. Published journals were ranked the least used source of knowledge. Similarly, a descriptive exploratory cross-sectional study was done in Australia among graduate nurses on nurses' wishes, knowledge, attitudes and perceived barriers on implementing research findings into practice. Of the 1825 nurses who participated, 77.4 % indicated that they had seldom or never used research in their practice. Lack of knowledge on basic aspects of research and how to translate research into practice were cited as the main reasons for not applying research into practice (Breimaier, Halfens & Lohrmann, 2011).

With regards to PMTCT and evidence-based practice, Nguyen, Oosterhoff, Yen Ngoc et al. (2009), in a qualitative study on the views of 53 health workers on the quality of PMTCT and postnatal care for HIV-infected women and their children, established that some nurses relied on knowledge from PMTCT training, but others who had not been trained on PMTCT relied on observing colleagues to develop their knowledge and skills. An interesting finding emanated from a study done in Uganda that assessed midwives' knowledge and attitudes regarding HIV which established that the midwives relied on media (radio and television) for information on HIV/PMTCT (Salyer, Walusimbi & Fitzpatrick, 2008). The researchers assert, however, that the information provided by the media was intended for lay people and was thus too limited and shallow in nature to inform nurses' practice. Other sources of knowledge for nurses on HIV/AIDS and PMTCT, include seminars, workshops, peers and the internet (Salyer et al., 2008; Hassan & Wahsheh, 2011; Delobelle, Rawlinson, Ntuli et al., 2009). From the literature, it becomes clear that nurses seldom use research as a source of knowledge to inform practice.

2.6 DETERMINANTS OF EVIDENCE-BASED PRACTICE

Rycroft-Malone (2004) proposed the Promoting Action on Research Implementation in Health Services (PARIHS) framework, which posits that successful implementation of evidence is influenced by the interaction between context, evidence and facilitation. Successful implementation occurs where there is strong scientifically derived evidence that matches with professional consensus and preferences; the context is receptive to change, has a learning culture, strong leadership, and appropriate monitoring and feedback systems; and where change is facilitated with input from skilled external and internal facilitators. Evidence-based knowledge can be derived from diverse sources that have been proven credible and these include research, clinical experience, patient preference and local information. Facilitation is a process of enabling the implementation of evidence into practice achieved through an individual taking the role of helping others. Context, on the other hand, is the setting where the evidence is put into practice. Contextual factors include culture, leadership and evaluation.

Meijers, Janssen, Cummings et al. (2006) identified six contextual factors that influence evidence-based practice: role of the nurse, multifaceted access to resources, organizational climate, multifaceted support, time for research activities and provision of education. Van Achterberg et al. (2008), on the other hand, assert that aspects of the context that determine evidence-based practice include nursing culture, leadership, hospital size, staffing support, organizational innovativeness, administrative responsiveness, access to resources, organization climate, provision of education, access to research findings, inter-organizational collaboration, money, workload and time.

French (2005) conducted a study on contextual factors influencing research utilization in nursing in UK using a descriptive, qualitative approach. This author identified the following four types of

context: physical context, which relates to the work setting (hospital, clinic, existing health care delivery systems, clients' needs and priorities and resources); social context, which relates to preferences, beliefs and working practices of the team; political context, which relates to structures and procedures for policy formulation, that is, whether the nurses are in hierarchical positions; and the wider context, which relates to financial limitations impacting on the availability of equipment and resources, thereby shaping how care is delivered.

Leadership is one of the contextual factors that appear consistently in the literature as a determinant of evidence-based practice. According to Sandström, Borglin, Nilsson et al. (2011), leadership characteristics that are needed to promote implementation of evidence-based practice include role modeling, supportiveness, communication skills, knowledge and accessibility. Gifford, Davies, Edwards et al. (2007), in their integrative review of managerial leadership for nurses' use of research evidence, identified two leadership behaviors that are determinants of evidence-based practice: facilitative and regulatory. Facilitative behaviors are aimed at stimulating the intrinsic motivation of people through support, encouragement, education and appealing to a common purpose. Supportive behaviors can be relations oriented such as social emotional interactions, consideration, encouragement, communicating well and valuing individual contributions. Supportive behavior can also be instrumental in providing feedback, allocating resource and initiating structures. Regulatory behaviors, on the other hand, are aimed at extrinsic motivation through monitoring and policy change. Monitoring involves tracking of key performance indicators, process variables and outcomes so as to illuminate staff on the outcomes of their performance and to provide information for planning, problem solving and determining training needs. Policy change involves modifying policies to include research findings.

Scott and Pollock (2008) studied culture as a predictor for research utilization and identified hierarchical structure, the nurses nature of work, work ethos and forms of knowledge that are valued as aspects of culture associated with research translation. With hierarchical structure, they found that highly controlled environments with top-down decision making affects research translation. The nature of nurses' work relates to too much reliance on technology and as a result nurses are much more concerned with observation of patients which does not demand much from them. Work ethos relates to how ethical issues are handled. Errors that are handled with a punitive approach will hamper research translation as nurses will not be willing to try new ways. Valued forms of knowledge are another predictor, with experience being a highly valued form of knowledge (Scott & Pollock, 2008).

Apart from the external factors discussed, individual factors can also influence evidence-based practice. In their systematic review on individual determinants of research translation by nurses, Squires, Estabrooks, Gustavsson et al. (2011) identified the following six characteristics that have an influence on nurses' research translation: beliefs and attitudes; involvement in research activities; information seeking; education; professional characteristics; and socio-demographic and economic characteristics.

2.7 NURSES' KNOWLEDGE OF EVIDENCE-BASED PRACTICE

Nurses' knowledge of evidence-based practice has an influence on their attitudes and practices (Park, Ahn & Park, 2014; Brown et al., 2009). Studies indicate that nurses usually have insufficient knowledge of evidence-based practice because they have not been adequately trained (Breimaier et al., 2011; Brown et al., 2009). The findings of a cross-sectional survey of 456 Californian nurses that examined the practice, knowledge, attitudes and barriers to evidence-based practice showed

that the nurses possessed average knowledge of evidence-based practice, having a mean score of 4.56 from a possible total of 7. The areas that were identified as top learning needs included converting information into research questions, research skills, evaluating validity of material, critical appraisal and awareness of information types and sources (Brown et al., 2009). Similarly, in the USA, a descriptive survey of 286 nurses that examined practicing nurses' attitude and knowledge of evidence-based practice found that the nurses possessed average knowledge. The findings revealed that the nurses scored higher levels of knowledge in sharing of ideas and information, ability to review own practice and dissemination of new ideas. The nurses had the least knowledge/skills in converting information to research questions, research skills, ability to critically analyze evidence and awareness of major information types (Linton & Prasun, 2013).

Information technology is considered a pre-requisite to evidence-based practice. A descriptive survey of 540 nurses in Iceland regarding their beliefs, skills and resources associated with evidence-based practice found that the participants were reasonably confident in using email, word processing programs and the computer in general. However, the findings revealed that the participants were less confident in using electronic databases, with only 29.6% indicating competence in this area. This was in spite of the fact that the participants had good access to the internet and had been trained in using electronic databases (Thorsteinsson, 2013).

Nurses' knowledge of evidence-based practice is influenced by several social demographic factors. In the USA, Linton and Prasun (2013) conducted a descriptive survey of practicing nurses' attitudes and knowledge in relation to evidence-based practice. These researchers found that the older nurses possessed more knowledge than the younger nurses and concluded that knowledge was positively associated with age. Studies indicate that qualification is another demographic factor that has an influence on knowledge with higher qualifications being associated with more

knowledge. In a study carried out in Singapore, nurses holding bachelor and masters degrees scored higher on all items on the knowledge scale compared to certificate and diploma nurses (Majid et al., 2011). Similarly, in USA, Linton and Prasun (2013) found knowledge to be positively correlated with education. These researchers therefore concluded that nurses need to be trained at a higher level where evidence-based practice concepts are included in the curriculum. In contrast, Koehn and Lehman (2008) in a USA study found no significant differences in knowledge among nurses of different educational levels.

Nursing category is another demographic factor that has an influence on nurses' knowledge. In a cross-sectional survey of advance practice nurses (APNs) in UK on promoting evidence-based practice among frontline nurses, Gerrish, Ashworth, Lacey et al. (2008) noted that APNs were more knowledgeable of evidence-based practice and had a broader view of the sources and benefits of evidence-based practice compared to front line nurses. Findings on the influence of experience on evidence-based practice knowledge are contradictory, with some finding knowledge of evidence-based practice to be associated with more experience (Melnyk et al., 2008) and others with less experience (González-Torrente, Pericas-Beltrán, Bennasar-Veny et al., 2012). González-Torrente et al. (2012) argue that nurses who have recently started their nursing careers are more likely to have good knowledge of evidence-based practice as they are fresh from school and possibly still have lectures that can support them.

Evidence based practice Training is another determinant of knowledge of evidence-based practice. In Queensland, Sherriff, Wallis and Chaboyer (2007) employed a quasi-experimental study design to evaluate the effect of an educational program on attitudes and perceptions of 53 registered nurses with respect to their knowledge and skills of evidence-based practice. Findings showed that the

nurses' perceptions of their knowledge and skills improved tremendously after the educational intervention.

Studies however indicate that most nurses lack training in evidence based practice. In a study done in Singapore on adopting evidence-based practice in clinical decision making, 82.7% of the nurses indicated lack of training (Majid et al., 2011). Similarly, in a study done in Taiwan on implementation of evidence-based practice among medical, nursing, pharmacological and allied health care professionals, only 30.3% of the participants indicated that they had received training in evidence-based practice (Weng, Kuo, Yang et al., 2013). The low number of nurses who have been trained in evidence-based practice has been attributed to the fact that such training is generally offered at first degree level and, as the majority of the participants were trained at a lower level, they had not been introduced to the concept (Weng, Kuo, Yang et al., 2013; Majid et al., 2011). In contrast, a cross-sectional study done in Italy on evidence based practice among nurses, the majority of the nurses (86.2%) received information on evidence based practice (Filippini, Sessa, Di Giuseppe et al., 2011).

Eizenberg (2011) argues that organizations have a responsibility to provide educational support to the nurses in order to promote evidence-based practice. A study in Norway highlighted the success of organizational training. In this study, the majority of the participants (69.7%) indicated that they had received evidence-based practice training through their work, while only 25.7% and 8.5% indicated that they had received their training through basic nursing education and post-graduate studies respectively (Stokke, Olsen, Espehaug et al., 2014). Similarly, the majority of nurse participants (86.2%) in a cross-sectional study done in Italy on evidence-based practice among nurses indicated that they had received information on evidence-based practice (Filippini, Sessa, Di Giuseppe et al., 2011).

Other factors influencing knowledge of evidence-based practice include the nurses' perceptions of evidence-based practice and the organization. The more nurses perceive evidence-based practice as being difficult, the lower their perceived knowledge, and the more they perceive the organization as not supportive to evidence-based practice, the less their perceived knowledge (Brown et al., 2009).

2.8 NURSES' ATTITUDES TOWARDS EVIDENCE BASED PRACTICE

Attitude is a motivator for evidence-based practice, with more a positive attitude being associated with actual implementation or intention to implement evidence-based practice (Majid et al., 2011; Sredl et al., 2011). Studies have found that nurses generally have positive attitudes towards evidence-based practice (Stokke et al., 2014; Majid et al., 2011; Sredl et al., 2011; Brown et al., 2009; Sherriff et al., 2007). However, the nurses' attitudes towards evidence-based practice are less favorable than other health professionals.

A survey done in the Netherlands that compared the attitudes, awareness and knowledge of pediatric nurses and pediatricians regarding evidence-based practice found that the majority of pediatricians (72%) had a favorable attitude as compared to 53.3% of the nurses (Maaskant, Knops, Ubbink et al., 2013). Similarly, another study that was conducted in Taiwan on implementation of evidence-based practice across medical, nursing, pharmacy and allied health care professionals identified that a significantly lower percentage of nurses (52%) had positive attitudes and beliefs towards evidence-based practice than pharmacists (82%), physicians (80%), physical therapists (66%), technicians (62%) and other professionals (68%) (Weng et al., 2013).

Nurses' attitudes and beliefs regarding evidence-based practice are divided into four categories: knowledge of evidence-based practice, value of evidence-based practice, resources for evidence-

based practice and time and difficulty in implementing evidence-based practice (Stokke et al., 2014). Nurses attitudes and beliefs towards the value of evidence-based practice are higher than their attitudes and beliefs related to time and their knowledge of evidence based practice (Stokke et al., 2014). Similarly, findings have shown that most nurses agree with the statement on the attitude scale that their workload is too heavy to keep up to date with new evidence (Majid et al., 2011; Brown et al., 2009). It is interesting to note that although nurses' perceptions of some of the barriers to evidence-based practice changed after the education intervention in the quasi experimental study, they did not change their perceptions of time as a barrier (Sherriff et al., 2007).

Several factors have been found to influence nurses attitudes towards evidence-based practice and these include age, with attitude becoming more favorable with increasing age (Linton & Prasad, 2013); level of education, with nurses with higher qualifications having a more positive attitude than lesser qualified nurses (Park et al., 2014; Koehn & Lehman, 2008); level of position, with nurses in management positions having a more positive attitude than staff nurses (Park et al., 2014; González-Torrente et al., 2012; Bonner & Sando, 2008); and occupational view, with nurses who view their job as guaranteed having more positive attitudes than those who perceive their job as temporary (Park et al., 2014).

Park et al. (2014) assert that training in evidence-based practice improves nurses' perception thereof, which in turn results in more positive attitudes and intent to implement. This was supported by the quasi-experimental study that was conducted in Queensland to evaluate the effect of an evidence-based practice educational program on registered nurses' attitudes and perceptions of their knowledge and skills as their attitudes and perceptions of their knowledge and skills in locating research reports improved remarkably after the education program (Sherriff et al., 2007).

2.9 NURSES' PRACTICE OF EVIDENCE BASED PRACTICE

Studies have indicated that, generally, nurses' implementation of evidence-based practice is low (Stokke et al., 2014; Melnyk et al., 2012; Sredl et al., 2011; Filippini et al., 2011). Melnyk et al. (2008) surveyed 394 nurses in the USA to assess their beliefs and implementation of evidence-based practice and found that participants' implementation of evidence-based practice was very low, with a mean score of 18 in the range of 1-72. The item most selected by nurses as being practiced was informally discussing evidence from a research study with a colleague and the least selected item was accessing or using published evidence-based practice guidelines. Similarly, in a cross-sectional study of 185 Norwegian nurses that examined the nurses' beliefs and implementation of evidence-based practice, findings revealed very low implementation of evidence-based practice among the nurses, with a mean score of 7.8 of a possible 72. While the nurses indicated that they informally discussed evidence from a study with colleagues, read and critically appraised clinical research studies and shared evidence from a research study with a patient or family member, the majority of the participants (90%) indicated that they never evaluated their own practice (Stokke et al., 2014).

Studies have shown that implementation of evidence-based practice is lower among nurses than other health professionals. A study that compared nurses with pediatricians regarding evidence-based practice found low implementation among the whole sample as only 50% indicated that their practices were underpinned by evidence. However, all of the pediatricians (100%) acknowledged to have had accessed a database in the previous year, while only 53% of the nurses indicated that they had done so (Maaskant et al., 2013).

Some previous studies found that implementation of evidence-based practice is positively associated with level of education, with nurses holding degrees reporting higher incidence of evidence based practice than non-degree nurses (Park et al., 2014; Eizenberg, 2011). Stokke et al. (2014), however, found no relationship between educational level and practice. The results of the influence of experience on practice are also inconsistent with some studies finding more experience to be associated with high levels of practice (Park et al., 2014) and others (Stokke et al., 2014) finding no relationship. Training in evidence-based practice was also found to be positively associated with implementation thereof (Park et al., 2014; Melnyk et al., 2008). Previous studies have found no associations between gender and age and practice of evidence-based practice (Stokke et al., 2014; Eizenberg, 2011; Melnyk et al., 2008).

2.10 BARRIERS TO EVIDENCE BASED PRACTICE

Kajermo, Boström, Thompson et al. (2010) assert that one of the recommended strategies to improve translation of research is to identify barriers which will help to tailor interventions towards overcoming the barriers. Funk, Champagne, Tornquist et al (1991), cited in Kajermo et al. (2010), developed a barriers scale that is commonly used in studying barriers to evidence-based practice. The barriers scale has 28 items, with four subcategories: organizational characteristics, which deal with limitations of the setting; communication characteristics, which deal with how the research findings are presented and the availability of research; the adopter's characteristics, which relate to the awareness, values and skills of the adopter; and the innovations' characteristics, which deal with the quality of the research (Kajermo et al., 2010; Brown et al., 2009). Several previous studies have utilized the barriers scale in identify hindering factors to evidence-based practice and research translation among nurses.

Organization, or setting, has been cited by several studies as the greatest obstacle to research translation and evidence-based practice. Kajermo et al. (2010), in their systematic review, found that six of the top ten barriers were related to the organization. Thompson, Chau and Lopez (2006) had similar findings, with seven of the top ten barriers in the study being related to the organization. Items considered as major barriers with respect to the organization include; insufficient time to implement research findings, insufficient time to read research reports, physicians do not allow nurses to change practice or cooperate with them in trying to change practice, non-supportive staff and inadequate facilities (Maaskant et al., 2013; Moreno-Casbas, Fuentelsaz-Gallego, De Miguel et al., 2011; Kajermo et al., 2010; Brown et al., 2009; Carlson & Plonczynski, 2008; Thompson et al., 2006). Nurses are not usually the decision makers in clinical practice, which hinders their ability to translate research findings (Scott & Pollock, 2008). Thus, lack of authority to implement research also features among the top organizational barriers. In a study that was done in Hong Kong on barriers and facilitators to research utilization, masters and PhD nurses indicated lack of authority as the major obstacle to research translation. This was attributed to the nurses being subordinate to higher figures of authority and the female dominated nursing profession being perceived as having lower status by members of other disciplines (Thompson et al., 2006). Carlson and Plonczynski (2008) found that nurses in managerial positions do not perceive lack of authority as a barrier as opposed to their non-managerial counterparts.

The second major barrier to research translation and evidence-based practice that has been cited is the manner in which research findings are presented. Studies have shown that nurses experience difficulties in retrieving relevant literature from different sources and find statistical analysis difficult to understand (Maaskant et al., 2013; Rudman et al., 2012; Kajermo et al., 2010).

With respect to characteristics of the nurse that hamper research translation and evidence-based practice, studies have identified the nurse's attitude as a factor that can be barrier, with negative attitudes being associated with low research translation or intent to utilize research and positive attitudes with higher research utilization. However, studies have indicated that although nurses generally display positive attitudes towards evidence based practice, implementation still remains low, which indicates that there are other factors that have a role (Dalheim et al., 2012; Melnyk et al., 2012; Rudman et al., 2012; Kajermo et al., 2010). Other characteristics frequently cited by nurses as barriers to evidence-based practice include being unaware of research and feeling incapable of evaluating research (Dalheim et al., 2012; Melnyk et al., 2012; Rudman et al., 2012; Kajermo et al., 2010).

According to previous studies, there are not many barriers to translation of research and evidence-based practice that are associated with characteristics of the innovation. In a systematic review on barriers to research utilization that involved review of 63 published articles from North America, Europe, Australia and Asia, none of the items on characteristics of the research were found to be an obstacle to research translation (Kajermo et al., 2010). However, Carlson & Plonczynski (2008) found that the main item in this category that hinders utilization of research is lack of replication of research.

Previous studies have found that context influences the perception of barriers to research translation and evidence-based practice. The systematic review on barriers to research utilization that involved the review of 63 published articles from North America, Europe, Australia and Asia established that, overall, the barriers that were identified were consistent over time and across geographic location (Similar findings were also published by Carson, 2008). However, further analysis that categorized the studies as North America, European English speaking countries,

European non-English speaking countries, Australia and Asia established some differences according to context. Fewer nurses from European non-English countries reported being unaware of research as a barrier as opposed to nurses from European English speaking countries and North America. Nurses from European English speaking countries also reported inadequate facilities as a barrier to research utilization as opposed to nurses from North America. European English speaking countries also considered lack of support as a barrier as opposed to European non-English speaking countries. Finally, nurses from European non-English speaking countries reported language as a barrier as most studies are published in English (Kajermo et al., 2010).

Similarly, as much as the barriers are common in different settings, the ranking of the barriers differ from setting to setting. In their survey in Amsterdam of evidence-based practice among pediatric nurses and pediatricians that involved 192 nurses, Maaskant et al. (2013) found that the main barrier to evidence-based practice was lack of time to read research (75%), followed by the nurses being unaware of research (73%), inability to understand statistics (67%), lack of time to implement new ideas (66%) and lack of support for implementation (66%). In their cross-sectional survey of 458 Californian nurses on nursing practice, knowledge, attitudes and perceived barriers to evidence-based practice, Brown et al. (2009) identified the main barriers to evidence-based practice as being insufficient time to implement new ideas (67.3%), lack of time to read research (65.2%), lack of authority to change practice (59.7%), lack of support from other staff members (58%) and unawareness of research (57%). In a survey of 1487 registered nurses in Hong Kong, Thompson et al. (2006) found the main barriers to evidence-based practice to be inadequate facilities for implementation of evidence based practice (74.8%), lack of authority to change practice (73.9%), insufficient time on the job to implement new ideas (70.7%), lack of time to read research (70.5%), and relevant literature not being compiled in one place (69%). Using a different

scale in Norway, Dalheim et al. (2012) conducted a cross sectional survey of 407 nurses on factors influencing the development of evidence-based practice. These authors found the main barriers to evidence based practice to be insufficient time to find research reports, insufficient time to find organizational information, lack of confidence in assessing quality of research, difficulties in understanding the English language and insufficient time at the work place to implement changes.

Nurses demographic characteristics were also demonstrated to have an influence on their perceptions of barriers to evidence-based practice, with younger nurses and nurses with fewer years of experience perceiving more barriers than average aged nurses and nurses with more experience (Dalheim et al, 2012). Similarly, nurses' perceptions of their knowledge and skills also influence the way in which they perceive barriers. Dalheim et al. (2012) noted that nurses' perceptions of their skills in research were associated with their perceptions of certain barriers related to research. It can thus be concluded that although many barriers are consistent in many settings, it is still important to investigate the barriers in each context so that the barriers specific to that context can be identified and interventions tailored towards those contextual factors can be implemented to promote evidence-based practice. Brown et al. (2009) assert that strategies to promote evidence-based practice must be empirically derived to address the barriers that have been identified.

2.11 FACILITATORS TO EVIDENCE BASED PRACTICE

As facilitators to evidence-based practice go hand in hand with the barriers, facilitators to evidence-based practice have been identified by developing a scale from the barrier scale (Breimaier et al., 2011). Eizenberg (2011) purports that evidence-based practice is more likely to occur in an environment where the necessary resources are readily available, such as access to a

library, research journals, computers and the Internet. In a survey of 1486 nurses in Singapore regarding their perceptions, knowledge and barriers to evidence-based practice, Majid et al. (2011) identified the main facilitators as provision of adequate training, availability of protected time to learn and implement evidence-based practice, being mentored by experienced nurses, support from management and access to literature. Similarly, Melnyk et al. (2004) found a positive correlation between the extent of evidence-based practice and having a mentor.

Brown et al. (2009) identified the following three main areas which facilitate evidence-based practice: a learning environment, which relates to opportunities for education and mentorship; a building culture, which relates to a spirit of team-work and rewarding critical thinking; and availability and simplicity of evidence. Ploeg, Davies, Edwards et al. (2007) identified seven factors as facilitators to successful implementation of evidence-based practice, namely: education; positive attitudes and beliefs; leadership support; presence of champions; teamwork and collaboration; professional association support; and inter-organizational collaboration and networks. Maaskant et al. (2013), on the other hand, found integration of research results into protocols and guidelines; education on evidence-based practice; support by specialized professionals; and availability of summaries in the native language to enhance evidence-based practice.

It is evident from the reported studies that education is an indispensable part of evidence-based practice. Hutchinson and Johnston (2004), however, argue that statistical analyses and critical appraisal of research even challenge nurses in areas such as the USA, where research has been part of the curriculum for a long time. They therefore recommend that databases, such the Evidence Based Nursing Journal or Cochrane be more utilized as they contain synthesized evidence and concise summaries of selected high quality research. They also contain commentaries of clinical

relevance to study findings, which should help in overcoming the barrier related to lack of understanding statistics. Making simplified research reports available to nurse clinicians at ward level and via the post could also help to reduce the research practice gap by overcoming the barriers of difficulties to retrieve evidence and lack of time (Brown et al., 2009; Veeramah, 2008).

Ubbink, Vermeulen, Knops et al. (2011) argue that for implementation of evidence-based practice to be successful, it should be incorporated at different hierarchical levels of management and education. Management can facilitate evidence-based practice through role modeling, provision of resources and incorporation of evidence-based practice activities into quality indicators and departmental audits. Educators, on the other hand, can facilitate evidence-based practice by including it in the curriculum, both at under and post-graduate levels and also by collaborating with the clinicians so as to provide the nurses with the necessary knowledge and skills in finding, understanding and critiquing research findings and then utilizing their findings to inform practice.

Studies have indicated that nurses rely mostly on colleagues and experiential knowledge to inform practice (Dalheim et al., 2012; Gerrish, Guillaume, Kirshbaum et al., 2011; Estabrooks et al., 2005). Gerrish and Clayton (2004) therefore recommend using the same channels to facilitate evidence-based practice. The nurse managers can be used to disseminate current research evidence to the nurses, which in turn can promote integration of the research into practice. Joint research projects by teachers and nurse practitioners have also been recommended as an effective way to improve research utilization. This would ensure that research undertaken is relevant to the needs of the practitioners as some studies have indicated that lack of utilization is because the research was not relevant to practice. Joint research should therefore facilitate adoption of the research findings (Veeramah, 2008). Journal clubs and nursing rounds are also ways of keeping up to date with the latest research and would encourage nurses to debate, discuss and appraise findings, which

would increase their confidence and skills in critical thinking (Veeramah, 2008). A cross sectional study in UK, which involved pre and post survey designs to evaluate personal and professional characteristics, organizational culture and effect of organizational strategies on research utilization, found that research utilization among the nurses improved tremendously with the introduction of nursing rounds and a journal club (Fink, Thompson & Bones, 2005) .

2.12 SUMMARY OF THE CHAPTER

This chapter has highlighted the knowledge base on the phenomena understudy. The literature review focused on HIV/AIDS and women, nurses and PMTCT, nurses' knowledge, attitudes and practices of evidence-based practice and the barriers and facilitators to evidence-based practice. Literature on evidence-based practice in PMTCT is limited, thus substantiating the need for the present study. The studies reviewed were of different designs, ranging from descriptive surveys to experimental studies. While most of the studies had low response rates, the demographic variables of the participants were comparable across studies. Although diverse instruments were used in different studies, the studies, in general, indicated that the participants had positive attitudes towards evidence-based practice, but low knowledge and practices. The barriers and facilitators have been consistent in different studies, although ranking of the importance of the barriers differed from study to study. The results of the interrelationships between social demographic variables, knowledge, attitudes and practices of evidence based practice remain inconclusive.

The next chapter will present the methodology for the study.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter presents the methodology for the study. It therefore focuses on the research paradigm, and the research approach and design. It also describes the study setting, the population, sample and sampling strategy, as well as data collection procedures and instruments, validity and reliability, data analysis, data management, ethical considerations and dissemination of findings.

3.2 RESEARCH PARADIGM

Polit and Beck (2004) suggest that a quantitative study such as this should adopt a positivist paradigm. Positivists hold the view that truth is absolute and that there is a single reality that can be defined by careful measurement (Burns & Grove, 2009). To find the truth, the researcher must be completely objective and therefore values, feelings and personal perceptions cannot enter into the measurement (Burns & Grove, 2009). The ontological assumption underlying this paradigm is that an objective reality exists independent of human observation (Polit & Beck, 2004). It is on this ontological assumption that the study sought to explore the knowledge, attitudes and practices of nurses regarding evidence-based practice in PMTCT. The epistemological assumption of the paradigm is that the inquirer is independent from what is being researched and does not influence the findings (Polit & Beck, 2004). In line with the epistemology, data was collected through a self-administered questionnaire and thus the researcher had no influence on the findings. Regarding the axiological assumption, positivists maintain that values and biases should not influence the

study and therefore objectivity is required (Polit & Beck, 2004). This was also achieved through the researcher taking an objective stance in the data collection and analysis processes.

3.3 RESEARCH APPROACH

The study used a quantitative approach. Quantitative research is a formal, objective, systematic process that describes and tests relationships and examines cause-and-effect interactions among variables (Burns & Grove, 2009). The researcher based the choice of this approach on the assumption that collecting this diverse data would provide a better understanding of the research problem (Creswell, 2009).

3.4 RESEARCH DESIGN

A non-experimental exploratory descriptive design was used for the study. This is a design in which one observes, describes and documents aspects of a situation as it naturally occurs (Polit & Beck, 2004). The design is used to generate new knowledge about concepts or topics about which limited or no research has been conducted (Burns & Grove, 2009). As there is no manipulation of the independent variables in a descriptive design, it gives a true reflection of the phenomena under study. Exploratory research, on the other hand, fully investigates the nature of the phenomenon, the manner in which it is presented and the other factors related to it (Polit & Beck, 2004). Since descriptive study aims at observing and describing a phenomenon, it was used along with exploration to understand the full nature of the phenomenon; which is an understanding of the existing knowledge, attitudes and practices of nurses regarding evidence-based practice in PMTCT of HIV.

3.5 STUDY SETTING

The study was conducted at a selected public tertiary hospital in Malawi. The hospital is located in the capital city of Malawi and is a referral hospital for the central region. The hospital has a bed capacity of 930 and serves approximately 5 million people. It has a number of departments including Pediatric, Obstetrics and Gynecology which were the focus of the study. The pediatric department has a bed capacity of 250 but admits up to 500 children especially during Malaria season. The obstetrics and Gynecology department on the other hand has a bed capacity of 220. The hospital is also a teaching hospital for the University of Malawi, Kamuzu College of Nursing.

The hospital was chosen because it provides PMTCT services and has a large number of nurses of different categories. There are 309 nurses in total and of these, 197 (63.8%) are NMTs, 95 (30.7%) are professional nurses and 17 (5.5%) are registered nurses. However, only 267 nurses were available during the time of study as 31 nurses were in training and 11 nurses were on secondment in other government departments and training institutions. Of the 267, 182 (68.2%) were NTMs, 76 (28.5%) were professional nurses and the remaining 9 (3.4%) were registered nurses.

Furthermore, according to Malawi Demographic Health Survey (2010), HIV prevalence is higher in urban areas than rural areas and as the hospital is located in the capital city, there are likely to be many HIV infected women attending. PMTCT services provided at the hospital include pre-test counseling, HIV testing and post-test counseling, specific PMTCT counseling, maternity services, infant feeding counseling and nutritional support, family planning, management of STIs and management of ARVs (Ministry of Health, 2012).

3.6 STUDY POPULATION, SAMPLE AND SAMPLING

At the time of the study, there were 267 nurses working in various departments at the selected hospital. The nurses fell into three categories, namely: professional nurses, registered nurses and nurse midwife technicians. This study, however, focused on nurses who were involved in PMTCT services, which are offered in maternity (antenatal clinics, labor and postnatal), gynecology and pediatric departments (Ministry of Health, 2012). Purposive sampling was therefore used to enroll only nurses working in these departments. There were 86 nurses working in these departments and all three reported categories were represented. Considering the small population size, all of the 86 nurses were invited to participate in the study.

3.6.1 Inclusion criteria

To be eligible for inclusion in the study, nurses had to be:

- working in maternity, gynecology or pediatric departments,
- permanently employed.

3.6.2 Exclusion criteria

Nurse Managers were excluded from the study.

3.7 DATA COLLECTION INSTRUMENT

Data for the study was collected with the use of a self-administered questionnaire. The researcher adopted the Developing Evidence-based Practice questionnaire (DEBPQ) by Upton and Upton (2006) on items for knowledge/skills and attitudes, as well as making use of other sources, such as Melnyk et al. (2008), on implementation of evidence-based practice, Gerrish et al. (2008) on

items for sources of practice knowledge and barriers to evidence-based practice and Majid et al. (2011) on items for facilitators to evidence-based practice. The researcher added a section on the nurses' social-demographic data. The questionnaire had six sections in total, namely: social-demographic data; knowledge / skills of evidence-based practice; attitudes towards evidence-based practice; practice of evidence-based practice; barriers to evidence-based practice and facilitators to evidence based practice. It had seventy-seven items in total.

The social demographic characteristics section included questions on age, gender, nursing category, qualification, work experience, department of work, and length of time in the department, PMTCT and evidence-based practice training. The questionnaire had fourteen statements to assess the nurses' knowledge / skills that required the participants to rate their knowledge / skills on a 5 point Likert scale, with responses ranging from 'poor' as 1 to 'excellent' as 5. Scoring consisted of summing the responses for a minimum score of 14 and maximum score of 70. A score of less than 35 was considered low knowledge, 36-55 as high knowledge and 56-70 as very high knowledge.

The sources of evidence scale consisted of twenty-two statements that allowed participants to indicate their source of evidence for practice with responses on a five point Likert scale ranging from 'never' as 1 to 'always' as 5. In presenting the results, the response options were further collapsed with options of 'never', 'seldom' and 'sometimes' combined as 'seldom', and 'frequently' and 'always' combined as 'frequent' due to few observations in some of the response options.

The attitudes scale consisted of four items on a five point Likert scale ranging from 'strongly agree' to 'strongly disagree'. Scoring for the items involved adding up the responses to a minimum of

four and maximum of twenty. A score of 4-12 was considered as a less favorable attitude, while a score of 13-20 was considered a more favorable attitude. The responses were further collapsed into three categories of 'agree', 'disagree' and 'neutral' due to few observations on some of the response options.

To assess practices, seventeen questions were included that required participants to report how often they had performed a particular evidence-based practice task to improve PMTCT services in the previous eight weeks. The responses were on a five point frequency scale ranging from zero times, as score 0, to more than eight times, as score 4. Scoring for the items involved summing the responses to the 17 items for a total score ranging from 0- 68. A score of less than 34 was considered low practice and a score of 35-68 was considered high practice. Alternatives were further collapsed into three categories namely 0 times, 1-6 times and more than 6 times due to few observations on some of the response options.

The barriers scale had fourteen items on a five point Likert scale ranging from strongly agree to strongly disagree. The alternatives were collapsed into three categories of agree, disagree and neutral due to few responses on some of the response options. There were six items to assess for facilitators to evidence-based practice in PMTCT, also on a five point Likert scale, with options ranging from strongly agree to strongly disagree. These alternatives were also collapsed into three categories namely: agree, disagree and neutral also due to few observations on some of the response options (Annexure 3).

3.8 VALIDITY AND RELIABILITY

Polit and Beck (2004) contend that the reliability of a quantitative instrument is a major criterion for assessing its quality and adequacy. The questionnaires that were used for this study were

adopted from other studies and the original questionnaires had been tested and had acceptable Cronbach's alphas. Items on the knowledge/skills and attitudes that had been adopted from Upton and Upton (2006) had Cronbach's alphas of 0.91 and 0.79 respectively. Items on practice of evidence-based practice, which had been adopted from Melnyk et al. (2008), had an acceptable Cronbach's alpha of 0.96. The items on bases of practice knowledge and barriers to evidence-based practice, which had been adopted from Gerrish et al. (2008), had Cronbach's alphas ranging from 0.70-0.86. Items on facilitators to evidence-based practice from Majid et al. (2011) had a Cronbach's alpha of 0.91.

A pilot study was conducted where a test-retest method was applied to assess for stability of the instrument over time. The pilot study involved nurse managers working in the departments where the study was conducted. There were five nurse managers in total and they were not included in the main study as they do not provide direct patient care. The re-test was done three days after the first test. Test-retest reliability was analyzed using the Kappa statistic, which found an acceptable reliability co-efficient as it ranged from 0.8 - 0.9. Cronbach's alphas for the different sections of the questionnaire were as follows: knowledge/skills: 0.89, attitude: 0.69 practice: 0.92, barriers: 0.71, facilitators: 0.82.

Validity refers to the degree to which an instrument measures what it is supposed to measure (Polit & Beck, 2004). Content validity was used for this study. Content validity refers to whether items measure the content they are intended to measure (Creswell, 2009). This was done by relating objectives of the study as well as constructs in the theoretical framework to the specific questions on the instrument as demonstrated in Table 3.1.

Table 3.1: Content validity for the study

Objective	Items in the instrument	Literature that informed the item	Theoretical framework
Knowledge/ skill of EBP in PMTCT	Items 1-14	Upton and Upton (2006)	Knowledge in the innovation decision process.
Sources of evidence based practice knowledge	Items 15-36	Gerrish et al. (2008)	
Attitudes towards EBP in PMTCT	Items 37-40	Upton and Upton (2006)	Persuasion and decision.
Practices regarding EBP in PMTCT	Items 41-57	Melnyk et al. (2008)	Implementation/ confirmation.
Barriers to EBP in PMTCT & Facilitators to EBP in PMTCT	Items 58-71 Items 72-77	Gerrish et al. (2008) Majid et al. (2011)	Prior conditions: previous EBP, felt need, norms of the social system. Characteristics of the setting, the nurses, and communication channels.

3.9 DATA COLLECTION PROCEDURE

Data collection is the precise, systematic gathering of information relevant to the research purpose or the specific objectives, questions or hypotheses of the study (Burns & Grove, 2009). Data collection requires planning that involves laying down a step by step sequence of data collection from the subjects (Burns & Grove, 2009). Data collection commenced after securing ethical clearance from the Biomedical Research Ethics Committee and the Malawi Ministry of Health Ethics committee, as well as permission from the relevant stakeholders. The data was collected within a period of two weeks and, in order to prevent disruption to patient care, data was collected only during tea, lunch and/or supper breaks.

An information sheet (Annexure 1) which described the details of the study was handed to the participants to help them make an informed decision whether to participate in the study or not. The information sheet described the type of study, its purpose and benefits, risks, the data collection procedure, participants' freedom to decline or withdraw, data handling and dissemination of results. The information was also explained verbally to the potential participants and they were given a period of two days to decide whether or not to participate. Those willing to participate were enrolled in the study and were requested to sign a consent form. They were then handed the questionnaires and were given some guidance on how to fill them in. The participants were allowed to take the questionnaires and complete them at a time which was convenient to them. In an attempt to get a prompt response from as many participants as possible, they were requested to fill the questionnaires within two days. The researcher kept a list of all the participants that had been handed the questionnaire and their respective departments. The researcher made follow-ups after the two days and the questionnaires were collected from those that managed to fill them in and more time was given to those that could not manage. No names were included on the

questionnaires. Codes and numbers were assigned to each questionnaire and these were not included on the list of the participants that the researcher had so that it was not possible to link the questionnaire to an individual.

3.10 DATA ANALYSIS

Data were entered and subsequently analyzed using the Predictive Analytics Software (PASW) version 21. Descriptive statistics, such as frequencies, percentages, means, medians, standard deviations and inter-quartile ranges have been used to summarize the data. The Kruskal-Wallis test, Mann-Whitney U test, Fishers exact test and Pearson chi-squared test were used to test if the distribution of knowledge, attitude and practices differed across the nurses' social demographic characteristics. Spearman's rho correlation was performed to assess if there was an association between knowledge, attitude and practices. The level of significance was set at 0.05. Information has been presented graphically and by means of frequency tables.

3.11 DATA MANAGEMENT AND STORAGE

The questionnaires for this study are kept in a locked personal locker which can only be accessed by the researcher and the electronic data is stored in a personal computer in files that can only be accessed by means of a password, which is known only to the researcher. The questionnaires and the electronic data will be disposed of 5 years after publishing the research report.

3.12 ETHICAL CONSIDERATIONS

Ethics is a system of moral values and is concerned with the degree to which research procedures adhere to professional, legal and social obligations to the participants (Polit & Beck, 2004). Ethical

conduct is very important in studies dealing with humans to ensure that their rights are protected (Polit and Beck, 2004). The study was underpinned by the following ethical principles:

Beneficence: Beneficence is a fundamental ethical principle that seeks to maximize benefits to the study participants and prevent them from being harmed or exploited (Polit & Beck, 2004). Beneficence was promoted in this study as there were no physical, social or psychological risks involved in participating in the study. While there were no direct benefits in participating in the study, recommendations from the study may be used to help improve the nurses' knowledge, skills and practices of evidence-based practice, which will bring a sense of satisfaction to the participants as they will be part of a campaign to reduce MTCT of HIV, which is a global concern. Furthermore, no names have been used in the study and the final product has been quantified.

Respect for human dignity: This principle includes the right to self-determination and full disclosure (Polit & Beck, 2004). Right to self-determination involves treating prospective subjects as autonomous (Burns & Grove, 2009). In order to ensure respect for human dignity, the researcher provided all the information about the study, as already discussed, to help the participants to make an informed consent. Participants were informed that participation in the study was voluntary and that they could withdraw at any time should they wish to, with no negative consequences. In addition, they were not coerced in any way to participate in the study.

Justice: This principle relates to participants' right to fair treatment and privacy (Polit & Beck, 2004). It also involves fair selection of subjects (Burns & Grove, 2009). Justice was ensured in this study by ensuring the anonymity of the participants. No names but codes were used on the questionnaire and only signatures were required for the consent form. No other person apart from the researcher has access to any of the information. The questionnaires are kept in a personal locker

which can only be accessed by the researcher and information that has been entered into the computer is kept in files that are protected by a password known only to the researcher. The researcher provided no prejudicial treatment for the participants who refused to participate or withdrew from the study. Justice was also ensured through the sampling method that was used, which gave all the nurses in the population a chance of participating in the study. The researcher was accessible when needed by the participants. They were also assured that the final product would be quantified and generalized to the whole population and not just them (Annexure 1).

3.12.1 Ethical clearance

Ethical Clearance for the study was sought from the Biomedical Research Ethics Committee; reference number BE386/14, (Annexure 4) and the Malawi Ministry of Health Research Ethics Committee (Annexure 6). After obtaining ethical clearance, the researcher sought permission from the director of the selected hospital to conduct the study at the hospital (Annexure 8).

3.13 DISSEMINATION OF RESEARCH FINDINGS

The research report will be disseminated through presentations at professional meetings and publication in nursing journals. Copies of the research report will be placed in the University of KwaZulu-Natal (UKZN) library for access by interested parties. A copy of the research report will also be sent to the selected hospital where the study was conducted.

3.14 SUMMARY OF THE CHAPTER

This chapter highlighted the methodology for the study. A non-experimental exploratory descriptive approach was used for the study. The study was conducted at a selected public tertiary hospital in Malawi and the population for the study was all nurses working in the maternity,

gynecology and pediatric departments. Purposive sampling was used to draw participants for the study. Data was collected through the use of a self-administered questionnaire. The instruments that were adopted had been tested and had acceptable Cronbach's alphas. For the present study, a pilot test-retest was performed and the results were also acceptable, proving reliability of the instrument. Validity was ensured by matching the objectives of the study to the items on the questionnaire and the theoretical framework for the study. The chapter also presented the steps that were followed to ensure ethical conduct during the study.

The chapter that follows will provide an in-depth presentation of the findings of the study.

CHAPTER FOUR

PRESENTATION OF THE FINDINGS

4.1 INTRODUCTION

This chapter presents the findings of the study whose aim was to explore the knowledge, attitudes and practices of nurses regarding evidence-based practice in a PMTCT program at a selected public tertiary hospital in Malawi. The participants of the study were nurses involved in PMTCT, namely those working in maternity, gynecology and pediatric departments. Due to the small population (N=86), all the nurses were invited to participate in the study. A total of 81 nurses agreed and participated, giving a response rate of 94%.

A self-administered questionnaire was used to collect the data, which were entered and subsequently analyzed using PASW version 21. The results have been presented in frequency tables and figures. Statistical tests such as Fisher's exact, Pearson's chi-square, the Kruskal Wallis t-test and the Mann-Whitney U test were performed to test for associations between different social demographic variables and knowledge, attitudes and practices. Spearman's rho correlation was also performed to test for correlation between knowledge, attitudes and practices.

The findings have been presented as follows:

- Social-demographic data;
- Knowledge of evidence-based practice in PMTCT;
- Attitudes towards evidence-based practice in PMTCT;
- Practice of evidence-based practice in PMTCT;

- Inter-relationships between social demographic factors, knowledge, attitude and practices of evidence based practice in PMTCT;
- Barriers to evidence-based practice in PMTCT;
- Facilitators to evidence-based practice in PMTCT;

4.2 SOCIAL DEMOGRAPHIC CHARACTERISTICS

The participants' social demographic variables that were collected included age, gender, nursing category, qualification, work experience, department of work, length of time in the department, PMTCT training and evidence-based practice training.

4.2.1 Age of the participants

The participants' ages were not normally distributed, as demonstrated in Figure 4.1. The minimum age was 22 years and the maximum age was 61 years with a median age of 35 years and an interquartile range of 20 years. When the data was grouped, the majority of the participants (34.6%: n=28) fell within the age range of 20-29, followed by 30.9% (n=25) who fell into the age range of 30-39 years. The 40-49 year age group comprised 19.7% (n=16) of the participants and the smallest group were those who were older than 50 years; 18.8% (n=12). Thus, the majority of the participants (65.5%: n=53) were younger than 40 years.

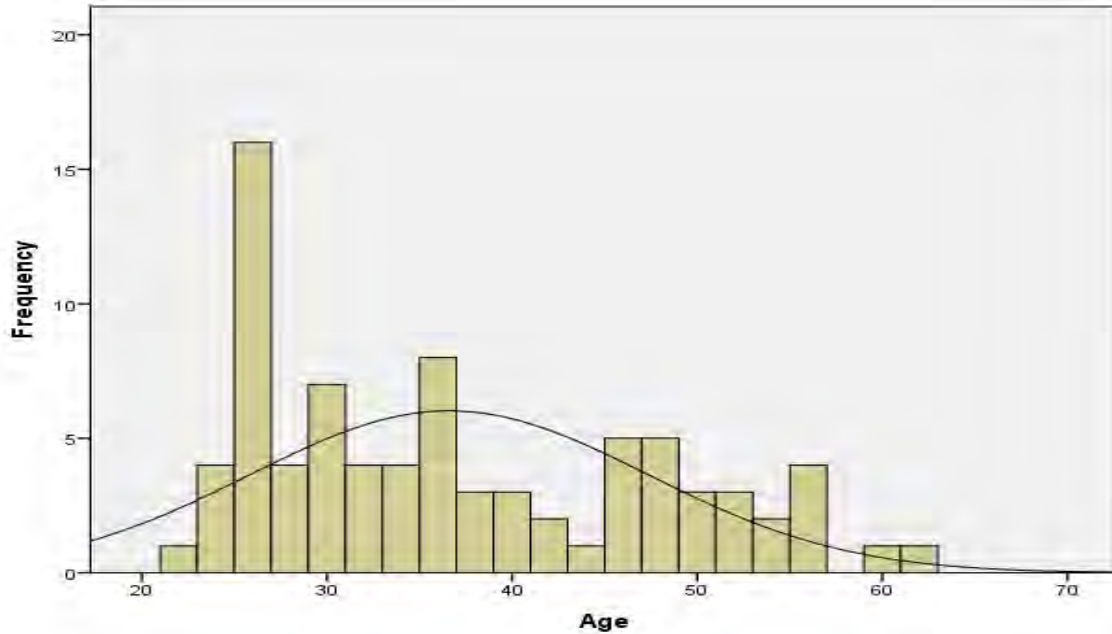


Figure 4.1: Histogram of age

4.2.2 Gender of the participants

The results displayed in Figure 4.2 shows that the PMTCT nursing population was predominantly female (90 %: n=73), while males were in the minority making up only 10% (n=8) of the population.

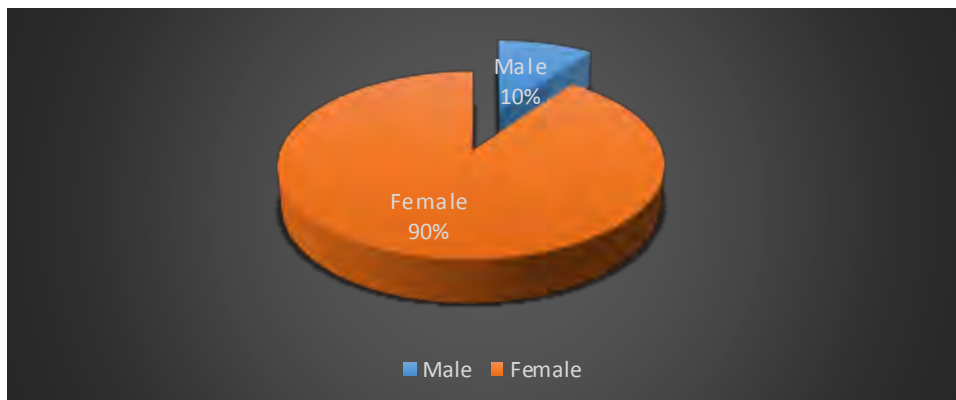


Figure 4.2: Gender of the participants

4.2.3 Category of nurse

The results shown in Figure 4.3 demonstrate that the majority of the participants (61.7%: n=50) were NMTs followed by Professional Nurses (29.6%: n= 24). Registered nurses were in the minority making up only 8.6% (n=7) of the participants.

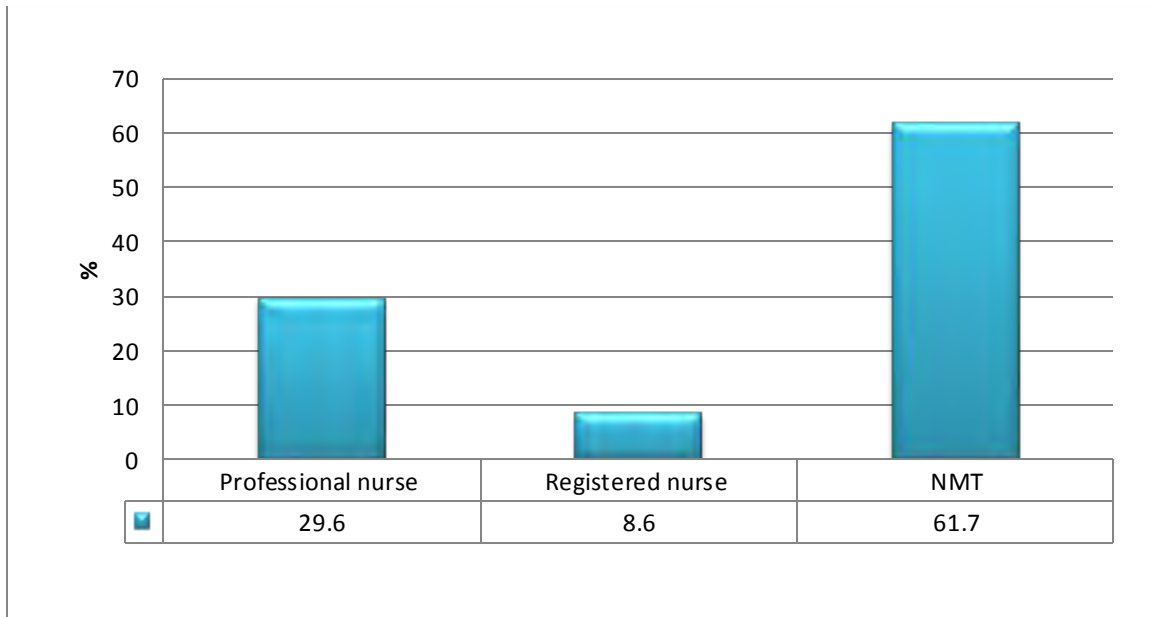


Figure 4.3: Category of nurse

4.2.4 Qualification of the participants

Analysis of qualification shows that the biggest group of participants (35.8 %: n= 29) had a certificate qualification which had entailed a two years period of training, followed by 29% (n=24), who had qualified through a four year bachelors degree program and then those with a diploma qualification, who had completed a three year integrated college program (25.9%: n=21). The smallest group (8.6%: n=7) were those with a university diploma having gone through a two year

upgrading course in nursing and mid-wifely. The results therefore show that the majority of the nurses were trained at a level below a first degree (Figure 4.4).

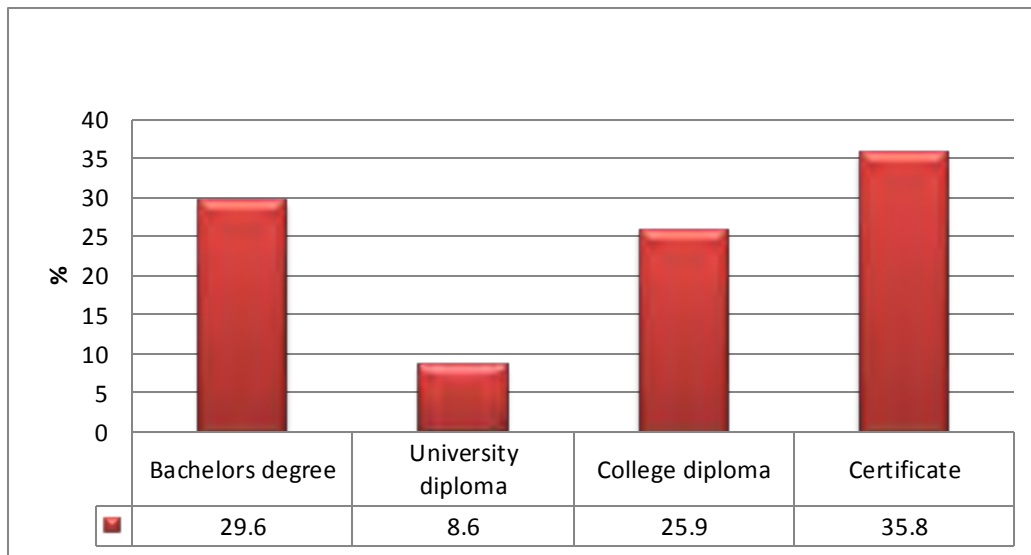


Figure 4.4: Qualification of the participants

4.2.5 Work experience of the participants

The findings revealed that the minimum work experience was one year and the maximum was 36 years, with a median of 10 years and interquartile range of 15.5 years. The biggest group of participants (39.5%: n=32) had less than five years' experience, followed by 18.5% (n= 15), who had more than 20 years' experience, 17.3% (n= 14), who had 5-10 years' experience; and 13.6% (n=11), who had 16-20 years' experience. The smallest group were those with experience of 11-15 years accounting for only 11.1% (n= 9) of the participants. Thus, in general, the participants were experienced as general nurses as only 39.5% had less than five years' experience (Figure 4.5).

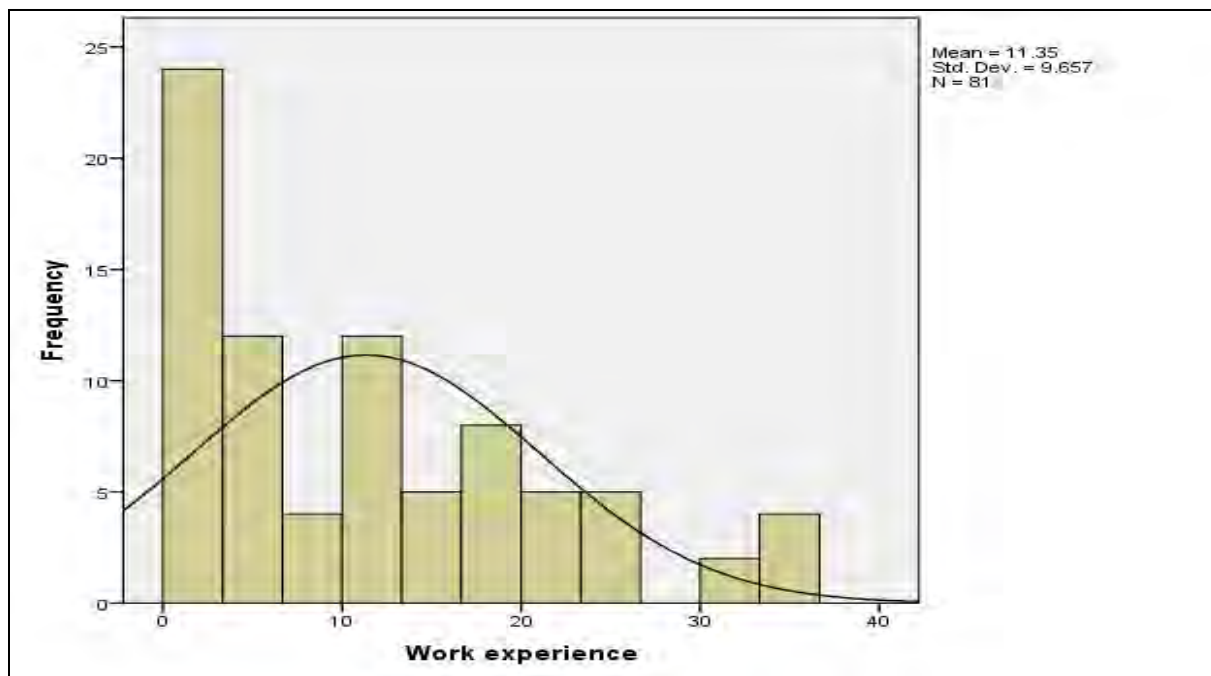


Figure 4.5: Work experience

4.2.6 Category of nurse and work experience

A cross tabulation (Table 4.1) was performed to compare the participants' work experience with their nursing category. The analysis shows that the majority of professional nurses (70.8%: n=17) had less than five years' experience, with none of them having more than 20 years' experience. The majority of registered nurses had more than 5 years' experience, with only 28.6% having less than 5 years' experience. Findings showed that the NMTs were the most experienced, with 28% (n=14) having more than 20 years' experience and only 26% (n=13) having less than five years' experience. Fisher's exact test shows a significant relationship between nursing category and experience; Fisher's value = 19.3, df = 0, and P-value = 0.004.

Table 4.1: Cross tabulation of nursing category and experience

Category		Experience					Total
		<5 years	5-10 years	11-15 years	16-20years	>20years	
Professional nurse	n	17	3	1	3	0	24
	%	70.8%	12.5%	4.2%	12.5%	0.0%	100.0%
Registered nurse	n	2	1	2	1	1	7
	%	28.6%	14.3%	28.6%	14.3%	14.3%	100.0%
NMT	n	13	10	6	7	14	50
	%	26.0%	20.0%	12.0%	14.0%	28.0%	100.0%
Total	n	32	14	9	11	15	81
	%	39.5%	17.3%	11.1%	13.6%	18.5%	100.0%

4.2.7 Department of work

The findings indicate that the majority of the participants were nurse/midwives working in maternity as they comprised 48.1% (n=39) of the sample, followed by those working in pediatrics comprising 39.5% (n=32) of the participants. The least participants (12.3%: n=10) were working in the gynecology department (Figure 4.6).

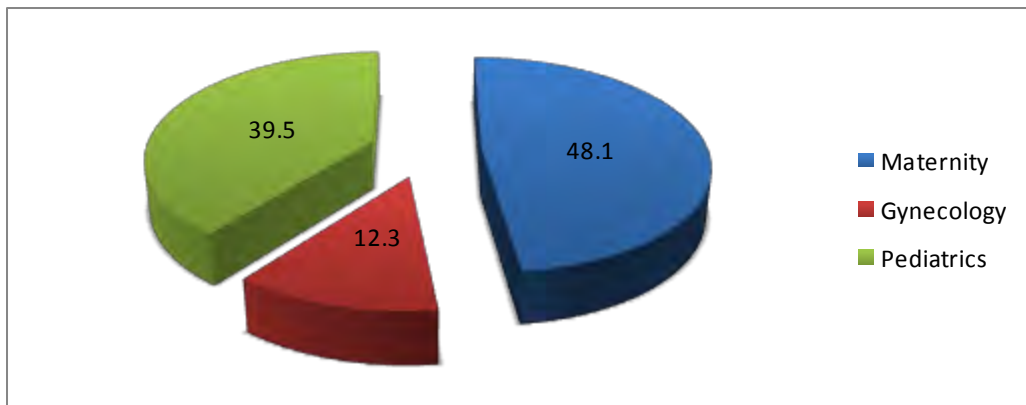


Figure 4.6: Department

4.2.8 Length of time in the department

The minimum length of time in a department was less than one year and the maximum was 34 years, with a median of 2.8 years and an interquartile range of 3 years. When put into groups, the biggest group of participants (37.5%: n=30) had been in the department for 1-2 years followed by 26.3% (n=21) who had been in their department for more than 5 years. Those that had been in the same department for 3-4 years comprised 22.2% (n=18) of the participants and the smallest group of participants (13.6%: n=11) had been in their department for less than one year. Thus the majority of the participants had stayed in the same department for a reasonably long duration (Figure 4.7).

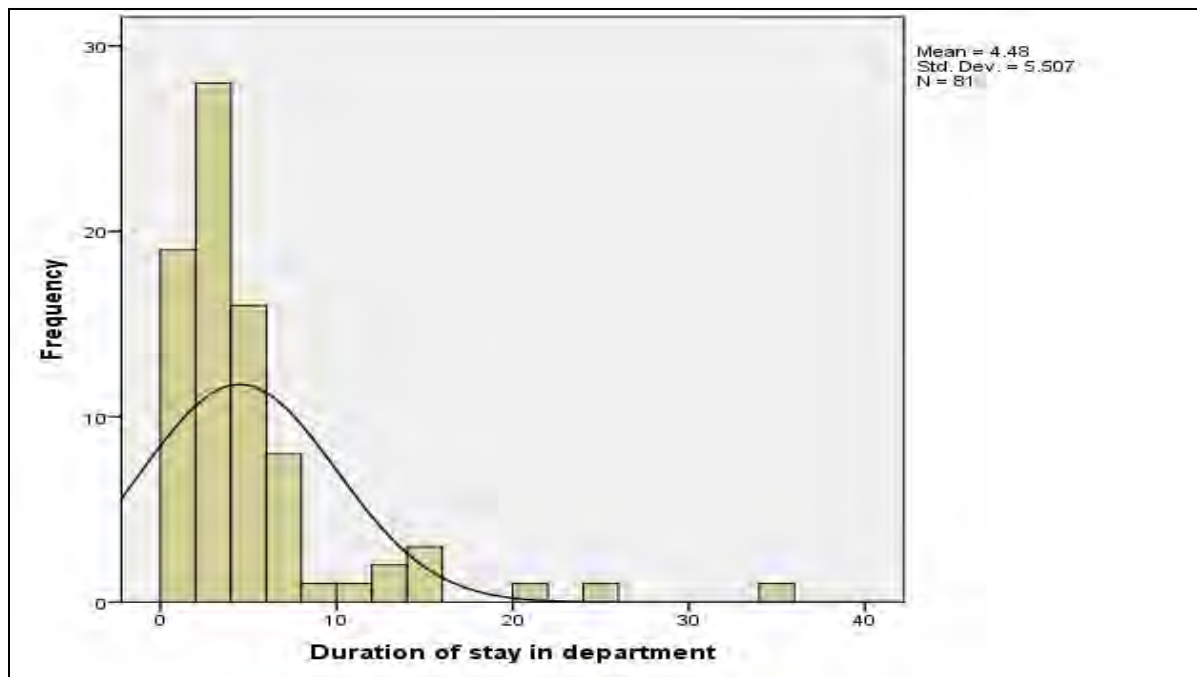


Figure 4.7: Length of time in department

4.2.9 Length of time in the department and nursing category

The results displayed in Table 4.2 show that NMTs have had more experience in their respective units as 32% (n=16) of the NMTs had been in the same department for more than five years compared with 28.6% (n=2) of the registered nurses and 13% (n=3) of the professional nurses. However, no significant relationship was found between experience in a department and qualification with a Fisher's exact value = 9.1, df = 0, and p-value = 0.127.

Table 4.2: Length of time in department and nursing category

Category		Length of time in department				Total
		<1 years	1-2 years	3-4 years	>5 years	
Professional nurse	n	7	8	5	3	23
	%	30.4%	34.8%	21.7%	13.0%	100.0%
Registered nurse	n	1	2	2	2	7
	%	14.3%	28.6%	28.6%	28.6%	100.0%
NMT	n	3	20	11	16	50
	%	6.0%	40.0%	22.0%	32.0%	100.0%
Total	n	11	30	18	21	80
	%	13.8%	37.5%	22.5%	26.3%	100.0%

4.2.10 PMTCT training

The participants were asked whether they were trained in PMTCT. The results displayed in Figure 4.8 show that the majority (70.4%: n= 57) were trained. Only 29.6% (n=24) were not trained.

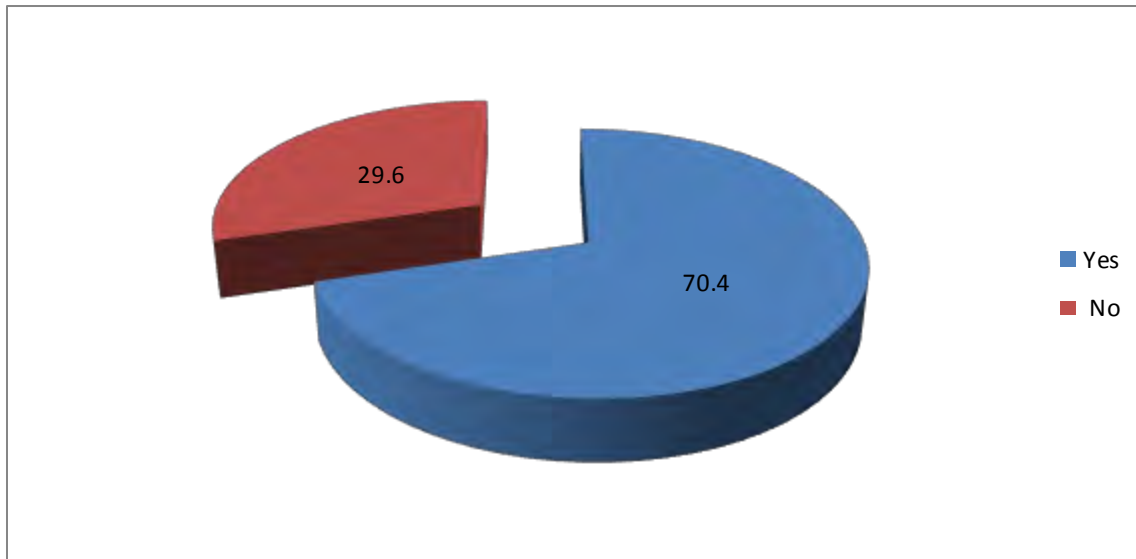


Figure 4.8: PMTCT training

4.2.11 PMTCT training and work experience

The cross tabulation results displayed in Table 4.3 shows that the higher the number of years the nurses had worked, the more likely they were to be trained in PMTCT as 81.8% (n=9) of the participants with 16-20 years' work experience and 80% (n=12) of those with more than 20 years' experience were trained. Only 68.8% (n=22) of those with less than 5 years' experience, and only 57.1% (n=8) of those with 5-10 years' experience were trained. However, Fisher's exact test showed no significant relationship between PMTCT training and experience; Fishers exact value = 2.5, df = 0, p-value = 0.65.

Table 4.3: Cross tabulation of work experience and PMTCT training

Work experience		PMTCT training		Total
		Trained	Not Trained	
< 5 Years	n	22	10	32
	%	68.8%	31.3%	100.0%
5-10 Years	n	8	6	14
	%	57.1%	42.9%	100.0%
11-15 Years	n	6	3	9
	%	66.7%	33.3%	100.0%
16-20 Years	n	9	2	11
	%	81.8%	18.2%	100.0%
> 20 Years	n	12	3	15
	%	80.0%	20.0%	100.0%
Total	n	57	24	81
	%	70.4%	29.6%	100.0%

4.2.12 PMTCT training and department

The cross tabulation results in Table 4.4 show that fewer participants working in the pediatric department were trained in PMTCT compared to those working in the maternity or gynecology departments as only 50 % (n=16) of those working in the pediatric department were trained compared with 90.9% (n=10) and 81.6% (n= 31) of the gynecology and maternity nurses respectively. The Pearson chi-squared test shows a very significant relationship between PMTCT training and the department with Fisher's exact value = 10.8, df= 0 and P-value = 0.00.

Table 4.4: Cross tabulation of PMTCT training and department

Department		PMTCT training		Total
		Yes	No	
Maternity	n	31	7	38
	%	81.6%	18.4%	100.0%
Gynecology	n	10	1	11
	%	90.9%	9.1%	100.0%
Pediatrics	n	16	16	32
	%	50.0%	50.0%	100.0%
Total	n	57	24	81
	%	70.4%	29.6%	100.0%

4.2.13 PMTCT training and nursing category

Cross tabulation was done between PMTCT training and nursing category. The results show that NMTs were the least trained as only 66% (n=33) were trained compared with 85.7% (n=6) and 75% (n=18) for registered and professional nurses respectively. However, Fisher's exact test shows no significant relationship between PMTCT training and nursing category; Fishers exact value = 1.2, df = 0 and p-value = 0.566 (Table 4.5).

Table 4.5: PMTCT training and nursing category

Category		PMTCT training		Total
		Yes	No	
Professional nurses	n	18	6	24
	%	75.0%	25.0%	100.0%
Registered nurses	n	6	1	7
	%	85.7%	14.3%	100.0%
NMTs	n	33	17	50
	%	66.0%	34.0%	100.0%
Total	n	57	24	81
	%	70.4%	29.6%	100.0%

4.2.14 PMTCT training and length of time in department

Figure 4.9 displays the participants' PMTCT training status and their length of time in their respective departments. The majority of the participants that were trained (81.8%: n=9) had been working in their respective department for less than one year, followed by those who had been in their department for longer than 5 years (71.4%: n=15). There were fewer nurses who had been trained who had been working in their departments for 1-3 years (66.7%: n=30) and 3-5 years (66.7%: n=12). Thus, training is not related to the length of time spent in a department. The Fishers exact test also shows an insignificant result; Fishers exact value = 1, df = 0, p-value = 0.80.

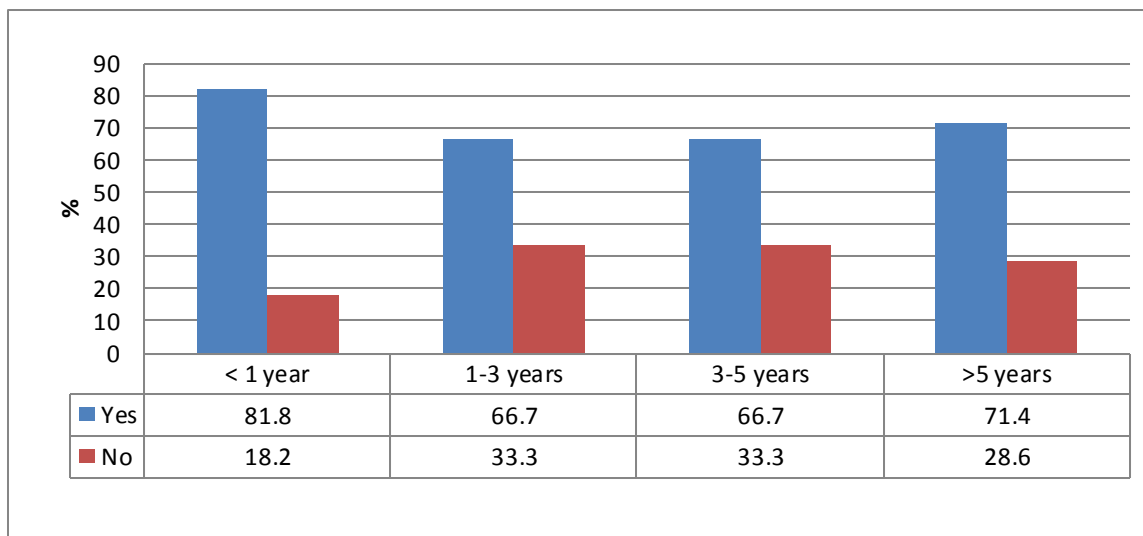


Figure 4.9: PMTCT training and length of time in department

4.2.15 When trained in PMTCT

Results displayed in Table 4.6 show that of those who were trained in PMTCT, 68.4% (n=39) had been trained through in-service education and 26.3% (n=15) had received pre-service education. A small minority of the participants (5.3%: n=3) indicated that they had received both pre-service and in-service training in PMTCT. Thus 73.7% (n=42) had been trained in-service and only 31.6% (n=18) had received pre-service education.

Table 4.6: When trained in PMTCT

	Variables	Frequency	Percentage
When nurses received PMTCT training	Pre-service (college)	15	26.3
	In-service	39	68.4
	Both	3	5.3
	Total	57	100%

4.2.16 Qualification and when trained in PMTCT

The cross-tabulation of qualification and when PMTCT training had been received shows that there were inconsistencies in terms of pre-service training in PMTCT among participants of the same educational level. The results shown in Table 4.7 indicate that only 55.6% (n=10) of those with a bachelor degree received pre-service training, 38.9% (n=7) were trained in-service and 5.6% (n=1) were trained both pre-service and in-service, thus 61.2% (n=11) received pre-service training and 44.5% (n=8) received in-service training. Similarly, only 33.3 % (n=2) of those with a university diploma received pre-service training, while the majority (67.7%: n=4) did not receive PMTCT training during their pre-service period. Only 28.6% (n=4) of those with a college diploma had received pre-service training, while 71.4% (n=10) had not and only 5.3% (n=1) of the certificate trained nurses had received pre-service training while the majority (94.7%: n=18) had not. The results further portray that the bachelor degree nurses were largely trained pre-service compared to other categories that were mainly trained in-service. Fisher's exact test also show significant results; Fishers exact value = 19.9, df = 0, p-value = 0.000.

Table 4.7: Qualification and when trained in PMTCT

Qualification		When trained in PMTCT			Total
		Pre-service education	In-service education	Both	
Bachelor degree	n	10	7	1	18
	%	55.6 %	38.9 %	5.6 %	100.0%
University diploma	n	0	4	2	6
	%	0.0%	66.7 %	33.3%	100.0%
College diploma	n	4	10	0	14
	%	28.6%	71.4 %	0.0%	100.0%
Certificate	n	1	18	0	19
	%	5.3%	94.7%	0.0%	100.0%
Total	n	15	39	3	57
	%	26.3%	68.4 %	5.3%	100.0%

4.2.17 Evidence-based practice training

The participants were also asked if they had received training in evidence-based practice. The results displayed in Figure 4.10 indicate that nearly half of the participants (49.4%: n=40) indicated that they had been trained in evidence-based practice, while just over half (50.6%: n=41) indicated that they had not been trained in evidence-based practice.

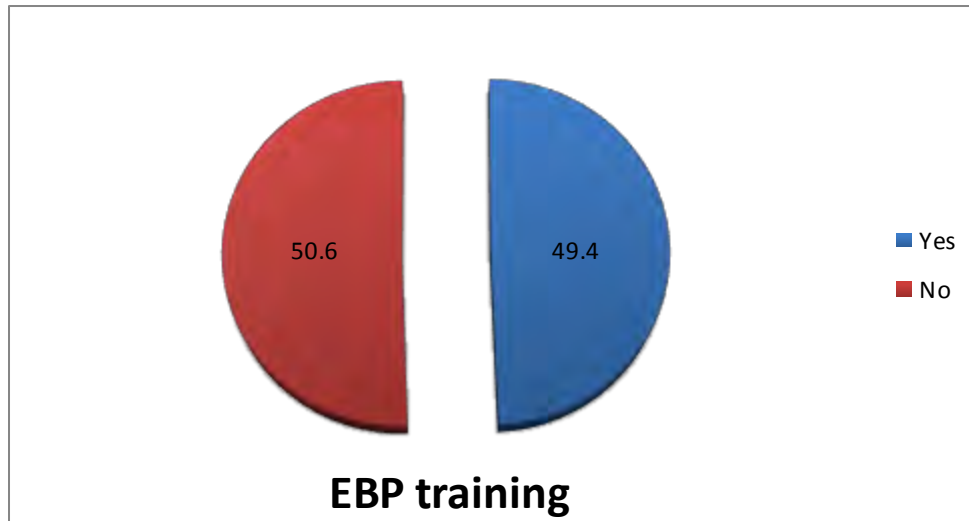


Figure 4.10: Training in evidence-based practice

4.2.18 Evidence-based practice training and qualification

Cross tabulation was done to determine if there were any significant differences in evidence-based practice training among the different qualifications. The results displayed in Table 4.8 show that the majority of participants who had university diploma (85.7%: n=6) and a large percentage of those with bachelors degree (66.7%: n=16) had received training on evidence-based practice. On the other hand, however, only 42.9% (n=9) of those with a college diploma and 31% (n=9) of the certificate nurses had been trained in evidence-based practice. Fisher's exact test showed a significant relationship between qualification and training in evidence-based practice; Fishers exact value = 10.6, df = 0 and p-value = 0.000.

Table 4.8: Cross tabulation of evidence based practice training and qualification

Qualification		Evidence based practice training		Total
		Trained	Not Trained	
Bachelor degree	n	16	8	24
	%	66.7%	33.3%	100.0%
University diploma	n	6	1	7
	%	85.7%	14.3%	100.0%
College diploma	n	9	12	21
	%	42.9%	57.1%	100.0%
Certificate	n	9	20	29
	%	31.0%	69.0%	100.0%
Total	n	40	41	81
	%	49.4%	50.6%	100%

4.2.19 When trained in evidence-based practice

The results shown in Figure 4.11 indicate that 52.5% (n= 21) of the participants had received their evidence-based training whilst in-service. Only 32.5% (n=13) had received pre-service training. The results further show that only a small percentage of the participants (15%: n=6) had received both pre-service and in-service training.

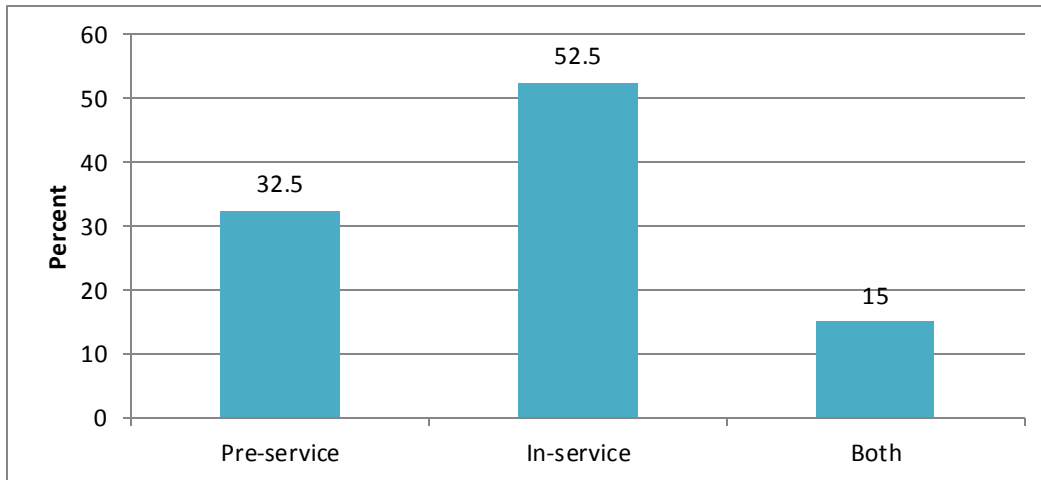


Figure 4.11: When trained in evidence-based practice

4.2.20 Qualification and when trained in EBP

The results of the cross tabulation of qualification and when evidence-based practice training had been received show that of the bachelor degree nurses, 56.3% (n=9) had received pre-service training, 18.8% (n=3) had received in-service training and 25% (n=4) had received both. Thus, the majority of the degree nurses (81.3%: n=13) had received pre-service training and only 43.8% (n=7) had received in-service training. In contrast, none of the college diploma and certificate nurses had received pre-service training; they had received their training whilst in-service. Fisher's exact test shows a significant relationship; Fisher's exact value = 35.2, df = 0, p-value = 0.00 (Table 4.9).

Table 4.9: Cross tabulation of qualification and when trained in EBP

Qualification		When trained in EBP			Total
		Pre-service	In-service	Both	
Bachelor degree	n	9	3	4	16
	%	56.3%	18.8 %	25%	100.0%
University diploma	n	2	2	2	6
	%	33.3%	33.3%	33.3 %	100.0%
College diploma	n	0	9	0	9
	%	0	100%	0	100.0%
Certificate	n	0	9	0	9
	%	0	100%	0%	100.0%
Total	n	13	21	6	40
	%	32.5%	52.5%	15%	100.0%

4.3 THE PARTICIPANTS LEVEL OF KNOWLEDGE REGARDING EVIDENCE BASED PRACTICE IN PMTCT

The participants were asked to rate their level of knowledge regarding evidence-based practice on a five point Likert scale ranging from poor to excellent. Due to low observations on the response options, especially on ‘very good’ and ‘excellent’, the results were collapsed into three categories, with the ‘poor’ and ‘fair’ categories being combined as ‘poor’, and the ‘very good’ and ‘excellent’ categories being combined as ‘very good’. Thus, there are three categories that will be reported namely poor, good and very good.

The findings as displayed in Table 4.10 show that the majority of the participants indicated that they had poor research skills as 64.2 % (n= 52) fell within the poor category. Only 25.9% (n=21) and 9.9% (n=8) reported good and very good skills respectively. With regard to IT skills, just over

half of the participants (50.6 %: n= 41) reported having poor skills and of the remaining half, 35.9% (n=32) felt they had good skills and only 9.9% (n=8) felt they had very good skills. When asked about monitoring and reviewing practice skills, a good number of the participants (58%: n= 47) indicated that they were good in this field, 3.7% (n= 3) felt they were very good and 38.3 % (n=31) reported having poor skills. Pertaining to converting information needs into research questions, the majority (64.2%: n=52) indicated that they were poor, while only 27.2% (n=22) and 8.6% (n=7) indicated that they were good and very good respectively.

Slightly more than half of the participants (53.1%: n=43) indicated that they were poor in awareness of major information sources, while 40.7% (n= 33) indicated that they were good and 6.2% (n=5) very good. Regarding their ability to identify gaps in professional practice, the majority reported having good knowledge, with 55.6% (n=45) falling within the good and 27.2% (n=22) into the very good categories and only 17.3% (n=14) indicating that their knowledge was poor in this field. Slightly more than half of the participants (51.9 %: n=42) indicated that they had poor knowledge of how to retrieve evidence, while 33.3% (n=27) felt they had good knowledge and 12.3% (n=10) very good knowledge. Regarding their ability to critically analyze evidence against set standards, almost half 49.4% (n=40) indicated that they were poor, while 37% (n=30) indicated that they were good and 12.3% (n=11) very good.

The results further show that the majority of the participants believed they had good ability in determining the validity of material, with 42% (n=34) reporting good ability and 13.6% (n=11) very good ability. Less than half (44.4 %: n=36) of the participants reported having poor ability to determine the validity of material. Regarding their ability to determine usefulness of material, the majority of the participants indicated that they were knowledgeable as 43.2% (n=35) and 22.2 % (n= 18) indicated that they are good and very good respectively. Only 34.6% (n=28) indicated

that they had poor ability. The majority of the participants also felt they had the ability to apply information to individual cases, with 52.5% (n=42) indicating that they were good, 36.3% (n=29) very good and only 11.3% (n=9) indicating that they were poor.

The findings revealed that the majority of the participants felt that they were good at sharing ideas and information with colleagues, with 44.4% (n=36) indicating that they were good and 46.9% (n=38) indicating that they were very good. Only 8.6% (n=7) reported being poor in this area. The majority of the participants also believed that they were good with dissemination of new ideas about care to colleagues, with 50.6% (n=41) indicating that they were good, 37% (n=30) very good and only 12.3 % (n=10) indicating that they were poor. Furthermore, the majority of the participants felt that they had the ability to review their own practice, with 51.9% (n=42) indicating that they were good and 43.2% (n=35) very good, and only 4.9% (n=4) indicating that they were poor.

The results therefore show that the participants had the least knowledge/skills in research, converting information needs into research questions, awareness of major information sources and knowledge of how to retrieve evidence. Their greatest skills/knowledge were ability to apply information to individual cases, ability to review own practice, sharing of ideas with colleagues, dissemination of new ideas, determining usefulness of information and ability to identify gaps in practice.

Table 4.10: Participants’ knowledge/skills on evidence-based practice

Item	Poor		Good		Very good	
	n	%	n	%	n	%
Research skills	52	64.2	21	25.9	8	9.9
Information technology (IT) skills	41	50.6	32	39.5	8	9.9
Monitoring and reviewing of practice skills	31	38.3	47	58.0	3	3.7
Converting information needs into a research question	52	64.2	22	27.2	7	8.6
Awareness of major information types and sources	43	53.1	33	40.7	5	6.2
Ability to identify gaps in ones’ professional practice	14	17.3	45	55.6	22	27.2
Knowledge of how to retrieve evidence	42	51.9	27	33.3	10	12.3
Ability to analyze critically evidence against set standards	40	49.4	30	37.0	11	13.6
Ability to determine validity (close to the truth) of the material	36	44.4	34	42.0	11	13.6
Ability to determine how useful (clinically applicable) the material is	28	34.6	35	43.2	18	22.2
Ability to apply information to individual cases	9	11.3	42	52.5	29	36.3
Sharing of ideas and information with colleagues	7	8.6	36	44.4	38	46.9
Dissemination of new ideas about care to colleagues	10	12.3	41	50.6	30	37.0
Ability to review own practice	4	4.9	42	51.9	35	43.2

4.3.1 Overall knowledge score

As previously discussed, the participants responded to the knowledge questions on a five point Likert scale, ranging from poor as a score of one, fair as two, good as three, very good as four and excellent as five. The knowledge scale had 14 items, thus the possible minimum score was 14 and

maximum score was 70. The minimum score for the participants was 21 and maximum score was 62. The mean knowledge score was 39.2 with a standard deviation of 8.1. Thus, on average, the results indicate that the participants were knowledgeable about evidence-based practice. When the scores were grouped, with a score of less than 35 indicating low knowledge, 36-55 high knowledge and 56-70 very high knowledge, the majority of participants (67.9%: n=53) fell within the high knowledge group, 6.4% (n=5) fell into the very high knowledge group and only 25.6% (n=20) into the low knowledge group (Table 4.11).

Table 4.11: Overall knowledge scores

	Score	n	%
Low knowledge	Less than 35	20	25.6
High knowledge	36-55	53	67.9
Very high knowledge	56-70	5	6.4
Total	70	78	100.0

4.3.2 Influence of social-demographic variables on overall knowledge

Cross-tabulation was done for the social demographic variables and knowledge to determine if any of the social demographic variables had an influence on the participants' level of knowledge.

4.3.2.1 Influence of age on knowledge

Cross tabulation was done to determine whether participants' age had an influence on their knowledge. The results show that participants who were older than 50 years were the least knowledgeable as 45.5% (n=5) fell within the low knowledge category compared with 26.7% (n=4) who were 40-49 years old, 24% (n=6) who were 30-39 years old and 18.5% (n=5) who were 20-29 years old. The cross tabulation shows that many of the younger participants fell into the high and very high knowledge categories, with 70.4% (n=19) and 11.1% (n=3) of the 20-29 year olds in each of these groups respectively.

Similar results were found in the 30-39 years age group although not as high as the 20-29 year old group. Again, the majority (68%: n=11) fell into high knowledge group, with 8% in the very high knowledge group. Interestingly, none of the participants over 40 years old fell into the very high knowledge group. While this would seem to indicate that young age is associated with high knowledge, Fisher's exact test showed an insignificant result; Fisher's exact value = 4.4, df = 0 and p-value = 0.615 (Table 4.12).

Table 4.12: Cross tabulation of age and level of knowledge

Age		Evidence based practice knowledge level			Total
		Low knowledge	High knowledge	Very high knowledge	
20-29 years	n	5	19	3	27
	%	18.5%	70.4%	11.1%	100.0%
30-39 years	n	6	17	2	25
	%	24.0%	68.0%	8.0%	100.0%
40-49 years	n	4	11	0	15
	%	26.7%	73.3%	0.0%	100.0%
>50 years	n	5	6	0	11
	%	45.5%	54.5%	0.0%	100.0%
Total	n	20	53	5	78
	%	25.6%	67.9%	6.4%	100.0%

4.3.2.2 Influence of nursing category on evidence-based practice knowledge

A cross-tabulation was done to determine the relationship between nursing category and level of evidence-based practice knowledge. The results displayed in Figure 4.12 show that professional nurses were more knowledgeable compared to the rest of the categories, as only 4.2% (n=1) of the professional nurses had low knowledge, while 83.3% (n=20) and 12.5% (n=3) had high knowledge and very high knowledge respectively. Registered nurses and NMTs, on the other hand, displayed similar levels of knowledge with 33.3% (n=2) of registered nurses and 35.4% (n=17) of NMTs having low knowledge and 66.7% (n=4) of registered nurses and 60.4% (n=29) of NMTs having high knowledge. Fisher's exact test showed a very significant result with Fisher's exact value = 10.4, df = 0, and p-value = 0.020. Thus, there is a relationship between nursing category and

knowledge, the higher the nursing category, the higher the level of knowledge and the lower the nursing category, the lower the knowledge level.

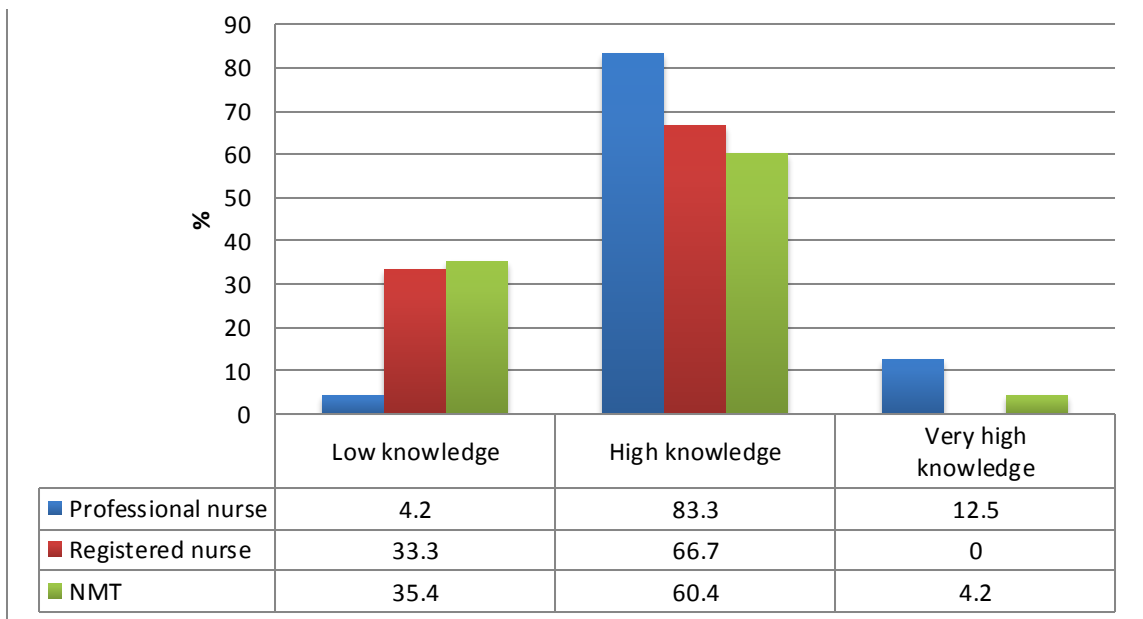


Figure 4.12: Nursing category and level of knowledge

4.3.2.3 Influence of qualification on level of knowledge of EBP

Cross tabulation of the participants' qualification and level of knowledge of evidence-based practice shows that the bachelors degree nurses were the most knowledgeable about evidence-based practice, with 88.3% (n=30) having high knowledge, 12.5% (n=3) very high knowledge and only 4.2% (n=1) having low knowledge. Nurses with certificates were the least knowledgeable, with only 58.6% (n=17) having high knowledge and 41.4% (n=12) having low knowledge. College diploma nurses were more knowledgeable than university trained diploma nurses as 10.5% (n=2) of the college diploma nurses had very high knowledge while none of the university diploma nurses had very high knowledge. Fisher's exact test shows a very significant relationship between education level and evidence-based practice knowledge with a value of 13.5, df = 0, p-value = 0.015 (Table 4.13).

Table 4.13: Qualification and knowledge of EBP

Qualification		Evidence-based practice knowledge level			Total
		Low knowledge	High knowledge	Very high knowledge	
Bachelors degree	n	1	20	3	24
	%	4.2%	83.3%	12.5%	100.0%
University diploma	n	2	4	0	6
	%	33.3%	66.7%	0.0%	100.0%
College diploma	n	5	12	2	19
	%	26.3%	63.2%	10.5%	100.0%
Certificate	n	12	17	0	29
	%	41.4%	58.6%	0.0%	100.0%
Total	n	20	53	5	78
	%	25.6%	67.9%	6.4%	100.0%

4.3.2.4 Influence of work experience on level of EBP knowledge

The results shown in Table 4.14 illustrate that only those participants with less than five years' experience indicated that they had very high knowledge of evidence-based practice (16.1%: n=5) although more of this group indicated low knowledge levels than those who had experience of 5-10 years. Furthermore, 92.9% (n=13) of those in the 5-10 years' experience group indicated that they had a high level of knowledge, with only 7.1% (n=1) having low knowledge. Fisher's exact test shows a very significant relationship, Fishers value = 13.8, df = 0, p = 0.038.

Table 4.14: Cross tabulation of experience and level of EBP knowledge

Experience		Evidence based practice knowledge level			Total
		Low knowledge	High knowledge	Very high knowledge	
<5years	n	6	20	5	31
	%	19.4%	64.5%	16.1%	100.0%
5-10years	n	1	13	0	14
	%	7.1%	92.9%	0.0%	100.0%
11-15 years	n	5	4	0	9
	%	55.6%	44.4%	0.0%	100.0%
16-20 years	n	2	9	0	11
	%	18.2%	81.8%	0.0%	100.0%
>20 years	n	6	7	0	13
	%	46.2%	53.8%	0.0%	100.0%
Total	n	20	53	5	78
	%	25.6%	67.9%	6.4%	100.0%

4.3.2.5 Influence of evidence-based practice training on knowledge

Cross tabulation of evidence-based practice training and knowledge shows that 76.3% (n=29) of those who had been trained in evidence-based practice had high knowledge compared to 60% (n=24) of those who had not been trained. Additionally, 7.9 % (n= 3) of those who had been trained had very high knowledge compared to 5% (n=2) of those who had not been trained. Only 15.8% (n=6) of the trained participants possessed low knowledge compared to 35% (n=14) of those who had not been trained. Thus, it can be said that training on evidence-based practice influences knowledge. However, Fisher’s exact test shows an insignificant result; Fisher’s exact value = 3.8, df= 0, p-value = 0.157 (Figure 4.13).

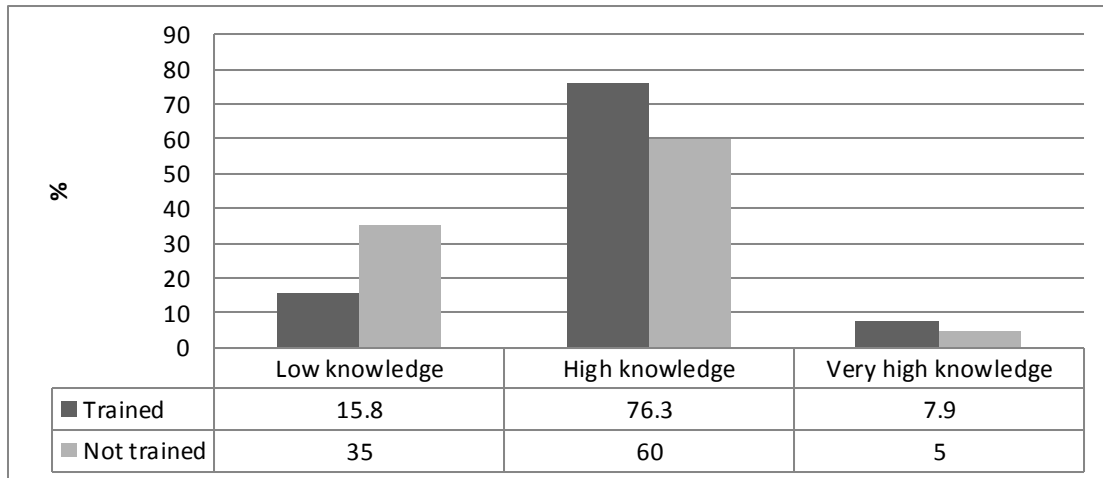


Figure 4.13: Evidence based practice training and knowledge

4.3.3 Social-demographics and individual knowledge items

Cross tabulations were performed for social-demographics and some items on the knowledge scale to determine if there were any differences between groups.

4.3.3.1 Qualification and research skills

It is worth noting that although the results for research skills were not statistically significant with a Fisher's exact value of 3.6, $df=0$ and p -value of 0.736, the cross-tabulation indicated that more nurses with a bachelors degree, 45.8% ($n=11$) possessed high levels of skill in research than university diploma nurses (28.6%: $n=2$), college diploma nurses (28.6%: $n=6$) and certificate nurses (34.5%: $n=5$).

4.3.4 Sources of knowledge for EBP

The participants were further asked to indicate the sources of knowledge they utilize for practice by responding to a five point Likert scale with options ranging from never to always. Due to very few observations on some of the categories, categories of never, seldom and sometimes were

combined as seldom, while frequently and always were combined as frequent. Table 4.15 displays the results of the sources of knowledge that are used by the nurses.

Slightly more than half of the participants (51.3%: n=41) indicated that they frequently use information that they learn about each patient/client as an individual while 48.4% (n=39) indicated that they seldom use that source. When asked whether they are guided by their intuitions about what seems right for the patient, 42.5% (n=34) indicated that they are frequently guided by their intuitions, while 57.5% (n=46) indicated that they seldom are. A good number (59.3%: n=48) indicated that they frequently use their personal experience of caring for patients over time while 40.7% (n=33) indicated that they seldom use personal experience. While the majority of the participants (66.3%: n=53) indicated that they seldom use what has worked for them for years, 33.8% (n=27) indicated that they use it frequently. Similarly, when asked if they do things the way they have always done them, 65 % (n=52) indicated seldom, while 35% (n=28) indicated frequent.

Pertaining to using information shared by fellow practitioners, 50.6% (n=41) said they seldom use this source, while 49.4% (n=40) said they use it frequently. Similarly, 51.3% (n=41) indicated that they seldom use information shared by senior nurses, while 48.8% (n=39) indicated that frequently use information shared by senior nurses and 55% (n=44) indicated that they seldom use what doctors discuss with them, while 45% (n=36) reported that they frequently make use of that source. Again, just over half of the participants (51.9%: n=42) indicated that they frequently use new treatments and medications that they learn about when doctors prescribe them for patients, but 48.1% (n=39) indicated that they seldom use this source of information. Information from pharmaceutical or equipment company representatives is seldom used by 59.3 % (n=48) of the participants and frequently by 40.7% (n=33). The majority of the participants (69.9%: n=55) also indicated that they seldom use information from product literature and 32.1% (n=26) indicated that

they use it frequently. When asked whether they use information from their training, the majority of the participants (70.4%: n=57) indicated that they frequently use it, with only 29.6 % (n=24) reporting that they seldom use it. Likewise, information from in-service training is used frequently by the majority of the participants (65.4%: n=53) and only 34.6% (n=28) seldom use it. Information from local policy and protocols is also frequently used by the majority of the participants (60.5%: n=49) and only 39.5 % (n=32) seldom use it. Similarly, 58% (n=47) of the participants also agreed that they frequently use information from national policy initiative and guidelines, while 42% (n=34) indicated that they seldom use it.

When asked if they use information from local audit reports, the majority 80.2% (n=65) indicated seldom use, while only 19.8% (n=16) said they use it frequently. Similarly, the majority of the participants indicated that they seldom make use of research, with 86.4 % (n=70) indicating that they seldom make use of articles published in medical journals and 87.7% (n=71) indicating seldom use of articles published in nursing and research journals. Only 13.6% (n=11), and 12.3% (n=10) indicated that they frequently use information from these respective journals. Table 4.15 further shows that text books are seldom used by 61.7% (n=50) of the participants, with only 38.3% (n=31) indicating that they frequently use them. The internet is also a source of knowledge that is seldom used, with 81.5% (n=66) indicating seldom use and only 18.5% (n=15) indicating that they use it frequently. Finally, information from the media is also seldom used by the majority of the participants (77.5%: n=62), with only 22.5% (n=18) indicating that they use it frequently.

The results therefore show that the frequently used sources of knowledge for PMTCT are college training, in-service training, personal experience, and policy initiatives and guidelines. Articles published in nursing journals, research journals, medical journals, local audit reports and the internet are the sources of knowledge that are least utilized by the nurses.

Table 4.15: Sources of knowledge for PMTCT practice

	Seldom		Frequently	
	n	%	n	%
Information that I learn about each patient/client as an individual	39	48.8	41	51.3
My intuitions about what seems to be right' for the patient/client	46	57.5	34	42.5
My personal experience of caring for patients/clients over time	33	40.7	48	59.3
What has worked for me for years	53	66.3	27	33.8
The ways that I have always done it	52	65.0	28	35.0
Information my fellow practitioners share	41	50.6	40	49.4
Information senior clinical nurses share, e.g. clinical nurse specialists, nurse practitioners	41	51.3	39	48.8
What doctors discuss with me	44	55.0	36	45.0
New treatments and medications that I learn about when doctors prescribe them for patients	39	48.1	42	51.9
Medications and treatments I gain from pharmaceutical or equipment company representatives	48	59.3	33	40.7
Information I get from product literature	55	67.9	26	32.1
Information I learn in my training	24	29.6	57	70.4
Information I get from attending in-service training/conferences	28	34.6	53	65.4
Information I get from local policy and protocols	32	39.5	49	60.5
Information I get from national policy initiatives/guidelines	34	42.0	47	58.0
Information I get from local audit reports	65	80.2	16	19.8
Articles published in medical journals	70	86.4	11	13.6
Articles published in nursing journals	71	87.7	10	12.3
Articles published in research journals	71	87.7	10	12.3
Information in textbooks	50	61.7	31	38.3
Information I get from the Internet	66	81.5	15	18.5
Information I get from the media (e.g. Magazines, TV)	62	77.5	18	22.5

4.3.4.1 Social-demographics and sources of knowledge used by the participants

Some items on source of knowledge were cross-tabulated with social-demographic variables to determine if there were differences among groups in terms of knowledge source used.

4.3.4.2 Use of information from training (college) and experience

A cross tabulation was performed for use of knowledge from pre-service training and experience since knowledge keeps changing and therefore at some point the knowledge from school may not always be relevant. The results, however, show that the more experienced nurses use knowledge from their training more than the less experienced. The majority (80%; n=12) of those having more than 20 years' experience use this source of knowledge more frequently than the group of those with less than five years' experience (62.5%: n=20). However, no significant association was found using Fisher's exact test; Fishers exact value = 1.7, df = 0 p-value = 0.815 (Table 4.16).

Table 4.16: Experience and use of knowledge from training

Experience		Information from training		Total
		Seldom use	Frequent use	
< 5 year		12	20	32
	%	37.5%	62.5%	100.0%
5-10 years	n	4	10	14
	%	28.6%	71.4%	100.0%
11-15 years	n	2	7	9
	%	22.2%	77.8%	100.0%
16-20 years	n	3	8	11
	%	27.3%	72.7%	100.0%
>20years	n	3	12	15
	%	20.0%	80.0%	100.0%
Total	n	24	57	81
	%	29.6%	70.4%	100.0%

4.3.4.3 Use of information from in-service and PMTCT training

Across tabulation was performed between use of in-service knowledge and PMTCT training. While it is encouraging to note that the majority of the trained participants (71.9%: n=41) put the knowledge into practice, it was surprising that 50% (n=12) of those who had not received training also indicated that they frequently use that source of knowledge. The results are therefore contradictory (Figure 4.14).

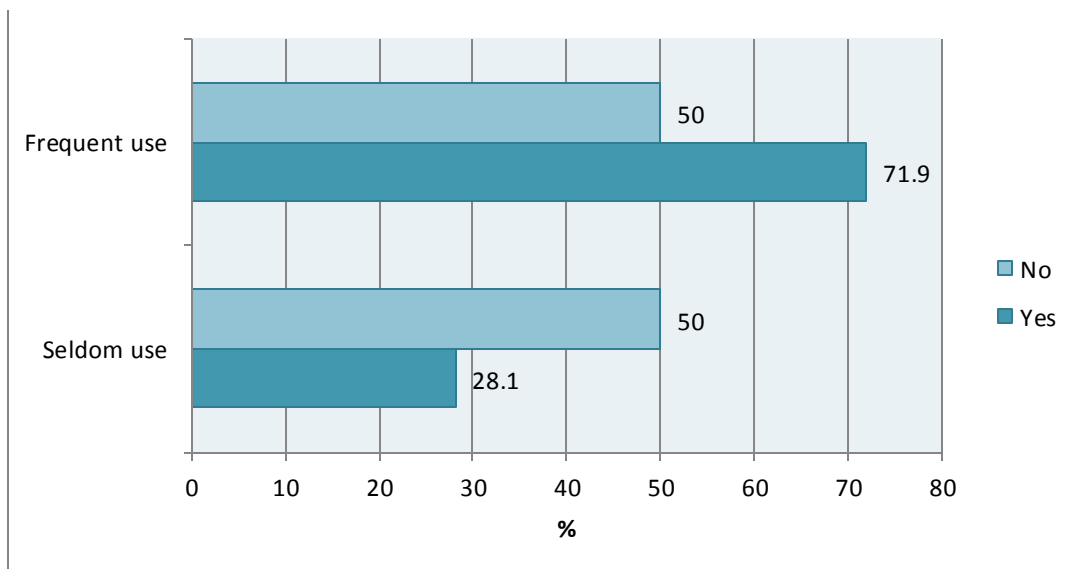


Figure 4.14: Use of in-service knowledge and PMTCT training

4.3.4.4 Knowledge of EBP and source of knowledge used

Cross-tabulation was also performed between nurses' sources of knowledge and some items on knowledge of evidence-based practice to determine if level of knowledge determines choice of source of knowledge.

4.3.4.4.1 Research skills and use of research as source of knowledge

There were no differences in the use of research as a knowledge source between those with poor skills and those with good/very good skills as use of research as a knowledge source was very low among both groups. For instance, 87.5% (n=7) of those with very high knowledge indicated that they seldom use articles from nursing journals, compared with 86.5 % (n=45) of those with low knowledge. Fishers exact value = 0.3, df = 0, p-value = 1.

4.4 ATTITUDES TOWARDS EVIDENCE BASED PRACTICE

Attitude towards evidence based practice was measured on a five point Likert scale ranging from strongly agree to disagree. However, due to few responses on some options, the scale was reduced to only three options, with the options of strongly agree and agree being combined as agree, and strongly disagree and disagree being combined as disagree. The results have been displayed in Table 4.17.

The majority of the participants (59.3%: n=48) agreed with the statement that their workload was too great for them to keep up-to date with all the new evidence, while only 32.1% (n=26) disagreed and 8.6% (n=7) took a neutral stance. The majority of participants (87.7%: n=71) disagreed with the statement that they resent having their clinical practice questioned, with only 6.2% (n=5) agreeing and 6.2 % (n=5) remaining neutral.

The results further show that 43.2% (n=35) of the participants disagreed with the statement that evidence-based practice is a waste of time, while 23.5% (n=19) agreed. Interestingly, a high number (33.3%: n=27) were neutral. More than half of the participants (55.6%: n=45) disagreed

with the statement that they stick to tried and trusted methods rather than changing to anything new, while 29.6% (n=24) were in agreement. The remaining 14.8 % (n=12) were neutral.

Table 4.17: Attitudes towards evidence based practice

Item	Agree		Neutral		Disagree	
	n	%	n	%	n	%
My workload is too great for me to keep up-to-date with all the new evidence	48	59.3	7	8.6	26	32.1
I resent having my clinical practice questioned	5	6.2	5	6.2	71	87.7
Evidence-based practice is a waste of time	19	23.5	27	33.3	35	43.2
I stick to tried and trusted methods rather than changing to anything new	24	29.6	12	14.8	45	55.6

4.4.1 Overall attitude scores

As previously discussed, the attitude scale was on a five point Likert scale with responses of strongly agree scored as one, agree as two, neutral as three, disagree as four and strongly disagree as five. The possible minimum score was four and the maximum was 20, with a score of 13 and above indicating more favorable attitudes. The minimum score for the participants was four and the maximum score was 20. The mean score was 13.5, with a standard deviation of 3.4. Grouping of the attitude scores shows that the majority of the participants 64.2% (n=52) had a more favorable attitude while only 35.8% (n= 29) had a less favorable attitude (Table 4.18).

Table 4.18: Attitudes scores

Attitude	Score	n	%
Less favorable attitude	4-12	29	35.8
More Favorable attitude	13-20	52	64.2
Total	20	81	100.0

4.4.2 Relationships between items in the attitude scale

Cross tabulations were done on some items in the attitude scale to determine if perception of one item might have an influence on perception of another. Cross-tabulation of the items ‘my workload is too great for evidence based practice’ and ‘evidence based practice is a waste of time’ showed no relationship in the perceptions of the two items as 100% (n=6) of those who were neutral on workload disagreed that evidence-based practice is a waste of time. Fisher’s exact test showed a significant difference in the perception of the two items with a value of 12.7, df= 0 and p-value =0.007. Similarly, the items ‘I resent my clinical practice questioned’ and ‘I stick to old and trusted rather than changing to something new’ were cross tabulated. The results also show no relationship in the perception of the two items. Of the group that was neutral on resenting their clinical practice being questioned, only 60% (n=3) were also neutral on sticking to old and trusted ways, while 40% (n=2) disagreed. Of those that disagreed that they resent their practice being questioned, 28% (n=19) agreed, 12.7% (n=9) were neutral while 60.6 % (n=43) still disagreed that they stick to old and trusted ways. Fisher’s exact test, shows a significant difference; Fishers exact value = 15.5, df= 0 and p-value = 0.001.

4.4.3 Influence of social-demographic variables on items on the attitude scale

Individual items on the attitude scale were cross tabulated with social-demographic variables to determine if the social-demographics influenced participants' responses to those items and hence had an influence on their attitudes.

4.4.3.1 Cross tabulation of age and resenting questioning

A statistical significance was noted only on age and responses to the item 'I resent having my clinical practice questioned'. None of the participants' aged younger than 40 years agreed to this statement. In the 20-29years age group, 92.9% (n=26) disagreed, none agreed and only 7.1% (n=2) were neutral. In the 30-39 years age group, 92% (n=23) disagreed, none agreed and only 8% (n=2) were neutral. In the 40-49 age group, 87.5 % (n=14) disagreed, 6.3% (n=1) agreed and a similar number were neutral. The over 50 year age group, however, demonstrated a negative attitude as only 66.7% (n=8) disagreed while 33.3% (n=4) agreed. Fisher's exact test shows a very significant relationship between experience and resisting change; Fishers exact value = 12.1, df = 0 and p-value = 0.001(Figure 4.15).

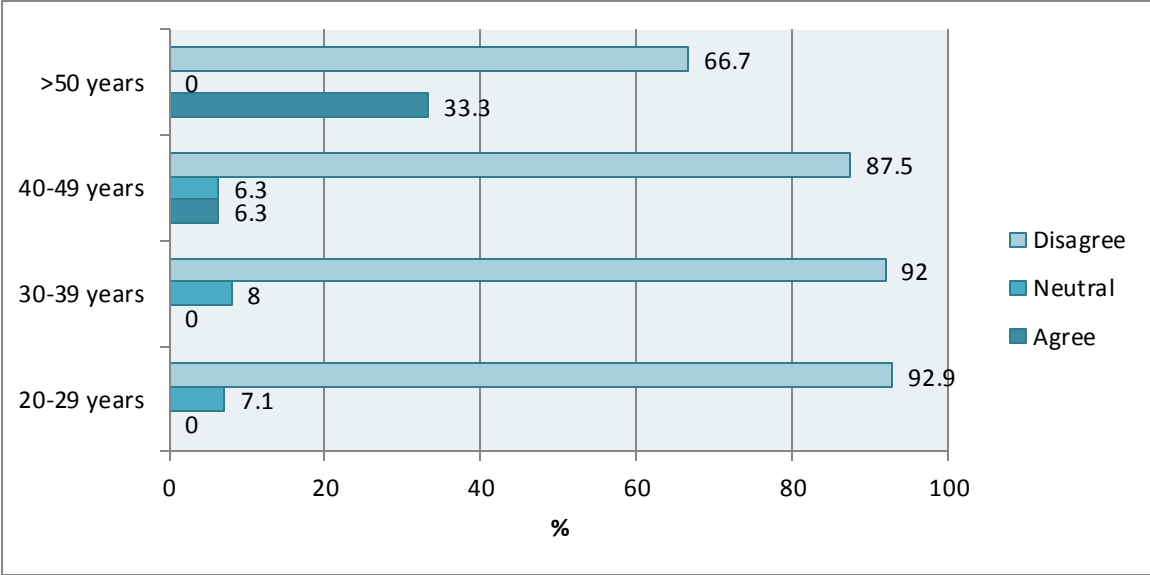


Figure 4.15: Age and resenting clinical practice being questioned

4.4.3.2 Nursing category, qualification and perception of workload

Although they were not statistically significant, differences were also noted with respect to nursing category and qualification in responses to the item relating to work load being too great for evidence-based practice. The majority of professional nurses (75 %: n=18) agreed to this statement compared to 28.6 % (n=2) of the registered nurses and 56% (n=28) of the NMTs. Similarly, the majority of the nurses with a bachelors degree (75 %: n=18) were also in agreement, compared with 28.6% (n=2) of those with a university diploma, 52.4% (n=11) of those with a college diploma and 58.6% (n=17) of those who had a certificate.

4.4.4 Influence of social-demographics on overall attitude

Cross-tabulations were done to determine the influence of social-demographic variables on overall attitude.

4.4.4.1 Evidence-based practice training and attitude

The only social-demographic variable that showed significant differences in terms of attitude was evidence-based practice training. The majority of the participants who were trained in EBP (75%: n=30) had a more favorable attitude compared with those who were not trained (53.7%: n=22). Only 25% (n=10) of those trained had an unfavorable attitude compared to 46.3% (n=19) of those who were not trained. Pearson's chi-squared test also showed significant results $X^2 = 4.0$, $df = 1$ and $p\text{-value} = 0.045$ (Figure 4.16).

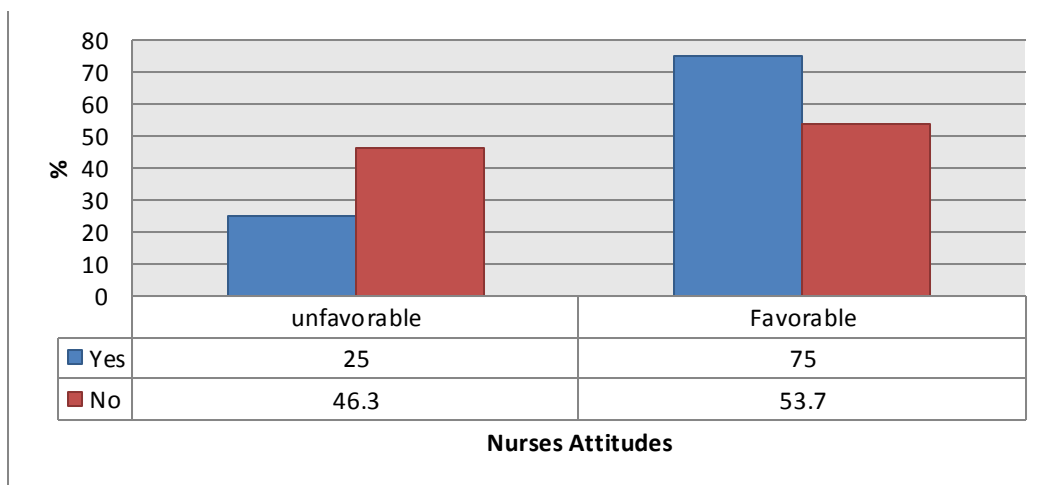


Figure 4.16: Evidence-based practice training and attitudes

4.4.4.2 Age and attitude

Although not statistically significant, an interesting difference was noted with respect to age and attitudes. The cross-tabulated results showed that the higher the age, the less favorable the attitudes, with 50% (n=6) of those in the older than 50 years category having less favorable attitudes compared to 28.6% (n=8) of those aged 20-29 years. The results for the other social-demographic variables and attitude are shown in Table 4.19.

Table 4.19: Influence of social-demographics on attitude of EBP in PMTCT

Variable	Test	Value	df	p-value
Age	Pearson chi-squared	1.7	3	0.635
Gender	Fishers exact	-	0	0.705
Nursing category	Fishers exact	4.8	0	0.089
Qualification	Fishers exact	4.9	0	0.174
Experience	Pearson chi-squared	1.8	4	0.759

4.5 PRACTICE OF EVIDENCE BASED PRACTICE IN PMTCT

To assess the nurses' practices of evidence-based practice, the participants were requested to respond to 17 questions to establish how many times in the preceding eight weeks they had performed certain activities to improve PMTCT services. The responses were on a five point Likert scale, ranging from 0 times to more than eight times. Due to few responses on most of the categories, categories of 1-3 times and 4-6 times were combined as 1-6 times, and 6-8 times and more than 8 times were combined as more than 6 times.

The results show that in terms of sharing patient outcome data with colleagues, only 8.6% (n=7) of the participants indicated that they had done this more than 6 times, while the majority (55.6%: n=45) indicated that they had done this 1-6 times and 35.8% (n=29) indicated 0 times. Only 6.2% (n=5) indicated that they had shared evidence from a study in the form of a report for more than 6 times, 33.3% (n=27) had done this 1-6 times, with the majority (60.5%: n=49) indicating that they had never done this. Similarly, only 11.1% (n=9) indicated that they had shared evidence-based practice guidelines with a colleague more than 6 times, 48.1% (n=39) indicated that they had done this 1-6 times, while 40.7% (n=33) indicated that they had never practiced this. The results further

show that only 3.7% (n=3) indicated that they had shared evidence from a research study with a multidisciplinary team member more than 6 times, 32.1% (n=26) responded that they had done this 1-6 times and the majority (64.2%: n=52) indicated that they had never done this.

A very small number of the participants 2.5% (n=2) indicated that they had used evidence-based practice guidelines or systematic reviews to change PMTCT practice more than 6 times, 40.7% (n=33) indicated that they had done this 1-6 times, but the majority (56.8%: n=46) indicated that they had never referred to EBP guidelines in the 8 weeks prior to the study. Similarly, only 4.9% (n=4) indicated that they changed practice based on patient outcomes data more than 6 times, while 50.6% (n=41) of the remaining participants indicated that they had done this 1-6 times and 44.4% (n=36) indicated that they had never changed practice based on patient outcome data. The analysis further revealed that only 4.9% (n=4) indicated that they had evaluated a care initiative by collecting patient outcome data more than 6 times, while 54.3% (n=3) indicated that they had done this 1-6 times and 40.7% (n=33) indicated that they had never done it. Furthermore, only 3.7% (n=3) had evaluated the outcomes of a practice change more than 6 times whereas 49.4% (n=40) had done this more than 1-6 times and 46.9% (n=38) had never done it.

Only 12.5% (n=10) of the participants indicated that they had promoted the use of evidence based practice to their colleagues more than 6 times in the previous eight weeks, while 45% (n=36) indicated that they had done this 1-6 times and 42.5% (n=34) indicated that they had never done it. Similarly, only 9.9% (n=8) indicated that they had made use of evidence to change clinical practice more than 6 times, while 54.3% (n=44) indicated they had only done this 1-6 times and the remaining 35.8% (n=29) had never performed this activity. Likewise, 4.9% (n=4) indicated that they shared evidence from a research study with a patient/family member more than 6 times,

while 38.3% (n=31) had only done this 1-6 times and the majority (56.8%: n=46) had never shared evidence from a research study with patients.

When it comes to reading and critically appraising a clinical research study, only 2.5% (n=2) indicated that they had done this more than 6 times, 33.3% (n=27) indicated they had done it 1-6 times and the majority (64.2%: n=52) had never performed this activity. Also, a very small number of the participants (3.7%: n=3) indicated that they had informally discussed evidence from a research study with a colleague more than 6 times, while 37% (n=30) indicated that they had done this 1-6 times and the majority (59.3%: n=48) indicated that they had never performed this activity.

When asked how many times in the last 8 weeks they had critically appraised evidence from a research study, only 1.2% (n=1) of the participants indicated that they had done it more than 6 times, 29.6% (n=24) indicated 1-6 times, while the majority (69.1%: n=56) indicated that they had never done it. Similarly, when asked how many times they had generated a PICO question about clinical practice, only 6.2% (n=5) indicated more than 6 times, 30.9% indicated 1-6 times and, once again, the majority (63%: n=51) indicated that they had never done it. Surprisingly, only 22.2% (n=18) of the participants indicated that they had collected data on a patient problem more than 6 times, 51.9% (n=42) indicated that they had done this 1-6 times and 25.9% (n=21) indicated that they had never performed this activity. Finally, when asked how many times they had accessed the Cochrane database of systematic reviews, only 3.7% (n=3) indicated more than 6 times, 23.5% (n=19) indicated 1-6 times and 72.8% (n=59) indicated 0 times (Table 4.20).

Table 4.20: The participants’ practice of evidence based practice in PMTCT

Item	0 times		1-6 times		> 6 times	
	n	%	n	%	n	%
Shared the patient outcome data collected with colleagues.	29	35.8	45	55.6	7	8.6
Shared evidence from a study/is in the form of a report or presentation to >2 colleagues.	49	60.5	27	33.3	5	6.2
Shared evidence-based practice guidelines with a colleague	33	40.7	39	48.1	9	11.1
Shared evidence from a research study with a multidisciplinary team member.	52	64.2	26	32.1	3	3.7
Used an evidence-based practice guideline or systematic review to change clinical practice at work.	46	56.8	33	40.7	2	2.5
Changed practice based on patient outcome data.	36	44.4	41	50.6	4	4.9
Evaluated a care initiative by collecting patient outcome data	33	40.7	44	54.3	4	4.9
Evaluated the outcomes of a practice change.	38	46.9	40	49.4	3	3.7
Promoted the use of evidence based practice to colleagues.	34	42.5	36	45.0	10	12.5
Used evidence to change clinical practice.	29	35.8	44	54.3	8	9.9
Shared evidence from a research study with a patient/family member.	46	56.8	31	38.3	4	4.9
Read and critically appraised a clinical research study.	52	64.2	27	33.3	2	2.5
Informally discussed evidence from a research study with a colleague	48	59.3	30	37.0	3	3.7
Critically appraised evidence from a research study.	56	69.1	24	29.6	1	1.2
Generated a PICO question about clinical practice.	51	63.0	25	30.9	5	6.2
Collected data on a patient problem.	21	25.9	42	51.9	18	22.2
Accessed the Cochrane database of systematic reviews	59	72.8	19	23.5	3	3.7

4.5.1 Overall practice scores

The response options ranged from 0 times as score zero, 1-3 times as one, 4-6 times as two, 6-8 times as three and more than 8 times as four. The possible minimum score was 0 and the maximum score was 68. According to the results of the analysis, the scores were not normally distributed and the minimum score was 0 and the maximum was 51, with a median score of 11 and an interquartile range of 15. Since the majority of the observations were in the 0-2 score and very few above 2, the scores were grouped into only two categories where a score of less than 34 indicated low practice and a score of 35-68 indicated high practice. The majority of the participants (95%: n=76) fell within the low practice group, while only 5% (n=4) fell within the high practice group (Table 4.21).

Table 4.21: Overall practice scores

	Score	n	%
Low practice	0-34	76	95.0
High practice	35-68	4	5.0
Total	68	80	100.0

4.5.2 Influence of social demographics on practice

Cross-tabulations were done to determine if the participants' age, gender, nursing category, qualification, experience, department, and PMCTC and evidence-based practice training had an influence on practice.

The results only showed a significant relationship between age and practice. As shown in Table 4.22, all 28 participants in the 20-29 year age group and 25 in the 30-39 year age group fell within the low practice category. On the other hand, 18.8% (n=3) of those aged 40-49 years and 9.1%

(n=1) of those older than 50 years fell into the high practice group. Thus, practice is positively associated with age. Fisher's exact test also showed significant results; Fisher's exact value = 7.3, df = 0 and p-value = 0.012.

Table 4.22: Cross tabulation of age and practice

Age		Practice of evidence based practice		Total
		Low practice	High practice	
20-29years	n	28	0	28
	%	100.0%	0.0%	100.0%
30-39years	n	25	0	25
	%	100.0%	0.0%	100.0%
40-49years	n	13	3	16
	%	81.3%	18.8%	100.0%
>50 years	n	10	1	11
	%	90.9%	9.1%	100.0%
Total	n	76	4	80
	%	95.0%	5.0%	100.0%

The variables gender, nursing category, qualification, experience, department, and PMTCT and evidence based practice training showed no significant relationship with practice, as shown in Table 4.23. However, surprising results were noted between evidence-based practice and qualification, nursing category and training in evidence-based practice as those who reported high practice were those with low knowledge. None of the nurses with a bachelors degree reported high practice compared with 50% (n=2) of the certificate nurses and 25% (n=1) of both diploma groups. Similarly, in terms of nursing category, 75% (n=3) of those who reported high practice were NMTs

and 25% (n=1) were registered nurses. In terms of evidence-based practice training, 75% (n=3) of those who were not trained reported high practice, while the remaining 25% (n=1) were the trained.

Table 4.23: Practice and demographic variables

	Test	Value	df	p-value
Gender	Fishers exact	-	0	1.0
Nursing Category	Fishers exact	2.7	0	0.256
Qualification	Fishers exact	3.1	0	0.390
Experience	Fishers exact	4.2	0	0.224
Department	Fishers exact	1.1	0	0.634
PMTCT training	Fishers exact	-	0	0.574
Evidence based practice training	Fishers exact	1.0	0	0.615

4.5.3 Practice and level of knowledge

Cross tabulations were performed between some of the items in the practice scale and items in the knowledge scale to test if they had an influence on practice.

4.5.3.1 Research skills and critically appraising evidence from a study

No statistically significant difference was found between research skills and reading and appraising research study: Fisher's exact value = 2.4, df = 0 and p-value = 0.662. However, a high number (50%: n=4) of those with very high research skills performed this activity for 1-6 times compared with 32.7% (n=17) for those with low research skills (Figure 4.17).

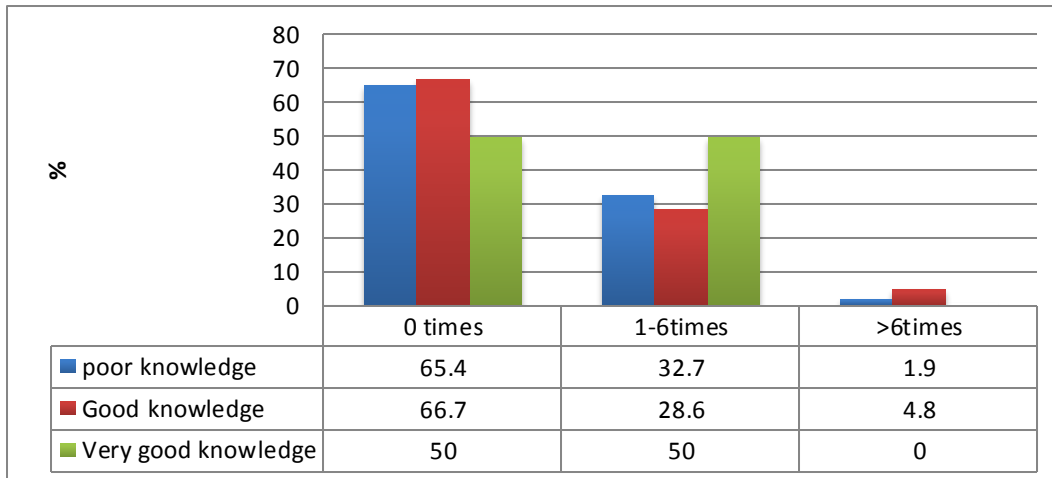


Figure 4.17: Research skills and frequency of reading and appraising research evidence

4.5.3.2 Ability in reviewing own practice and evaluating the outcomes of a practice

A cross tabulation was done on the participants' ability in reviewing their own practice and evaluating the outcomes of practice. The results show that those with high knowledge are more likely to perform this activity as 65.9% (n=22) of those with very high knowledge indicated that they performed this activity 1-6 times, compared to 40.5% (n=17) of those with high knowledge and 25% (n=1) of those with low knowledge. Fisher's exact test, however, shows no significant relationship; Fisher's exact value = 5.5, df = 0 and p-value = 0.219 (Table 4.24).

Table 4.24: Ability to review own practice and evaluating the outcomes of practice

Ability to review own practice		Evaluated the outcomes of a practice change			Total
		0times	1-6times	>6times	
Poor knowledge/skill	n	3	1	0	4
	%	75.0%	25.0%	0.0%	100.0%
Good Knowledge/skill	n	23	17	2	42
	%	54.8%	40.5%	4.8%	100.0%
Very good knowledge/skill	n	12	22	1	35
	%	34.3%	62.9%	2.9%	100.0%
Total	n	38	40	3	81
	%	46.9%	49.4%	3.7%	100.0%

4.6 INTERRELATIONSHIPS BETWEEN SOCIAL-DEMOGRAPHICS, KNOWLEDGE, ATTITUDE AND PRACTICES

Non-parametric tests and Spearman's rho were performed to examine interrelationships between social-demographics, knowledge, attitude and practices.

4.6.1 Interrelationships between social-demographic variables and evidence-based practice knowledge, attitude and practices

Kruskal Wallis and Mann Whitney U tests were performed to test if there were any associations between social demographics, namely age, gender, nursing category, qualification, experience, department, and training in PMTCT and evidence based practice, and knowledge, attitude and practices of evidence-based practice in PMTCT. For analysis purposes, qualification and nursing category were transformed for the test due to a very small sample in one of the groups. Professional

nurses were combined with registered nurses as registered nurses and qualification had only two groups, university trained and college trained.

Kruskal Wallis tests were performed for age, experience, department of work and length of time in department. The results found an association between knowledge and length of time in department, p -value = 0.003. No associations were found between knowledge and age, p -value = 0.861; knowledge and experience, p -value = 0.230; and knowledge and department, p -value = 0.255. Similarly, no relationships were found between age and attitude, p -value = 0.302; department and attitude, p -value = 0.434; and length of time in department and attitude, p -value = 0.752. With respect to practice, associations were found between age and practice, p -value = 0.003; experience and practice, p -value = 0.043; and department and practice, p -value = 0.031. No association was found for practice and length of time in department, p -value = 0.303.

Mann Whitney U tests were performed for gender, nursing category, qualification, and training in PMTCT and evidence-based practice. The results for gender showed no associations with knowledge, attitude and practices, with p -values of 0.334, 0.229 and 0.505 respectively. With respect to nursing category, associations were found between nursing category and knowledge, p -value = 0.035; and nursing category and practice, p -value = 0.003, but no association between nursing category and attitude, p -value = 0.135. Similarly, associations were found between qualification and knowledge, p -value = 0.035; and qualification and practice, p -value = 0.003, but no association was found between qualification and attitude, p -value = 0.135. No associations were found between PMTCT training and knowledge, p -value = 0.546; PMTCT training and attitudes, p -value = 0.296; and PMTCT training and practices, p -value = 0.259. Also, no associations were found between evidence-based practice training and knowledge, p -value =

0.245; evidence-based practice training and attitude, p-value = 0.071; and evidence-based practice training and practice, p-value = 0.053.

4.6.2 Interrelationships between evidence-based practice knowledge, attitude and practices

Spearman's rho correlation was performed to test the associations between knowledge, attitude and practices. The results showed no linear relationship between attitude and knowledge, with a correlation co-efficient value of 0.146; attitude and practice, with a correlation co-efficient value of 0.083; or knowledge and practice, with a correlation co-efficient value of 0.320 (Table 4.25).

Table 4.25: Correlation between knowledge, attitude and practice

Spearman's rho			Knowledge	Attitude	Practice
	Knowledge	Correlation	1.000	.146	.320**
		Sig 2-tailed		.203	.004
		N	78	78	78
	Attitude	Correlation	.146	1.000	.083
		Sig 2-tailed	.203	.	.464
		N	78	81	80
	Practice	Correlation	.320**	.083	1.000
		Sig 2-tailed	.004	.464	.
		N	78	80	80
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

4.7 BARRIERS TO EVIDENCE-BASED PRACTICE IN PMTCT AMONG THE NURSES

To identify the barriers to evidence-based practice in PMTCT, the participants were asked to respond to various statements. The responses were on a five point Likert scale ranging from 'strongly agree' to 'strongly disagree'. For analysis purposes, the options of 'strongly agree' and 'agree' were combined as 'agree' and 'strongly disagree' and 'disagree' were combined as 'disagree' due to low observations on some of the categories.

Just over half of the participants (51.9%: n=42) agreed with the statement that they do not know how to find appropriate research reports, while 27.2% (n=22) disagreed and 21% (n=17) were neutral. On the other hand, the majority of the participants (51.9%: n=42) disagreed with the statement that they do not know how to find organizational information, while 34.6 (n=28) agreed and 13.6% (n=11) were neutral. For the item, I do not have sufficient time to find research reports, 45.7 % (n=37) agreed, 35.8% (n=29) disagreed while 18.5% (n=15) were neutral. However, for a similar item of lack of time to find organizational information, the majority of the participants 48.1% (n=39) disagreed, while 39.5% (n=32) agreed and the remaining 12.3% (n=10) were neutral.

Pertaining to the statement that research reports are not easy to find, the majority (55.6%: n=45) agreed, while 33.3% (n=27) disagreed and the remaining 11.1% (n=9) took a neutral stance. However, in response to a similar statement that organizational information is not easy to find, the majority (55.6%: n=45) disagreed that this is a barrier, while 39.5% (n=32) agreed and 4.9% (n=4) were neutral. Just over half of the participants (50.6%: n=41) disagreed with the statement that they find it difficult to understand research reports, while 25.9 % (n=21) agreed that this is a barrier

and 23.5 % (n=19) were neutral. The majority (42%: n=34) disagreed with the statement that they lack confidence in judging the quality of research reports, while 32.1 % (n=26) agreed and 25.9% (n=21) were neutral. The majority (40.7%: n=33) agreed with the statement that they find it difficult to identify implications of research findings, 37 % (n=30) disagreed and 22.2% (n=18) remained neutral. Similarly, 37% (n=30) agreed with the statement that they find it difficult to identify the implications of organizational information to their practice, 35.8% (n=29) disagreed and 27.2% (n=22) remained neutral.

The majority of the participants (74.1%: n=60) disagreed with the statement that they do not feel confident about beginning to change practice, with only 17.3% (n=14) considering this a barrier and 8.6% (n=7) taking a neutral position. Pertaining to the statement that the culture of the team is not receptive to change, the majority 56.8% (n=46) disagreed, 28.4% (n=23) agreed and 14.8% (n=12) remained neutral. Half of the participants (50%: n=40) disagreed with the statement that they lack authority at the work place to change practice, 36.3% (n=29) agreed and 13.8% (n=11) remained neutral. The majority of the participants (67.9%: n=55) agreed with the statement that there are insufficient resources to change practice, 21% (n=17) disagreed and 11.1% (n=9) remained neutral.

The findings therefore show that the major barriers to evidence based practice in PMTCT for the nurses were insufficient resources and difficulties in accessing research reports. Other barriers include lack of knowledge on how to find appropriate research reports, lack of time to find research reports and difficulties in identifying implications of research and guidelines to practice (Table 4.26).

Table 4.26: Barriers to evidence-based practice

Item	Agree		Neutral		Disagree	
	n	%	n	%	n	%
I do not know how to find appropriate research reports	42	51.9	17	21.0	22	27.2
I do not know how to find organizational information (guidelines, protocols, etc.)	28	34.6	11	13.6	42	51.9
I do not have sufficient time to find research reports	37	45.7	15	18.5	29	35.8
I do not have sufficient time to find organizational information (guidelines/protocols, etc.)	32	39.5	10	12.3	39	48.1
Research reports are not easy to find	45	55.6	9	11.1	27	33.3
Organizational information (protocols, guidelines, etc.) is not easy to find	32	39.5	4	4.9	45	55.6
I find it difficult to understand research reports	21	25.9	19	23.5	41	50.6
I do not feel confident in judging the quality of research reports	26	32.1	21	25.9	34	42.0
I find it difficult to identify the implications of research findings for my own practice	33	40.7	18	22.2	30	37.0
I find it difficult to identify the implications of organizational information for my own practice	30	37.0	22	27.2	29	35.8
I do not feel confident about beginning to change my practice	14	17.3	7	8.6	60	74.1
The culture of my team is not receptive to changing practice	23	28.4	12	14.8	46	56.8
I lack the authority in the work place to change practice	29	36.3	11	13.8	40	50.0
There are insufficient resources to change practice	55	67.9	9	11.1	17	21.0

4.7.1 Perception of barriers and evidence based practice knowledge

Cross-tabulations were performed between some items on the knowledge scale with related items on the barriers scale to determine if participants are being consistent in their responses because one would expect poor knowledge on a particular theme to be a hindrance to evidence-based practice.

4.7.1.1 Knowledge of how to retrieve evidence versus I do not know how to find appropriate research reports

The results show consistency in the responses as 66.7% (n=28) of those with poor knowledge of how to retrieve evidence indicated not knowing how to find research reports as being a barrier compared with 44.4% (n=12) and 20% (n=2) of those with good and very good knowledge respectively. Fisher's exact test results also show significant differences among the groups in their perception of this item as a barrier; value = 14.4, df = 0, p-value = 0.004 (Table 4.27).

Table 4.27: Cross tabulation of skill in evidence retrieval and its perception as a barrier

Knowledge of how to retrieve evidence		I do not know how to find research reports			Total
		Agree	Neutral	Disagree	
Poor knowledge/skill	n	28	9	5	42
	%	66.7%	21.4%	11.9%	100.0%
Good Knowledge/skill	n	12	5	10	27
	%	44.4%	18.5%	37.0%	100.0%
Very good knowledge/skill	n	2	1	7	10
	%	20.0%	10.0%	70.0%	100.0%
Total	n	42	15	22	79
	%	53.2%	19.0%	27.8%	100.0%

4.7.1.2 Research skills and perception of difficulties in understanding research reports

A cross-tabulation was performed between research skills and participants perceiving difficulties in understanding research reports as a barrier. The results are contradictory for the poor knowledge group as only 26.9% (n=24) of those with poor research skills agreed that this is a barrier, while 40.4% (n=21) disagreed and the remaining 32.7% (n=17) were neutral (Table 4.28).

Table 4.28: Research skills and difficulties in understanding research reports barrier

Research skills		I find it difficult to understand research reports			Total
		Agree	Neutral	Disagree	
Poor knowledge/skill	n	14	17	21	52
	%	26.9%	32.7%	40.4%	100.0%
Good Knowledge/skill	n	5	2	14	21
	%	23.8%	9.5%	66.7%	100.0%
Very good knowledge/skill	n	2	0	6	8
	%	25.0%	0.0%	75.0%	100.0%
Total	n	21	19	41	81
	%	25.9%	23.5%	50.6%	100.0%

4.8 FACILITATORS TO EVIDENCE BASED PRACTICE IN PMTCT

Facilitators to evidence-based practice were measured by requesting participants to respond to various suggestions on a five point Likert scale, ranging from ‘strongly agree’ to ‘strongly disagree’. For analysis purposes, the ‘strongly agree’ and ‘agree’ options were combined as ‘agree’ and ‘strongly disagree’ and ‘disagree’ were combined as ‘disagree’ due to low observations in some of the categories.

The majority of participants (70.4%: n=57) agreed that nursing colleagues who embrace evidence-based practice will facilitate evidence based practice. Only 13.6% (n=11) disagreed and 16 % (n=13) were neutral. Similarly, the majority (65.4%: n=53) agreed that nursing management who embrace evidence based practice will facilitate evidence-based practice. Only 12.3% (n=10) disagreed and 22.2% (n=18) remained neutral.

Although participants had not considered lack of knowledge as a major barrier to evidence-based practice, the majority (84%: n=68) agreed that adequate training in evidence-based practice will facilitate evidence-based practice. Only 6.2% (n=5) disagreed and 9.9% (n=8) were neutral. Similarly, although participants had indicated that time was not a major barrier, 77.5% (n=62) agreed that being allocated protected time to conduct evidence-based practice would act as a facilitator. A few participants 8.8 % (n=7) disagreed and 13.8 % (n=11) remained neutral.

In line with participants identifying lack of facilities and inaccessibility of research reports as barriers, 81.5% (n=66) agreed that access to a system for comprehensive literature searching would facilitate evidence-based practice. Only 6.2% (n=5) disagreed and 12.3 % (n=10) were neutral. The majority of the participant (88.9%: n=72) also agreed that mentoring by nurses with adequate evidence-based practice experience is another facilitator. A minority of 6.2% (n=5) disagreed and 4.9% (n=4) were neutral. The findings therefore show that participants consider all the items on the facilitators scale as major facilitating factors to evidence-based practice in PMTCT (Table 4.29).

Table 4.29: Facilitators to evidence-based practice

Item	Agree		Neutral		Disagree	
	n	%	n	%	n	%
Nursing colleagues who embrace evidence-based practice	57	70.4	13	16.0	11	13.6
Nursing management who embrace evidence-based practice	53	65.4	18	22.2	10	12.3
Given adequate training in evidence-based practice	68	84.0	8	9.9	5	6.2
Given protected time to conduct evidence-based practice	62	77.5	11	13.8	7	8.8
Access to a system for comprehensive literature searching	66	81.5	10	12.3	5	6.2
Mentoring by nurses who have adequate evidence-based practice experience	72	88.9	4	4.9	5	6.2

4.9 SUMMARY OF THE CHAPTER

This chapter presented the findings of a study aimed at exploring the knowledge, attitudes and practices of nurses regarding evidence-based practice in a PMTCT program at a selected public tertiary hospital in Malawi. The findings show that the majority of the participants were female, middle aged and of average work experience. The majority of the participants had received some training in PMTCT. However, most of the nurses were NMTs who had been trained at certificate or diploma level and had not been exposed to adequate evidence based practice training for an acceptable level of practice. The findings also highlighted inconsistencies in training among nurses of the same qualification, as some had received PMTCT and EBP training in school, while others had not. Furthermore, most of the PMTCT and EBP training had been while the nurses were in-service, with very few being trained in nursing school.

Overall, the participants possessed average knowledge of evidence-based practice. The nurses possessed good knowledge/skills in reviewing of own practice, sharing of ideas with colleagues, applying information to individual cases, dissemination of new ideas and identifying gaps in practice. Research is the area where the nurses had least knowledge as they scored lower on all items related to research. As research is considered a pre-requisite to evidence based practice, it would appear from the findings that the nurses had not been adequately prepared for evidence-based practice.

The findings revealed that the participants demonstrated a favorable attitude towards evidence-based practice. However, they indicated that their heavy workload prevents them from taking initiatives to access and subsequently use new evidence. The findings further demonstrated that practice of evidence-based practice is unacceptably very low. Just as the nurses scored lower on knowledge of research, research related activities also received the lowest scores in the practice scale.

Certain demographic variables were found to influence the knowledge, attitudes and practices of the participants. Practice was correlated with age, nursing category, qualification, work experience and department of work. An association was found between knowledge and nursing category, and qualification and experience. The results further showed an association between attitudes and evidence-based practice training, but no correlation between knowledge and attitudes, knowledge and practice, and attitudes and practice. Thus the findings indicate that nurses' practices are more influenced by demographic factors than knowledge and attitudes. Furthermore, the study identified various barriers which hamper evidence-based practice in PMTCT among the nurses. These included lack of resources, inaccessibility of research articles, lack of knowledge on how to access research articles and lack of time to access research articles. The results further portrayed

mentoring, training and availability of resources as facilitators to evidence-based practice among the nurses.

The next chapter will present a discussion of the study findings and the conclusions drawn from the study.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The previous chapter presented the findings to the study whose aim was to explore the knowledge, attitudes and practices of nurses regarding evidence-based practice in a PMTCT program at a selected public tertiary hospital in Malawi. This chapter will discuss the findings in relation to literature. The chapter will further discuss the limitations of the study and, in line with the findings, present recommendations to nursing management, research, education and practice. The discussion has been organized in line with the findings.

5.2 SOCIAL DEMOGRAPHIC FINDINGS

It is noteworthy that the response rate for the present study was very high at 94%, compared to previous studies from Taiwan, Spain and California that had low response rates of 59.1%, 60.9% and 44.6% respectively (Weng et al., 2013; González-Torrente et al., 2012; Brown et al., 2009). The results showed that the majority of the participants (65.5%: n=53) were younger than 40 years. Thus, the population was younger than previous studies done in USA (Linton & Prasun, 2013; Melnyk et al., 2012; Koehn & Lehman, 2008) and Australia (Bonner & Sando, 2008), but similar to the studies done in Korea, Norway and Israel (Park et al., 2014; Dalheim et al., 2012; Eizenberg, 2011). However, the study population was older than the general population in Malawi where 67% of the population is aged below 25 years (Malawi Demographic Health Survey, 2010). Just as nursing is said to be a female dominated profession (Thompson et al., 2006), the majority of the participants (90%: n=73) in the present study were females, which is also consistent with previous

studies (González-Torrente et al., 2012; Melnyk et al., 2012; Breimaier et al., 2011; Eizenberg, 2011; Brown et al., 2009). Previous studies have indicated that nursing being a female dominated profession, the nurses face a barrier of lack authority to implement evidence based practice (Thompson et al., 2006)

Linton and Prasun (2013), observed that nurses need to be trained at a higher level where evidence-based practice concepts are included in the curriculum. Melnyk et al. (2008), further argue that graduate education increases appreciation of the importance of evidence-based practice and consequently a desire to practice it. Accordingly, in many European countries, nursing education shifted from basic to degree programs to prepare nurses for the requirements of evidence-based practice (Rudman et al., 2012). In Iceland, for instance, nursing education has been at Baccalaureate level for over 25 years now (Thorsteinsson, 2013). It is therefore worrying that in the present study, the majority of the participants (70.4%: n=57) were trained below first degree level, with only 29.6% (n=24) having a first degree. None of the participants had a masters degree. This is because, presently, there are few nurses with a masters degree in the specialty area that the study was focusing on, as in Malawi there has been a lack of training at advanced level in all the specialty areas (Bultemeier, 2012). Consequently, those few nurses are in managerial positions and nurse managers were excluded from the study.

The findings of the present study further showed that the participants were experienced as general nurses as 60.5% (n=49) had more than five years' experience and the median experience was 10 years. However, in terms of the department of interest, the participants were less experienced, as the majority had worked in the department for less than two years. The participants of this study were less experienced compared to previous studies done in USA and Spain, where the mean

experience was 24 years and 20.9 years respectively (Melnyk et al., 2012; González-Torrente et al., 2012).

The results of the study regarding PMTCT training for the nurses are encouraging as the majority of the nurses (70.4%: n=57) were trained in PMTCT. This contrasts the findings of a Nigerian study, where deficits were noted in the nurses' knowledge and PMTCT practices due to lack of training as only 43% of their participants had been trained (Ogbolu et al., 2013). The results further showed that most of the nurses who had been trained (73.7%: n=42) were trained whilst in-service, which is consistent with previous studies (Zuber et al., 2014). The findings also revealed that there were discrepancies among those who had been trained pre-service as some of the nurses with the same qualification had received training while others had not. Similarly, in their survey of senior nurse leaders from 15 African countries to describe the extent of NIMART in practice, education, policy and regulation, Zuber et al. (2014) also noted that PMTCT training was not standardized in some countries, which may have implications on the quality of care that is rendered.

Previous studies have demonstrated that training in evidence-based practice has an influence on knowledge (Sherriff et al., 2007), attitudes (Park et al., 2014) and practice of evidence-based practice (Weng et al., 2013; Melnyk et al., 2008). It is therefore of concern that in the present study, a considerably large number of the participants (50.6%: n=41) were not trained. This result, however, echoes previous findings from Taiwan and Singapore (Weng et al., 2013; Majid et al., 2011). In contrast, Filippini et al. (2011), in a cross-sectional survey of evidence-based practice among 449 Italian nurses, found that the majority of the nurses (86.2%) had been trained in evidence-based practice. The present result may be due to the fact that only few of the participants were trained up to first degree level where the concepts of evidence-based practice are introduced. The results further showed that the majority of the trained participants had qualified at university.

Eizenberg (2011) argues that organizations have a primary responsibility of providing support to nurses and this includes education support in order to promote evidence-based practice. It is therefore encouraging to note that while in-service education is not always available for the nurses (Chimwaza et al., 2014), the work place in this study provided in-service training for the nurses as the majority of those that were trained (67.5%: n=27) indicated that they had received in-service training, while only 32.5% (n=13) had received the training in their basic nursing education. Similarly, in Norway, Stokke et al. (2014) also found that the majority of their participants (69.7%) received evidence-based practice training through their work, while only 25.7% and 8.5% received their training through basic nursing education and post-graduate studies respectively.

5.3 KNOWLEDGE OF EVIDENCE BASED PRACTICE

Research is considered a foundation for evidence-based practice (Odom-Forren, 2013). Thus research skills are a prerequisite for evidence-based practice. The results of the study portrayed that the majority of the participants (64.2%: n=52) had poor research skills. These results corroborate previous findings in Australia, where lack of knowledge on basic aspects of research and how to translate research into practice were cited as reasons for low research use among nurses (Breimaier et al., 2011). Similarly, in the USA, research skills was identified as the top learning need for the nurses (Brown et al., 2009).

Evidence-based practice is a process involving a series of steps, one of which is formulation of a researchable question that will guide retrieval of the relevant evidence (Melnyk et al., 2004). The results of the present study found that a high number of participants (64.2%: n=52) had poor skills in converting information into research questions. These findings echo the findings of the USA study by Brown et al. (2009), where converting information into research questions was the top

learning need. Similarly, converting information into research questions received the least score in other USA studies (Linton & Prasun, 2013; Koehn & Lehman, 2008). These findings are not surprising considering that the majority of the nurses in this study were trained at a level lower than first degree and therefore research is not included in their curriculum. This is also supported by the results of the cross tabulation of research skills and qualification where a higher percentage of nurses holding a bachelors degree had good research skills compared to the diploma and certificate trained nurses.

Awareness of major information types is another area where the nurses acknowledged having poor knowledge, as 53.1% (n=43) fell within the poor knowledge/skill category. A study by Linton and Prasun (2013) had similar findings, where 48.3% of their participants indicated that they were not aware of the major information types. This was also identified by Brown et al. (2009) as a top learning need. IT skill is also considered a prerequisite for evidence-based practice. Only half of the participants in this study had high IT skills. In Iceland, Thorsteinsson (2013) found that although the majority of the participants had good access to the internet and had received training on how to use electronic data bases, they were much more confident in using email and general computer use than accessing data bases. The present results further showed that many of the nurses (51.9%: n=52) had poor knowledge of how to retrieve evidence and critically analyze evidence. These findings also substantiate previous findings from the USA (Linton & Prasun, 2013; Brown et al., 2009).

It is worth noting, however, that most of the nurses indicated that they had good/very good knowledge/skills in reviewing of own practice (95.1%: n=77); dissemination of new ideas (93.6%: n=71); sharing of ideas with colleagues (91.3%: n=74); applying information to individual cases (88.8%: n=71) and identifying gaps in practice (82.8%: n=67). Linton and Prasun (2013), in the

USA, obtained similar results, although the participants of this study scored higher in these areas than in their study.

Overall, the results of this study indicated that the nurses had average knowledge of evidence-based practice as the mean score was 39.2 of a possible 70. This is also consistent with observations in previous studies that the majority of nurses are not adequately prepared for evidence-based practice (Breimaier et al., 2011; Brown et al., 2009).

Some demographic variables are said to have an influence on the level of knowledge of evidence-based practice that nurses may possess. The results of this study portrayed no statistical relationship between age and knowledge with a p-value of 0.615. However, a higher percentage of the younger population had good knowledge compared with the older group, as only 18.5% (n=5) of those aged 20-29 had low knowledge compared to 45.5% (n=20) for those aged above 50 years. In contrast, Linton and Prasun (2013), in the USA, found knowledge to be positively associated with age; with the older nurses being more knowledgeable than the younger nurses.

The results further showed a significant association between knowledge and nursing category, and knowledge and qualification, with p-values of 0.020 and 0.015 respectively. The majority of professional nurses trained at bachelors level had high knowledge compared to registered nurses and NMTs trained at diploma and certificate levels respectively. These findings support various previous findings: In the UK, Gerrish et al. (2008) found that APNs were more knowledgeable of evidence-based practice when compared with front line nurses and in Singapore, masters and bachelors degree nurses scored higher on all items on the knowledge scale than certificate and diploma nurses (Majid et al., 2011a). In contrast, however, the study by Koehn and Lehman (2008) in the USA found no significant differences in knowledge among nurses of different qualifications.

A significant relationship was also found between knowledge and experience with those nurses with less experience having high knowledge compared with those with high experience, p -value = 0.038. Previous studies have had contradictory findings, with some studies finding knowledge to be associated with less experience (González-Torrente et al., 2012) and others with high experience (Melnik et al., 2008). González-Torrente et al. (2012) argue that the less experienced are more likely to have good knowledge as they are fresh from school and therefore still have a good connection with lectures that can support them in evidence-based practice. In the present study, the results may be due to the fact that a good number of the less experienced were trained in evidence-based practice compared to the more experienced.

The results showed no significant relationship between knowledge and training in evidence-based practice, with a p -value of 0.157. However, a higher number of those who were not trained (35%: $n=14$) had low knowledge compared to only 15.8% ($n=6$) of those who were trained. Similarly, Sherriff et al., (2007) evaluated the effect of an educational program on attitude and perception of evidence-based practice knowledge and skills of registered nurses and found that the perception of knowledge/skills improved tremendously after the education intervention.

5.3.1 Sources of evidence-based practice knowledge

Evidence-based practice requires that nurses are able to use current and relevant information in their day-to-day practice (Majid et al., 2011). The study results revealed that the majority of the nurses frequently use evidence from college training (70.4%: $n=57$), in-service training (65.4%: $n=53$), policy initiatives (60.5%: $n=49$), personal experience (59.3%: $n=48$), and guidelines (58%: $n=27$). This is consistent with Thorsteinsson's (2013) observation that nurses rely more on information that can be accessed easily and quickly due to the need for rapid decision making and

limited time to seek information. The results also echo the findings of Gerrish et al., (2011), in the UK, who also found that the nurses ranked national guidelines and policies as frequently used sources of knowledge together with information gained from post-registration courses and experiential knowledge.

Findings revealed that the sources of knowledge used least by the participants were articles published in nursing and research journals (12%: n=10), medical journals (13.6%: (n=11), the internet (18.5%: n=15) and local audit reports (19.8%: n=16), which is similar to findings in the UK and Norway (Dalheim et al., 2012; Gerrish et al., 2011). The low use of research journals can be attributed to the fact that the nurses scored very low on research skills and information and technology skills. There is therefore a need to intervene on these aspects. A previous study also found that nurses often rely on information from the media, which they indicated as a shallow source of knowledge (Salzer et al., 2008). It is encouraging to note that nurses in the present study seldom use this source of knowledge as only 22.5% (n=18) indicated that they use it frequently.

The results of the study further showed that the use of information from basic nursing education increased with increasing experience. Although the finding was not statistically significant, it is worrying, as studies indicate that PMTCT knowledge keeps changing and therefore at some point information from school becomes irrelevant and hence need for use of other evidence-based sources (Wall, 2014; Kellerman et al., 2013; Moland et al., 2010). Some of the results are contradictory, however, as the number of participants indicating that they use knowledge from school was higher than the number that indicated they received evidence-based practice training at school. Similarly, the results on use of knowledge acquired during in-service PMTCT and EBP training were also contradictory as more participants indicated that they used this source of knowledge than those who indicated that they had received in-service training. This may mean

that the participants may have misunderstood the question. The results further showed that there were no differences in the use of research as a knowledge source between those with high knowledge/skills and those with low knowledge/skills. Dalheim et al. (2012), however, found an association between the use of research and self-reported skills in finding and reviewing research evidence. It can thus be concluded that knowledge is not the only predictor of research use and that other factors must also be involved.

5.4 ATTITUDES TOWARDS EVIDENCE BASED PRACTICE

The results showed that most of the participants had favorable attitudes towards evidence-based practice, with a minimum score of 13.5 of a possible 20. These results are in line with most of the previous literature on evidence-based practice (Stokke et al., 2014; Majid et al., 2011; Sredl et al., 2011; Brown et al., 2009; Sherriff et al., 2007). Stokke et al. (2014) put evidence-based practice attitudes and beliefs into four categories: belief of knowledge of evidence-based practice, value of evidence-based practice, resources for evidence-based practice and time and difficulty in implementing evidence-based practice. According to these authors, nurses attitudes and beliefs towards the value of evidence-based practice are usually higher than their attitudes and beliefs related to their knowledge, time and resources (Stokke et al., 2014). Similarly, in the present study, only 23.5 % (n=19) agreed that evidence-based practice is a waste of time. The majority of the nurses (59.3%: n=48), however, were in agreement with the fact that their heavy workload prevented them from keeping up with new evidence. Thus, their belief and attitude towards time was lower. The aspect of time also received lower mean scores in other previous studies (Majid et al., 2011a; Brown et al., 2009). This finding is not surprising as previous studies identified heavy workload and lack of time as major barriers to evidence-based practice (Maaskant et al., 2013; Dalheim et al., 2012; Brown et al., 2009; Thompson et al., 2006).

Studies indicate that knowledge reduces perceptions of barriers, including the barrier of time (Dalheim et al., 2012). In contrast, in the present study, more of the degree nurses (75%: n=18), who scored higher on knowledge, agreed that their workload was too great for evidence-based practice compared with certificate 58.6% (n=17) and diploma nurses 52.4% (n=11). These findings, however, are supported by Sherriff et al. (2007), who also noted that the perception of time as a barrier did not change after an education intervention while perception of other barriers changed.

Although the result was not statistically significant, cross-tabulation of attitude and age showed that half of the older nurses had less favorable attitudes compared with only 28.6% (n=8) of the younger nurses. In the USA, however, Linton and Prasun (2013) found a positive association between attitude and age, with attitude becoming more favorable with increasing age. They further found that knowledge was also positively associated with age. Other studies have demonstrated that knowledge influences attitudes (Park et al., 2014). With respect to the current study, it could thus be said that the younger nurses had a more favorable attitude because they also had good knowledge of evidence-based practice.

The results showed no relationship between qualification and attitudes, p -value = 0.174. Previous studies done in Korea and the USA, however indicated that level of education has an influence on attitudes, with nurses with higher education having a more positive attitude than lesser qualified nurses (Park et al., 2014; Koehn & Lehman, 2008). Regarding experience, the results showed no relationship between nurses' experience and attitudes p -value = 0.759. Previous studies, however, identified an association between attitudes and experience, with some indicating that high experience is associated with positive attitudes (Park et al., 2014; González-Torrente et al., 2012)

while others show that low experience is positively correlated with positive attitudes (Patelarou et al., 2013; Koehn & Lehman, 2008)

Findings showed a significant relationship between training in evidence-based practice and attitude, with those who had been trained showing a more positive attitude than those who had not been trained, p -value = 0.045. These findings support the results of a quasi-experimental study that was conducted in Queensland to evaluate the effect of an evidence-based practice educational program on attitudes, perceptions of knowledge and skills of registered nurses where the nurses attitudes improved remarkably after the education program (Sherriff et al., 2007).

5.5 PRACTICE OF EVIDENCE BASED PRACTICE

Previous studies have indicated that implementation of evidence-based practice among nurses is generally low (Stokke et al., 2014; Melnyk et al., 2012; Sredl et al., 2011; Filippini et al., 2011). Similarly, the results of this study showed that the nurses were practicing evidence-based practice to a very low extent, with a median score of 11. These findings echo the results of a study that was done in Norway using the same scale, where the participants' mean score was 7.8 (Stokke et al., 2014). The majority of the participants indicated that they never performed certain practices in the 8 weeks prior to the study, which included: accessing the Cochrane database (72.8%: $n=59$); critically appraising evidence from a research study (69.1%: $n=56$); sharing evidence from a study with a multi-disciplinary team member (64.2%: $n=52$); reading and critically appraising a research study (64.2%: $n=52$); and generating a PICO question (63%: $n=51$). Almost all of these items are research related and it is therefore not a surprising result since the nurses scored lower on research skills.

Stokke et al. (2014) argue that evidence-based practice can be improved if research findings are translated into high quality guidelines for the nurses to use. The present study however found that more than half of the participants (56.8%: n=46) indicated that they had never used an evidence-based practice guideline although when asked about barriers to evidence based practice they indicated that guidelines are not difficult to find at the institution.

The results also showed a significant relationship between age and practice, with more of the older nurses basing their practice on evidence than the younger nurses, p-value 0.012. This result is surprising because, although not statistically significant, it was noted that the younger nurses in this study were more knowledgeable and had more favorable attitudes than the older nurses, and previous studies found knowledge and attitudes to have an influence on practice (Melnyk et al., 2004). Other studies, however, found no relationship between age and practice (Stokke et al., 2014; Eizenberg, 2011; Melnyk et al., 2008).

The results further portrayed a relationship between qualification and practice, p-value 0.003. The findings on the influence of education on practice, however, are inconclusive in the literature, with some studies indicating a positive association (Park et al., 2014; Eizenberg, 2011) and others indicating no association (Stokke et al., 2014). Experience in this study was also found to have an influence on practice, with a p-value of 0.043, which is consistent with the findings of Park et al. (2014) in Korea. In contrast, in Norway, Stokke et al. (2014) found no association between practice and experience. Other previous studies also found training in evidence-based practice to be positively associated with practice (Park et al., 2014; Melnyk et al., 2008), while the findings of the present study indicated no association between the two.

5.6 INTERRELATIONSHIPS

When testing for interrelationships between various demographic variables and knowledge, attitudes and practice, Fisher's exact test and the Kruskal Wallis test showed contradictory results in some of the variables. Fisher's exact test showed an association between knowledge and experience, while the Kruskal Wallis test showed no association. Similarly, Fisher's exact test showed no association between age, experience, nursing category, qualification and practice, while results of Kruskal Wallis test showed a significant relationship between age, experience and practice and the Mann-Whitney U test showed a significant relationship between qualification, nursing category and practice. Furthermore, results of Fisher's exact test showed an association between training in evidence-based practice and attitude, while results of the Mann-Whitney U test showed no association.

Melnyk et al. (2008) argue that beliefs and attitudes about the value of evidence-based practice and ability to implement it are strongly associated with the extent to which practice will be evidence-based. Eizenberg (2011) further argues that participants that perceive themselves to possess greater skill in evidence-based practice have a higher probability of reporting their practice as evidence-based. The Diffusion of Innovation framework adopted for this study also suggests that nurses have to go through a series of stages that will ultimately lead to implementation of evidence-based practice. These stages include knowledge, which will then influence attitudes and eventually practice (Lekan, 2008). The results of the present study, however, portrayed no relationship between knowledge and attitude, knowledge and practice, and attitude and practice. A cross-tabulation of individual items on the knowledge and practice scale, however, showed that the frequency of reading and reviewing research increased with increase in research skills and also that the frequency of evaluation of practice outcomes increased with increasing ability to

review own practice. Dalheim et al. (2012), in Norway, also found that use of research was associated with self-reported skills in finding and reviewing research.

5.7 BARRIERS TO EVIDENCE BASED PRACTICE

Eizenberg (2011) purports that evidence-based practice is more likely to occur where the necessary resources are readily available, such as access to a library that is rich in research journals as well as access to computers and the internet for information searching. It is therefore not surprising that the majority of the participants in this study (67.9%: n=55) considered insufficient resources as the biggest barrier to evidence-based practice in PMTCT. The results further showed that the other major barriers were research reports not being easy to find (55.6%: n=45) and not knowing how to find appropriate research reports (51.9%: n=42). Findings with respect to barriers were consistent with the findings on knowledge, as the majority of the nurses indicated that they lacked skill in research and information technology.

The results further showed that participants who indicated that they had poor skills in retrieval of evidence also identified not knowing how to find research reports as a major barrier. This is consistent with findings of Dalheim et al. (2012), who also noted that perception of skills in research is associated with the perception of research related barriers, such as I do not know how to find appropriate research reports, research reports are not easy to find, difficulties in understanding research reports and confidence in judging quality of research reports. The present study, however, had different findings with respect to research skills and perception of difficulties in understanding research as a barrier, as only 29.6% (n=24) of those who indicated to have poor research skills perceived this as a barrier, while 40.4% (n=21) disagreed and 32.7% (n=17) were neutral.

The other moderate barriers that were identified were insufficient time to find research reports and difficulty in understanding implications of research to own practice. Several previous studies also identified lack of time as a major barrier to evidence-based practice (Maaskant et al., 2013; Dalheim et al., 2012; Brown et al., 2009; Thompson et al., 2006). Although time did feature as one of the barriers, the percentage of those indicating it as a barrier is smaller than the percentage of nurses who agreed to the statement that their workload is too great for them to engage in evidence-based practice, which is surprising.

The ranking of the barriers in this study differs from most of the previous studies that ranked lack of time and lack of authority to implement new ideas as the top major barriers (Maaskant et al., 2013; Brown et al., 2009; Thompson et al., 2006) as participants in the present study did not perceive these as major barriers. The other striking finding was that there were so many neutral responses on the items on the barriers scale. Majid et al. (2011) and Stokke et al. (2014) obtained similar results, which they attributed to the fact that as the nurses were not practicing evidence-based practice, they would not be aware of the barriers. The same conclusion can be drawn for this study as the practice scale also received the lowest score.

5.8 FACILITATORS TO EVIDENCE-BASED PRACTICE

Findings showed that participants regarded all the items on the questionnaire pertaining to facilitators as factors that would promote evidence-based practice. Ranking of the items showed that the nurses considered mentoring as the most important facilitator to evidence-based practice as 88.9% (n=72) were in agreement with this suggestion. Similarly, Melnyk et al. (2004) found a positive correlation between the extent of evidence-based practice and having a mentor. The participants also ranked training as one of the major facilitators to evidence-based practice with

84% (n=68) agreeing to this option. This is also consistent with previous studies findings (Maaskant et al., 2013; Majid et al., 2011; Brown et al., 2009). Similarly, 81.5% (n=66) of the participants also agreed that access to a system for comprehensive literature searching would act as a facilitator, which is in line with recommendations of Stokke et al. (2014), who suggested that opportunities should be made available for nurses to access journals when evidence-based practice is being introduced. Even though time was not considered as a major barrier by the participants, the majority (77.5%: n=62) agreed that availability of time would facilitate evidence-based practice in PMTCT. This finding is also consistent with previous studies (Majid et al., 2011).

Several studies have pointed out on the importance of a work place culture and management that supports evidence-based practice and thus creates an enabling environment (Majid et al., 2011; Brown et al., 2009; Ploeg et al., 2007). The majority of participants of the present study also agreed, 70.4% (n=57) and 65.4% (n=53) respectively, that colleagues and management who embrace evidence-based practice can help facilitate the process.

5.9 RECOMMENDATIONS

In line with the findings of the study, the following recommendations are made for nursing practice, management, education and research:

5.9.1 Nursing Practice

- The present study demonstrated that the main facilitator to evidence-based practice in PMTCT is mentoring. There is therefore a need for the presence of mentors in the clinical area who can support and model evidence-based practice to the PMTCT nurses, thereby promoting consistent implementation of evidence-based practice.

- Proper measures to be instituted for implementation of PMTCT evidence-based practice guidelines, such as in-service training, journal clubs, use of nursing rounds and regular meetings to share and critique research articles.

5.9.2 Nursing Management

There is need for management support through:

- Provision of resources for evidence-based practice in PMTCT, such as computers and access to the internet, as well as access to up-to-date research journals, evidence-based PMTCT guidelines, equipment and supplies, as lack of resources was identified as a major barrier to evidence-based practice by the nurses;
- Provision of adequate time off work to enable the nurses to read and implement new ideas, as lack of time was considered a moderate barrier by the nurses and they also agreed to the suggestion that being given protected time would facilitate evidence-based practice in PMTCT;
- Provision of on-going training in PMTCT and evidence-based practice, not only to train more nurses, but also to update those already trained, as in-service training was demonstrated to be the main medium of training for the nurses;
- Provision of more opportunities for the nurses to upgrade their education; and
- Nurse Managers to advocate and expect evidence-based practice from the nurses by incorporating it in performance appraisals as well as instilling a team working spirit in the nurses, as support from colleagues was also seen as a facilitator by the nurses.

5.9.3 Educators

- There is need for collaboration among educators so that PMTCT and evidence-based practice content can be standardized across the same educational levels;
- Basic concepts of evidence-based practice need to be incorporated into all levels of nursing curricula, since the majority of nurses are currently being trained at a level lower than first degree; and
- There is need for educators to create more opportunities for training at a higher level to suit the evidence-based practice requirement.

5.9.4 Researchers

- Nurse researchers should also be involved in imparting research skills to clinical staff as it was found that nurses had poor research skills; and
- Nurse researchers need to collaborate with clinical nurses in identification of context specific problems requiring research, thereby aiding in implementation of the findings.

5.9.5 Areas for further research

- The present study can be replicated on a larger scale or as nationwide survey so that the results can be generalizable and have much more impact;
- There is need to explore the subject further using qualitative research methods to have an in-depth understanding, especially on the barriers and facilitators to evidence-based practice;

- Further studies can employ a competency-based survey to gauge the actual level of evidence-based practice knowledge, since in the present study the nurses reported their perceived knowledge; and
- There is need to explore the actual PMTCT practices to determine if they are evidence-based or in line with the PMTCT evidence-based guidelines.

5.10 LIMITATIONS OF THE STUDY

The main limitation for the present study is that data was collected through the use of self-report, which may have been subject to personal bias and participants' ability to assess their skills and practices. The results may therefore not be a true reflection of what is happening in reality.

The other limitation is that the study was conducted at only one institution and therefore the results need to be interpreted with caution and not be generalized to the whole population of PMTCT nurses in Malawi.

5.11 SUMMARY OF THE CHAPTER

The chapter has discussed the findings of the study in line with the existing literature. Based on the findings, recommendations have been made for practice, management, education and research. Limitations of the study have also been highlighted.

5.12 CONCLUSIONS

This study sought to explore the knowledge, attitudes and practices of nurses regarding evidence-based practice in a PMTCT program at a selected public tertiary hospital in Malawi. Previous studies discussed have indicated the importance of training in promoting evidence-based practice.

The findings of this study demonstrated that the nurses lacked adequate training in evidence-based practice and consequently, their knowledge of evidence-based practice was average and therefore inadequate for successful implementation of evidence-based practice. The nurses particularly lacked knowledge and skill in research, which is a prerequisite for evidence-based practice, and therefore relied on other sources of evidence other than research.

The results revealed that the nurses possessed favorable attitudes towards evidence-based practice in PMTCT. However, lack of time influenced their perceptions of evidence-based practice. The results further demonstrated that the nurses practiced evidence-based practice to a very low extent. As hypothesized in the Diffusion of Innovation framework, which was adopted for this study, knowledge, attitude and practices were influenced by certain social-demographic and organizational factors. Knowledge was found to be influenced by nursing category, qualification and work experience, attitude was found to be influenced by training in evidence-based practice, and practice was associated with age, nursing category, qualification and experience. The main barriers to evidence-based practice that were identified were insufficient resources and difficulties in accessing evidence. It emerged from this study that mentoring, training and access to resources would facilitate evidence-based practice.

The findings of this study support and add to previous findings that nurses have a positive attitude towards evidence-based practice, but their knowledge is often inadequate and therefore their practice of evidence-based practice is low. This study, unlike previous studies, found no relationship between knowledge, attitudes and practices although some demographic factors were identified that influenced the nurses' knowledge, attitude and practices. The study also found that evidence-based practice is hampered to a large extent by organizational barriers that the nurses face. Evidence based practice is a multi-dimensional construct and, in order to promote it, an effort

should be made to address all influencing factors. These findings have implications to nursing practice, education, management and research and it is hoped that the recommendations made will be implemented and thus help to promote evidence-based practice in PMTCT among nurses.

REFERENCES

- Abayomi, J. A., Adewum, N., Emokpa, A., Fagorala, T., Aruma E, D., Abidoye, G., Ganikale, I. & Audu, R. (2011). Outcome of PMTCT Services and Factors Affecting Vertical Transmission of HIV Infection in Lagos, Nigeria. *HIV & AIDS Review*, 10 (1), 14-18.
- Ahmed, S., Kim, M. H. & Abrams, E. J. (2013). Risks and Benefits of Lifelong Antiretroviral Treatment for Pregnant and Breastfeeding Women: A Review of the Evidence for the Option B+ Approach. *Current Opinion in HIV and AIDS*, 8 (5), 474-489
- Beltman, J., Fitzgerald, M., Buhendwa, L., Moens, M., Massaquoi, M., Kazima, J., Alide, N. & Van Roosmalen, J. (2010). Accelerated HIV Testing for PMTCT in Maternity and Labour Wards Is Vital to Capture Mothers at a Critical Point in the Programme at District Level in Malawi. *AIDS Care*, 22 (11), 1367-1372.
- Berragan, L. (1998). Nursing Practice Draws Upon Several Different Ways of Knowing. *Journal of Clinical Nursing*, 7 (3), 209-217.
- Bonner, A. N. N. & Sando, J. (2008). Examining the Knowledge, Attitude and Use of Research by Nurses. *Journal of Nursing Management*, 16 (3), 334-343.
- Breimaier, H. E., Halfens, R. J. G. & Lohrmann, C. (2011). Nurses' Wishes, Knowledge, Attitudes and Perceived Barriers on Implementing Research Findings into Practice among Graduate Nurses in Austria. *Journal of Clinical Nursing*, 20 (11-12), 1744-1756.

- Brown, C. E., Kim, S. C., Stichler, J. F. & Fields, W. (2010). Predictors of Knowledge, Attitudes, Use and Future Use of Evidence-Based Practice among Baccalaureate Nursing Students at Two Universities. *Nurse Education Today*, 30 (6), 521-527.
- Brown, C. E., Wickline, M. A., Ecoff, L. & Glaser, D. (2009). Nursing Practice, Knowledge, Attitudes and Perceived Barriers to Evidence-Based Practice at an Academic Medical Center. *Journal of Advanced Nursing*, 65 (2), 371-381.
- Brown, G. T. & Rodger, S. (1999). Research Utilization Models: Frameworks for Implementing Evidence-Based Occupational Therapy Practice. *Occupational Therapy International*, 6 (1), 1-23.
- Bultemeier, K. I. (2012). Nursing in Malawi: Nursing Theory in the Movement to Professionalize Nursing. *Nursing Science Quarterly*, 25 (2), 184-186.
- Burns, N. & Grove, S. K. (2009). *The Practice of Nursing Research: Appraisal, Synthesis, and Generation of Evidence*, Saunders/ Elsevier.
- Carlson, C. L. & Plonczynski, D. J. (2008). Has the Barriers Scale Changed Nursing Practice? An Integrative Review. *Journal of Advanced Nursing*, 63 (4), 322-333.
- Chi, B. H., Bolton-Moore, C. & Holmes, C. B. (2013). Prevention of Mother-to-Child HIV Transmission within the Continuum of Maternal, Newborn, and Child Health Services. *Current Opinion in HIV and AIDS*, 8 (5), 498-503.
- Chimbwandira, F., Mhango, E., Makombe, S., Midiani, D., Mwansambo, C., Njala, J., Chirwa, Z., Jahn, A., Schouten, E., Phelps, B. R., Gieselman, A., Holmes, C. B., Maida, A., Gupta, S., Tippett, Modi, S., Dale, H., Aberle-Grasse, J., Davis, M., Bell, D. & Houston,

- J. (2013). Impact of an Innovative Approach to Prevent Mother-to-Child Transmission of HIV -- Malawi, July 2011-September 2012. *Morbidity and Mortality Weekly Report, Recommendations & Reports*, 62 (8), 148-151.
- Chimwaza, W., Chipeta, E., Ngwira, A., Kamwendo, F., Taulo, F., Bradley, S. & Mcauliffe, E. (2014). What Makes Staff Consider Leaving the Health Service in Malawi? *Human Resources for Health*, 12 (17).
- Chinkonde, J. R., Sundby, J., De Paoli, M. & Thorsen, V. C. (2010). The Difficulty with Responding to Policy Changes for HIV and Infant Feeding in Malawi. *International Breastfeeding Journal*, 5 (11).
- Chopra, M., Doherty, T., Mehattru, S. & Tomlinson, M. (2009). Rapid Assessment of Infant Feeding Support to HIV-Infected women Accessing Prevention of Mother-to-Child Transmission Services in Kenya, Malawi and Zambia. *Public Health Nutrition*, 12 (12), 2323 - 2328.
- Chopra, M. & Rollins, N. (2008). Infant Feeding in the Time of HIV: Rapid Assessment of Infant Feeding Policy and Programmes in Four African Countries Scaling up Prevention of Mother to Child Transmission Programmes. *Archives of Disease in Childhood*, 93, 288-291.
- Côté, F., Gagnon, J., Houme, P. K., Abdeljelil, A. B. & Gagnon, M.-P. (2012). Using the Theory of Planned Behaviour to Predict Nurses' Intention to Integrate Research Evidence into Clinical Decision-Making. *Journal of Advanced Nursing*, 68 (10), 2289-2298.

- Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, Sage Publications.
- Critchley, M. (1978). *Butterworths Medical Dictionary*, Butterworths.
- Dalheim, A., Harthug, S., Nilsen, R. M. & Nortvedt, M. W. (2012). Factors Influencing the Development of Evidence-Based Practice among Nurses: A Self-Report Survey. *BioMed Central Health Services Research*, 12 (1), 367-376.
- Decock, K. M., Fowler, M. G., Mercier, E., Devincenzi, I., Saba, J., Hoff, E., Alhwick, D. J., Rogers, M. & Shaffer, N. (2000). Prevention of Mother-to-Child HIV Transmission in Resource- Poor Countries. Translating Research into Policy and Practice. *Journal of the American Medical Association*, 283, 1175-1182.
- Delobelle, P., Rawlinson, J. L., Ntuli, S., Malatsi, I., Decock, R. & Depoorter, A. M. (2009). HIV/AIDS Knowledge, Attitudes, Practices and Perceptions of Rural Nurses in South Africa. *Journal of Advanced Nursing*, 65 (5), 1061-1073.
- Dohrn, J., Miller, N. & Bakken, S. (2006). Assessment of South African Nurse-Midwives' Knowledge Pre- and Post-Short-Term Training in Antiretroviral Treatment. *Journal of the Association of Nurses in AIDS Care*, 17 (4), 46-49.
- Druce, N. & Nolan, A. (2007). Seizing the Big Missed Opportunity: Linking HIV and Maternity Care Services in Sub-Saharan Africa. *Reproductive Health Matters*, 15 (30), 190-201.
- Du-Preez, A., Du-Plessis, E. & Pienaar, A. (2006). Intrapartum Practices to Limit Vertical Transmission of HIV. *African Journal of AIDS Research* 5 (2), 197-206.

- Eagly, A. H. & Chaiken, S. (2007). The Advantages of an Inclusive Definition of Attitude. *Social Cognition*, 25 (5), 582-602.
- Earle-Foley, V. (2011). Evidence-Based Practice: Issues, Paradigms, and Future Pathways. *Nursing Forum*, 46 (1), 38-44.
- Eizenberg, M. M. (2011). Implementation of Evidence-Based Nursing Practice: Nurses' Personal and Professional Factors? *Journal of Advanced Nursing*, 67 (1), 33-42.
- Estabrooks, C. A., Rutakumwa, W., O'Leary, K. A., Profetto-Mcgrath, J., Milner, M., Levers, M. J. & Scott-Findlay, S. (2005). Sources of Practice Knowledge among Nurses. *Qualitative Health Research*, 15 (4), 460-476.
- Facchiano, L. & Hoffman Snyder, C. (2012). Evidence-Based Practice for the Busy Nurse Practitioner: Part Three: Critical Appraisal Process. *Journal of the American Academy of Nurse Practitioners*, 24 (12), 704-715.
- Fasawe, O., Avila, C., Shaffer, N., Schouten, E., Chimbwandira, F., Hoos, D., Nakakeeto, O. & De Lay, P. (2013). Cost-Effectiveness Analysis of Option B+ for HIV Prevention and Treatment of Mothers and Children in Malawi. *PloS One*, 8 (3), e57778.
- Ferguson, L., Grant, A. D., Watson-Jones, D., Kahawita, T., Ong'ech, J. O. & Ross, D. A. (2012). Linking Women Who Test HIV-Positive in Pregnancy-Related Services to Long-Term HIV Care and Treatment Services: A Systematic Review. *Tropical Medicine & International Health*, 17 (5), 564-580.

- Filippini, A., Sessa, A., Di Giuseppe, G. & Angelillo, I. F. (2011). Evidence-Based Practice among Nurses in Italy. *Evaluation & the Health Professions*, 34 (3), 371-382.
- Fink, R., Thompson, C.J. & Bonnes, D. (2005). Overcoming barriers and promoting the use of research in practice. *Journal of Nursing Administration*, 35 (3), 121-129.
- French, B. (2005). Contextual Factors Influencing Research Use in Nursing. *Worldviews on Evidence-Based Nursing*, 2 (4), 172-183.
- Gerrish, K., Ashworth, P., Lacey, A. & Bailey, J. (2008). Developing Evidence-Based Practice: Experiences of Senior and Junior Clinical Nurses. *Journal of Advanced Nursing*, 62 (1), 62-73.
- Gerrish, K. & Clayton, J. (2004). Promoting evidence-based practice: an organizational approach. *Journal of Nursing Management*, 12, 114-123.
- Gerrish, K., Guillaume, L., Kirshbaum, M., McDonnell, A., Tod, A. & Nolan, M. (2011). Factors Influencing the Contribution of Advanced Practice Nurses to Promoting Evidence-Based Practice among Front-Line Nurses: Findings from a Cross-Sectional Survey. *Journal of Advanced Nursing*, 67 (5), 1079-1090.
- Gifford, W., Davies, B., Edwards, N., Griffin, P. & Lybanon, V. (2007). Managerial Leadership for Nurses' Use of Research Evidence: An Integrative Review of the Literature. *Worldviews on Evidence-Based Nursing*, 4 (3), 126-145.
- Global Fund 2010. *Scaling up Prevention of Mother-to-Child Transmission of HIV (PMTCT)* : Information Note. Geneva, Switzerland.

- González-Torrente, S., Pericas-Beltrán, J., Bennasar-Veny, M., Adrover-Barceló, R., Morales-Asencio, J. M. & De Pedro-Gómez, J. (2012). Perception of Evidence-Based Practice and the Professional Environment of Primary Health Care Nurses in the Spanish Context: A Cross-Sectional Study. *BioMed Central Health Services Research*, 12 (1), 227.
- Govender, T. & Coovadia, H. (2014). Eliminating Mother to Child Transmission of HIV-1 and Keeping Mothers Alive: Recent Progress. *Journal of Infection* 68, S57-S62.
- Grimshaw, J. M., Eccles, M. P., Lavis, J. N., Hill, S. J. & Squires, J. E. (2012). Knowledge Translation of Research Findings. *Implementation Science*, 7 (1), 50.
- Grol, R. & Grimshaw, J. (2003). From Best Evidence to Best Practice: Effective Implementation of Change in Patients' Care. *The Lancet*, 362 (9391), 1225-1230.
- Hassan, Z. M. & Wahsheh, M. A. (2011). Knowledge and Attitudes of Jordanian Nurses Towards Patients with HIV/AIDS: Findings from a Nationwide Survey. *Issues in Mental Health Nursing*, 32, 774-784.
- Hutchinson, A. M. & Johnston, L. (2004). Bridging the Divide: A Survey of Nurses' Opinions Regarding Barriers to, and Facilitators of, Research Utilization in the Practice Setting. *Journal of Clinical Nursing*, 13 (3), 304-315.
- International Council of Nurses (2002). *Nursing matters*.
- Jennings, B. M. & Loan, L. A. (2001). Misconceptions among Nurses About Evidence-Based Practice. *Journal of Nursing Scholarship*, 33 (2), 121-127.

- Jones, R. J. E. & Santaguida, P. (2005). Evidence-Based Practice and Health Policy Development: The Link between Knowledge and Action. *Physiotherapy*, 91 (1), 14-21.
- Kajermo, K. N., Boström, A.-M., Thompson, D. S., Hutchinson, A. M., Estabrooks, C. A. & Wallin, L. (2010). Systematic Review the Barriers Scale--the Barriers to Research Utilization Scale: A Systematic Review. *Implementation Science*, 5 (32).
- Kasenga, F. (2010). Making It Happen: Prevention of Mother to Child Transmission of HIV in Rural Malawi. *Global Health Action*, 3 .
- Kasenga, F., Byass, P., Emmelin, M. & Hurtig, A. K. (2009). The Implications of Policy Changes on the Uptake of a PMTCT Programme in Rural Malawi: First Three Years of Experience. *Global Health Action*, 2.
- Kellerman, S. E., Ahmed, S., Feeley-Summerl, T., Jay, J., Kim, M., Phelps, B. R., Sugandhi, N., Schouten, E., Tolle, M., Tsiouris, F. (2013). Beyond Prevention of Mother-to-Child Transmission: Keeping HIV-Exposed and HIV-Positive Children Healthy and Alive. *AIDS*, 27, (02) S225-S233
- Kocaman, G., Seren, S., Lash, A. A., Kurt, S., Bengu, N. & Yuromezoglu, H. A. (2010). Barriers to Research Utilisation by Staff Nurses in a University Hospital. *Journal of Clinical Nursing*, 19 (13/14), 1908-1918.
- Koehn, M. L. & Lehman, K. (2008). Nurses' Perceptions of Evidence-Based Nursing Practice. *Journal of Advanced Nursing*, 62 (2), 209-215.

- Koye, D. N. & Berihun, M. Z. (2013). Mother-to-Child Transmission of HIV and Its Predictors among HIV-Exposed Infants at a PMTCT Clinic in Northwest Ethiopia. *BioMed Central Public Health*, 13 (1), 1-6.
- Labhardt, N. D., Manga, E., Ndam, M., Balo, J. R., Bischoff, A. & Stoll, B. (2009). Early Assessment of the Implementation of a National Programme for the Prevention of Mother-to-Child Transmission of HIV in Cameroon and the Effects of Staff Training: A Survey in 70 Rural Health Care Facilities. *Tropical Medicine & International Health*, 14 (3), 288-293.
- Landes, M., Van Lettow, M., Chan, A. K., Mayuni, I., Schouten, E. J. & Bedell, R. A. (2012). Mortality and Health Outcomes of HIV-Exposed and Unexposed Children in a PMTCT Cohort in Malawi. *PloS One*, 7 (10), e47337.
- Lekan, D. (2008). *Diffusion of Innovation*, Duke University School of Nursing.
- Leshabari, S. C., Blystad, A., De Paoli, M. & Moland, K. M. (2007). HIV and Infant Feeding Counselling: Challenges Faced by Nurse-Counsellors in Northern Tanzania. *Human Resources for Health*, 5, (18).
- Linton, M. J. & Prasun, M. A. (2013). Evidence-Based Practice: Collaboration between Education and Nursing Management. *Journal of Nursing Management*, 21, 5-16.
- Maaskant, J. M., Knops, A. M., Ubbink, D. T. & Vermeulen, H. (2013). Evidence-Based Practice: A Survey among Pediatric Nurses and Pediatricians. *Journal of Pediatric Nursing*, 28 (2), 150-157.

- Magadi, M. A. (2011). Understanding the Gender Disparity in HIV Infection across Countries in Sub-Saharan Africa: Evidence from the Demographic and Health Surveys. *Sociology of Health & Illness*, 33 (4), 522-539.
- Magder, L. S., Mofenson, L., Paul, M. E., Zorrilla, C. D., William, A., Blattner, K., Tuomala, R. E., Larussa, P., Landesman, S. & Rich, K. C. (2005). Risk Factors for in Utero and Intrapartum Transmission of HIV. *Journal of Acquired Immune Deficiency Syndrome*, 38 (1), 87-95.
- Majid, S., Foo, S., Luyt, B., Xue, Z., Yin-Leng, T., Yun-Ke, C. & Mokhtar, I. A. (2011). Adopting Evidence-Based Practice in Clinical Decision Making: Nurses' Perceptions, Knowledge, and Barriers. *Journal of the Medical Library Association*, 99 (3), 229-236.
- Malawi Demographic Health Survey.(2010). National Statistics Office. Zomba, Malawi.
- Manafa, O., Mcauliffe, E., Maseko, F., Bowie, C., Maclachlan, M. & Normand, C. (2009). Retention of Health Workers in Malawi: Perspectives of Health Workers and District Management. *Human Resources for Health*, 7 (65).
- Mantzoukas, S. (2008). A Review of Evidence-Based Practice, Nursing Research and Reflection: Levelling the Hierarchy. *Journal of Clinical Nursing*, 17 (2), 214-223.
- Mccloskey, D. J. (2008). Nurses' Perceptions of Research Utilization in a Corporate Health Care System. *Journal of Nursing Scholarship*, 40 (1), 39-45.
- McInerney, P. & Suleman, F. (2010). Exploring Knowledge, Attitudes, and Barriers toward these of Evidence-Based Practice Amongst Academic Health Care Practitioners in Their

- Teaching in a South African University: A Pilot Study. *Worldviews on Evidence-Based Nursing*, 7 (2), 90-97.
- Meijers, J. M., Janssen, M. A., Cummings, G. G., Wallin, L., Estabrooks, C. A. & Yg Halfens, R. (2006). Assessing the Relationships between Contextual Factors and Research Utilization in Nursing: Systematic Literature Review. *Journal of Advanced Nursing*, 55 (5), 622-635.
- Melnyk, B. M., Fineout-Overholt, E., Fischbeck Feinstein, N., Li, H., Small, L., Wilcox, L. & Kraus, R. (2004). Nurses' Perceived Knowledge, Beliefs, Skills, and Needs Regarding Evidence-Based Practice: Implications for Accelerating the Paradigm Shift. *Worldviews on Evidence-Based Nursing*, 1 (3), 185-193.
- Melnyk, B. M., Fineout-Overholt, E., Gallagher-Ford, L. & Kaplan, L. (2012). The State of Evidence-Based Practice in Us Nurses: Critical Implications for Nurse Leaders and Educators. *Journal of Nursing Administration*, 42 (9), 410-417.
- Melnyk, B. M., Fineout-Overholt, E. & Mays, M. Z. (2008). The Evidence-Based Practice Beliefs and Implementation Scales: Psychometric Properties of Two New Instruments. *Worldviews on Evidence-Based Nursing*, 5(4), 208-216.
- Ministry of Health. (2012). *Malawi National Plan for the Elimination of Mother to Child Transmission*.
- Misiri, H. E., Tadesse, E. & Muula, A. (2004). Are Public Antenatal Clinics in Blantyre Malawi Ready to Offer Services for the Prevention of Vertical Transmission of HIV? *African Journal of Reproductive Health*, 8 (2).

- Moland, K. M. I., De Paoli, M. M., Sellen, D. W., Van Esterik, P., Leshabari, S. C. & Blystad, A. (2010). Breastfeeding and HIV: Experiences from a Decade of Prevention of Postnatal HIV Transmission in Sub-Saharan Africa. *International Breastfeeding Journal*, 5, 10-16.
- Moreno-Casbas, T., Fuentelsaz-Gallego, C., De Miguel, Á. G., González-María, E. & Clarke, S. P. (2011). Spanish Nurses' Attitudes Towards Research and Perceived Barriers and Facilitators of Research Utilisation: A Comparative Survey of Nurses with and without Experience as Principal Investigators. *Journal of Clinical Nursing*, 20 (13/14), 1936-1947.
- Msellati, P. (2009). Improving Mothers' Access to PMTCT Programs in West Africa: A Public Health Perspective. *Social Science & Medicine*, 69 (6), 807-812.
- Murila, F., Obimbo, M. M., Musoke, R., Tsikhutsu, I., Migiro, S. & Ogeng'o, J. (2013). Breast-Feeding and Human Immunodeficiency Virus Infection: Assessment of Knowledge among Clinicians in Kenya. *International Journal of Nursing*, 21 (1), 37-42.
- Ndikom, C. M. & Onibokun, A. (2007). Knowledge and Behaviour of Nurse/Midwives in the Prevention of Vertical Transmission of HIV in Owerri, Imo State, Nigeria: A Cross-Sectional Study. *BioMed Central Nursing*, 6, (9).
- Nduati, R., John, G., Mbari-Ngacha, D., Richardson, B., Overbaugh, J., Mwatha, A., Ndinya-Achola, J., Bwayo, J., Onyango, F. E., Hughes, J. & Kreiss, J. (2000). Effect of Breast Feeding and Formula Feeding on Transmission of HIV-1. A Randomized Clinical Trial. *Journal of the American Medical Association*, 283 (9), 1167-1174.

- Nguyen, T. A., Oosterhoff, P., Yen Ngoc, P., Hardon, A. & Wright, P. (2009). Health Workers' Views on Quality of Prevention of Mother-to-Child Transmission and Postnatal Care for HIV-Infected Women and Their Children. *Human Resources for Health*, 7, 1-11.
- Nkole, T. (2014). *Knowledge, Attitudes and Practices on Prevention of Mother to Child Transmission of HIV among Health Care Providers at the University Teaching Hospital and Urban Clinics in Lusaka*. Masters Thesis, University of Zambia, Retrieved from dspace.unza.zm.
- Nurses and Midwives Council of Malawi (2011). Accessed from <http://www.nmcm.org.mw/>
- Odom-Forren, J. (2013). Research: The Foundation for Evidence. *Journal of Perianesthesia Nursing*, 28 (6), 331-332.
- Ofi, B., Sowunmi, L., Edet, D. & Anarado, N. (2008). Professional Nurses' Opinion on Research and Research Utilization for Promoting Quality Nursing Care in Selected Teaching Hospitals in Nigeria. *International Journal of Nursing Practice*, 14 (3), 243-255.
- Ogbolu, Y., Iwu, E. N., Zhu, S. & Johnson, J. V. (2013). Translating Research into Practice in Low-Resource Countries: Progress in Prevention of Maternal to Child Transmission of HIV in Nigeria. *Nursing Research Practice*, 2013.
- Oyeyemi, A., Oyeyemi, B. & Bello, I. (2006). Caring for Patients Living with AIDS: Knowledge, Attitude and Global Level of Comfort. *Journal of Advanced Nursing*, 53 (2), 196-204.

- Park, J. W., Ahn, J. A., & Park, M. M. (2014). Factors Influencing Evidence-Based Nursing Utilization Intention in Korean Practice Nurses. *International Journal of Nursing Practice*. doi:10.1111/ijn.12296
- Patelarou, A. E., Patelarou, E., Brokalaki, H., Dafermos, V., Thiel, L., Melas, C. D. & Koukia, E. (2013). Current Evidence on the Attitudes, Knowledge and Perceptions of Nurses Regarding Evidence-Based Practice Implementation in European Community Settings: A Systematic Review. *Journal of Community Health Nursing*, 30 (4), 230-244.
- Ploeg, J., Davies, B., Edwards, N., Gifford, W. & Miller, P. E. (2007). Factors Influencing Best-Practice Guideline Implementation: Lessons Learned from Administrators, Nursing Staff, and Project Leaders. *Worldviews on Evidence-Based Nursing*, 4 (4), 210-219.
- Polit, D. F. & Beck, C. T. (2004). *Nursing Research: Principles and Methods*, Lippincott Williams & Wilkins.
- Read, J. S. & Newell, M. L. (2005). Efficacy and Safety of Casearian Delivery for Prevention of Mother-to- Child Transmission of HIV-1 (Review). *Cochrane Database of Systematic Reviews*, 4.
- Relf, M. V., Mekwa, J., Chasokela, C., Nhlengethwa, W., Letsie, E., Mtengezo, J., Ramantele, K., Diesel, T., Booth, C., Deng, L., Mallinson, R. K., Powell, D., Webb, A., Liddle, A., Yu-Shears, J., Hall, C., Aranda-Naranjo, B. & Hopson, D. P. (2011). Essential Nursing Competencies Related to HIV and AIDS. *Journal of the Association of Nurses in AIDS Care*, 22 (1), e5-e40.

- Rolfé, G., Segrott, J. & Jordan, S. (2008). Tensions and Contradictions in Nurses' Perspectives of Evidence-Based Practice. *Journal of Nursing Management*, 16 (4), 440-451.
- Roxby, A. C., Unger, J. A., Slyker, J. A., Kinuthia, J., Lewis, A., John-Stewart, G. & Walson, J. L. (2014). A Lifecycle Approach to HIV Prevention in African Women and Children. *Current HIV/AIDS Reports*, 11 (2), 119-127.
- Rudman, A., Gustavsson, P., Ehrenberg, A., Boström, A.-M. & Wallin, L. (2012). Registered Nurses' Evidence-Based Practice: A Longitudinal Study of the First Five Years after Graduation. *International Journal of Nursing Studies*, 49 (12), 1494-1504.
- Rujumba, J., Tumwine, J. K., Tylleskär, T., Neema, S. & Heggenhougen, H. K. (2012). Listening to Health Workers: Lessons from Eastern Uganda for Strengthening the Programme for the Prevention of Mother-to-Child Transmission of HIV. *BioMed Central Health Services Research*, 12 (3).
- Rycroft-Malone, J. (2004). The Parih Framework—a Framework for Guiding the Implementation of Evidence-Based Practice. *Journal of Nursing Care Quality*, 19 (4), 297-304.
- Rycroft-Malone, J., Seers, K., Titchen, A., Harvey, G., Kitson, A. & McCormack, B. (2004). What Counts as Evidence in Evidence-Based Practice? *Journal of Advanced Nursing*, 47 (1), 81-90.
- Sackett, D. L., Rosenberg, W. M. C., Gray, J. a. M., Haynes, R. B. & Richardson, W. S. (1996). Evidence Based Medicine: What It Is and What It Isn't: It's About Integrating Individual

- Clinical Expertise and the Best External Evidence. *British Medical Journal*, 312 (7023), 71-72.
- Sahin, I. (2006). Detailed Review of Rogers' Diffusion of Innovations Theory and Educational Technology-Related Studies Based on Rogers' Theory. *The Turkish Online Journal of Educational Technology*, 5 (2).
- Salyer, J. L. H., Walusimbi, M. L. & Fitzpatrick, J. J. (2008). Knowledge and Attitudes of Ugandan Midwives Regarding HIV. *Journal of the Association of Nurses in AIDS Care*, 19 (2), 105-113.
- Sandström, B., Borglin, G., Nilsson, R. & Willman, A. (2011). Promoting the Implementation of Evidence-Based Practice: A Literature Review Focusing on the Role of Nursing Leadership. *Worldviews on Evidence-Based Nursing*, 8 (4), 212-223.
- Scott, K. & McSherry, R. (2009). Evidence-Based Nursing: Clarifying the Concepts for Nurses in Practice. *Journal of Clinical Nursing*, 18 (8), 1085-1095.
- Scott, S. D. & Pollock, C. (2008). The Role of Nursing Unit Culture in Shaping Research Utilization Behaviors. *Research In Nursing & Health*, 31 (4), 298-309.
- Shaibu, S. (2006). Evidence-Based Nursing Practice in Botswana: Issues, Challenges, and Globalization. *Primary Health Care Research & Development*, 7 (4), 309-313.
- Sherriff, K. L., Wallis, M. & Chaboyer, W. (2007). Nurses' Attitudes to and Perceptions of Knowledge and Skills Regarding Evidence-Based Practice. *International Journal of Nursing Practice*, 13 (6), 363-369.

- Siddiqi, K. & Robinson, M. (2006). Getting Evidence into Practice in Developing Countries. *Evidence-based Cardiovascular Medicine*, 10 (1), 5-7.
- Smith, J. R. & Donze, A. (2010). Assessing Environmental Readiness: First Steps in Developing an Evidence-Based Practice Implementation Culture. *The Journal of Perinatal & Neonatal Nursing*, 24 (1), 61-71.
- Squires, J. E., Estabrooks, C. A., Gustavsson, P. & Wallin, L. (2011). Individual Determinants of Research Utilization by Nurses: A Systematic Review Update. *Implementation Science*, 6 (1), 1-20.
- Sredl, D., Melnyk, B. M., Hsueh, K.-H., Jenkins, R., Ding, C. & Durham, J. (2011). Health Care in Crisis! Can Nurse Executives' Beliefs About and Implementation of Evidence-Based Practice Be Key Solutions in Health Care Reform? *Teaching and Learning in Nursing*, 6 (2), 73-79.
- Stokke, K., Olsen, N. R., Espehaug, B. & Nortvedt, M. W. (2014). Evidence Based Practice Beliefs and Implementation among Nurses: A Cross-Sectional Study. *BioMed Central Nursing*, 13 (8).
- Taulo, F., Berry, M., Tsui, A., Makanani, B., Kafulafula, G., Li, Q., Nkhoma, C., Kumwenda, J. J., Kumwenda, N. & Taha, T. E. (2009). Fertility Intentions of HIV-1 Infected and Uninfected Women in Malawi: A Longitudinal Study. *AIDS and Behavior*, 13 (1), 20-27.
- Thomas, T. K., Masaba, R., Borkowf, C. B., Ndivo, R. & Zeh, C. (2011). Triple-Antiretroviral Prophylaxis to Prevent Mother-to-Child HIV Transmission through Breastfeeding—the Kisumu Breastfeeding Study, Kenya: A Clinical Trial. *PLoS Med*, 8 (3).

- Thompson, D. R., Chau, J. P. & Lopez, V. (2006). Barriers to, and Facilitators of, Research Utilisation: A Survey of Hong Kong Registered Nurses. *International Journal of Evidence-Based Healthcare*, 4 (2), 77-82.
- Thorsteinsson, H. S. (2013). Icelandic Nurses' Beliefs, Skills, and Resources Associated with Evidence-Based Practice and Related Factors: A National Survey. *Worldviews on Evidence-Based Nursing*, 10 (2), 116-126.
- Townsend, C. L., Cortina-Borja, M., Peckham, C. S., De Ruiter, A., Lyall, H. & Tookey, P. A. (2008). Low Rates of Mother-to-Child Transmission of HIV Following Effective Pregnancy Interventions in the United Kingdom and Ireland, 2000-2006. *AIDS*, 22 (8), 973-981.
- Tudor Car, L., Brusamento, S., Elmoniry, H., Car, J., Majeed, A. & Atun, R. (2011). Integrating Interventions for Prevention of Transmission of HIV from Mothers to Infants During Pregnancy, Delivery and Breastfeeding with Other Healthcare Services to Increase the Coverage. *The Cochrane Library*.
- Tweya, H., Feldacker, C., Breeze, E., Jahn, A., Haddad, L. B., Ben-Smith, A., Chaweza, T. & Phiri, S. (2013). Incidence of Pregnancy among Women Accessing Antiretroviral Therapy in Urban Malawi: A Retrospective Cohort Study. *AIDS and Behavior*, 17 (2), 471-478.
- Ubbink, D., Vermeulen, H., Knops, A., Legemate, D., Oude Rengerink, K., Heineman, M., Roos, Y., Fijnvandraat, C., Heymans, H. & Simons, R. (2011). Implementation of Evidence-

- Based Practice: Outside the Box, Throughout the Hospital. *Netherlands Journal Medicine*, 69 (2), 87-94.
- UNAIDS.(2008). UNAIDS Report on the Global AIDS Epidemic. Geneva, Switzerland.
- UNAIDS. (2013a). Global Report : UNAIDS Reprot on the Global AIDS Epidemic. Geneva, Switzerland.
- UNAIDS. (2013b). Regional Fact Sheet, Sub-Saharan Africa. Geneva, Switzerland .
- Upton, D. & Upton, P. (2006). Development of an Evidence-Based Practice Questionnaire for Nurses. *Journal of Advanced Nursing*, 53(4), 454-458.
- Van Achterberg, T., Schoonhoven, L. & Grol, R. (2008). Nursing Implementation Science: How Evidence-Based Nursing Requires Evidence-Based Implementation. *Journal of Nursing Scholarship*, 40 (4), 302-310.
- Van Lettow, M., Bedell, R., Landes, M., Gawa, L., Gatto, S., Mayuni, I., Chan, A., Tenthani, L. & Schouten, E. (2011). Uptake and Outcomes of a Prevention-of Mother-to-Child Transmission (PMTCT) Program in Zomba District, Malawi. *BioMed Central Public Health*, 11 (1), 426.
- Veeramah, V. (2008). Exploring Strategies for Promoting the Use of Research Findings in Practice. *British Journal of Nursing*, 17 (7), 466-471.
- Wall, D. Y. (2014). The Cochrane Collaboration and Evidence-Based Practice: Where the Art and Science of HIV Nursing Meet. *Journal of the Association of Nurses in AIDS Care*, 25 (1), 4-6.

Weigel, R., Hosseinipour, M. C., Feldacker, C., Gareta, D., Tweya, H., Chiwoko, J., Gumulira, J., Kalulu, M., Mofolo, I., Kamanga, E., Mwale, G., Kadzakumanja, A., Jere, E. & Phiri, S. (2012). Ensuring HIV-Infected Pregnant Women Start Antiretroviral Treatment: An Operational Cohort Study from Lilongwe, Malawi. *Tropical Medicine & International Health*, 17 (6), 751-759.

Weng, Y.-H., Kuo, K. N., Yang, C.-Y., Lo, H.-L., Chen, C. & Chiu, Y.-W. (2013). Implementation of Evidence-Based Practice across Medical, Nursing, Pharmacological and Allied Healthcare Professionals: A Questionnaire Survey in Nationwide Hospital Settings. *Implementation Science*, 8 (1), 112.

World Health Organization. (2010). *Anteretroviral drugs for treating pregnant women and preventing HIV infections in infants: Recommendations for a public health approach*. Geneva, Switzerland

World Health Organization. (2011a). European Observatory on Health Systems and Policies. Geneva, Switzerland.

World Health Organization.(2011b). *Global HIV/AIDS Response: Epidemic Update and Health Sector Progress Towards Universal Access : Progress Report*. Geneva, Switzerland

World Health Organization.(2013a). *Global Update on HIV Treatment 2013 : Results, Impact and Opportunities*. Geneva, Switzerland

World Health Organization.(2013b). *Mother-to- Child Transmission of HIV*. Geneva, Switzerland.

World Health Organization. (2008). *WHO expert consultation on new and emerging evidence on the use of Antiretroviral drugs for the prevention of mother-to-child transmission of HIV*. Geneva, Switzerland .

Young, S. L., Mbuya, M. N., Chantry, C. J., Geubbels, E. P., Israel-Ballard, K., Cohan, D., Vosti, S. A. & Latham, M. C. (2011). Current Knowledge and Future Research on Infant Feeding in the Context of HIV: Basic, Clinical, Behavioral, and Programmatic Perspectives. *Advanced Nutrition*, 2 (3), 225-43.

Zachariah, R., Ford, N., Philips, M., S.Lynch, Massaquoi, M., Janssens, V. & Harries, A. D. (2009). Task Shifting in HIV/AIDS: Opportunities, Challenges and Proposed Actions for Sub-Saharan Africa. *Transactions of The Royal Society of Tropical Medicine and Hygiene*, 103 (6), 549-558.

Zuber, A., Mccarthy, C. F., Verani, A. R., Msidi, E. & Johnson, C. (2014). A Survey of Nurse-Initiated and -Managed Antiretroviral Therapy (Nimart) in Practice, Education, Policy, and Regulation in East, Central, and Southern Africa. *Journal of the Association of Nurses in AIDS Care*, 25 (6), 520-531.

ANNEXURE 1: PARTICIPANTS' INFORMATION DOCUMENT

Dear Participant

My name is Chisomo Mulenga. I am a student of the University of KwaZulu-Natal in Durban, South Africa. I am pursuing masters' degree in nursing research. In partial fulfillment for the award of the degree, I am required to do a research project. The title of my research is: **An exploratory descriptive study on nurses' knowledge, attitudes, and practices regarding evidence based practice in a PMTCT program at a selected public tertiary hospital in Malawi.**

Mother to child transmission (MTCT) of HIV has raised concern as it contributes to 90% of all infections in children. Elimination of MTCT of HIV requires health care workers to implement evidence based practice as it has been proven effective in other countries. The study therefore aims to establish baseline knowledge on the above as no studies have been done in Malawi so as to make recommendations on how evidence based practice can be promoted and hence helping in the global agenda of virtual elimination of MTCT of HIV.

If you are willing to participate in the study, you will be requested to fill a questionnaire that will be provided. It will take you a minimum of 30 minutes to fill the questionnaire.

Please note that participation in the study is voluntary and you can withdraw any time you wish to should you agree to participate and later change your mind.

There will be no negative consequences for those who decline to participate or withdraw from the study.

The information you will give will not be used against you in any way. The final product will be figures generalized to the whole population and not just one participant.

No names will be indicated on the questionnaire and only signatures will be required for the informed consent form. No other person apart from the researcher will have access to the information. However, in special circumstances, Biomedical Research Ethics Committee of the University of KwaZulu-Natal or Malawi National Health Sciences Research Ethics Committee may be given access to the confidential information.

There are no physical, social and emotional risks in participating in the study. You may not benefit directly from participating in the study but recommendations to be made from the findings of the study if utilized may help to improve nurses knowledge on evidence based practice and hence boost confidence and job satisfaction.

The research report will be published. No names or identifying details will appear on any publications, reports, presentations or briefings. A copy of the research report will be put in the hospital library where you can have access. All documents for the study will be destroyed after a period of five years.

Should you need to contact the researcher for clarification, below are the contact details:

Name: Chisomo Mulenga

Contact Address: 530 Frere Road

Sunning dale 10, Glenwood, Durban 4001

Phone number: +265 884 456 166 or +265 999 390 705

Email address: chimindozo@yahoo.com

You May also contact the following for queries, clarification

Supervisor: Dr J.R Naidoo
Contact address: School of Nursing and Public Health
Howard College Campus
Phone Number: +27 31 260 2213 or +27 83 670 4262
Email address: Naidoojr@ukzn.ac.za

Research Ethics: University of KwaZulu-Natal
Biomedical Research Ethics Administration
Research Office, Westville Campus
Private Bag X54001
Durban 4000, KwaZulu-Natal, South Africa

Phone Number: +27 31 260 4769

Fax: +27 31 260 4609

Email: BREC@ukzn.ac.za

National Health Sciences Research Committee

P.O Box 30377

Lilongwe 3

Malawi.

Thank you.

ANNEXURE 2: DECLARATION OF CONSENT TO PARTICIPATE IN THE STUDY

I understand that I am being requested to participate in a research study that aims at exploring and describing nurses' knowledge, attitudes, and practices regarding evidence based practice in a PMTCT program.

I understand that participation in the study is voluntary and that I can withdraw any time I wish to should I accept and later change my mind.

I understand that I will be required to fill a questionnaire that will take a minimum of 30 minutes.

I understand that my participation will be anonymous and that data will be kept confidential. However results that will be generalized to the whole population will be used in nursing publications.

The study has been explained to me and I have read and understood this consent form. All my questions have been answered. However, should I require further clarification I understand that I can contact the researcher any time.

I agree to participate in the study

Participant signature

Date

Researchers' Signature

Date

ANNEXURE 3: QUESTIONNAIRE

Research Title: Exploratory descriptive study on nurses' knowledge, attitudes and practices regarding evidence based practice in a PMTCT program at a selected public tertiary hospital in Malawi.

- This questionnaire contains six sections namely: social demographic data, knowledge, attitudes, practices, barriers and facilitators to evidence based practice in PMTCT.
- Indicate your answer by ticking in the appropriate box
- Please make sure you have answered all the questions
- Make sure you answer the questions as honest as possible

Section A: Social demographic data

1. What is your age?

2. What is your gender?

1	Male	
2	Female	

3. What is your nursing category?

1	Professional nurse	
2	Registered nurse	
3	NMT	
4	Other	

4. What is your qualification?

1	Masters degree	
2	Bachelors degree	
3	University diploma	
4	College diploma	
5	Certificate	

5. What is your work experience (number of years practicing as a nurse)?

6. In which department are you working?

1	Maternity	
2	Gynecology	
3	Pediatrics	

7. How long have you been working in this department?

8. Have you ever received any training in PMTCT?

1	Yes	
2	No	

9. If yes, when?

1	Pre-service (college)	
2	In-service	
3	Both	

10. Have you ever received general training on evidence based practice?

1	Yes	
2	No	

11. If yes, when?

1	Pre-service (college)	
2	In-service	
3	Both	

Section B: Knowledge / Skills of evidence based practice in PMTCT

Please rate your knowledge / skills regarding evidence based practice in PMTCT by responding to the following questions through ticking in the appropriate box.

Key: Poor = lack of knowledge / skill, Fair = Minimal knowledge, Good = Satisfactory knowledge, Very good = Above satisfactory, Excellent = Outstanding

	How would you rate your ability in:	Poor	Fair	Good	Very Good	Excellent
1	Research skills					
2	Information technology skills					
3	Monitoring and reviewing of practice skills					
4	Converting your information needs into a research question					
5	Awareness of major information types and sources					
6	Ability to identify gaps in your professional practice					
7	Knowledge of how to retrieve evidence					
8	Ability to analyze critically evidence against set standards					
9	Ability to determine how valid (close to the truth) the material is					
10	Ability to determine how useful (clinically applicable) the material is					
11	Ability to apply information to individual cases					
12	Sharing of ideas and information with colleagues					
13	Dissemination of new ideas about care to colleagues					
14	Ability to review your own practice					

Please tick in the appropriate box regarding the evidence you use for PMTCT practice.

Key: Never = you don't use it, Seldom = you use once/ twice every 1/2 year, Sometimes = once/ twice every month, frequently = several times every month, Always = all the time.

	The evidence that I use for PMTCT practice is based on :	Never	Seldom	Sometimes	Frequently	Always
15	Information that I learn about each patient/client as an individual					
16	My intuitions about what seems to be 'right' for the patient/client					
17	My personal experience of caring for patients/clients over time					
18	What has worked for me for years					
19	The ways that I have always done it					
20	Information my fellow practitioners share					
21	Information senior clinical nurses share, e.g. clinical nurse specialists, nurse practitioners					
22	What doctors discuss with me					
23	New treatments and medications that I learn about when doctors prescribe them for patients					
24	Medications and treatments I gain from pharmaceutical or equipment company representatives					
25	Information I get from product literature					
26	Information I learn in my training					
27	Information I get from attending in-service training/conferences					
28	Information I get from local policy and protocols					
29	Information I get from national policy initiatives/guidelines					
30	Information I get from local audit reports					
31	Articles published in medical journals					
32	Articles published in nursing journals					
33	Articles published in research journals					
34	Information in textbooks					
35	Information I get from the Internet					
36	Information I get from the media (e.g. Magazines, TV)					

Section C: Attitudes towards evidence based practice in PMTCT

Please tick in the appropriate box the level of your agreement to the following statements:

	Do you agree or disagree with the following statements?	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
37	My workload is too great for me to keep up-to-date with all the new evidence					
38	I resent having my clinical practice being questioned					
39	Evidence-based practice is a waste of time					
40	I stick to tried and trusted methods rather than changing to anything new					

Section D: Practice of evidence based practice in PMTCT

How often in the past eight weeks have you performed the following to improve PMTCT services?

Please respond to the statements by ticking in the appropriate box.

	How often in the past eight weeks have you performed the following to improve PMTCT services :	0 times	1-3 times	4-6 times	6-8 times	More than 8 times
41	Shared the patient outcome data collected with colleagues.					
42	Shared evidence from a study/is in the form of a report or presentation to >2 colleagues.					
43	Shared Evidence based practice guidelines with a colleague					
44	Shared evidence from a research study with a multidisciplinary team member.					
45	Used an Evidence Based Practice guideline or systematic review to change clinical practice where I work.					
46	Changed practice based on patient outcome data.					
47	Evaluated a care initiative by collecting patient outcome data					
48	Evaluated the outcomes of a practice change.					
49	Promoted the use of evidence based practice to my colleagues.					
50	Used evidence to change my clinical practice.					
51	Shared evidence from a research study with a patient / family member.					
52	Read and critically appraised a clinical research study.					
53	Informally discussed evidence from a research study with a colleague					
54	Critically appraised evidence from a research study.					
55	Generated a PICO question about my clinical practice.					
56	Collected data on a patient problem.					
57	Accessed the Cochrane database of systematic reviews					

Section E: Barriers to evidence based practice in PMTCT

Do you agree or disagree that the following barriers have been preventing you from adopting evidence based practice in PMTCT? Respond to the statements by ticking in the appropriate box your level of disagreement / agreement

	What are the barriers to evidence based practice in the PMTCT program?	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
58	I do not know how to find appropriate research reports					
59	I do not know how to find organizational information (guidelines, protocols, etc.)					
60	I do not have sufficient time to find research reports					
61	I do not have sufficient time to find organizational information (guidelines / protocols, etc.)					
62	Research reports are not easy to find					
63	Organizational information (protocols, guidelines, etc.) is not easy to find					
64	I find it difficult to understand research reports					
65	I do not feel confident in judging the quality of research reports					
66	I find it difficult to identify the implications of research findings for my own Practice					
67	I find it difficult to identify the implications of organizational information for my own practice					
68	I do not feel confident about beginning to change my practice					
69	The culture of my team is not receptive to changing practice					
70	I lack the authority in the workplace to change practice					
71	There are insufficient resources to change practice					

Section F: Facilitators to evidence based practice in PMTCT

Do you agree or disagree that the following factors can facilitate evidence based practice in Prevention of Mother to Child Transmission of HIV? Respond to the statements by ticking in the appropriate box your level of disagreement / agreement.

	What are the facilitating factors to evidence based practice in Prevention of Mother to Child Transmission of HIV?	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
72	Nursing colleagues who embrace evidence based practice					
73	Nursing management who embrace evidence based practice					
74	Given adequate training in evidence based practice					
75	Given protected time to conduct evidence based practice					
76	Access to a system for comprehensive literature searching					
77	Mentoring by nurses who have adequate evidence based practice experience					

Thank you very Much for your participation in the study.

ANNEXURE 4: ETHICAL CLEARANCE FROM BIOMEDICAL ETHICS COMMITTEE

 UNIVERSITY OF
KWAZULU-NATAL
INYUVESI
YAKWAZULU-NATALI

17 October 2014

Mrs Chisomo Mulenga
530 Frere Road
Sunningdale 10
Glenwood
Durban, 4001
chimindozi@yahoo.com

PROTOCOL: An exploratory descriptive study on nurses knowledge, attitudes and practices regarding evidence based practice in a Prevention of Mother to Child Transmission of HIV Program at a selected public tertiary hospital in Malawi: Degree Purposes (Masters). BREC REF: BE386/14.

EXPEDITED APPLICATION

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application received on 05 August 2014.

The study was provisionally approved pending appropriate responses to queries raised. Your responses received on 17 September 2014 to queries raised on 15 September 2014 have been noted by a sub-committee of the Biomedical Research Ethics Committee. The conditions have now been met and the study is given full ethics approval.

This approval is valid for one year from 17 October 2014. To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2004), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be **RATIFIED** by a full Committee at its meeting taking place on 11 November 2014.

We wish you well with this study. We would appreciate receiving copies of all publications arising out of this study.

Yours sincerely,


Professor D.R. Wassenaar
Chair: Biomedical Research Ethics Committee

Biomedical Research Ethics Committee
Professor D.R. Wassenaar (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54091, Durban 4053
Telephone: +27 (0) 31 260 2400 Facsimile: +27 (0) 31 203 4529 Email: brec@ukzn.ac.za
Website: <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>

1911 - 2011
100 YEARS OF ACADEMIC EXCELLENCE

Innovation | Enterprise | Research | Education | Service

ANNEXURE 5: APPLICATION LETTER TO MALAWI ETHICS COMMITTEE

The Chairperson
National Health Sciences Research Committee
Ministry of Health
Private Bag 30377
Lilongwe 3, Malawi

530 Frere Road
Sunning dale 10
Glenwood, 4001
Durban, South Africa

15 July 2014

Dear Sir/ Madam

APPLICATION FOR RESEARCH ETHICAL CLEARANCE

I am a student of the University of KwaZulu-Natal pursuing a Master's degree in Nursing Research. In partial fulfillment for the award of the degree, I am required to conduct a research study. My research is an **exploratory descriptive study on the nurses' knowledge, attitudes and practices regarding evidence based practice in a Prevention of Mother to Child Transmission of HIV program at a selected public tertiary Hospital in Malawi.**

I write to apply for ethical clearance to conduct the study at Kamuzu central hospital. I intend to collect data from 18th August to 3rd September 2014 which is our Mid-semester period. The study has no physical, social and emotional risks. Findings of the study will be used to make recommendations on strategies to promote evidence based practice among nurses in the provision of PMTCT services which in turn may contribute to virtual elimination of Mother to child transmission of HIV/AIDS which is a global agenda that Malawi is part of.

The sample for the study will include **all** nurses working in Maternity, Gynecology and Pediatric departments. The Nurses will be required to fill a questionnaire. All the ethical considerations as stipulated in the proposal will be adhered to in the conduct of the study.

Attached find a copy of the research proposal and a letter of support from the University.

Looking forward to your favorable consideration

Yours Faithful

Chisomo Mulenga.

ANNEXURE 6: MALAWI ETHICS CLEARANCE

Telephone: +265 785 400
Facsimile: - 265 799 431
e-mail: doccentre@malawi-net
All Communications should be
addressed to:
The Secretary for Health



In reply please quote No. MHT/01/00
MINISTRY OF HEALTH
P.O. BOX 30377
LILONGWE 3
MALAWI

20th August 2014

Chisomo Malunga
University of Kwazulu Natal

Dear Sir/Madam,

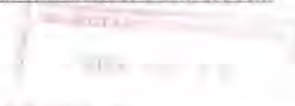
Re: Protocol #1314: An explanatory descriptive study on the nurses' knowledge, attitudes and practices regarding evidence based practice in a prevention of mother to child transmission of HIV program at a selected public tertiary hospital in Malawi.

Thank you for the above cited proposal that you submitted to the National Health Sciences Research Committee (NHSRC) for review. Please be advised that the NHSRC has reviewed and **approved** your application to conduct the above titled study.

- **APPROVAL NUMBER:** NHSRC # 1314
The above details should be used for all correspondence, consent forms and documentation appropriate.
- **APPROVAL DATE:** 26-08-2014
- **EXPIRATION DATE:** This approval expires on 25-08-2015.
After this date, the project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the NHSRC's secretariat should be submitted one month before the expiration date for continuing review.
- **SERIOUS ADVERSE EVENT REPORTING:** All serious problems having to do with subject safety must be reported to the National Health Sciences Research Committee within 10 working days using standard forms obtainable from the NHSRC's secretariat.
- **ADDITIONAL ACTIONS:** Prior NHSRC approval using standard forms obtainable from the NHSRC's Secretariat is required before implementing any changes in the Protocol (including changes in the amount of assessment). You may not use any other consent documents besides those approved by the NHSRC.
- **TERMINATION OF STUDY:** On termination of a study, a report has to be submitted to the NHSRC using standard forms obtainable from the NHSRC's Secretariat.
- **QUESTIONS:** Please contact the NHSRC on Telephone No: (01) 724410, 0888344441 or by e-mail on: info@nhsrc.mw
- **Others:**
Please be reminded to send us copies of your final research results for our records as well as for the Health Research Database.

Kind regards from the NHSRC Secretariat

FOR CHAIRMAN, NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE



PROMOTING THE ETHICAL CONDUCT OF RESEARCH
Executive Committee of the *Association to Advance Practical Ethics in Human Research*
Registered with the U.S.A Office for Human Research Protections (OHRP) as an International IRB
(OHR Number IRB00003905 - FWA00005976)

ANNEXURE 7: LETTER REQUESTING SITE PERMISSION

The Director	530 Frere Road
Kamuzu Central Hospital	Sunnigdale 10
PO Box 149	Glenwood
Lilongwe 3	Durban 4001
Malawi	South Africa

22 September, 2014.

Dear Sir

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH STUDY AT KAMUZU CENTRAL HOSPITAL

I am a student of the University of KwaZulu-Natal in South Africa, pursuing masters in nursing research. In partial fulfillment for the award of the degree, I am required to conduct a research project. The title of my research is: **An exploratory descriptive study on nurses' knowledge, attitudes, and practices regarding evidence based practice in a PMTCT program at a selected public tertiary hospital in Malawi.**

I write to request permission to conduct the study at this hospital. The study requires that I collect information from nurses. Informed consent will be sought from the nurses and they will be required to fill a questionnaire. Findings of the study will be used to make recommendations on how evidence based practice can be promoted thereby helping in PMTCT of HIV. Once the research has been finalized, a copy of the research report will be made available to this hospital.

Attached find a copy of the research proposal and ethical approval letter from Ministry of Health Ethics committee

Your favorable consideration will be greatly appreciated.

Yours faithfully

Chisomo Mulenga

ANNEXURE 8: SITE PERMISSION

Ref. No. KGH/D/0.01
TELEPHONE No.: (265) 1 753 555
TELE FAX No.: (265) 1 756 300
Please forward all correspondence
to: The Hospital Director
K.M.H.



MINISTRY OF HEALTH
KAMUZU CENTRAL HOSPITAL
P. O. BOX 109
LILONGWE

23rd September, 2014.

Ms. Chisomo Mulenga
530 Free Road
Sunning Dale 10
Glenwood 4001
Durban
South Africa

Dear Madam,

PERMISSION TO CONDUCT A RESEARCH STUDY

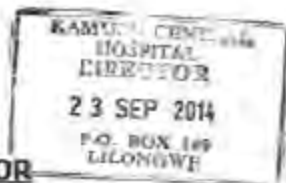
Reference is made to your letter dated 22nd September, 2014 regarding the above quoted subject.

Please be informed that approval has been granted for you to collect research data on topic entitled **"An Exploratory Descriptive Study on Nurses' Knowledge, Attitudes and Practices Regarding Evidence Based Practice in a PMTCT Program at a Selected Public Hospital in Malawi"**.

I expect you to use the information for academic purposes only.

Yours faithfully,

Dr J. W. Ngoma
HOSPITAL DIRECTOR



ANNEXURE 9 : EDITOR'S LETTER

Editing Declaration

P O Box 531
Hillcrest
3650
KwaZulu-Natal

2015-02-23

TO WHOM IT MAY CONCERN

Thesis Title: An exploratory descriptive study on the nurses' knowledge, attitudes and practices of evidence-based practice in a PMTCT program at a selected public tertiary hospital in Malawi

Author: Chisomo Mulenga

This is to certify that I have edited the above thesis from an English language perspective and have made recommendations to the author regarding spelling, grammar, punctuation, structure and general presentation.

A marked-up version of the thesis has been sent to the author and is available as proof of editing.

I have had no input with regard to the technical content of the document and have no control over the final version of the thesis as it is the prerogative of the author to either accept or reject any recommendations I have made. I therefore accept no responsibility for the final assessment of the document.

Yours faithfully

A handwritten signature in black ink, appearing to read 'M. Addis', with a horizontal line underneath.

Margaret Addis