University of Fort Hare
Together in Excellence

THE EFFECTIVENESS OF MEDIUM-FIDELITY SIMULATION ON THE CLINICAL READINESS OF STUDENT LEADERS IN MIDWIFERY

DEPARTMENT OF NURSING SCIENCE,
FACULTY OF HEALTH SCIENCES,
UNIVERSITY OF FORT HARE,

June 2017

THE EFFECTIVENESS OF MEDIUM-FIDELITY SIMULATION ON THE CLINICAL READINESS OF STUDENT MIDWIVES

BY

ZUKISWA BRENDA NTLOKONKULU

A thesis submitted in fulfilment of the requirements for the degree of

MAGISTER CURATIONIS

DEPARTMENT OF NURSING SCIENCE
FACULTY OF HEALTH SCIENCES
UNIVERSITY OF FORT HARE

Supervisor: **Mrs NM Rala**
Co-Supervisor: **Prof DT Goon**

June 2017

DECLARATION

I, Zukiswa Brenda Ntlokonkulu, declare that this dissertation, submitted in fulfilment of the requirement for the Masters by research in nursing, is entirely my own work, except where otherwise accredited. It has not at any time, either in whole or in part, been submitted for any other educational award. Furthermore, I took reasonable care to ensure that the work is original, and, to the best of my knowledge, does not breach copyright law, and has not been taken from other sources except where such work has been cited and acknowledged.

Name: **Zukiswa Brenda Ntlokonkulu**

Signature: ……………………….

Date: ………………………. ……

DECLARATION ON PLAGIARISM

I, **Zukiswa Brenda Ntlokonkulu**, student number: 201409884, hereby declare that I am fully aware of the University of Fort Hare's policy on plagiarism and I have taken every precaution to comply with the regulations.

DEDICATION

I dedicate this dissertation to my paternal grandmother, Noxuza Ketani, who bought my first school uniform. I'm certain, Dabawo, that you would have been proud of this achievement. To my maternal grandmother, Marona Nyati, who herself was a nurse; you encouraged me to be a nurse, insisting that I would make a good one. I miss the discussions we used to have when you were still alive. I know that you would have been fascinated about modern simulation and its impact on nursing education.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank God for His faithfulness; there is none like Him.

To my supervisor, Mrs NM Rala, I am ever so grateful that you took on such a big project with me and walked the journey with me. Thank you for your words of wisdom, your critical and analytical eye and the knowledge you shared so freely. To my co-supervisor, Prof DT Goon; I am forever indebted to you for the commitment you showed to my research project. Thank you for the input you had on my work. The ease that you demonstrated when dealing with my work is admirable, and I stand in awe of your wisdom regarding research.

This project would have not been possible without the University of Fort Hare Bachelor of Nursing finalist class of 2015. Thank you, guys, for making the ESMOE simulation possible and for all the valuable information that you shared. Thank you to Prof Nikodem for the advice that you gave during the infancy stage of this project. To Ms Zukiswa Dasheka and Nonceba Vellem; thank you for your assistance with the pilot and your ongoing support throughout the years. My eternal gratitude goes, too, to the Acting Dean of Health Sciences, Prof E Seekoe, for your encouragement and the way you opened funding doors for us. Thank you to Ms Chanel Brown who co-coded this work. Thank you for taking time out of your mummy duties to spend time with my work and your valued inputs were appreciated. To Ms Jane Mqamelo, my editor thank you so much for your willingness and dedication you showed in your involvement with my work. I have never enjoyed making corrections so much as I did with you.

To my husband, Libhongo Ntlokonkulu, thank you for your support, encouragement and understanding. Thank you for holding the fort when the demands of this project removed me from my daily routine. To my only child, Zezothukela; thank you for understanding when Mama had to do some work at home or go to the office on Saturdays. To my parents, Zamile and Buyiswa Ketani, thank you so much for your love and just being there for me. For being such great parents. I love you a lot.

LIST OF ACRONYMS

CBL - Case-based learning

CT - Critical thinking

ESMOE - Essential Steps in management of Obstetrical Emergency

HCA – Health care assistant

HFS – High-fidelity simulation

IPA - Interpretative phenomenological analysis

MFS - Medium-fidelity simulation

MOET - Managing Obstetrical Emergencies and Trauma

MOSES - Multidisciplinary obstetric simulated emergency scenarios

NTS - Non-technical skills

NQN – Newly qualified nurse

PBL - Problem-based learning

PCC - Patient-centered care

PPH - Post-partum haemorrhage

PROMPT - Practical Obstetric Multi-Professional Training

SANC - South African Nursing Council

SP - Standardised Patient

UFH - University of Fort Hare

ABSTRACT

Simulation affords the student a safe and supportive environment in which to practise skills repeatedly without causing any harm to a real patient. The Department of Nursing Sciences at the University of Fort Hare has a laboratory that offers low- to medium-fidelity simulation in the form of task trainers and mannequins. These task trainers and mannequins are used in general nursing, and in community and midwifery nursing sciences, for the demonstration of skills, the practising of skills by students and for formative assessments.

In midwifery, task trainers are used for vaginal examinations, abdominal palpation, breech and vaginal deliveries and the management of post-partum haemorrhage (PPH). Given that in a real-life clinical environment limited opportunities exist for students to practise during an obstetrical emergency, medium-fidelity simulation (MFS) in midwifery ideally positions the student in a practical environment without risking the patient's safety.

Despite the availability of MFS at UFH, its benefit on the clinical readiness of student midwives is not known. The present study was designed to assess the effectiveness of MFS in enhancing the clinical readiness of student midwives at the University of Fort Hare. The main research objective of the study was to explore, describe and analyse the effect of medium-fidelity simulation on student midwives' confidence, critical thinking ability, communication, satisfaction and team work in an obstetrical clinical emergency environment.

This was a qualitative, interpretive, phenomenological analysis designed to explore the student midwives' lived experiences regarding the effectiveness of medium-fidelity simulation and the effect of these experiences on clinical readiness. The target population was fourth-year Bachelor of nursing student midwives at the University of Fort Hare. Purposive sampling was used to select five student midwives who were team leaders during the management of PPH using MFS.

Ethical approval was granted by the University of Fort Hare Ethics Committee. Informed consent was obtained from the participants prior to data collection.

Trustworthiness was ensured by observing the principles of transferability, credibility, confirmability and dependability.

Data was collected through individual face-to-face interviews and a semi-structured interview guide. All fourth-year student midwives had viewed an on-line video entitled *Essential Steps in Management of Obstetrical Emergency(ESMOE) Post-partum Haemorrhage*, in which the procedure was demonstrated. The video, sent via Backboard, was presented in such a way that student midwives had the opportunity to watch it repeatedly in order to thoroughly comprehend the demonstrated skill.

A semi-structured interview guide was used for data collection. Interviews were conducted in the simulation laboratory. A Samsung smartphone was used to record interviews and a notepad was used to make notes of gestures, such as smiles or other facial expressions. Data was analysed using thematic content analysis applicable to interpretative phenomenological analysis (IPA) studies using the six steps: reading and re-reading; initial noting taking; developing emergent themes; searching for connections across the emergent themes; moving to the next case and lastly, looking for patterns across cases.

Findings

The major findings indicated that the participants had differing views regarding the concept of clinical readiness; some held that clinical readiness meant being ready or prepared to handle any eventuality in the course of work, others opined that it was a state of being conversant with the policies and procedures in the clinical ward. Participants believed that clinical readiness was parallel to being competent and that midwives should always be ready to anticipate complications that might arise with the patient, endeavouring to analyse and interpret such conditions clinically. Participants expressed the need to see the simulation skill demonstrated repeatedly for thorough understanding of the technique, so that they could work independently in an obstetrical emergency situation. During simulation, participants were confident in delegating duties to team members, affirming that in order to ensure that tasks were carried out, team leaders should receive regular updates from team members.

The finding of the study showed that all participants had good experiences of working in a team, believing that co-operative team work brings good results and success, and that team support during obstetrical emergencies was very important. Participants had varied experiences of team leadership. Some found the simulation challenging, and some felt nervous initially, at being team leader; they reported however, that that they gradually gained confidence during the process.

The participants reported good communication among team members during the simulation. They said that communication with the patient was important, and felt that explaining clinical health issues to the patient built trust between midwife and patient. Participants acknowledged the importance of keeping the patient informed, not just during the emergency, but at every step of any procedure, so as to ensure co-operation from the patient. The participants in this study maintained that management of postpartum haemorrhage cannot be done alone.

Participants stated that having to think critically during simulation elicited various emotions, such as fear and nervousness. Comparing the SP with the low-fidelity mannequin made participants aware of the benefits of the SP. The fact that the SP was able to communicate helped the student to understand the situation better.

Conclusions

Participants who had been exposed to post-partum haemorrhage simulation expressed their readiness to confidently handle obstetrical emergencies, and expressed the essential value of such equipment for clinical emergency situations. Participants stressed the need for delegation of duties, team work, and good communication skills among team members during the simulation, affirming that talking and explaining clinical health issues to the patient built trust between midwife and patient. Participants acknowledged the importance of keeping the patient informed, not just during the emergency, but during every procedure, so as to ensure co-operation from the patient. Students compared the SP favourably with the low-fidelity mannequin, pronouncing it superior as a means to practise emergency work as it was able to speak.

It is recommended that the South African Nursing Council (SANC) enforce the use of simulation in nursing education. Training institutions should incorporate simulation as part of the curriculum, as it is practised globally and has clear benefits. Furthermore, simulation of obstetrical emergencies should be made mandatory in all training institutions as it may contribute to reducing maternal and child mortality rates. Further research should be conducted on the various types of simulation fidelity and their applicability and relevance, taking into consideration the contextual environment.

Key words: Medium fidelity, obstetrical emergency, critical thinking, confidence, communication, teamwork, satisfaction, post-partum haemorrhage, interpretative phenomenological analysis.

TABLE OF CONTENTS

ProsePerfect

54 Blakeway Road Mthatha 5100
Tel Nr. (047) 532 2303 or (071) 217 7489
e-mail Janemqamelo@gmail.com
http://janemqamelo.wixsite.com/proseperfect

---

23 June 2017

To Whom It May Concern

I, Peta Jane Mqamelo, ID Nr 611120 0014 08 1, do herewith confirm that I have conducted an English proofreading and grammar edit on a masters dissertation by Zukiswa Brenda Ntlokonkulu, being a study on the effectiveness of medium-fidelity simulation on the clinical readiness of student midwives.

Yours sincerely

Jane Mqamelo
ProsePerfect
Editing, proofreading, writing

...7

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND

Simulation has been applied in many teaching and learning contexts. Fidelity in simulation refers to the extent to which a simulation mimics reality; the believability or degree to which a simulated experience approaches reality (Jeffries, 2007:28; Meakim et al., 2013:S6). There are several classifications of fidelity simulation, the use of which will depend on what the simulation aims to achieve. Simulation is classified as low, medium or high fidelity (Rush et al., 2010:469; Yuan, William & Fang, 2012:27). Low-fidelity simulation refers to role plays, static mannequins and task trainers such as venipuncture arms. Medium-fidelity simulation refers to mannequins that have a pulse and breathing sounds but a chest that is unable to move. High-fidelity simulation (HFS) refers to the use of computerised, life-like mannequins and standardised patients and the creation of an environment that resembles the real world.

Grable and Ochoa (2011:765) describe simulation as a practic that affords the learner an opportunity to manage rare and complex situations that he or she might encounter during clinical training. According to Antony and Dildy (2013:253), simulation can stimulate the application of information after it has been learned, and help student midwives to identify deficiencies in knowledge. Partin, Payne and Slemmons (2011:186) highlight that one of the advantages of simulation is that it offers an opportunity to observe effectively, think critically and prioritise patient care in a conducive environment. Simulation affords the student a safe and supportive environment that allows him or her to practise skills repeatedly, without causing any harm to a real patient.

Insufficient clinical sites, a shortage of student mentors and lecturers, and advances in technology have made simulation an attractive method of teaching and learning, especially for student midwives (Partin et al., 2011:186). Midwives are the first people to respond to obstetrical emergencies, and thus they need to be ready to deal with such emergencies (Reynolds, Ayres-De-Campos & Lobo, 2011:76). If the student midwife is equipped with the skills of keen observation and analysis, and can prioritise patient care in the simulation environment, she/he is far more likely to be competent

in real obstetrical emergencies than a student who has not been exposed to simulation experiences.

Clinical practice in nursing has evolved over the centuries from the 'see one, do one, teach one' modality, which put the patient at risk, to modern simulation modalities which focus on patient safety (Harder, 2009:169). Simulation has been used in nursing education since the 1900s, with the introduction of 'Mrs. Chase', a life-sized mannequin that taught basic nursing care (Herrmann, 2008:53). The use of modern simulators began in the medical profession with the introduction of 'Resusci Ann', a task trainer designed for mouth to mouth resuscitation (Rosen, 2008:161). In midwifery, simulation has been used in the form of task trainers to teach skills such as vaginal examination, and in the form of medium- to high-fidelity mannequins to teach the skills necessary for the management of obstertrical emergencies (Smith et al., 2012).

The Department of Nursing Sciences at the University of Fort Hare (UFH) has a skills laboratory which offers low- to medium-fidelity simulations in the form of task trainers and mannequins. These task trainers and mannequins are used in general, community and midwifery nursing sciences for skills demonstrations and practice by students, and for formative assessments. Medium-fidelity simulation is also achieved by the use of standardised patients. Objective Structured Clinical Examinations (OSCE) are carried out using task trainers, low- to medium-fidelity mannequins and standardised patients. Only task trainers are used for vaginal examinations, abdominal palpations, breech and vaginal deliveries and the management of post partum haemorrhage (PPH). Medium-fidelity simulation (MFS) with the use of standardised patient is not used in the management of obstetrical emergency like post partum haemorhage. Medium-fidelity can be helpful to student midwives in preparing them to deal with obstetrical emergencies. The aim of this study was to closely investigate the effectiveness of MFS in enhancing critical thinking, team work and communication.

1.2 PROBLEM STATEMENT

Given that in a real-life clinical environment, limited opportunities exist for students to practise emergency obstetrical skills, medium-fidelity simulation (MFS) offers the student midwife an opportunity to learn and practise these skills without risking a

patient's safety. Despite the availability of MFS at UFH, its benefit on the clinical readiness of student midwives is not known. Whether or not midwifery students are confident and capable of managing obstertrical emergencies when they graduate remains speculative. It is expected that qualifying midwives are able to manage obstetrical emergencies such as post partum haemorrhage (PPH), shoulder distocia and cord prolapse. It is not known whether MFS enhances the clinical readiness of student midwives at UFH, and if it does, to what extent. Against this backdrop, the present study was designed to assess the effectiveness of MFS in enhancing the clinical readiness of student midwives at the University of Fort Hare. This study assesses the effectivess of MFS in enhancing student midwives' confidence, critical thinking, communication skills, satisfication and teamwork in a clinical environment.

1.3 PURPOSE

The purpose of this study was to assess the effectiveness of MFS on student midwives in enhancing confidence, critical thinking, communication, satisfication and team work in a clinical environment.

1.4 MAIN RESEARCH OBJECTIVE

The main research objective of the study was to explore, describe and analyse the effect of medium-fidelity simulation on the confidence, critical thinking ability, communication skills, satisfication and teamwork of student midwives in an obstetrical clinical emergency environment.

 The sub-objectives of the study were:

- to explore, describe and analyse the critical thinking ability of student midwives when exposed to medium-fidelity obstetrical emergency simulation;

- to explore, describe and analyse the student midwives' self-efficacy in successfully resolving an obstetrical emergency within an acceptable period.

- to explore, describe and analyse if teamwork, student midwives' confidence, communication skills and satisfication increased after exposure to medium-fidelity simulation.

3

1.5 CENTRAL RESEARCH QUESTION

What is the lived experience of student midwives regarding the effectiveness of medium-fidelity simulation to enhance confidence, critical thinking, communication skills, satisfication and teamwork in a clinical environment? This question can be broken down further, as:

- What are the lived experiences of student midwives concerning the effectiveness of medium-fidelity obstetrical emergency simulation at enhancing critical thinking?

- What is the student midwives' self-efficacy regarding resolving an obstetrical emergency within an acceptable, defined period?

- What are the lived experiences of student midwives concerning the effectiveness of medium-fidelity simulation at promoting teamwork, satisfaction, confidence and communication skills during an obstetrical emergency?

1.6 SIGNIFICANCE OF THE STUDY

The findings of this study will provide student midwives with certain aspects of the knowledge required to manage obstetrical emergencies effectively in a clinical, multi-disciplinary environment. The findings will also provide information on the effectiveness and posssible weaknesses of this medium-tech method of teaching and learning to nursing education institutions. Additionally, the findings of this study will add to the limited literature on midwifery simulation. It will also provide insight on how skills learned during simulation can be transferred to the practical environment by the acquisition of new knowledge, thus setting a standard for simulation in the teaching and learning of the nursing curriculum, at least at the University of Fort Hare.

1.7 DELIMITATION OF THE STUDY

This study was delimitated to fourth-year Bachelor of Nursing students at the University of Fort Hare. The focus was on the lived experiences of student midwives regarding the effectiveness of medium-fidelity simulation on the confidence, critical thinking, communication skills, satisfaction and teamwork of fourth-year student widwives in the obstetrical clinical emergency environment.

1.8 CONCEPTUAL FRAMEWORK

Kolb's experiential learning framework was used for this study. This framework has the following components:

1.8.1 Concrete Experience

Kolb (1984:30) refers to concrete experience as an opportunity to be fully and openly involved in new experiences without bias. In this study, students received theory on obstetrical emergencies through a problem-based learning approach in the classroom. Thereafter, demonstrations and practice of the skills were carried out, using Advanced OB Susie, a simulation task trainer and a standardised patient (SP).

1.8.2 Reflective Observation

Student midwives were able to observe and reflect on actions during simulation. During data collection the students were able to recall and discuss their experiences and opinions of the simulation.

1.8.2 Abstract Conceptualisation

During abstract conceptualisation the student should be able to intergrate theory and practice. Learners should be able to link what they have learned in class with the simulated activity, and they should be able to draw meaningful conclusions based on evidence. Students should be able to refer to previous knowledge and how this knowledge played a role during the simulation experience.

1.8.3 Clinical Outcomes

In the clinical environment, the student midwife should be able to think critically in order to make decisions and solve problems when confronted with an obstetrical emergency. The student midwife should exhibit an increase in confidence and be able to function as part of a team during an obstetrical emergency. A habit of lifelong learning should be established as the learner retrieves information as and when needed.
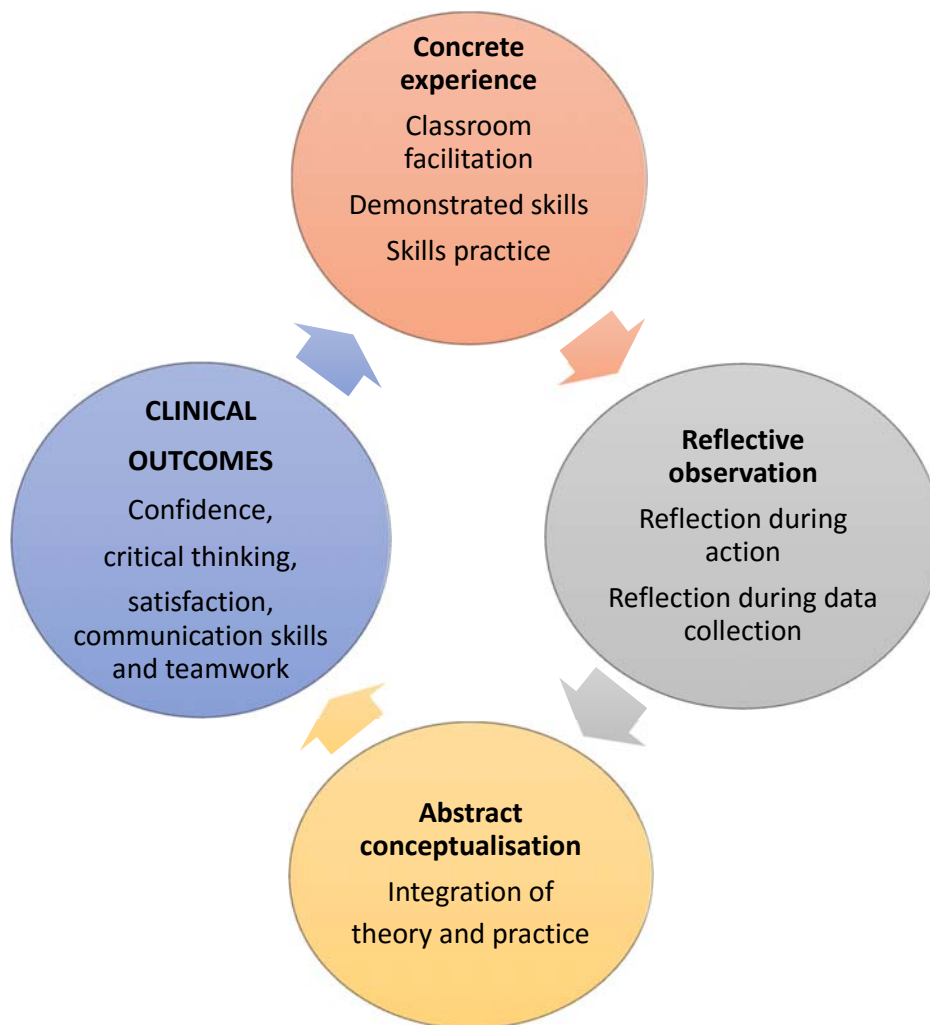
Figure 1.1: **Conceptual framework, adapted from Kolb's (1984) Experiential Learning Theory.**

1.9 OPERATIONAL DEFINITION OF KEY TERMS

Medium-fidelity simulation (MFS): This is the use of a safe and supportive environment that mimics the real-world environment, allowing trainees to manage rare, complex situations (Grable & Ochoa, 2011:763; Rush et al., 2010:467). In this study, MFS was achieved by the use of an Advanced Obstetric Susie, a birthing torso and a standardised patient to increase the realism of the simulation experience.

Student midwife: According to the South African Nursing Council, a student midwife is a student nurse who is undergoing training as a nurse in general, psychiatric, community nursing and midwifery, with two academic years devoted to midwifery (Nursing Act, No. 50 of 1978. Regulation, 425). In this study, the student midwife was a fourth-year student nurse who learning how to manage high-risk childbirth and puerperium.

Clinical readiness Clinical readiness has been coined as work readiness, preparedness for practice, readiness for practice and is evaluated at different periods in the student nurse's training (Missen, Mckenna, & Beauchamp, 2015; Aggar & Dawson, 2014; Watt & Pascoe, 2013. In this study clinical readiness relates to how well participants will view their preparedness to work in the clinical environment or setting.

1.10 CHAPTER OUTLINE

The background to this study, the problem statement, the aim and objectives, the research question, the significance of the study, the conceptual framework and definitions of key operational terms are presented and described in chapter one. The chapter also describes the division of the study.

Chapter two presents a review of the literature on the effectiveness of medium-fidelity simulation on the clinical readiness of student midwives. It examines different forms of experiential learning used in both theory and practice. Chapter two also considers levels and forms of communication and its influence on the delivery of health care. Simulated learning is examined with regard to its effects on

learners' confidence and satisfaction, and compelling evidence is supplied to both support and refute the effects of simulation on learners' confidence and satisfaction. The importance of collaborative teamwork in the high-risk health care setting is presented, and various teamwork strategies applicable in this high-risk profession are described.

Chapter three describes the research methodology of the study, the research design, the population, sample and sampling procedure, ethical considerations, the trustworthiness of the study, data collection and analysis.

Chapter four presents the findings of the study and discusses them, in line with the research questions.

Chapter five presents the summary, conclusions and recommendations of the study.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews the relevant literature on the effectiveness of medium-fidelity simulation on the clinical readiness of student midwives. It examines various forms of experiential learning used in both theory and practice to enhance critical thinking. It also considers communication in health care and its influence on the delivery of health care. Simulated learning is examined with regard to its effects on learners' confidence and satisfaction, and evidence is supplied that both supports and refutes the effects of simulation on learners' confidence and satisfaction. The importance of collaborative teamwork in the high-risk health care setting is presented, and various teamwork strategies applicable in this high-risk professions are described.

2.2 HISTORY OF SIMULATION

Simulation has been applied in high-risk professions such as the military, in aviation and in nuclear power production for decades (Gaba, 2004:i2). These high-risk professions use simulation as a didactic modality in the teaching of non-technical skills (NTS) such as teamwork, communication and critical thinking. The use of simulation in health care derives from its use in these high-risk professions. Several studies have shown that strategies to enhance teamwork and communication in health care have been adapted from these high-risk professions (Aggarwal et al., 2010; Deering, Johnston & Colacchio, 2011; Guise & Segel, 2008). Upadhyay and Scholefield, (2008:1153) states that although simulations in aviation are designed to enhance safety in the cockpit obstetricians can learn from them. However, Siassakos et al. (2009:502) hold the view that training programmes derived from these high-risk professions are not appropriate for the obstetric setting, as they are not patient-centred. They further argue that training programs adapted from aviation should be altered in order to meet the training needs in obstetrics such as communication.

A positive appraisal of simulated education depends on outcomes for students, in particular, on their experience of confidence and satisfaction after using these methods. Therefore, the design of the simulation environment takes into consideration the learning needs of the student such as confidence and satisfaction. The findings of

the phenomenological study conducted by Partin et al. (2011:187) support the concept of student-centred learning. The study found that the non-threatening simulation environment enhances student learning and makes students confident and satisfied, and ultimately prepares students for clinical practice.

2.2.1 Simulated Learning

Simulated learning is a student-centred modality that replicates real-life experiences in a safe environment without putting the patient at risk (Archer, 2010:31; Gaba, 2004:12). A safe environment allows students to make mistakes without causing harm to the patient or making the student feel incompetent. Aggarwal et al. (2010:142) assert that a training environment that permits students to make mistakes ensures improvements in training outcomes. Berragan (2011:661) makes a distinction between a patient-centred approach in clinical practice and the student-centred approach in simulation. He posits that student-centred simulation is about the intended outcomes for the student while a patient-centred approach is built around the patient's needs. Simulation guarantees the student an environment where learning is centred on meeting the desired outcomes.

Patient acuity coupled with the patient's rights and the severity of illness rob students of an opportunity to practise direct patient care (Murphy et al., 2011:e143). This has resulted in students assuming the role of observers which may not elicit the desired clinical experience for students. Lapkin et al. (2010:e208) assert that for all intents and purposes, experiential learning should occur in the clinical environment. Simulation bridges the gap between theory and practice by offering an ideal environment where experiential learning can effectively take place. Miller and Carr (2016:e208) describe the experiential learning environment as dynamic and one which encourages students to think critically. Experiential learning during simulation is exhibited by the ability of the students to link previous knowledge to existing knowledge (Benner, 2005:179; Bland & Tobbell, 2016:12; Maran & Glavin, 2003:23). During simulation, the student is able to reflect on actions, bringing in previous knowledge and experience to solve problems.

Two studies had conflicting findings on pre-existing knowledge on the use of critical thinking. Participants in a study conducted by Chan (2013:562) rejected the notion that personal experience and established knowledge enhanced critical thinking abilities.

However, Hunter et al. (2014:812) examined nurses' experiences and how these affect critical thinking, and asserted that students who are in their third year of nursing studies possessed higher critical-thinking and analysis abilities than either first or second-year nursing students.

Students develop their critical thinking (CT) skills during their clinical placement under the guidance of skilled midwives (Carter et al., 2014:1019). However, the reluctance of some midwives to become independent decision makers may hinder the development of their critical thinking skill (Carter et al., 2014:1019). Bland, Topping and Wood (2011:664) state that the purpose of simulation is to create a participatory environment where students are able to think critically while solving problems. Moreover, the ultimate goal of a nursing programme is to produce a student who is confident in practice and is able to demonstrate improved critical thinking skills (Goodstone et al., 2013:159).

Several studies have investigated the merging of simulation with other teaching modalities such as concept mapping and problem-based learning to enhance the critical thinking of nursing students (Murphy et al., 2011; Samawi, Miller & Haras, 2014). Comparative studies have also been undertaken to compare simulation with other teaching modalities. Goodstone et al. (2013:161) conducted a quasi-experimental study to compare simulation with written case studies on the development of critical thinking (CT). The study found an increase in CT skills in both simulation groups using the Health Studies Reasoning Test (HSRT). However, using the California Critical Thinking Disposition Inventory (CCTDI), Goodstone et al. (2013) showed that there was more-improved critical thinking in the electronic interactive simulation (EIS) group than in the case-study group. Brown and Chronister's (2009:50) comparative correlation study showed no statistically significant difference between CT skills in students who were exposed to high-fidelity human simulation (HFHS) and those exposed only to normal didactic instruction.

2.3 CRITICAL THINKING IN THE NURSING PROFESSION

The South African Nursing Council's (SANC) core standards requires nursing education institutions (NEI) to produce student nurses who demonstrate critical, analytical and reflective thinking (Nursing Education and Training Standards ,2005:16). Globally, nursing institutions have moved away from traditional pedagogy

in the education of their students to methods that encourage critical thinking (Carr, 2015:283; Papathanasiou et al., 2014:283; Potgieter, 2012:4). Critical thinking is imperative in the nursing profession as nurses have to make decisions that affect patients' lives as part of a team or as individuals. This is even more so in midwifery, where midwives have to make decisions in emergencies that affect not only the mother but also the unborn child or neonate.

Critical thinking (CT) has been described by Facione (1990:9) as 'a purposeful, self-regulatory judgement which results in interpretation, analysis, inferences as well as explanation of the evidential, conceptual, methodological considerations upon which that judgement is made'. Judgement is purposeful and self-regulatory as the individual is consciously aware of being immersed in a situation and is able to reflect on actions taken. Dwyer, Hogan and Stewart (2014:46) have described self-regulation during critical thinking as the driving force that encourages individuals to consciously use explicit thought processes when solving problems. Facione (1990:4) identified six cognitive skills that the critical thinker should have, namely; interpretation, analysis, evaluation, inference, explanation and self-regulation.

2.3.1 Strategies to Develop Critical Thinking in Nursing Education

The use of critical thinking in nursing education has encouraged nursing education institutions to move from methods that encourage rote learning to methods that inspire learners to achieve lifelong learning. Lifelong learning is imperative in nursing as students do not learn only for mastery of knowledge but to be able to use that knowledge later in life, in order to make decisions on patient care. Higher-order thinking approaches ensure a paradigm shift from a teacher-centred approach to a learner-centred approach, where a student is consciously aware of when, where and how to use knowledge (Kantar, 2014:791). Facione (1990:5) identified CT, problem solving, decision making and creative thinking as some of the closely related forms of higher-order thinking. Bloom's taxonomy of cognitive domains revised by Anderson (1999:8) recognised six cognitive processes, namely; remembering, understanding, applying, analysing, evaluating and creating, and categorised these into lower-order and higher-order levels of thinking. All learner-centred approaches are aimed at increasing the critical thinking of students.

2.3.1.1 Problem-Based Learning and Critical Thinking

Problem-based learning (PBL) is a problem-focused, student-centred, self-directed, self-reflective and facilitator-driven pedagogy that aims to increase students' use of higher-order thinking (Hung, Johassen & Liu, 2008:289). Problem-based learning has been used globally in nursing education in countries such as China (Chan, 2013; Tiwari et al., 2006), USA (Hung et al., 2008); United Kingdom (Cooper & Carver, 2012), Jordan (Al-Kloub, Salemeh & Froelicher, 2014), Korea (Choi, Lindquist & Song, 2014) and Iran (Khatiban & Sangestani, 2014). In essence, PBL is centred on the existence of a problem. As pointed out by Hung et al. (2008:488), students in PBL have to deal with a problem before acquiring a theory about the problem. This poses a problem to students who are straight from high school and are accustomed to learning the theory first and occasionally solving a problem afterwards. Studies conducted to measure the effects of critical thinking on nursing students have found that students find it difficult to adapt to the first academic year of PBL (Choi et al., 2014:55; Spiers et al., 2014:5). The premises of 'problem before content' make students realise that they have not entered the learning environment as 'clean slates' but already know something about many things. Anderson (1999:9) refers to the existing knowledge, abilities, attitudes and interests of the student as the 'history of the student'.

In PBL the nurse educator assumes the role of a facilitator, which can be a challenge for both the educator and the student. For PBL to be an effective pedagogy, there should be synergy between the facilitator and the student. Potgieter (2012:4) postulates that the clinical facilitator has a responsibility of modelling the correct critical thinking disposition and encouraging students to have an enquiring mentality. This requires a mind shift for the facilitator, who may herself be a product of rote learning that enforces lower-order cognitive learning. Zygmont and Schaefer (2006:266) and Raymond and Profetto-McGrath (2004:212) conducted studies that measured the CT of facilitators. These studies showed that facilitators had strong to moderate CT dispositions and demonstrated an awareness of the importance of critical thinking, its significance in their teaching style and its intended long-term impact on their learners.

One of the attributes of PBL is that of being a self-directed, student-centred pedagogy. This is in direct contrast to the traditional methods which are teacher centred and lack the ability to develop learners' initiative. Problem-based learning as a student-centred

pedagogy which fosters teamwork and critical thinking, both imperative in nursing education. Self-directed learning can pose a problem between the facilitator and the student as postulated by Hung et al. (2008:493). The problem stems from the student's reluctance to assume an active role and facilitators who are not used to being passive in the delivery of learning.

2.3.1.2 Case-Based Learning and Critical Thinking

Case-based learning (CBL) is a student-centred approach that fosters a safe environment where students are able to analytically and systematically discuss real patient situations (Bimray, Le Roux & Fakude, 2013:118; Lin et al., 2015:150). A safe environment is one that allows the learner to construct knowledge in collaboration with peers under the guidance of a facilitator. Popil (2011:205) further describes case studies as experiential learning that allows students to be actively involved in finding solutions to patients' problems. Active involvement fosters collaboration and team work with peers, which is of benefit in midwifery, as posited by (Gray & Aspland, 2011:42). Kaddoura (2011:1) asserts that in CBL the teacher assumes the role of the facilitator while the students become active participants who develop critical thinking and problem-solving skills in a team-based setting. This assertion is also echoed by Bimray et al. (2013:118) who says that students take responsibility for learning and teachers become facilitators in CBL. The shortfall of CBL is in the practical skills acquisition.

Case-based learning stimulates critical thinking in the learner as he is not able to converse with the patient and is dependent on the narrative at hand to come up with solutions to the problem (Lin et al., 2015:150). In a study on the use of unfolding case-studies in midwifery education, Carr (2015:283) found that unfolding case studies foster critical thinking, as the patient's condition unfolds and requires the midwife to make decisions as the condition changes. Furthermore Carter and Welch (2016:145), in a quasi-experimental study on the effectiveness of unfolding case studies on associate degree nursing students' levels of knowledge and critical thinking, found that students exposed to didactic lectures had lower scores in tests than those taught by means of the unfolding case study. Carr (2015:284) further compared the unfolding case study with the static case study, and found that although the static case study

allows the learner to work in a realistic and systematic manner, the unfolding case study depicts the real emergency clinical environment where the situation continually changes, requiring one to anticipate and to think critically on the go.

Students in the CBL programmes learned to think more critically than those undergoing traditional lecture-based education (Kaddoura, 2011:12). This finding is in line with the findings of the quasi-experimental study by Yoo and Park (2014:50) on the use of CBL and lecture-based teaching methods, where new graduate nurses exposed to CBL had higher scores in both subjective and objective problem solving than those exposed to the lecture-based method. Case-based learning fosters critical thinking, as the leaner is faced with a scenario and no warm body to interrogate in order to come up with answers (Lin et al., 2015:150). The learner is left to think critically and come up with solutions to problems.

2.3.1.3 Concept mapping as a case-based learning method

Concept mapping is a case-based learning method that uses a visual, schematic format to show relationships between concepts. According to Hsu and Hsieh (2005:141), concept mapping is an instructional method that gives a visual representation of related concepts in hierarchical order, showing connections between related concepts. In nursing education, it allows the re-organisation of information in a visual manner to enhance critical thinking in nursing students (Senita, 2008:6). The visual representation of information allows students to identity causes and effects and to understand how data is related. The connections between concepts encourages critical thinking as the learner is able to question or give reasons for each identified concept. The learner is also able to make use of previous knowledge to solve problems. Gerdeman, Lux and Jacko (2013:12) refer to this acquisition of knowledge as meaningful learning. For meaningful learning to take place, the learner should have existing knowledge so as to assimilate new knowledge. Novak (2002:558), and Daley and Torre (2010:441) state that the use of meaningful learning is imperative in medicine, as the learner is able to integrate existing knowledge with prior knowledge.

Concept mapping encourages teamwork which is imperative in obstetrical emergencies. Students learn to function as part of a team and begin to understand the principles of group cohesion (Hsu & Hsieh, 2005:147; Lin et al., 2015:153). Team

interaction can be a source of anxiety to learners who were previously exposed to lecture methods where the student assumes a passive role (Lin et al., 2015:153). Team work is enhanced by the safe environment created by concept mapping; the student is allowed to ask, listen and debate with others (Lin et al., 2015:153). Furthermore, teamwork during concept mapping in didactic situations fosters communication with others (Gerdeman et al., 2013:14; Hsu & Hsieh, 2005:147; Lin et al., 2015:153). The student learn to communicate with peers as concepts are expatiated, and to give explanations and rationales for ideas (Hsu & Hsieh, 2005:147; Lin et al., 2015:153). Communication with the clinical facilitator is enhanced as students learn to share information and get involved in dialogue.

Concept mapping affords the learner an opportunity to develop a holistic view of the presented problem, as he or she forms connections between concepts, identifying causes and effects (Gerdeman et al., 2013:12). The learner is able to reason and give rationales for chosen concepts and explain how they are linked. Davies (2011:280) argues that if learners are able to present a multifaceted set of connections in a diagram they will be able to understand them and remember how they are linked. Identifying and understanding the connections between concepts enhances critical thinking, as the student not only memorises the concepts but is able to expatiate on them.

This seems to be an important attribute to have in clinical nursing. Students are faced with patients with complex and interrelated conditions. Concept mapping, when used with other teaching modalities like high-fidelity simulation and problem-based learning, can enhance critical thinking (Samawi et al., 2014:409; Tseng et al.,2011:44). Also, in a study evaluating the effects of various teaching and learning strategies, Lin et al. (2015:152) posited that concept mapping encouraged critical thinking amongst student nurses. However, a study by Wheeler and Collins (2003:344) found no significant difference between the use of concept mapping and traditional nursing care plans in enhancing the critical thinking of baccalaureate nursing students. Furthermore, Maneval et al. (2011:231) conducted a similar study on the effectiveness of concept mapping in teaching critical thinking in comparison to the traditional nursing care plan. In this case, the traditional care plan group had significantly higher scores in tests than the concept mapping group. However, the use of concept mapping

enabled the students to identify gaps in their critical thinking. Concept mapping alone cannot be used in enhancing practical skill of the student midwives.

2.4 CONFIDENCE

Limited exposure to patients with variable conditions results in nursing students not receiving the necessary experience to become competent and confident practitioners (Aggarwal et al., 2010:35). One of the key responsibilities of simulation as a teaching modality is to have a positive impact on the learner. Reinhardt et al. (2012:e158) asserted that for a student to assume a nurse's role, he or she should possess a positive self-disposition. This is attained by focussing on both technical and non-technical skills during simulation, such as critical thinking, confidence and teamwork. It is therefore appropriate that nursing institutions take on the responsibility of implementing teaching strategies that promote learners' confidence and competencies (Yuan et al., 2012:31). Furthermore, the nursing student is expected to develop and apply both technical and non-technical skills such as decision making (Yuan et al., 2012:26).

Confidence during simulation is further influenced by emotions elicited during the simulation experience. Bandura (1977:198) asserts that emotional arousal affects perceived self-belief and abilities when the individual is faced with threatening situations. Simulation can be a catalyst for the student to deal with emotions such as fear, anxiety and stress, which they may encounter in the real clinical environment (Kaddoura et al., 2016:301). Participants from several studies highlighted how simulation helped to reduce their anxiety and fear regarding certain procedures (Partin et al., 2011:187; Reid-Searl et al., 2012:81) and how simulation helped to reduce anxiety experienced in the clinical environment (Khalaila, 2014:256). One study, interestingly, also found that simulation can cause students to experience fear and anxiety (Pollock & Biles, 2016:316). These emotions are said to be elicited by being exposed to simulation for the first time and being consciously aware of being watched. Finding educational experiences challenging or stressful may, in fact, produce positive changes in learners that may beneficially influence their preconceived assumptions and opinions (Straub et al., 2013:801).

There are limited studies that investigate the effect of medium-fidelity simulation on student midwives. Most of the literature found is based on high fidelity simulation using high-fidelity mannequins. Progressive and comparative studies that have been conducted in low, medium and high-fidelity simulation investigate communication, knowledge and clinical readiness (McCaughey and Traynor, 2010; Lapkin et al., 2010; Brady, Bogossian & Gibbons, 2015). Reinhardt et al. (2012) in a comparative study investigating the use of high and low fidelity simulation on student nurses' confidence regarding intravenous insertion found that HFS increases confidence. The participants in a study conducted by Fuselier, Baldwin and Townsend-Chambers (2016:199) asserted having gained confidence during simulation using mannequins. Furthermore, findings from several studies indicate that high-fidelity simulation (HFS) enhances confidence in learners (Kaddoura et al., 2016:300; Straub et al., 2013:798). Comparative studies have been conducted to compare high-fidelity simulation (HFS) with low-fidelity simulation (Basak et al., 2016). The results showed that high-fidelity mannequins increased students' confidence more than low-fidelity mannequins did Studies have shown that repeated exposure to HFS increases students' confidence (Kaddoura et al., 2016:300). Medium-fidelity simulation can be effective in enhancing student midwives' confidence during simulation.

2.4.1 Self-Efficacy

Confidence is synonymous with self-efficacy which, according to Bandura (2006:308), is a perceived capability to perform a task. Bandura (1993:119) further stated that possessing a skill is not enough to succeed; one should also have self-belief or self-efficacy regarding the skill. Several studies have been conducted to investigate the impact of simulation on self-efficacy (Christian & Krumwiede, 2013; Pike & Donnell, 2010; Roh et al., 2013). Also, other studies have reported an increase in self-efficacy among participants who were exposed to high-fidelity simulation (Akhu-Zaheya et al., 2013:340; Christian & Krumwiede, 2013:376). A comparison study by Roh et al. (2013:126) found no significant difference in the mean score of self-efficacy between participants exposed to computer-based simulation and those exposed to mannequin-based simulation. Pike and Donnell (2010:408) argue that the authenticity of the simulation environment influences self-efficacy. The authors state that simulation produces a false sense of self-efficacy which is not sustainable in the clinical

environment. The simulation environment should replicate the clinical environment as much as humanly possible.

2.4.2 Acquisition of Knowledge

Wolff et al. (2010:7) explored the perceptions of nurses on the concept of clinical readiness. Participants in that study stressed the importance of the new graduate nurse having both knowledge and skills in the clinical environment. Bandura (1993:119) asserts that there is a difference between the acquisition of knowledge and being able to use that knowledge under pressure. The acquisition of knowledge in nursing education is achieved through the use of various teaching modalities. Simulation as a teaching modality helps students to identify deficits in both their theory and practical knowledge (Kaddoura et al., 2016:301; Stirling, Smith & Hogg, 2012:119). Studies conducted to investigate the effects of various simulation modalities in knowledge acquisition showed an increase in participants' knowledge after exposure to HFS (Christian & Krumwiede, 2013:376; Straub et al., 2013:800) However, a comparative study conducted by Akhu-Zaheya et al. (2013:339) showed an increase in knowledge acquisition in students who were exposed to both HFS and low-fidelity simulation (LFS). These findings were similar to those of the study by Levett-Jones et al. (2011:382) that showed no statistically significant difference between the knowledge of students exposed to HFS and those exposed to medium-fidelity simulation. Both studies showed that knowledge acquisition is not influenced by the type of fidelity simulation.

Vadnais et al. (2012:1640) raise the issue of how long knowledge acquisition lasts after exposure to simulation. Gaining knowledge during simulation is achievable, but retaining that knowledge is a challenge. Some studies have found no significant knowledge retention after exposure to simulation (Akhu-Zaheya et al., 2013:340; Lo et al., 2011:1441). These findings were attributed to the limited time allocated for simulation. However, a study conducted by Vadnais et al. (2012:1643) showed an increase in knowledge retention in participants after exposure to a single-day, multi-task simulation. The need for multi-task simulation to enhance knowledge retention is echoed by (Akhu-Zaheya et al.,2013:341).

2.4.3 Transferability of Skills

Training that encompasses the cognitive, affective and psychomotor domain is important in nursing practice and theory (Tuzer, Dinc & Elcin, 2016:120). Nursing students should be equipped with knowledge and skills in order to cope with the demands of their profession (Bloomfield et al., 2013:251). Simulation is a teaching modality that offers an opportunity for nursing students to perfect skills, knowledge and attitudes (Vyas, Ottis & Caligiuri, 2011:2). Acquisition and transferability of such skills is dependent on the simulation design and the cognitive and affective domain of the learner. Freeth et al. (2009:99) assert that it is important to transfer skills, knowledge and attitudes gained during training to the practical environment for daily functioning and the prevention of adverse events.

Tuzer et al. (2016:120) posit that the development of psychomotor skills is important in the development of nurses' competencies. Differing simulation fidelities can be used to expedite transfer of skills to the clinical environment, from task trainers to high-fidelity simulators. Several studies have been conducted to investigate the transferability of skills obtained during simulation to the real clinical environment (Freeth et al., 2009; Reynolds et al., 2011). Part task trainers, which are low fidelity, are valuable for the attainment of technical skills but do not address the attainment of non-technical skills such as communication (Kneebone et al., 2006:22). A comparative study conducted by Tuzer et al. (2016:121) on the use of standardised patients and high-fidelity simulators found that HFS enhances transferability of skills. Participants who were exposed to HFS found the mannequin convincing as it had audible lungs and heart compared to the SP which could not demonstrate such physiological phenomena. Furthermore, Master of Nursing students in a study by Kowitlawakul et al. (2015:5) found the use of SP restrictive as they were not able to display physiological changes. Experiencing such challenges can interfere with the transferability of skills to the clinical environment.

Hall (2015:124) affirmed that the more students improve their competencies and skills, the more motivated they are to become competent in those skills. If students are unable to obtain confidence in skill performance, it becomes impossible to transfer the skill to the clinical environment (Reinhardt et al., 2012:e159). Simulation-based

training improves students' knowledge and skills, which in turn leads to positive outcomes in the reduction of adverse obstetrical events (Grable & Ochoa, 2011:763).

2.5 SATISFACTION

Straub et al. (2013:798) identified three characteristics that determine the fidelity of the simulation environment:

• Physical nature of the situation

• Expected behaviour of the learner

• Resources or equipment available

Simulation-based training should be designed to meet the training needs of learners (Roh *et al.,* 2013). Berragan (2011:663) posits that institutions get so immersed in the creation of the authentic simulation environment that they often ignore the learning needs of students. Frequently, the creation of the simulation environment is so exciting that learning objectives become side-lined. Cass, Croft and Draycott (2011:72) state that there is a wealth of evidence to demonstrate the effectiveness of some simulation training, but the challenge remains with its delivery and target group.

2.5.1 Creation of an Authentic Space and its Relevance to Clinical Readiness

In a study conducted by Mckenna et al. (2011:684), midwifery educators posited that perceived low levels of realism in some models used in midwifery posed a challenge in meeting the learning objectives. However, Brady et al, (2015:528) conducted a study on the progressive levels of simulation using a low-fidelity task trainer in combination with a poster and a hybrid. The study concluded that the level of students' learning experiences depended on whether they had perceived realism genuinely and psychologically. This idea is echoed by Thidemann and Söderhamn (2013:1603) who found that participants were able to learn vicariously during immersive simulation just by being observers.

The creation of an authentic simulation environment is important both for attaining the ultimate simulation experience and for meeting the learning objectives. Several studies have been conducted to evaluate the realism of differing levels of fidelity in nursing

education (Brady et al., 2015; Kable et al., 2012; Luctkar-Flude, Wilson-Keates & Larocque, 2012). Participants in these studies perceived simulations that involved standardised patients, community volunteers and hybrid simulators as more realistic than high-fidelity simulators. They considered actors wearing masks more realistic than mannequins (Kable et. al., 2012:240). This is in direct contrast to studies that only evaluated the realism of HFS (Maas & Flood, 2011:e233; Thidemann & Söderhamn 2013:1603). The participants in these studies affirmed the realism of high-fidelity simulation. The participants found the simulation immersive, as the mannequin could speak and had an audible heart and lungs.

2.5.2 The Validity of the Equipment Used in Simulation

In order to be authentic, simulation equipment commonly used in practice needs to be of a kind that students can relate to (Roh et al., 2013:127). This is keeping with Gaba's (2004:i2) words that 'simulation is a technique, not a technology' – meaning that emphasis should not be on the equipment itself but on the valid use of the equipment. Argani et al. (2012:451) state that the biggest mistake that training institutions make is to furnish the simulation laboratory before designing the learning programme. Designing the simulation environment should take into consideration who the learners are and what their learning needs are. The simulation environment should be designed in such a manner that it resembles the real world, from the clock on the wall telling the correct time to the type of documentation used. Studies have demonstrated how seemingly mundane items such as charts and documents can be an important part of a simulation environment (Kable et al., 2012:240; Levett-Jones et al., 2015:347; Luctkar-flude et al., 2012:451). The participants in the study by Luctkar-Flude et al. (2012:451) did not perceive the simulation as real and therefore did not see the importance of the documentation. This contrasts with the findings of Kable et al. (2012:240); 78% of their participants perceived charts and documents used in simulation as being similar to the clinical environment.

Design of the simulation space is dependent on the cost of the simulation equipment and its availability. Smith et al. (2013:154) and Gaba (2004:i6) state that the cost of the simulation is dependent on the target population, the purpose of the simulation and the technology used. Lapkin and Levett-Jones (2011:3548) conducted a study on the cost utility analysis of high-fidelity mannequins versus low-fidelity mannequins.

The study found that medium-fidelity simulation was cost effective in helping to impart non-technical skills, such as clinical reasoning, knowledge acquisition and student satisfaction. This is in contrast to the results of a study conducted by Basak et al. (2016:41) comparing HFS and low-fidelity simulation (LFS). The students exposed to LFS scored low in simulation design, concentrating on fidelity amongst other things, compared to the students exposed HFS.

2.6   COMMUNICATION IN HEALTH CARE SETTINGS

Poor communication in health systems is seen as one of the major contributors to adverse events and malpractice claims. In the United States of America, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) found that 65% of medical errors are associated with communication breakdowns (Fay-Hillier, Regan & Gordon, 2012:18). It is therefore important for healthcare workers to be trained in communication for the benefit of the patient and colleagues (Cass et al., 2011:71; Guise & Segel, 2008:931). Unfortunately, it is evident that institutions of higher education invest far less time and resources in training undergraduates in communication skills than in teaching technical skills (Levinson, Lesser & Epstein, 2010:1312). Simulation offers a calm environment in which learners can learn repeatedly in order to fine-tune their skills in communication (Cass et al., 2011:72). In addition, experiential learning pedagogy such as simulation has been found to be of benefit in fostering communication for improved team performance and in the psychiatric setting (Deering et al., 2011; Fay-Hillier et al,. 2012; Monod et al., 2014). To enhance communication skills in health care even further, standardised patients (SP) have been used in simulation. There has been a wealth of studies conducted to evaluate the effectiveness of SP in enhancing learners' communication skills (Bosse et al,. 2010; Choi, 2012; Yardley, Irvine & Le Froy, 2013). Moreover, Levinson et al., (2010:1311) state that communication skills should be taught using a pedagogy that affords repetitive practice and constructive feedback from peers, educators and patient.

2.6.1 Patient-centred Care

In midwifery, obstetrical emergencies frequently occur in the presence of a conscious patient and 'significant other', where events unfold in front of their eyes (Cass et al., 2011:71). Many legal disputes in health care have their root cause in poor communication with the patient and about the patient. Furthermore, advances in health care have shifted the caring role of the health professional and have left patients feeling vulnerable, ill-informed and excluded from decision making that involves their lives (Barry & Edgman-Levitan, 2012:780). It is therefore crucial that health care workers are trained to effectively communicate with the patient and significant others, no matter how dire the situation appears.

Patient-centred care (PCC), patient-centred approach and patient-centred communication are terms used interchangeably to direct the focus onto the patient and make the patient the centre in decision making, communication and safety (Barry & Edgman-Levitan, 2012; Fay-Hillier et al., 2012; Mckeon et al., 2009). Epstein et al. (2010:1490) assert that PCC does not imply giving in to patients' demands and just throwing information at them, expecting them to make their own decisions. It involves giving the patient all the information available and guiding him or her to make the right choices. Patient-centred care is able to help health providers deal with cultural issues, as the health provider is made aware of the patient's norms and culture and is able to engage with the patient at the level of the patient's understanding (Epstein et al., 2010:1492). The care provided using PCC is personalised, tailor-made care that meets the individual needs. Furthermore, PCC benefits both the institution and the patient, as it saves the institution money from litigations and improves the patient's quality of life, enabling him or her to make informed decisions (Epstein et al., 2010: 1492).

Barry and Edgman-Levitan (2012:781) posit that in shared decision making the health care professional enters into a partnership with a patient, in which the patient is kept informed of health options available in order to gain his or her cooperation. In shared decision-making, the health care worker contributes the expertise and the patient sets out her expectations for her care, in a therapeutic environment that enhances discussion, concession and commitment to mutual decision-making (Noseworthy,

Phibbs & Benn, 2013:e43). The final decision for appropriate care becomes a joint one, and can come from either the care worker or the patient. In cases of an emergency, as is common in obstetrics, the patient's autonomy gets overridden by the duty to care; here the expert's knowledge and experience takes over (Noseworthy et al., 2013:e46).

Patient-centred communication does not require that the health care provider is eloquent, but that he or she is simply able to listen attentively and be aware of both verbal and non-verbal cues by self and by the patient (Brock et al., 2013:643; Levinson et al., 2010:1311). Furthermore, patient-centred communication helps the health care provider to identify the individual patient's background, needs and convictions, all of which could help in providing information that will be relevant to the care of the patient (Levinson et al., 2010:1311). Effective patient-centred communication can be hindered by the patient's age, culture and education level. Patients who perceive greater autonomy in terms of options and choices provided by the doctor have higher trust and satisfaction ratings with regard to their physicians (Lee & Lin, 2010:1816). Fostering good patient-centred communication results in mutual respect and trust.

2.6.2 Communication among Health Care Professionals

Communication among health care workers occurs on a one-on-one basis during handoffs or patient transfers or during teamwork (Brock et al., 2013; Hohenhaus, Powel & Hohenhaus, 2006; Kripalani et al., 2007). During collaborative team performances, failure to communicate effectively may result in non-complementary team relationships, poorly-defined responsibilities and poor communication amongst team members (Brock et al., 2013:643). Frequently the presence of individuals with high seniority status in health care efforts may hinder effective communication, as the most junior members lack assertiveness to verify or challenge orders (Deering et al., 2011:90). Therefore, it is important for nursing students to be provided with a safe environment where they can learn and practise communication strategies in order to provide concise and accurate shift reports to colleagues (Wang et al., 2015:881). In the process of caring for the patient, nurses do not work in silos, but as members of a multi-disciplinary team; therefore, it is vital for nurses to learn to communicate efficiently with other members of the multi-disciplinary team. Robinson et al. (2010:209) conducted a study on nurses and physicians' perception of effective and

ineffective communication. The participants of the study perceived that effective nurse-physician communication that is clear and precise and is provided in a calm way, even during crises, can result in better understanding of each profession and in greater mutual respect.

Effective communication among health care workers is important in order to ensure that duties are carried out and to prevent unintentional mistakes. SBAR, an acronym that stands for Situation, Background, Assessment and Recommendation, is a standardised communication framework that was initially used by the navy (Fay-Hillier et al., 2012:718). SBAR is an effective communication method to convey crucial and relevant information during critical and emergency situations (Wang et al., 2015:882). Furthermore, several studies have been conducted to demonstrate the effectiveness of team communication using SBAR during obstetrical emergencies (Guise & Segel, 2008; Sweeney, Maietta & Olson, 2015). In addition, SBAR has been used by health care providers to convey information about the patient at the end of shift handoff (Fay-Hillier et al*.,* 2012; Hawthorne et al., 2017; Novak & Fairchild, 2012). Subsequently the information that is shared is concise and clear, ensuring better transfer of patient information (Fay-Hillier et al., 2012:719; Hawthorne et al*.,* 2017:9).

SBAR has been proven to be of benefit in healthcare when conveying information about vulnerable patients who are unable to talk for themselves, such as in paediatrics and with unconscious patients (Hawthorne et al., 2017; Novak & Fairchild, 2012). Jenerette and Brewer (2011:560) conducted a study on the use of SBAR during communication between the health care provider and the patient. The study showed that improving the communication skills of health-seeking individuals might improve individual patient management. Furthermore, communicating with the patient using SBAR increases credibility and trust, resulting in better management of the patient's condition (Jenerette & Brewer, 2011:560).

2.7   COLLABORATIVE TEAMWORK

There is a dearth of research on nursing teamwork, despite evidence that many errors committed by nurses are partly due to poor teamwork. Deering et al. (2011:89) assert that complications in health care are not attributed to individual but to team performance failure. Furthermore, there is evidence that poor communication during

teamwork is one of the reasons for poor team performances (Kalisch, Weaver & Salas, 2009:298). A focus on team performance, and training started in the discipline of aviation, then proceeded to the army to improve safety (Deering et al., 2011:89). In health care, the importance of teamwork to improve patient safety was first identified in the much publicised report, *To err is human* (Kohn, Corrigan & Donaldson, 2000).

2.7.1 Team Training in Health Care

Team training in health care can be achieved through didactic methods such as the lecture and experiential learning methods such as simulation (Guise & Segel, 2008:947). The former method is proving to be less attractive in the modern era in terms of applicability and skills acquisition. Moreover simulation is ideal for team training as it is hands-on and can offer collaboration among participants (Aggarwal et al., 2010:i38). In addition, simulation training on teamwork is of benefit in high-risk environments such operating rooms, obstetrics, the intensive care unit, trauma and for rapid response teams (Hunt et al., 2007:309).

Varying experiential methods are used in health care to train health care workers in teamwork, including simulation, *in situ* simulation and fire drills (Ameh & Van den Broek, 2015; Gundrosen, Solligård & Aadahl, 2014; Walker et al., 2012). Guise and Segel (2008:947) state that a deeper understanding of team behaviour in obstetrics requires the use of simulation. *In situ* simulation is gaining popularity as a way of teaching staff members in a familiar environment. Besides being able to learn in the comfort of their own known environment, participants reported that working with familiar equipment and in familiar surroundings was less stressful than being taught elsewhere (Gundrosen et al.,2014:312). Gundrosen et al. (2014:316) and Siassakos *et al.* (2009:499) argue that *in situ* simulation comes with challenges, such as not being able to control the learning environment, finding a vacant room for simulation and increased workload at work, making it impossible for some staff to attend simulation practices. Miller et al. (2008:106) posit that *in situ* simulation for teamwork does not place the emphasis on specific competencies, but rather on making individuals better team members.

The use of simulation centres for team training is the most attractive alternative, as training is done in a controlled environment in the presence of a skilled facilitator, a knowledgeable technician and advanced technology (Deering et al., 2011:94).

Creating team training simulation exercises can be expensive. Health care workers found that working with unfamiliar equipment and unfamiliar people, coupled with travelling to the simulation centre, was challenging (Deering et al., 2011:94; Siassakos et a*l.,* 2009:499). However, the benefits of team training simulation tend to outweigh the challenges as reported by Phipps et al. (2012:6), who asserted that working in collaboration ensured that duties were carried out which ultimately contributed to patient safety. Furthermore, collaborative teamwork results in better team communication (Hunt et al., 2007:303).

In obstetrics, emergencies are not the norm, but when they do occur, they have dire consequences for the patient and the institution (Walker et al., 2012:128). The need to conduct fire drills in obstetrics is being recognised globally for the management of emergencies and for fostering a culture of teamwork. Moreover, Crofts, Winter and Sowter (2011:14) assert that there should be a global effort to provide appropriate training to low-resource areas that is both affordable and viable. Training programmes in obstetrical emergencies, such as Managing Obstetrical Emergencies and Trauma (MOET) (Jyothi, Cox & Johanson, 2001), Multidisciplinary Obstetric-Simulated Emergency Scenarios (MOSES) (Freeth et al., 2009), Practical Obstetric Multi-Professional Training (PROMPT) (Crofts *et al.,* 2015) are used both for clinical and non-clinical skills such as teamwork. These training programmes have been adapted to meet the training needs of health care workers in developing countries such as South Africa and Zimbabwe (Frank, Lombaard & Pattison, 2009). Crofts et al. (2015) reported that incorporating PROMPT in the training programme resulted in increased staff confidence in the management of emergencies, improved teamwork and inter-professional relations.

2.7.2 Effective Teamwork

Salas, Sims and Burke (2005:557) made a distinction between team performance and team effectiveness. They argued that team performance focusses on whether the team achieves the desired goals, disregarding the process taken to achieve those goals. Team effectiveness, on the other hand, focusses at the process taken to achieve such goals. Salas et al. (2005) identified five process that encompasses effective teamwork namely team leadership, mutual performance monitoring, backup behaviour, adaptability, and team orientation. Team performance cannot be in

isolation of team effectiveness; hence the study explores team effectiveness in obstetric emergency.

2.7.2.1 Team Leadership

In order to ensure efficient and effective execution of duties and better outcomes in health care, there should be an identified leader (Guise & Segel, 2008:941). Effective teamwork depends on the characteristics of the team leader. Kalisch et al. (2009:300) further state that team performance depends on the manager's leadership style. An effective leader takes responsibility for the creation and the accuracy of team members' shared mental model (Salas et al., 2005:573). Shared mental model is achieved through effective communication among team members during handoffs, briefing and facing team hurdles (Deering et al., 2011:91). Furthermore, a shared mental model enables team members to recognise the goals, objectives, responsibilities and resources that are available to achieve the set goals (Salas et al., 2005:573).

2.7.2.1   *Mutual Performance Monitoring*

Mutual performance monitoring refers to how team members monitor fellow team members' work to identify shortfalls whilst doing their own job (Salas et al., 2005:576). It is important during emergencies for team members to keep the bigger picture in mind, in order to prevent tunnel vision which can contribute to mismanagement and incorrect care. Salas et al. (2005:577) further assert that team members may view mutual performance monitoring as whistle-blowing and may react negatively to assistance provided by team members. However, participants in the study conducted by Kalisch et al (2009:302) identified the need for mutual performance monitoring for effective team work.

2.7.2.2   *Back-up Behaviour*

Back-up behaviour is implemented during mutual performance monitoring as team members ensure that work is evenly distributed and that team members are supported (Salas et al., 2005:579). A shared mental model and performance monitoring are important precursors, as they determine who needs help and when to step in (Salas et al., 2005:580). This was evident in a study on team performance and communication by Freeth et al. (2009:101). The participants in that study identified the need to assertively communicate concerns about patient care to the leader during an emergency.

2.7.2.3 Adaptability

The ability of team members to recognise changes in a patient's condition necessitate adaptation in team members roles (Salas et al., 2005:582). This requires team members to remain vigilant of other team members' roles and to step in when errors are being made (Salas et al., 2005:582). Phipps et al. (2012:6) assert that team members are expected not to concentrate only on their own roles during emergencies but also to monitor the environment for anticipated complications. Adaptability requires teams to be able to change a course of treatment if desired outcomes are not being achieved.

2.7.2.4 Team Orientation

Team orientation is attitudinal in nature and emanates from personal preference to work with certain people (Salas et al., 2005:584). There is an element of mutual respect among team members, with members valuing one another's opinions and inputs. Team members work in a cooperative and coordinated fashion, which enhances team performance. Team orientation is vital in multi-disciplinary teams in health care, which are characterised by different work ethics but nonetheless involve working towards a common goal.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter presents the methodological plan for conducting an interpretive phenomenological analysis of the lived experiences of student midwives, regarding the effectiveness of medium-fidelity simulation (MFS) in relation to clinical readiness. The chapter describes the research design, the population, the sample and sampling procedure, ethical considerations, the trustworthiness of the study, data collection and analysis.

3.2 RESEARCH DESIGN

This study used a qualitative, interpretive, phenomenological, analytical research design to explore, describe and analyse the lived experiences of student midwives regarding the effectiveness of medium-fidelity simulation in an obstetrical emergency setting. An interpretative phenomenological analysis research design has the philosophical underpinnings of phenomenology, hermeneutics and idiography, and affords all participants an opportunity to describe and interpret their experiences during the phenomenon under investigation (Smith, Flowers & Larkin, 2009:11). The student midwives' individual experiences of the post-partum haemorrhage (PPH) simulation demonstrated the diverse experiences of the same phenomenon which are the reflective, interpretative and idiographic premises of IPA.

3.2.1 Phenomenology

Smith et al. (2009:12) argue that phenomenology is an experiential enquiry that advocates that peoples' experiences should be examined according to their own merit and should not be altered. To guard against altering the participants' subjective experiences in this study, the researcher described the experiences of student midwives with MFS (Kruger 1988:143). The reflective process included the researcher being aware of her personal experiences of managing PPH and allowing the participants to tell their stories in their own words (Smith et al., 2009:56). In order to optimise the reflective process, the researcher looked at the experiences at a level deeper than just face value; it was necessary to probe responses, so as to understand

the meanings (Smith et al., 2009:33). During data analysis, the researcher immersed herself in each transcript, trying to make sense of each participant's experiences by first reading the participant's description and then trying to gain a sense of what the participant had experienced during the event described.

The process of bracketing and transcendental subjectivity, described by Smith et al. (2009:13) and Lopez and Willis (2004:728), requires the researcher to be aware of own knowledge, experiences and perceptions of the subject and to guard against the intrusion of these, in order to prevent bias. Each interview was analysed and described individually and conclusions and opinions were drawn from it; the researcher guarded against allowing her analysis to influence subsequent interviews and analyses.

3.2.2   Hermeneutics

Hermeneutics was originally used by theologists for the interpretation of biblical texts and was later used in the interpretation of historical and literary works (Smith et al., 2009:22). The researcher used hermeneutics in the interpretation of participants' descriptions of their experiences as they tried to make sense of their exposure to MFS (Smith et al., 2009:3). That is referred to as 'double hermeneutics'. As much as the researcher has authority over the text, the participants' own interpretation was not distorted. The researcher went through the transcripts trying to analyse data and interpreting participants' experiences of the PPH simulation phenomenon as each one perceived it. This process makes the researcher wary, as one does not want to lose the essence of the participants' experiences as described and interpreted by them. The dynamic nature of hermeneutics is evident as the researcher goes through the transcript several times, each time discovering new meanings.

3.2.3   Idiography

Idiography requires an in-depth analysis of the lived experiences of the individual student midwife provided by the small sample size. According to Smith et al. (2009:29) idiography is concerned with the particular; in this case, how the researcher interprets the student midwife's experiences with MFS. The particularity of interpretative phenomenological analysis (IPA) is evident with the use of single-case studies and

small sample sizes (Larkin, Watts & Clifton, 2006:103). The five student midwives provided a small sample size which made it possible for the researcher to conduct a deep analysis. To stay true to the idiography of the current study, each interview was transcribed and analysed individually. The convergences and divergences of themes were identified without losing the original meaning of each participant's description before moving on to the subsequent interviews (Smith et al., 2009:166).

3.2 POPULATION

The target population was eleven fourth-year Bachelor of nursing student midwives at the University of Fort Hare.

3.2.1 Inclusion and Exclusion Criteria

The inclusion criteria were the fourth-year student midwives who had passed the first semester's midwifery module. Students who were repeating their second year of midwifery and had not been exposed to problem-based learning (PBL) were excluded from the study.

3.3 SAMPLING METHOD

A purposive sampling method was used to select five fourth-year student midwives who were the team leaders during the management of post-partum haemorrhage (PPH) using MFS. Fourth-year student midwives were selected because at the University of Fort Hare, obstetrical emergencies are taught in the second year of midwifery. Usually high-risk midwifery involves emergencies that demand the use of critical thinking, confidence, communication and teamwork. A small sample was used because a sample size of three to six participants is suggested for the novice IPA researcher (Smith et al., 2009:51). The small sample size used in this study allowed for homogeneity in order to identify convergence and divergence in responses (Smith et al., 2009:3). Furthermore, a small sample size afforded an in-depth and sufficient analysis of individual transcripts, while not being overly time-consuming (Smith et al., 2009:49).

3.4 ETHICAL CONSIDERATIONS

Ethical approval of the study was obtained from the University of Fort Hare Ethics Committee (Appendix A). Permission to conduct the study was granted by the Head of Department of Nursing Sciences, University of Fort Hare (Appendix B). Three fundamental ethical principles were applied, namely; the principle of respect for the person, beneficence and justice (Brink et al., 2012:34).

3.4.1 Principle of Respect for the Person

The student midwives were informed of the right to refuse to participate and to withdraw from the study at any given time without any prejudice or penalty. The nature and aim of the study was explained to the participants, prior to data collection.

3.4.2 Principle of beneficence

The principle of beneficence refers to the individual's right to protection from harm. This study was non-invasive, and the student midwives were informed that the simulation was not for assessment reasons but for exploring their experiences of the simulation.

3.4.3 Principle of Justice

The principle of justice refers to how the researcher comes to choose the study population. The student midwives' right to anonymity was maintained. Before the beginning of each interview, permission was sought from each student midwife to use a pseudonym during the interview. Participants were made to understand their right to the privacy of any information provided, and their consent was sought before the use of a tape recorder. Prior to the interview, each student midwife completed an informed consent form with a clear explanation (Appendix C). The participants had the right to ask any question(s) during and after interviews.

3.5 TRUSTWORTHINESS

The principle of trustworthiness, as outlined by (Guba, 1981:83), refers to transferability, credibility, confirmability and dependability; these principles were

applied. Transferability of the study was ensured by keeping a thick data base that could be accessed, followed and used by others. Credibility of the findings was determined by taking the research findings to an independent coder for data validation. The independent coder and the researcher discussed and verified the analysis. Confirmability was attained by ensuring that there was enough data to support the findings and conclusions. The use of an audit trail made it possible to check the steps of the research process, as highlighted by Lietz, Langer and Furman (2006:449) and Shenton (2004:72). All the transcripts including the steps followed in analysis were printed and hard copies kept in a box for future auditing and reference. An auditor who is one of the researcher's supervisors and in knowledgeable of IPA as sought to cross-check the research process. Dependability was ensured by narrating a detailed description of the research design and the steps taken in data collection. The detailed narrative was discussed with a senior colleague to ensure that the steps were acceptable.

3.6 PILOT STUDY

A pilot study made up of four fourth year Bachelor of nursing Science student midwives was conducted before the data collection. After the simulation, one team leader was selected and consent was obtained to conduct the pilot study. The pilot interview was done by the researcher under the guidance of the supervisor in one of the rooms in the simulation laboratory. Two Galaxy A3 smartphones were used to record the interview. The interview lasted for 22 minutes and 20 seconds and was then transferred to the researcher's laptop. The researcher listened to the interview twice using earphones. The interview was transcribed verbatim and data was analysed following the four steps of interpretative phenomenological analysis given by Smith et al. (2009:82). As a result of the pilot process, one question with several prompts was added to the interview guide, centering on meaning of experiences. The pilot study was not included in the final sample.

3.7 DATA COLLECTION

Data was collected through individual face-to-face interviews and a semi-structured interview guide was used (Appendix D). All fourth-year student midwives had viewed

an on-line Essential Steps in Management of Obstetrical Emergency (ESMOE) post-partum haemorrhage video which was sent through Blackboard in order to demonstrate the process. The student midwives had an opportunity to watch the video repeatedly in order to thoroughly comprehend the demonstrated skill.

In order to create a medium-fidelity simulation environment, a hybrid simulator was used with the use of a standardised patient and Advanced OB Susie a gaumard birthing torso with a foetal and maternal pulse in a six-bedded simulation laboratory. The standardised patient was positioned above the birthing torso, creating a hybrid simulator. The Advanced OB Susie torso was placed between the standardised patient's legs and covered with a green towel. Obstetrical Susie had a bladder filled with simulated urine and simulated blood coming through the vagina. There was enough simulated blood on the green towel and linen savers covering the bed linen to illustrate PPH. The standardised patient was provided with a handout with her name, age and details of what had happened and what the students were to act out.

On the day of the simulation, the student midwives watched the ESMOE video once more to refresh their memories on the simulation procedure. The midwifery lecturer gave all groups of midwifery students a scenario with all the details of the childbirth process. Each student midwife group was given an opportunity to decide on roles to play.

Five student midwives who were the team leaders during simulation were interviewed. Team leaders were those who had been most engaged with the simulation. In line with the principle of homogeneity in the sample, as suggested by Smith et al. (2009:49), team leaders were selected because they were able to give meaning to the research question. Interviews of the five participants were conducted over a period of three months. In order to prevent bias, a research randomizer software was used to place team leaders in a certain order for interviews. All 11 team leaders were given numbers and were entered in the research randomizer software in order to select the five students. A one set of numbers was generated and five unique numbers were requested for that set. The following numbers one, two, four, eight and eleven.

 A semi-structured interview guide was used with nine questions. Open-ended questions were used in order to allow the student midwives the opportunity to explore

their lived experiences of an obstetrical emergency using medium-fidelity simulation. Prompts during the interview centered on the students' experiences of obstetrical emergencies using medium-fidelity simulation. Interviews were conducted at the University of Fort Hare's simulation laboratory. Each interview session lasted between 26 minutes and 44 minutes. A Samsung smartphone was used to record the interviews, and a notepad was used to make notes of gestures such as smiles or other facial expressions. After each interview, the recorded interview was transferred onto a laptop and a file was opened for the interviewee, identified by a pseudonym. The interviews were transcribed verbatim as Word documents.

3.8 DATA ANALYSIS

Data was analysed following the six steps suggested by Smith et al. (2009:79)

Step 1: Reading and re-reading

Step 2: Initial noting

Step 3: Developing emergent themes

Step 4: Searching for connections across the emergent themes

Step 5: Moving to the next case

Step 6: Looking for patterns across cases

3.8.1 Reading and Re-Reading

The audio tape transferred into the laptop was listened to using earphones, before each transcription, in order to gain familiarity with the participant and the interview. Each interview was transcribed verbatim, using earphones, to a Word document. A two-sectioned lined and numbered document with the right margin reserved for initial comments was created. The transcript was read through twice. The first reading was done whilst listening to the recording. During that time any parts of the transcription that did not make sense were clarified by moving back and forth on the recording. During the second reading the researcher listened in detail, immersing herself in the words of the participant. During this process, the researcher began to comprehend each participant's overall experience, comparing the recording with notes made on

voice, body language, smiles and gestures. During this time, the researcher tried to bracket any preconceived knowledge that she might have had, so as not to misinterpret the participant's own experience of the phenomenon.

3.8.2   Initial Noting

A two-sectioned Word document with the right margin reserved for exploratory comments was used. The transcript was analysed line by line, to identify three types of exploratory comments, namely; descriptive, linguistic and conceptual, while trying to make sense of each participant's experiences and being consciously aware not to change original meaning. Descriptive comments were mostly based on midwifery terminology, which relates to the procedures undertaken to manage PPH. The emotions that the student midwives experienced and the language used during the interviews gave meaning to the comments. Conceptual comments were based on the covert meaning that the students gave to their experiences. The conceptual comments required intense involvement with the text as the researcher tried not to lose the meaning of the participant's own experience. Table 3.1 shows an example of the transcript, with exploratory comments:

Table 3.1: Sample transcript of the interview for initial comments

1. I – What does clinical readiness mean to you in terms of midwifery? 2. R – Eh … It means first you have to understand that in midwifery the emergency can happen any time. Emergency is something that is 3. imminent in midwifery so you have to be competent in skills. You have to always be prepared, even your area where you work for all procedures, equipment and staff	Midwifery is unpredictable (Conceptual) Emergency is part of midwifery (Conceptual) Know how to perform a skill (Descriptive)
4. I – If I take you back to the statement that you've given; by 'being prepared', what do you mean by 'being prepared'? 5. R – By being prepared, eh … I mean when you arrive in the morning you have 6. To make sure that every equipment is available. Your staff must know that 7. my responsibility is this and that during any particular emergency … so it 8. means you are prepared, you have to practise so that you are sure of your staff and even yourself, you are sure that you are ready and you 9. are competent to perform a particular procedure in an emergency.	Be prepared all the time (Descriptive) Have equipment ready (Descriptive) Staff to be prepared for emergencies (Conceptual)
10. I – Also, I want to mention about, in midwifery, you said in midwifery emergencies happen. Do they only happen in midwifery? What causes emergencies to happen in midwifery? 11. R – In midwifery it's unpredictable, is not like, eh, other like other … (pause) 12. I – Disciplines? 13. R – Yes, like other disciplines; like, if you have a patient that has a heart attack or anything related to the heart, you are expecting that this patient – the heart might stop at any time, but in midwifery it's unpredictable … eh … you can have a breech, for example, undiagnosed breech – especially there are patients who don't even go for ANC booking, who just come. You might find out the patient has triplets, twins or there's a breech presentation and you have to transfer the patient. 14. I – As we were having the PPH simulation what was going through your head when you saw that patient in that state? When the patient was in that	Check equipment every day (Descriptive) Staff to be aware of responsibility during emergency (Conceptual) Staff to practise the management of the emergency (Conceptual) Ready and able to perform procedure in an emergency (Descriptive)

pool of blood. What was going through your head?	Repetitive use of unpredictability of midwifery shows how situations can change in midwifery (Linguistic)
15. R – Eh … (pause). Firstly … eh … (pause) when I saw the blood, I knew that the patient – this is a postpartum haemorrhage. So what came first to me was that, OK, I have to call for staff and make sure, and ensure that everything is nearby to us, is within our reach. I knew that the PPH is the most complication that is killing the patients but I had confidence in my staff, my colleagues during that time.	Call for help (Descriptive)
	Have equipment ready (Descriptive)
	Patient can die from PPH (Descriptive)
16. I – What made you to have confidence in your colleagues?	Had competent staff (Conceptual)
17. R – Because we practised the skill, yes, so I had confidence, even those people I was doing the skill with.	Had opportunity to practise skill (Descriptive)
	Confidence in team members (Descriptive)

3.8.3 Developing Emergent Themes

Having been through the transcripts and made the phenomenological exploratory comments, the researcher made sense of each participant's experiences. Working now on a three-sectioned Word document and using the left margin to jot down emerging themes, the researcher tried to interpret the exploratory comments, paying no attention to the original transcript. The researcher bore in mind that the interpretation of the exploratory comments should not be a polar opposite of the original transcript. This involved the hermeneutics of IPA. From the five transcripts, a

total of 517 emergent themes were developed. Computer Assisted Qualitative Data Analysis (CAQDAS) using Atlas.TI was used to show the network of emergent themes of each transcript.

3.8.4 Searching for Connections among Emergent Themes

After identifying the emergent themes, the researcher copied and pasted the themes into a separate page chronologically. In order to identify connections between themes, the font for themes was increased to 48, and each was cut out as a clipping. Clippings were then pasted onto an A4-sized sheet of paper, arranged according to their similarities. There was a lot of pasting, removing and re-pasting as the researcher tried to establish correct connections between themes. Abstraction was used for the clustering of themes, as each superordinate themes was identified. The super-ordinate themes were mostly linked to the research objectives. Some differences were identified in some clusters, indicating polarization. Contextualization was evident in the way participants used their critical thinking and decision-making skills. During clustering, numeration was noted as certain words were used repeatedly by participants. Below is the diagram showing clustering of one interview.
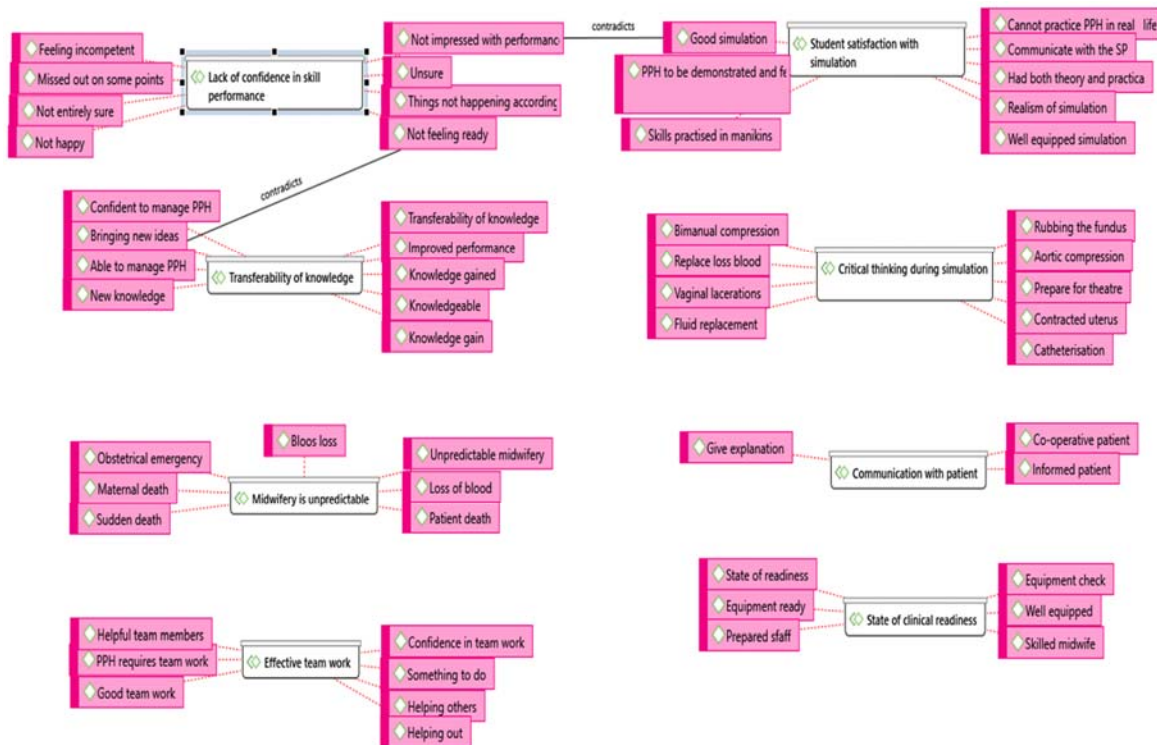
Figure 3.1 Clustering of emergent themes

3.8.5 Moving to the Next Case

Each interview was transcribed and analysed separately before moving on to the next case. The researcher was consciously aware of her own experience with the subject matter that had the potential to influence her analysis, and thus tried to bracket all knowledge and opinions surrounding the research project. Each interview was treated on its own merit and each analysis was conducted with a clean slate, as if hearing the information for the first time.

3.8.6 Looking for Patterns across Cases

The final step in IPA was to bring together all the themes of the five participants and look for commonalities, differences and idiosyncrasies. The themes that were common for most participants were noted, as well as those that were idiosyncratic. This involved going back and forth between transcripts, labelling and re-labelling themes and superordinate themes. An Excel spreadsheet was used to show the superordinate themes across all participants. The detailed description of the superordinate themes for participants will be analysed in Chapter 4.

CHAPTER 4: FINDINGS AND DISCUSSION

4.1 INTRODUCTION

This chapter presents the experiences of student midwives who were exposed to a medium-fidelity simulation, focussing on post-partum haemorrhage (PHH) management. Five participants formed the sample size in this study. The data collected during in-depth interviews was analysed, and yielded the following five superordinate themes and clusters of sub-themes: (1) The meaning of 'preparedness' (2) Working in collaboration (3) Effective communication (4) Knowledge and judgement (5) Sense of fulfilment (see Figure 4.1).

The schematic representation of the analysis shows how the superordinate theme, 'meaning of preparedness' is linked to the other four superordinate themes. The four other themes – working in collaboration with others, having good communication skills, being able to make good, sound decisions and having a sense of accomplishment – contribute to preparing a student midwife for clinical placement. Superordinate theme one, 'the meaning of preparedness', refers to how the participants interpreted being ready, in terms both of self and of the health institution, for any incident in their field of work. The importance of working in a team is highlighted in superordinate theme two, 'working in collaboration'. Teamwork is evident in how duties are shared among team members and how team members perceive teamwork. Superordinate theme three, 'effective communication', relates to how the participants communicated with each other during the emergency and the impact of their communication on the patient. Superordinate theme four, 'knowledge and judgement', refers to how the participants resolved the obstetrical emergency and how they reflected on their actions. Superordinate theme five, 'sense of fulfilment', refers to a sense of accomplishment; a feeling of having attained something and gaining confidence as a result.

WORKING IN COLLABORATION
Delegation of duties
Importance of teamwork
Team support
Confident team leader

EFFECTIVE COMMUNICATION
Communication among team members
Addressing team members by name
Providing feedback
Communication with the patient
An informed patient
A cooperative patient

THE MEANING OF PREPAREDNESS
Clinical readiness in midwifery
Well-equipped institutions
Personal clinical readiness

KNOWLEDGE AND JUDGEMENT
Use of critical thinking during simulation
Reflected on knowledge in action

SENSE OF FULFILMENT
Transferability of skill
Knowledgeable
Equipment used during simulation
Realism of simulation
Sense of accomplishment
Sure or unsure of performance

Figure 4.1 Superordinate themes and sub-themes

4.1 SUPERORDINATE THEME ONE: THE MEANING OF PREPAREDNESS

Three emergent sub-themes were identified that gave meaning to this superordinate theme, namely:

- Meaning of clinical readiness
- Health facilities preparedness
- Personal clinical readiness

4.1.1 Meaning of Clinical Readiness

The participants had differing opinions concerning clinical readiness. Some participants viewed clinical readiness as being at both individual and institutional level. Others conceived clinical readiness as being ready for any eventuality in midwifery, which the midwife should able to handle competently and swiftly.

Clinical readiness relates to how well midwives are prepared to work in the clinical environment or setting. The midwife should be able to perform the skills that are required of her when the situation or the patient's condition require that of her. As stated by one of the participants:

'… One has to be prepared that anything can happen and expect sudden changes at any time during labour. Also you must have the necessary equipment to handle any situation …' [Thembi]

'In terms of midwifery, I think it means that one should just be ready to perform the relevant and needed skill for a particular situation that arises in midwifery.' [Zandie]

A sense of readiness is related to the nature of midwifery, wherein a patient's condition can change rapidly at any time; the midwife should possess the ability and skills to handle any changes with the appropriate action. It means that midwives need to have a keen sense of anticipation when working in a midwifery setting, because an emergency can happen at any time. This view was echoed by one participant:

'It means first you have to understand that in midwifery an emergency can happen any time. Emergency is something that is imminent in midwifery so you have to be competent in skills. The working area must be well-equipped, and staff, to respond to any clinical situation.' [Lunga]

It is important to identify the unit where the midwife is working, because the conditions, policies, guidelines, protocols and procedures for each unit help to position the midwife

in a state of preparedness for any situation that might arise. This means that the midwifery unit needs to be ready by providing the necessary guiding principles for the unit to function normally. This idea was captured as follows:

'Firstly, the midwife should know the mission, vision and objectives of the unit in order to ascertain clearly what's happening to the unit before attending to the patient. Then you have to know the conditions of both the mother and the baby.' [Sino]

Clinical readiness is synonymous with the quality of nurses produced by a training institution. The kind of training received impacts on the clinical performance and readiness of the midwife. Training simulations afford students opportunities to practise complex skills in a secure environment. Repeated practice gives experience and improves skills, leading to competency and ability to manage the many emergencies of clinical nursing. This being the case, adequate and thorough skills training is needed for optimal intervention in a clinical setting. As stated:

'… in midwifery clinical readiness means that one is fit enough to perform the required skill learned in the school … Being fit enough means that you are prepared emotionally and physically to undertake a particular task that comes your way. In this way, you will be competent, if you get enough time to practise the skill, like getting your own time to perform the skill …' [Anga]

4.1.2 Health Facilities Preparedness

Health institutions can function well in handling emergencies if they are well-equipped. The participants identified the need to check and ensure that all equipment was made available in case of emergency and that staff members were aware of their roles. This was emphasised by participants thus:

'Anything can change at any time during labour, so one must have the necessary equipment to handle any situation. If needed or required facilities and equipment are lacking, it becomes very difficult to handle emergencies requiring clinical attention.' [Thembi]

'Adequate equipment is needed to handle emergencies. The institutions must ensure that equipment is in place. Eish, without equipment, it is difficult' [Zandie]

'Being prepared involves checking and ensuring that equipment is available and that your staff is aware of their responsibilities.' [Lunga]

Institutions that do not have necessary equipment have a negative impact on patients' lives, as indicated by the student midwifes' comments:

'At times some institutions do not have necessary equipment to resuscitate a patient and the patient finds herself in a dire situation.' [Sino]

4.1.3 Personal Clinical Readiness

Participants had differing opinions about their clinical readiness following the PPH simulation. Being exposed to the PPH simulation generally increases students' confidence in their capabilities so much that some choose to work in midwifery units, despite numerous lawsuits. Being competent in midwifery and working according to the guidelines and protocols reduces the chances of lawsuits. This is confirmed by the following comment:

'I'm ready. I'm so ready it makes me feel like I would like to work in midwifery as much as people say there's lot of litigation. There is a lot of litigation, but if you do the right thing, then nothing will come back to haunt you. [Thembie]

There was an element of uncertainty. Some students felt not fully ready for clinical practice, and did not feel competent in the simulation environment. Repeated exposure and previous experience with obstetrical emergencies in class help student midwives feel prepared for the clinical environment. Repeated simulation drills develop competency, as affirmed by the following participants:

'Now that I have done it, if I can watch the video again and perform the scenario again I will be more confident. Yes, I will be ready, because I've experienced it, I will know what to do.' [Zandie].

'Since I'm starting my professional career next year I will say I'm ready, but I will need assistance. I'm not fully competent. There are skills that I only performed once during my training and that make me feel not 100% ready.' [Anga]

'In the simulation laboratory we have seen and practised some of the emergencies such as shoulder dystocia. I'm prepared because our lecturer had specific time to take us to the simulation laboratory and demonstrate to us.' [Sino]

One participant felt it impossible to confirm his clinical readiness after exposure to the simulation. To this participant, the simulation experience did not make him feel competent enough. He felt that clinical readiness could only be confirmed when he was faced with and successfully handled the real emergency:

'I've gained something in that simulation but I can't say I'm ready for clinical. But if I can be faced with PPH on my own I will know what to do. But because I haven't yet been exposed to that, I can't say I'm ready.' [Lunga]

4.2 SUPERORDINATE THEME TWO: WORKING IN COLLABORATION

Four emergent themes were clustered namely:

- Delegation of duties
- Importance of teamwork
- Team support
- Confident team leader

Teamwork is imperative in any kind of emergency. During obstetrical emergencies staff members need to learn to function as a team for better outcomes for the patient.

4.2.1 Delegation of Duties

Participants highlighted that there is a need for someone to assume the leadership role during emergencies. The person who assumes the leadership role should be able to do introspection for his or her capabilities. As team leaders, the five participants all felt responsible to assign duties to other team members. Assigning duties in an emergency is important so as to ensure that tasks are carried out effectively. The effectiveness of assigned tasks needs to be confirmed through continuous mutual updates from team members. In a midwifery unit, every midwife should be competent to assume a leadership role and to direct team members in order to manage the case effectively, at the correct time and in the correct sequence, as affirmed by the following comments:

'I delegated duties to other team members and asked for the updates to ensure that duties are carried out and whether they are effective.' [Thembi]

 'As the person who arrived first and assumed the leadership role, I felt I should assign duties to other team members such as taking vital signs, inserting intravenous cannulas and calculating the amount of blood loss.' [Anga]

'You have to delegate specific duties to your team members. If this person is responsible for observations and you want an equipment, you can't ask this person to take an equipment for you.' [Lunga]

'Delegating duties to other team members ensures the duties are carried out. Specific duties were delegated to team members and team members kept me updated with the progress of the patient.' [Zandie]

4.2.2 Importance of Teamwork

Some of the participants were not especially aware that obstetrical emergencies require team effort. To them, when they call for help, they expect anyone to assist. Participants acknowledged that the team leader should give out instructions and team members should be co-operative. Some participants felt that working in cooperation with other team members contributed towards the well-being of the patient. Also, most participants acknowledged the importance of teamwork in resolving obstetrical emergencies, and showed awareness that one cannot function alone in such instances. In a midwifery unit, collective teamwork results in better outcomes. Teamwork is alluded to by the following comments:

'Firstly, I didn't know that when you are managing PPH you need more people. I knew that you call for help and you do some of the things then the person will come and help you.' [Lunga]

'I felt confident because I was able to do it with the help of my team members and it made me to value teamwork more. This made me realise that there are certain things you cannot do alone.' [Thembi]

'Teamwork was very good because my team had knowledge about PPH so there was a good teamwork.' [Sino].

'Working with a team that wants to help and that keeps on advising made my job easy. I was a team leader who was unsure of what I was doing, but I knew that my team knows what to do.' [Zandie]

'Teamwork … I could say that my colleagues cooperated very well with me. They did everything I told them to do and then we managed the patient well.' [Anga]

4.2.3 Team Support

Having a supportive team helped the participants rely on fellow team members. The team members were not just a source of support but also helped each other with critical thinking and decision making. Team members gave advice when necessary,

talking over the team leader when important steps were missed out. In an emergency, every team member can have a positive contribution that could be of great benefit to the team and the emergency. One participant reported that her team demonstrated a sense of serenity and respect, as they were consciously aware that they were having a discussion about the patient and that the patient was present; therefore, they were careful not to speak negatively and so affect the patient. The team leader needs to acknowledge and value other team members. Team support in the midwifery unit is a significant factor to pay attention to, to ensure positive midwifery outcomes. In a supportive midwifery unit, achievements are not regarded as belonging to any individual but to the whole unit. Team members who work in collaboration with one another avoid the chaos that defines many emergencies, as affirmed by the following comments:

'I just needed someone to reassure me that this is the step that follows after the other one. That's how I did my critical thinking, and with the assistance of others.' [Zandie]

'The team leader was the one giving the instruction but others were just talking because it's an emergency. You can't keep quiet when you see that the team leader is missing something.' [Lunga]

'If another member has forgotten something, the team leader or another colleague will say please do this, not in a harsh way, but in a respectful way, so that even the patient does not sense that something is wrong.' [Sino].

4.2.4 Confident Team Leader

Participants had varying experiences of the role of team leader during the simulation. Being able to confidently delegate tasks and making sure that people carried out those tasks increased the student midwives' confidence at being leader. Participants reported seeing themselves as leaders in the real-life clinical situation. Simply being chosen to be a leader by one's peers has the effect of increasing confidence. Knowing that people see the potential in one to lead has a motivating effect and encourages people to give of their best. Participants reported feeling nervous in the role, but found that as they were immersed in the role, capabilities and confidence increased. Assuming a leadership role in a simulation enables the participant to visualise a similar role for her- or himself in the clinical arena. However, a lack of knowledge in a team leader about the subject matter can at times make the leader doubt his capabilities.

The sense that team members had to take over at certain points made one participant feel less of a leader:

'I was not impressed because the things didn't according to plan, so I'm not happy about being a leader …Yes, I did the job, but I missed some of the important points during the procedure so you can't be impressed having your team members talking over you because you missed some important points whereas it's your job.' [Lunga]

Others were more positive:

'The whole scenario, it's challenging and when something is challenging, it brings out the best in you. I could see myself delegating to my peers and seeing them carrying out duties without complaints.' [Thembi].

'The fact that they chose me to be the team leader, like they have trust and confidence in me that I can to do this, it means I can do this.' [Zandie]

'At first I was nervous being chosen as a team leader, but I thought OK let me try it, but as time went on I felt proud of myself that I'm able to assign duties to people.' [Anga].

'I feel like I'm competent, even if I can come across PPH in the institution I will be able to take part in saving the patient's life. You gain confidence and more experience when you do things practically.' [Sino]

4.3 SUPERORDINATE THEME THREE: EFFECTIVE COMMUNICATION

Communication among team members in any emergency is important as it ensures that instructions are passed on from one team member to another and that duties are carried out. Six sub-themes are discussed, namely:

- Communication among team members
- Addressing team members
- Providing feedback
- Communicating with the patient
- An informed patient
- A cooperative patient

4.3.1 Communication among Team Members

Communication among team members is what makes or breaks teams. Most of the participants verbalised good communication among team members. Even though participants experienced heightened emotions, such as nervousness and anxiety, and were at times unsure of what they were doing, they were still able to communicate with each other effectively. Moreover, the team members saw the importance of communicating with each other as they tried to save the patient's life. Maintaining good communication with team members is important as it facilitates good teamwork and good outcomes for the patient.

'Communication was OK because we were not used to calling each other by surnames.' [Thembi]

'Communication was good, beside the fact that we were just not too sure on how to use the equipment. We knew this equipment was to do this, it's just trying to take the equipment and use it to the patient, but communication was good.' [Zandie.

'Communication was the key because everyone was under pressure to save the patient so communication was good.' [Sino]

'Team members communicated very well with me and with each other, like we assisted each other very well.' [Anga]

However, one participant felt that communication had not been good as the team leader was not competent and had to be instructed by other team members:

'Communication was not good because others had to do what the team leader is saying and it was not the case here. The team leader was the one giving the instructions but others were just talking over because it's an emergency. You can't keep quiet when you see that the team leader is missing something.' [Lunga].

4.3.2 Addressing Team Members

In order to ensure that orders are carried out, it is important to give a direct order to a specific individual. By giving a direct order, one is sure of the specific task being carried out. Directly assigning a job to an individual promotes confidence in the one to whom it is assigned:

'Firstly I had to call them by names because it is very important. Because I can't say, "Do blood pressure" because all of them will go there and no one will do maybe to put up IV line, so I had to call them by name.' [Sino]

'Calling people by name when assigning duties makes them aware that you are talking to them directly.' [Thembi]

'I think firstly it builds the confidence of the colleague so that she knows what she is doing and takes responsibility for it.' [Sino]

4.3.3 Providing Feedback

In order to make sure that delegated duties are carried out, it is the responsibility of the team leader to check up on team members, and to request feedback from them in order to confirm that the duties have been effectively carried out for the patient's well-being. It is also necessary to ask about the condition of the patient at specific times. The team leader needs to be able to make decisions regarding appropriate care when the condition of the patient alters. The trail of evidence provided through regular updates is used as a point of reference when assessing the effectiveness of the intervention. The leader can decide whether to continue with the same treatment, or to try something else. Providing constant, regular feedback from team members to team leader ensures communication within the midwifery unit as emphasised by the following:

'You tell one to monitor vital signs and then ask for the findings … As a team leader you make sure you ask them, not to just take it for granted they are aware of what they are supposed to be doing.' [Thembi]

'So every time, if I'll say, "How is the BP?" the person in charge of the BP should immediately tell me the BP is this …' [Zandie]

'… in the middle of the procedure I will ask how are things, how is the blood pressure, how is the bleeding …' [Sino]

4.3.4 Communication with the Patient

Communicating with the patient at all times helps to build a trusting relationship with the patient and increases patient confidence. Participants communicated with the patient, explaining as much as possible about treatment plans. Some participants affirmed the advantages of communication with the patient thus:

'Communication with patient was good because we explained what we were doing to the patient.' [Zandie]

'Communication with the patient was good. We were informing the patient what is happening each and every step and the patient was cooperative, which means really the communication was good.' [Lunga]

'Communication was good because remember during PPH the patient sometimes loses consciousness because of blood loss. We had a specific person communicating with the patient.' [Sino]

One participant felt that communication with the patient did not start off well but it got better as things were explained to her:

'Communication with the patient did not start off well but as we explained to the patient that things are going to be OK, to give the patient that sense of hope, she started to calm down and cooperated with us.' [Anga]

4.3.5 An Informed Patient

Keeping the patient informed reassures the patient that things are under control. The participants identified the need to keep the patient informed on what was happening to her at all times. Participants reported that having one person communicating with the patient helped to ensure that the patient did not receive conflicting information. Nurses should explicitly explain certain procedures to their patients. Providing concise information to the patient is important as it helps in patient care decision making. This was emphasised by the following participant thus:

'The patient was informed of what was happening, for example, someone has to press the stomach; you have to tell her that you will experience pain.' [Thembi]

'… we explained what we were doing, even though we had to reassure the patient.' [Zandie]

'… explaining everything to the patient ensures cooperation, so it's one of the important things in nursing. In general, you keep the patient informed.' [Lunga]

'We had a specific person to communicate, to keep the patient informed.' [Sino]

'I tried to calm the patient down, explaining what is happening, that we are the handling the situation.' [Anga]

4.3.6 A Cooperative Patient

Some participants reported that telling the patient what was going on guaranteed patient compliance with care. When explanations are given, the patient feels that she is being cared for by competent and knowledgeable staff. Intuitively, it may be deduced

that when a patient feels properly cared for by competent staff, she will cooperate and remain fairly calm, even in an emergency situation. A non-panicking patient can go a long way to ensuring effective treatment and correct procedures. As reported by the following:

'… we explained everything to the patient and that helped us to get the patient cooperation…' [Zandie]

'The communication with the patient was good. We were informing the patient what is happening each and every step, and the patient was cooperative which really helped.' [Lunga]

'… as we explain to the patient that things are going to be OK, to give the patient that sense of hope, she started to calm down and cooperated with us.' [Anga]

4.4 SUPERORDINATE THEME FOUR: KNOWLEDGE AND JUDGEMENT

Student midwives had differing opinions about the use of knowledge and judgement during simulation. The following sub-themes were identified:

- Use of critical thinking during simulation
- Reflecting on knowledge in action

4.4.1 Use of Critical Thinking during Simulation

It is important to identify what should be done first, so as to prioritise patient care. As such, one has to think critically and quickly during emergency situations so as to make lifesaving decisions. Most participants saw the resuscitation of the patient using fluids as a priority, since the patient was profusely bleeding.

- The first priority for the nurse is always to stabilise the patient, making sure that she is safe and recovering, as evident in the following comments:

'Because I saw the patient has lost some blood, so the first thing was to start to stabilise the patient by commencing an intravenous infusion of normal saline and the other things will come after …' [Lunga]

'The patient was given an infusion of fluids such as Ringers Lactate and Voluven …' [Thembi]

'The proper management of the patient, which is like inserting IV lines to balance the fluid of the patient.' [Anga]

- The cause of uncontrolled bleeding should be identified in order to stop the bleeding. Identifying the cause of the bleeding is important for further management, as supported by the following comments:

'We had to identify where the bleeding was coming from and after the bleeding was identified, you have to stop the bleeding by any means possible.' [Thembi]

'One would try to find the cause of the bleeding in order to stop further bleeding.' [Zandie]

- Some participants indicated that managing an emergency requires teamwork and someone to take charge of the situation, as affirmed by the following comments:

'When the person is bleeding the first thing that came to my mind at that moment was to get other health practitioners or other nurses to assist me.' [Anga]

'You call for help because you cannot manage the emergency all by yourself.' [Lunga]

- Some participants understood the importance of prioritising the management of the patient's condition effectively. Prioritising the various procedures is essential; nurses need to start with interventions that will have a positive and immediate impact on the patient and improve the patient's condition. The participants maintained:

'I applied my critical thinking because I had to know what comes first. I have to maintain priorities, not starting with the last thing, but starting with the things that are a priority in saving the life of the patient.' [Lunga]

'Firstly, I ordered that there should be someone who is going to monitor her vital signs and report at least every five minutes if there is any change.' [Thembi]

'I started with the things that I thought will benefit the patient.' [Anga]

- Emptying the patient's bladder was seen as necessary for helping to stop the bleeding, as reported by the following participants:

'We checked if the bladder was not full so we catheterised the patient in order to encourage the uterus to contract.' [Zandie]

'I emptied the bladder of the patient to see if the bleeding is not caused by a full bladder.' [Sino]

- Seeing the amount of blood made some participants think of the worst-case scenario; anticipating this enabled participants to be ready for appropriate action should the worst arise. A sense of anticipation forms part of critical thinking in managing a patient's condition in midwifery, as evident in the following comments:

'I knew that the PPH is the most complication that is killing the patients.' [Lunga]

'I thought of the patient dying after seeing the amount of blood.' [Sino]

'Firstly I thought the patient was going to die because she's was going to lose a lot of blood.' [Thembi]

- An atonic uterus can cause uncontrollable bleeding, as reported by the following participant:

'If the midwife fails to check if the uterus is well contracted and expelling any clots that might be present, patient will continue to bleed.' [Sino]

'You have to ensure that the uterus is well contracted. If the uterus is not well contracted, you won't be able to identify the cause of the bleeding because the patient will continue to bleed.' [Lunga]

'The woman could bleed because the uterus is not contracted or there are retained products or clots.' [Zandie]

This is further affirmed by the following comment:

'The most important thing is to make sure the uterus contracts. If the uterus does not contract the way it is required, you give oxytocin.' [Lunga]

- Checking the vagina and cervix for lacerations in order to identify the origins of the bleeding is important. The participants stated this point thus:

'I checked if there is any episiotomy or lacerations present.' [Sino]

'Checking for vaginal laceration which can also cause vaginal bleeding – that's the way you can find out the cause of PPH.' [Anga]

'You use the vaginal speculum to check if the bleeding is from the cervix and vaginal walls.' [Thembi]

- The coagulation factors that may cause the patient to bleed uncontrollably were considered by a participant who stated:

'I think if the patient has clotting factors that may cause the bleeding … PPH may occur if the patient wasn't cared for, if the patient was not seen during antenatal visits, yes.' [Sino]

- The participants considered the patient's age and how the younger patient might be better able to tolerate significant blood loss than the older patient. The age of the patient plays an important role in the effective management of PPH. A participant maintained:

'*I had to consider the age of the patient, because if the patient was old you have to act early as possible, compared to the young person who is able to tolerate significant amounts of blood loss.*' [Sino]

4.4.2 Reflecting on Knowledge in Action

Reflecting on the use of critical thinking during simulation, participants had mixed feelings about the use of critical thinking. Initial feelings of fear and nervousness at the beginning of the simulation were echoed by the participants. Being a leader and having to think and make decisions can be nerve-wracking. Having to think in action for oneself and for the group puts one under pressure. This was echoed thus:

'At first I was nervous. Then I was excited that we were able to do it as a group, because it wasn't just about me doing it, was also about getting help from the people I was working with.**'** [Thembi]

'I was nervous when I was directing people to do things. As time went on, the PPH started to be managed and I became proud of myself that I'm capable of being the team leader in such a situation.' [Anga]

The use of critical thinking inculcates a sense of contentment and fulfilment in the participant. The participants felt thus:

'It actually feels good to save someone from the situation that could actually determine their life.' [Zandie]

Reflecting on the use of critical thinking, one participants was able to acknowledge her shortcomings and identify areas that needed improvement:

'Reflecting on my performance makes me think I was not that competent, and need more practice to be competent.' [Lunga]

Applying previous knowledge and experience, especially experience on PPH, is a critical part of critical thinking:

'I was able to think critically during the simulation because I was sort of prepared, because in the institution, we've learned how to care for the woman who has haemorrhage.' [Sino]

4.5 SUPERORDINATE THEME FIVE: SENSE OF FULFILMENT

Having been exposed to the simulation experience, the student midwives' confidence to handle any obstetrical emergency was greatly enhanced. Six sub-themes were clustered to support this notion:

- Transferability of skill
- Knowledgeable
- Equipment used during simulation
- Realism of simulation
- Sense of accomplishment
- Sure or unsure of performance

4.5.1 Transferability of skill

Transferability of skill refers to how skills learned during PPH simulation can be applied to the real-world clinical environment. The use of a standardised patient makes the transition to real patients much easier, as is evident in the following comment:

'I have seen a real person actually collapsing during the simulation, so it makes you less nervous when you are in clinical and you're dealing with the real patient.' [Thembi]

In this case, the PPH simulation sensitised the participant to the clinical environment. The overall management of PPH, practised during simulation, is obviously intended to be transferred to the real clinical environment. The participants became more aware of their clinical environment, and started to ask questions that were relevant to their training, as is evident in the following comments:

'Even now, if you can put me in the real situation clinically at least I'm sure that most of the important things I will be able to do and at the correct time. After that simulation activity, when I arrived in clinical during my allocation, I always make sure that all the equipment is available and the expiry ...' [Lunga]

The exposure to obstetrical emergency simulation made the participant feel confident and eager to be involved in a real obstetrical emergency. One participant reported:

'I have seen or I have done some of those emergencies, like shoulder dystocia. I'm prepared because our lecture had specific time to take us to the simulation laboratory and show us how it is done. So I think I am prepared.' [Sino]

Participants reported being immersed in an environment that resembles a real-life situation, thus making it easy for them to apply the acquired knowledge to the real situation. They maintained:

'I think the PPH simulation really helped us to get ready when we go out in the clinical areas, to be able to perform if there's such situations.' [Anga]

'When I go to work next year and be stuck with someone who is having a PPH, at least I will know that somehow I need to insert a condom tamponade to stop the bleeding.' [Zandie]

4.5.2 Knowledgeable

The participants felt that they possessed enough knowledge not only to assist during an emergency but to be actively involved in resolving any emergency situation. The student midwives' practical knowledge about PPH increased after the simulation. The participants reported that knowledge of the management of PPH increased during simulation as they were made aware of the steps that are available to manage PPH. This is affirmed in the following quotes:

'… Then I had no idea what's really, really going on but I knew this was a PPH but we were all observing, just getting what was needed. Now being able to do it yourself, then it's a different case, then you like feel more aware.' [Thembi]

'The fact that there are other steps after rubbing the fundus and giving Ringers Lactate, it made you open that you must always try every single option. My knowledge stopped at Ringer's Lactate and of the fundus and bimanual compression.' [Zandie]

The knowledge gained from the simulation made this participant feel confident to go back to the clinical area and implement the knowledge gained:

'When I'm in the ward I will try to inform my colleagues at least to understand their responsibilities during the PPH. They will know now we usually manage the PPH being two people but now at least I'm coming with the idea that let's be four people, because I've seen that from the simulation …' [Lunga]

4.5.3 Equipment Used During Simulation

Concerning the equipment used during simulation, participants maintained that equipment used was comparable to that used in the clinical environment. To make the simulation as authentic as possible equipment used during management of PPH was provided such as vaginal cuscus, swab holding forceps, artery forceps, green towels, PPH box with contents. They expressed this as follows:

'It is what I expected, because I already seen a PPH complication at CMH, but fortunately there was a doctor there and they did what we did there, for example, the doctor had vaginal speculum and she was checking.' [Thembi]

'After that simulation activity when I arrived in the clinical during my allocation I always made sure that all the equipment is available and the expiry date is fine because I always have thoughts of that simulation.' [Lunga]

Participants held that the equipment used during the simulation was high-technology and sophisticated. Some participants saw such advanced high-tech equipment for the first time during the simulation. One participant stressed:

'The equipment used during simulation to me was new, it was at another level. It made me feel like an advanced midwife. When we did theory on management of PPH I did not remember hearing anything about using a condom to try and stop the bleeding.' [Zandie]

'Some of the things that were demonstrated or were done, I was not aware of them, for instance the condom tamponade.' [Sino]

One participant maintained that a well-equipped simulation environment contributed to efficacy:

'The simulation was good, especially all the equipment that was there …'[Lunga]

4.5.4 Realism of Simulation

Some participants felt that the use of the standardised patient (SP) enhanced the realism of the simulation. The realism of the simulation environment refers to how much it resembled the real world, as is clear from the following comments:

'… if you have a standardised patient that will help the students to be ready during practical, knowing I have faced a real patient so I'm ready.' [Anga]

The participants compared the use of a low fidelity-mannequin with a use of an SP. The interaction that resulted from talking with the patient made the simulation look and feel real, as asserted by the following participant.

'*Having the standardised patient was good because Dodo [the mannequin] was not responsive. It's just Dodo – she's lying, you're saying whatever you're saying. The SP will talk to you and tell you how she feels compared to Dodo, who just remained quiet.'* [Thembi]

The use of the hybrid simulator enhanced the realism of the simulation, as evident in the following comment:

'*We used real patients, yes, even though in some parts we were using the dolls but it's the real human being and the human being is talking. In your mind you know it's not a real situation but you are able to grasp some important points, OK, I missed this.'* [Lunga]

The simulation was so realistic that the participants could relate it to it as if in a real clinical environment:

'*Doing the PPH simulation make you realise that the patient condition can deteriorate. At times the patient's condition does not go the way we learn from the books.'* [Zandie]

4.5.5 Sense of Accomplishment

Saving a patient's life and experiencing a generally positive outcome enhances a nurse's sense of accomplishment. Being able to treat the PPH within a reasonable time frame definitely had this effect on the student midwives. Participants said:

'*It felt like it's going well after she started regaining consciousness and after the balloon tamponade was stable and not moving at the end, and the vital signs were stable.'* [Thembi]

'*It depends on the amount of blood loss, whether you did it at the acceptable time. The only thing that we are managing during PPH is to prevent further blood loss. At that time we did manage it properly and the bleeding stopped.'* [Anga]

4.5.6 Sure or Unsure of Performance

The participants reported having to stop and think and discuss with team members, prolonging the time taken to resolve the PPH. Being unsure of what to do demanded some discussion, thus using up valuable time. Also, there was lower confidence at the beginning of the simulation, prolonging the time taken to actually deal with the emergency.

'There were times with my group, we will stop and think, "OK what follows after this? What to do next?" Being unsure of what to do actually prolonged the time taken to save the patient.' [Zandie]

'I will say not exactly at the time because it is very rare you will come across management of PPH. It was difficult at first and thus it took us longer to resolve the emergency.' [Sino]

Team members who fail to adhere to their assigned duties may cause some tasks to be executed too late, or not to be done at all.

'I can't really, we were not strict with time because the person who was recording time and all the observations was not strict with time. Her job was not just to record observations, as she was also involved in other assignments, so I'm not sure about the time.' [Lunga]

4.6   DISCUSSION

The findings of this study will be discussed in relation to the purpose of the study, which was to assess the effectiveness of MFS on the student midwives in relation to promotion of confidence, critical thinking, good communication, sense of satisfication and teamwork in a clinical environment.

4.6.1 Clinical Readiness in Midwifery

The participants had differing views about the concept of clinical readiness. The first view was that clinical readiness denotes being ready for any eventuality in the course of work. In the midwifery setting, all midwives should always be able to perform the necessary skills promptly when required by the situation. Wolff et al. (2010:6) explain that clinical readiness refers to the midwife's ability to perform the necessary skills when required by the situation. However, the authors of that study stress that students cannot be expected to come out of nursing schools knowing everything. Some competencies will be acquired in the work situation.

Another view concerning clinical readiness as postulated by the participants was that it is a state in which one is conversant with the ward and understands the policies, protocols and procedures in the clinical setting. Ward policies, protocols and procedures are valuable to nursing students in preparing them for clinical practice. The four safe-practice characteristics identified by Wolff et al.(2010:7) stipulate that new graduate nurses should be able to organise and prioritise patient care, incorporating ward policies and procedures into their work.

In this study, two participants felt that clinical readiness is parallel to competence. The midwife should not only be ready in that she can identify the problem, but should be competent to carry out the required action. Levett-Jones et al. (2011:68) equate readiness for practice with attaining necessary competencies. Competency will be achieved by the student having enough time to practise, as stressed by one of the participants. These sentiments resonate with the findings of other studies which stress the importance of skills repetition for building competence (Partin et al., 2011:187; Reid-Searl et al., 2012:80).

Participants acknowledged that midwives should always be in a position to anticipate complications that can happen to a patient, and should endeavour to analyse and

interpret the conditions of patients as they work. Wolff et al. (2010:6) point out that new graduates should be ready not only in familiar situations but also in new and unexpected situations. Another related finding of participants' clinical readiness was that after participating in MFS, participants expressed their readiness to deal with obstetrical emergencies. This is consistent with Aggar and Dawson (2014: 902) study in which the students indicated preparedness to practise after an oral medication simulation.

Demonstration of skills to student nurses, followed by repeated practise by students and mentoring, reinforces clinical readiness. One participant felt that that if the skill could be demonstrated and practised repeatedly, students would be clinically ready. This is validated by the findings of Woods et al. (2015:364) on third-year pre-registration nurses, who felt ready for the registered nurse's role after watching many demonstrations and engaging in many simulations. The findings of the present study show that one participant, at least, felt entirely ready to function independently after having been trained in theory, watched demonstrations and engaged in simulation. This finding is congruent with the findings of the study by Dlamini et al. (2014:153) on new-graduate readiness for practice in Swaziland, where participants felt that they should be supported and not to be left to work independently. In the present study only one participant could not assert his clinical readiness until after she had been exposed to a real-life obstetrical emergency during placement. The same sentiments were shared by participants in a study by Yardley et al (2013:502) on a student encounter with simulated and authentic patients, in which participants were not able to attest to their preparedness for the clinical environment until they had experienced an encounter with real patients in a real clinical environment.

Some participants in this study equated clinical readiness with equipment. The institution was deemed to be ready when the necessary equipment was available to deal with any obstetrical emergency. Three participants asserted that the midwife should have the necessary equipment in order to be ready to deal with any emergency. Having the necessary equipment will certainly help in ensuring good outcomes for the patient. The midwife should make sure that the equipment is available and is in working order. This view is echoed by Taylor-Adams, Vincent and Stanhope (1999:155) who state that in clinically adverse events, it is the responsibility of the nurse on duty to make sure equipment is available and in good working order. One

participant acknowledged that the lack of equipment has detrimental consequences for the patient in an emergency situation. It has been stressed elsewhere that lack of hospital equipment would have adverse effects on maternal and neonatal mortality (Oiyemhonlan, Udofia & Punguyire, 2013:137).

4.6.2 Demonstrated Teamwork

Team work is inherent in the management of obstetrical emergencies. The obstetrical fire drills are designed to enforce teamwork (Anderson, Black and Brocklehurst, 2005). Newly Qualified Nurses (NQN) holds a contradictory view. The participants in that study reported that inadequate delegation skills resulted in stress, anxiety and poor time management in NQN (Johnson et al., 2015:32).

Another finding of the present study is that sharing duties among team members is important during emergencies. This is congruent with the findings of the study by Deering et al. (2011:91), that monitoring the actions of others during teamwork ensures that the workload is evenly shared and patient safety is guaranteed. There is a need to clearly share and specify the duties to be performed by each member of the team in order to achieve the group goal. Participants affirmed that in order to ensure that the delegated work was carried out, the team leader should ask or be provided with regular updates by team members. Receiving updates from team members contributes to the leader's awareness of the patient's condition (Deering et al., 2011:91). One participant felt that delegating people to perform specific functions is important so as to ensure that tasks are performed. However, Johnson et al. (2015:32) point out that poor delegation by NQNs can result in loss of collaboration and a lack of a sense of responsibility by HCAs (Health care assistant).

The data in this study show that all participants had good experiences of working in a team; only one participant expressed a degree of ignorance about during teamwork obstetrical emergencies. Monod et al. (2014:735) found that simulated team training for the management of obstetrical emergencies was considered useful.

One participant acknowledged the importance of working in a team. Having a confident team ensures good outcomes. In a retrospective study by Siassakos et al. (2009:1089) on the effect of team training, good teamwork was deemed necessary for the management of obstetric emergencies. Poor teamwork is one of the causes of adverse

events in patient care (Guise & Segel, 2008:938). Working in close collaboration during emergencies is more likely to result in good outcomes for both the patient and the care givers (Siassakos et al., 2009:1095).

Two participants affirmed that co-operative teamwork brought good results and success. A sense that team members support and respect one another during obstetric emergencies is important. In this study, it was found that one participant recognised that team support enabled her to think better; to apply her critical thinking. Advice from team members during an emergency benefitted both the patient and the team leader. Phipps et al. (2012:6) study on determining the implementation of labour and delivery team-training programmes with a simulation component stressed the importance of 'shared responsibility' and 'cross monitoring', which equipped team members to be assertive. Supporting each other during an emergency is done in a harmonious manner, demonstrating respect and good teamwork (Deering et al., 2011:91; Phipps et al., 2012: 6).

The collective attributes of individual team members contribute to the performance of the team as a whole and tend to strengthen the confidence of the team leader. Participants had varied experiences of team leadership. One participant found the simulation challenging, thus bringing out the best in her. This is consistent with the findings of other studies, which found that it was the challenging aspect of simulation that enabled students to give of their best (Reid-Searl et al., 2012:80; Rush et al., 2010:475). Smith et al. (2013:154) assert that simulation training in obstetrical emergencies encourages team work and increases confidence in managing such emergencies. This is congruent with the experience of one participant, who felt that having a good team alongside her gave her the confidence to be a good team leader.

One participant felt nervous as team leader initially, but gained confidence as she became immersed in the leader's role. Deering et al. (2011:90) state that the role of the leader in obstetrical emergency is to ensure that duties are performed effectively without unnecessary delays. Providing the students with an opportunity to practise a skill in a simulated environment increases students' confidence in managing complications (Andrighetti et al., 2012:55). One participant felt that his limited knowledge inhibited his ability as a team leader. This is inconsistent with the studies conducted by Pollock and Biles (2016:316) and Carter et al. (2014:1022), which found

that the experiential learning pedagogy made possible in HFS and root cause analysis facilitated student learning.

By creating a safe learning environment where students were allowed to make mistakes without causing harm to the patient, MFS has the effect of increasing student confidence. This safe learning environment can also be achieved by the use of teaching modalities such as high-fidelity simulation and root cause analysis, as posited by Pollock and Biles (2016:316) and Carter et al. (2014:1022). The participants asserted that the safe learning environment helped them to learn the necessary skills.

4.6.3 Effective Communication among Team Members

Four participants reported good communication among team members during the simulation. Monod et al. (2014:735) found that team members' reciprocal communication skills developed during simulation. In a three months follow up study using a self-assessment questionnaire of the same cohort, communication skills remained improved. In the present study, one participant felt there had been poor communication by the team leader. Polis et al. (2015:4) reported poor communication among nurses during teamwork in an acute-care hospital.

Participants acknowledged that calling team members by name made a difference, heightening their awareness of needs in the situation and helping to ensure that duties were carried out. Two participants mentioned that being called by name made team members assume responsibility for their own actions and increased their confidence. Siassakos et al. (2009:502) conducted a study on team communication during a simulated low-fidelity obstetric scenario and found that communication styles, such as the use of directed and undirected commands among health professionals, influenced the flow of information. The study further stated that directed commands, which consisted of calling individuals by name, resulted in acknowledgement and more effective carrying out of tasks. This compares with the findings of a pilot study by Miller et al. (2008:110) on simulated obstetric emergencies, where closed-loop communication was lacking and orders were not carried out. Similar findings were made in a study conducted by Williams et al. (2007:166) on communication principles, where one of the communication principles was that the team member should use direct, clear instructions.

In order to ensure that there is progress in patient care and to ensure that duties are carried out, the team leader should be kept informed at all times by the team members. Three of the five participants confirmed that they requested regular updates from team members. This is consistent with the one of the communication principles identified by Williams et al. (2007:161) in a study on information transfer and communication among surgeons; that the team leader should be informed immediately when duties have been carried out. Siassakos et al. (2009:502) affirm that failure to update team members, and in particular leaders, may lead to duplication of duties and mistakes that could have been avoided.

Three of the participants found communication with the standardised patient good. This was consistent with the findings of Siassakos et al. (2010:196) in a randomised controlled study on hybrid obstetric simulation training. The participants who had human actors to practise on had higher communication skills than those who had used mannequins. These findings were echoed in a progressive study conducted by Terzioglu et al. (2016:106), which found students' effective communication skills were lower in the nursing skill laboratory than in the SP laboratory. Cass et al. (2011:72) state that health care professionals who demonstrate a calm and reassuring manner when communicating instil a sense of trust in the patient. This is congruent with the experiences of one participant who felt communication with the patient was not going well in the beginning. The more the participant talked and explained things to the SP, the more confident and calm they felt about their abilities to handle a real patient.

Participants acknowledged the importance of keeping the patient informed during the emergency. One participant stated that it is not only during emergencies that one keeps a patient informed, but during every procedure. Advances in health care have shifted the attention of health care professionals, sometimes away from patients, and have sometimes left patients feeling ill-informed and excluded from decisions that involve their lives (Barry & Edgman-Levitan 2012:780). Rosenzweig et al. (2008:368) conducted a study to develop a patient-communication simulation laboratory for the acute-care nursing programme, using standardised patients; their finding during the 'breaking bad news' scenario indicated that the standardised patients felt their concerns about their illness and future plans for their care were discussed with them.

Participants realised that keeping the patient informed during an emergency helps the patient to co-operate. This is in line with the finding of Barry and Edgman-Levitan (2012:781), that shared decision making between the health care professional and the patient makes the patient aware of options available, and boosts patient co-operation. Epstein et al.(2005:1571) also found in a study on patient-centred communication that involving patients in their treatment makes patients feel considered and more inclined to cooperate. Levinson et al. (2010:1313) state that improving the physician's communication skills with patients results in well-informed patients.

4.6.4 Knowledge and Judgement

Participants recognised the need to prioritise patient care for better outcomes for the patient, particularly during emergencies. Wolff et al. (2010:6) found that prioritising procedures in order of urgency was identified by nursing educators as vital, in a study on new graduate nurses' readiness for practice. This was echoed by the findings of Simkins and Jaroneski (2016:18) on student nurses' preparedness for professional practice. In contrast, Scholes et al. (2012:6) found that student midwives found it difficult to prioritise patient care when dealing with PPH. The stress of the simulation was identified as the reason for the disjointed approach to saving the patient's life.

Participants identified that the first priority was to stabilise the patient by establishing intravenous access. The recognition of this step as the first intervention showed the use of critical thinking by participants. Several studies have shown that the establishment of intravenous access is critical in the management of PPH (Devine, 2009:79; King & Scrutton 2010:102; Kominiarek & Kilpatrick, 2007:162). Insufficient fluid resuscitation of the woman during post-partum haemorrhage is associated with maternal death (Lombaard & Pattinson, 2009:319).

The finding of the present study indicates that participants were curious to identify the cause of the bleeding and to apply measures to stop the bleeding. Cheng and Lew (2014:121) assert that the cause of the PPH should be identified as quickly as possible as delays in the diagnosis have adverse outcomes for the patient (Paloma et al., 2007:1736). Although the participants did not mention the four-T system advocated by Devine (2009:78) and King and Scrutton (2010:102), which is Trauma, Thrombin, Tissue and Tone during the management of the emergency, they did follow the system. The four-T system ensures a systematic identification of the causes of the bleeding without excluding any

vital information. Facione (1990:6) described critical thinking as systematic thinking that one employs when dealing with complex situations. Shields et al. (2011: e5) assert that the initiation of a haemorrhage protocol and the use of the algorithm in the systematic management of obstetric haemorrhage results in patients requiring less intervention and being managed at lower levels of care.

The participants in the present study maintained that they had discovered through MFS that postpartum haemorrhaging cannot be unilaterally managed. They stressed the need to call for help and to delegate certain duties to team members who were working with them. This is in contrast to the findings of Scholes et al. (2012:10) on the clinical decision-making skills of midwifery students. In the study, midwifery students did not immediately call for help in response to the patient's condition but did so only after they had exhausted all possible solutions on their own. Upadhyay and Scholefield (2008:1156) consider it as good practice to call for help from colleagues early. Teams need not be composed of individuals from the same discipline such as all midwives or all obstetricians; effective teams may also be multidisciplinary, with midwives, obstetricians, anaesthetist, haematologist and blood bank personnel all assembled to care for the patient during PPH (Devine, 2009:79; Lilley et al., 2015:8).

Two participants identified the need to empty the patient's bladder in order to control the haemorrhage. A full bladder can prevent the uterus from contracting. Upadhyay and Scholefield (2008:1150) refer to emptying of the patient's bladder as the simplest form of management for PPH. Shields et al. (2011:e3), Smit et al. (2014:np) acknowledged the emptying of the patient's bladder in combination with uterine massage, the use of uterotonics and administration of the oxygen triad in the management of PPH. Urinary catheterisation does not only assist with uterine contraction but also helps to assess the patient's fluid status.

Participants identified the need to check if the uterus is well contracted. An uncontracted uterus accounts for 80% of the causes of PPH (Moore & Chandraharan, 2010:177). The participants in this study stated the presence of retained products as the reason for the uncontracted uterus. These findings are consistent with the recommendations of Shields et al. (2011:e3) and Tunçalp, Souza and Gulmezoglu (2013:255), that uterine tone should be assessed post-partum to exclude uterine atony. In a study conducted by Scholes et al. (2012:4) on uterine massage, it was found that 68% of the student midwives conducted

intermittent uterine massage and 30% conducted continuous uterine massage during PPH simulation. Similar findings were made in studies conducted by Hofmeyr and Qureshi (2016:5) and Tunçalp et al. (2013:255) on the effectiveness of continuous uterine massage on patients who had received uterotonics. These authors did not see the value of sustained uterine massage, as in most cases patients in their studies had already been given uterotonics.

Participants in this study indicated checking the vaginal canal and cervix for any bleeding or laceration. This measure was instituted before invasive measures were used to control the bleeding, such as insertion of a balloon tamponade and bimanual compression. Moore and Chandraharan's (2010:177) case study on the management of massive postpartum haemorrhage and coagulopathy highlighted the need for careful examination of the vagina and the cervix for any lacerations. This is further emphasised by Hofmeyr and Qureshi (2016:8) and Smit et al. (2014:np), that the midwife should be prompted to check for vaginal and cervical tears if PPH does not respond to the use of uterotonics.

One participant considered maternal age in light of blood loss. The participant made a comparison between the younger and the older patient, and how each would respond to blood loss. The participant felt that increased maternal age would cause the patient's condition to deteriorate quickly compared to the younger person who would be better able to sustain considerable blood loss. This is consistent with the findings of Moore and Chandraharan (2010:76) and Cheng and Lew (2014:121) on the compensatory mechanism of the young pregnant woman to cope with excessive blood loss. The young pregnant woman is able to sustain considerable blood loss before showing any signs of hypovolaemia (Mukherjee & Arulkumaran, 2009:122). This becomes problematic in the management of PPH as the clinical signs of hypovolaemia are masked until the patient has lost 40% of total blood volume (Cheng & Lew., 2014:121).

Critical thinking is imperative in the nursing profession, as nurses have to make decisions that affect patients' lives as part of a team and sometimes as an individual. This is particularly so in midwifery, where the midwife has to make decisions in an emergency that not only affect the mother, but the unborn child or neonate. Helping students to develop critical thinking skills in the management of obstetrical emergencies remains a challenge (Carr, 2015: 283) but in this respect, it is clear that the MFS helped a great deal, enabling students to experience the pressure of an emergency and to think on their feet.

4.6.4.1 Reflection on the Use of Critical Thinking

The participants stated that reflecting critically during simulation elicited strong emotions, such as fear and nervousness. Participants were nervous at the beginning but this did not deter them from using their critical thinking skills and making the right decision. Participants in Kaddoura et al.*'s* (2016:301) study found simulation overwhelming and that it interfered with their ability to think critically. In the present study, two participants acknowledged the importance of teamwork to enable better critical thinking. This finding is consistent with the findings of Lin et al. (2015:153) on the effects of the teaching-learning experience on the critical thinking development of student nurses. This study acknowledges that working in a team encourages the development of critical thinking and stimulates learning from others.

One participant was fearful at the beginning, being unsure whether decisions taken would improve the patient's condition. Simulation provided a safe environment where students could learn to deal with negative emotions such as fear, while making important decisions (Reid-Searl et al., 2012:80).

Gaps in knowledge were acknowledged by one participant while using critical thinking. This ability to self-evaluate is in line with one of the cognitive skills identified for critical thinking in the Delphi report on critical thinking (Facione 1990:10). The report identified self-regulation, composed of self-examination and self-correction, as vital to critical thinking. It involves identifying a mistake and proffering solutions. Previous exposure to managing PPH in clinical situations would lead to better critical thinking and may contribute to saving a patient's life. This is in accordance with the findings of studies conducted by Brown and Chronister (2009:51) and Hunter et al. (2014:812) on critical thinking of student nurses. The studies identified that previous experiences contributed to better critical thinking among student nurses. These findings were echoed by Chang et al. (2011:3228), in a cross-sectional correlation study on the critical thinking of qualified nurses.

4.6.5 Confidence after Exposure to Simulation

There is mounting evidence that teaching students complex skills in a relaxed, conducive and safe environment increases students' sense of confidence regarding various skills required in the clinical environment (Partin et al., 2011:187). The use of simulation to teach concepts relevant in midwifery has been widely implemented in

order for such skills to be transferred to the clinical environment (Reynolds et al., 2011:73). The effectiveness of learning transfer during simulation is further stressed by Rush et al. (2010:471).

The use of a standardised patient during the simulation instead of a mannequin prepared participants for the real clinical environment. This is consistent with the findings of Pike and Donnell (2010:408) in their study on the authenticity of the simulation experience, where participants found it difficult to transfer skills they had acquired after using mannequins. The use of mannequins was reported to have a negative impact on the credibility of the simulation. On the other hand, in a study conducted by Choi (2012:94), student nurses found it difficult to apply the skills they had learned in a psychiatric simulation using a standardised patient. This was attributed to the fact that the real psychiatric patient is not scripted, and therefore will not give the predictable responses and behaviour that the standardised patient gives.

The findings of this study show that after being involved in the simulation, participants became more inquisitive regarding the management of the simulated condition. This is consistent with the findings of the study done by Rush et al. (2010:475) on the effect of simulation on first- and third-year Bachelor of nursing students, where third-year students found simulation thought-provoking, instigating them to reflect on the care they gave to patients. Similarly, Straub et al. (2013:801) found that an increase in the confidence of students during simulation encouraged them to learn more about obstetrical emergencies, which ultimately would improve patient care. Having been exposed on the use of mannequins in the management of obstetrical emergencies, one participant in this study felt completely prepared to deal with such emergencies in the clinical environment. This is congruent with the findings of the study done by Brady et al. (2015:528) on the use of varied levels of simulation fidelity, in which students were exposed to progressive-fidelity simulation repeatedly, scoring higher in tests than students exposed only once to one level of simulation fidelity.

Similarly, Frank et al. (2009:99) conducted a study with interns to ascertain whether exposure to obstetrical drills can result in changes in their clinical performance. The participants in the present study compared their simulation practice with previous experiences of PPH management in a clinical environment. Participants' knowledge of the progressive steps in the management of PPH increased after exposure to PPH

simulation. This concurs with Kaplan et al. (2011:50) findings in a study on emergency preparedness disaster simulation (EPDS), where student nurses said that the use of EPDS increased their knowledge of disaster management. Having acquired new knowledge, one participant in that study became enthusiastic about sharing his knowledge in the clinical environment with other staff members. Reinhardt et al. (2012:e158) asserted that success in the clinical environment was influenced by the student's level of confidence in the simulation environment.

The findings of this study showed that participants' satisfaction with simulation depended on whether the simulation activity met the student's expectations, and if the simulation equipment resembled real clinical equipment. Smith et al. (2013:154) stressed that the simulation environment should reflect reality as much as possible. Simulation attributes enable learning in undergraduate students (Bland & Tobbell 2016:11). The third year midwifery students in a study conducted by Carolan-olah et al. (2016:378) expressed low confidence in using the resuscitation equipment. This was attributed to the fact that they found the simulation stressful, causing them to focus more on simulating the scenario than on using the equipment correctly.

The participants in this study said that the simulation enabled them to see and use some of the equipment for the first time. The participants found the experience overwhelming, but this did not deter their participation. Kaplan et al. (2011:49) conducted a study on the use of emergency preparedness simulation in undergraduate nursing students and found that the students found the equipment realistic, shocking and overwhelming. The students in that study found the simulation more effective and realistic than others they had experienced because of the high standard of equipment used. Brady et al. (2015:525) posit that inadequate equipment hinders simulation learning. In the present study, the participants were satisfied with the simulation because it was well-equipped and stimulated learning.

The realism of the simulation environment is the key determinant to how effective the simulation is. The simulation experience must be immersive enough to make the student become 'lost in the moment'. The use of the standardised patient was seen by one participant as adequate preparation for the real clinical environment. These findings are consistent with the findings of Choi (2012:94) on the use of standardised

patients during psychiatry simulation which made the student imagine what the clinical environment will be like.

Comparing the SP with the use of a low-fidelity mannequin made participants aware of the benefits associated with the use of the SP. The fact that the SP was able to communicate helped students to understand the situation. This is comparable with the findings of Kaplan et al. (2011:50) on the incorporation of real patients during EPS. The students in that study reported that increased realism help them to immerse themselves in the situation and respond more accurately. The synergy between the two simulation models, namely the task trainer and the SP, increased the realism of the simulation (Siassakos et a*l.,* 2010:194; Smith et al., 2013:154). This is consistent with the findings of this study, as one of the participants acknowledged the use of the SP and part-task trainer. The participant reported how communicating with the SP made the simulation authentic.

Participants identified the gap between theory and practice and how the PPH simulation had bridged that gap. Participants felt that the PPH simulation painted a clear picture of how things can rapidly deteriorate during real-life situations. Yardley et al. (2013:506) suggest that the learning gaps that are identified in teaching modalities should not be used to find faults but to point to areas to focus on in practice. Simulation is the ideal tool to bridge the gap between theory and practice (Thidemann & Söderhamn, 2013:1603).

Successfully resolving PPH does not depend only on the time that elapses from the onset of bleeding, but also on factors such as amount of blood loss, the cause and origin of the PPH and general maternal condition. One participant verbalised that they wasted valuable time discussing options among themselves. However, two participants felt that they had resolved the PPH within an acceptable time, and that discussion had helped them to locate the cause of the bleeding. Kurrek, Morgan and Howard (2015:8) posit that in a PPH emergency, time may not be an optimal indicator for performance and competence. They further argue that a set time may not work well when there are many possibilities to resolve the problem. Su and Chong (2012:78) assert that clinicians who are caring for pregnant woman should be skilled and knowledgeable to manage patients with PPH timeously. Su and Chong (2012:87)

conclude that there should be a dedicated person to record the sequence of events and the timing of medical interventions.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents a summary of the study, conclusions, limitations and strength of the study, and makes recommendations based on the findings.

5.1 SUMMARY

Fidelity in simulation refers to the extent to which a simulation mimics reality; the believability or degree to which a simulated experience approaches reality (Jeffries, 2007:28; Meakim et al., 2013:S6). There are several levels of fidelity of simulation, the use of which will depend on what the simulation aims to achieve. Insufficient clinical sites, a shortage of student mentors and lecturers, and advances in technology have made simulation an attractive option for teaching and learning, especially for student midwives (Partin et al., 2011:186). The first contact persons to respond to obstetrical emergencies are midwives. If the student midwife is equipped with skills to be observant, to critically analyse situations, to correctly prioritise patient care and to intervene effectively in the simulation environment, she or he is far more likely be competent in real obstetrical emergencies.

Simulation creates an environment that affords the learner an opportunity to manage rare and complex situations that the learner might encounter during clinical training (Grable & Ochoa, 2011:765). One of the advantages of simulation is to offer an opportunity to observe effectively, think critically and prioritise patient care in a conducive environment (Partin et al., 2011:186). Simulation affords the student a safe and supportive environment in which to practise skills repeatedly without causing any harm to a real patient.

The Department of Nursing Sciences at the University of Fort Hare has a laboratory that offers low- to medium-fidelity simulation in the form of task trainers and mannequins. These task trainers and mannequins are used in general, community and midwifery nursing sciences for the demonstration of skills, the practising of skills by students and for formative assessments. Medium-fidelity simulation is also achieved by the use of standardised patients. Besides this, Objective Structured Clinical Examinations (OSCE) are carried out using the task trainers, low- to medium-fidelity mannequins and standardised patients. In midwifery, task trainers are used for

vaginal examinations, abdominal palpations, breech and vaginal deliveries, and management of post partum haemorrhage (PPH).

Given that in a real clinical environment, limited opportunities exist for students to practise during an obstertrical emergency, medium-fidelity simulation (MFS) is ideally positioned to help students in a practical environment without risking patient safety. Despite the availability of MFS at UFH, its benefits for the clinical readiness of student midwives was not yet known. As such, whether qualifiying students who have been exposed to MFS are confident and equipped to manage obstetric emergencies was a matter of speculation. It is expected that qualifying midwives are able to manage obstetrical emergencies, such as post partum haemorrhaging (PPH), shoulder distocia and cord prolapse. It was not known whether MFS would enhance the clinical readiness of student midwives at UFH and if so, to what extent.

The present study was designed to assess the effectiveness of MFS in enhancing the clinical readiness of student midwives at the University of Fort Hare. The findings of the study will provide the student midwives with the needed knowledge and skills to manage an obstetrical emergency effectively in a clinical, multi-disciplinary environment. In addition, the findings will provide insights to nursing education institutions on this medium-tech method of teaching and learning.

The main research objective of the study was to explore, describe and analyse the effect of medium-fidelity simulation on the confidence, critical thinking ability, communication skills, satisfication and team work of student midwives in an obstetrical clinical emergency environment.

The sub-objectives of the study were:

- to explore, describe and analyse the critical thinking ability of student midwives when exposed to medium-fidelity obstetrical emergency simulation;

- to explore, describe and analyse the student midwives' self-efficacy in successfully resolving an obstetrical emergency within an acceptable period.

- to explore, describe and analyse if teamwork, student midwives' confidence, communication skills and satisfication increased after exposure to medium-fidelity simulation.

The central research question was: **'What is the lived experiences of student midwives about the effectiveness of medium-fidelity simulation in enhancing confidence, critical thinking, communication, satisfication and teamwork in a clinical environment?'**

The sub-research questions of the study were:

- What are the lived experiences of student midwives concerning the effectiveness of medium-fidelity obstetrical emergency simulation at enhancing critical thinking?
- What are the student midwives' self-efficacy regarding resolving an obstetrical emergency within an acceptable time, defined period?
- What are the lived experiences of student midwives concerning the effectiveness of medium-fidelity simulation at promoting teamwork, satisfication, confidence and communication skills during obstetrical emergencies?

This was a qualitative, interpretive phenomenological analysis designed to explore the student midwives' lived experiences regarding the effectiveness of medium-fidelity simulation and the meaning of these experiences for clinical readiness. An interpretative, phenomenological research design was used, with the philosophical underpinnings of phenomenology, hermeneutics and idiography. This afforded all participants an opportunity to describe and interpret their experiences during medium-fidelity simulation (Smith, Flowers & Larkin, 2009:11). The target population was all fourth-year Bachelor of nursing student midwives at the University of Fort Hare. Only participants who were in the fourth year and had passed the first semester midwifery module were included in the study. Purposive sampling was used to select five student midwives who were team leaders during the management of PPH using MFS.

Ethical approval was obtained by the University of Fort Hare Ethics Committee. Permission to conduct this study was granted by the Head of Department of Nursing Sciences of the University of Fort Hare. Due explanations about the aim, nature and procedures of the study were provided to the participants before data collection.

Trustworthiness was ensured by observing the principles of transferability, credibility, confirmability and dependability.

Data was collected through individual face-to-face interviews and a semi-structured interview guide. All fourth-year student midwives had viewed an on-line Essential Steps in Management of Obstetrical Emergency (ESMOE) post-partum haemorrhage video which was sent via Blackboard so that students could see it demonstrated. The video gave the student midwives an opportunity to watch the demonstration repeatedly in order to reinforce the demonstrated skill.

A semi-structured interview guide was used with nine questions. Open-ended questions were used in order to allow the student midwives the opportunity to explore their feelings and reflect critically on the value of the MFS for their learning. Prompts that were used during the interview were mostly about feelings. Interviews were conducted in the simulation laboratory, and each interview opened and closed with a question about clinical readiness. Interview sessions lasted between 26 minutes and 44 minutes. A Samsung smartphone was used to record the interview and a notepad was used to make notes of gestures such as smiles and other facial expressions. After the interview, the recording was transferred onto a laptop, a file was opened for the interview, and each was identified with a pseudonym and the date. The interviews were transcribed verbatim on a Word document.

Data were analysed using thematic content analysis applicable to IPA studies, using the six steps suggested by Smith et al. (2009:79), which involve reading and re-reading, initial noting, developing emergent themes, searching for connections across emergent themes, moving to the next case and lastly, looking for patterns across the cases.

5.1.1 Major Findings

i.   The participants had differing views about the concept of clinical readiness; some held that clinical readiness meant being ready to handle any eventuality in the course of work, and others felt it meant being conversant with the policies and procedures in the clinical ward.

ii. Most participants felt that clinical readiness is parallel to just being competent, and that midwives should always be ready to anticipate the complications that might

arise with a patient, and should endeavour to analyse and interpret such complications clinically.

iii. Medium-fidelity simulation was felt by all to be beneficial; having been exposed to a simulation of post-partum haemorrhage, all felt increased readiness to confidently deal with obstetrical emergencies.

iv. The participants expressed the need to watch demonstrations more than once in order to master skills, and likewise felt that going through a simulation more than once would enable a more thorough understanding of the techniques, which help them to work independently in an obstetrical emergency situation.

v. The participants expressed the need for equipment used in MFS to be of a high standard and complete, so that they would be familiar not only with what each item was for, but would know how to use it.

vi. Most participants in this study were confident in delegating duties to team members. Participants affirmed that in order to ensure that delegated tasks were carried out, the team leader should be given regular updates by team members.

vii. The simulation experience had a definitely positive effect on teamwork, enabling students to experience harmonious and effective team work in practice, which is an essential component of emergency medical care.

viii. Participants had varied experiences of team leadership. Some found the simulation challenging, and this brought out the best in them. Most said that their initial nervousness dissipated as they became accustomed to the role.

ix. Participants reported good communication among team members during the simulation. They expressed an appreciation of the importance of good communication between team members for effective work, and the need for good communication with the patient, affirming that talking and explaining clinical health issues to the patient builds trust between midwife and patient.

x. Participants acknowledged the importance of keeping the patient informed, not just during an emergency, but during every procedure, so as to ensure co-operation from the patient.

xi. Participants expressed an awareness of the need to prioritise procedures for patient care, especially during emergencies. Participants identified the need to establish intravenous access to the patient first in order to stabilise the patient, which signifies the practice of critical thinking.

xii. Participants indicated checking the vaginal canal and cervix for any bleeding or laceration. This measure was instituted before invasive measures were used to control the bleeding, such as insertion of a balloon tamponade and bimanual compression. This, again, indicated critical thinking.

xiii. Participants in this study maintained that postpartum haemorrhaging cannot be unilaterally managed. They stressed the need to call for help and to delegate certain duties to team members who were working with them. It is clear that the simulation experience enhanced their appreciation for the intricacies of teamwork.

xiv. The participants stated that having to make quick decisions during simulation elicited different emotions such as fear and nervousness. They were nervous at the beginning at having to make critical decisions under pressure but this did not deter them from making the right decisions.

xv. The use of standardised patients during the simulation instead of the mannequin prepared the participants for the real clinical environment.

xvi. The findings of this study showed that after being involved in the simulation, participants became more inquisitive regarding the management of the condition they had rehearsed.

xvii. Participants' knowledge of the sequence of steps in the management of PPH increased after exposure to PPH simulation. Having acquired new knowledge, they became enthusiastic to share the knowledge in the clinical arena with other staff members.

xviii. Having used both the SP and a low fidelity-mannequin made participants aware of the benefits of the SP. The fact that the SP was able to communicate helped students to understand the situation.

xix. The participants were able to identify the gap between theory and practice, and to understand how the PPH simulation had helped them to bridge that gap.

5.2 LIMITATIONS

The study focused on the lived experiences of fourth-year nursing students utilising simulation laboratories at one university. As such, the findings of the study cannot be extrapolated to other university in South Africa. Further research should endeavour to explore the views of the nursing students in other universities. Also, due to time

constraint, follow-up interviews were not conducted to ascertain long-term knowledge and skills retention after conducting a simulation.

5.3 CONCLUSIONS

Based on the findings of the study, the following conclusions can be drawn:

i. Participants have different views concerning the concept of clinical readiness. They stated that clinical readiness is different from being competent.

ii. Having been exposed to post-partum haemorrhage simulation, participants expressed their readiness to confidently handle obstetrical emergencies. Having the correct equipment greatly enhanced the experience.

iii. Participating in a simulation greatly increased participants' appreciation for teamwork, and made them more acutely aware of the importance of delegation and good communication when working as part of a team.

iv. The participants had differing understandings and experiences regarding team leadership.

v. Participants reported good communication among team members during the simulation and showed an awareness of the importance of establishing trust in the patient, by speaking to the patient and keeping her informed.

vi. The participants affirmed that management of postpartum haemorrhage cannot be unilaterally managed, as such, duties must be delegated to team members.

vii. The simulation experience gave participants an opportunity to practise critical thinking under duress, and to deal with their emotions of fear and nervousness while having to make life-affecting decisions on behalf of the patient. In this, the simulation experience was very valuable.

viii. The participants maintained that the use of standardised patients during the simulation instead of the mannequin better prepared them to face the real clinical situation.

ix. Participants' knowledge of the sequence of steps in the management of PPH increased after exposure to PPH simulation.

x. The SP was felt to be superior as a simulation prop than the low-fidelity mannequin.

xi. The participants believed that the simulation helped then to close gaps between their theoretical knowledge and their practical experience.

5.4 RECOMMMENDATIONS

Based on the findings of the study, the following recommendations can be made:

5.4.1 Implications for practice

This interpretative phenomenological analysis study was able to elicit feelings and experiences from the participants that were either idiographic or shared. These feelings and experiences brought to light issues that are debatable in nursing education. The simulation experience brought out issues that touched on both theory and practical nursing. The participants saw the value of a simulated obstetrical emergency in nursing education. The findings support the value of simulated PPH as it is impossible to practise PPH in the real clinical environment. In addition, the value of the simulated PPH is evident in the reported confidence and satisfaction that student midwives felt with the simulation. The findings showed how learnings made during simulation can be transferred to the practical environment because it enabled the acquisition of new knowledge. In addition, the findings highlight the characteristics that make good teams, such as communication, close collaboration, mutual respect and delegation. In general, the findings show that simulation supports the objectives of preparing a graduate nurse for clinical practice.

5.4.2 Implications for Research

The findings of this study have added to the limited literature on midwifery simulation. Furthermore, the study showed the benefits of simulation in midwifery education for both the learner and the nursing profession. The study further identified the need to conduct extensive research on the management of other obstetrical emergencies, using the fire drills on student midwives. In addition, further research should be conducted on the different types of simulation fidelity and its applicability and relevance, taking into consideration the contextual environment

5.4.3 Implications for Professional Practice

The South African Nursing Council (SANC) should enforce the use of simulation in nursing education not only on paper but in practise. The Council should ensure that

the training institution makes fire drills part of their training programme. Furthermore, SANC should also ensure that all hospitals have in-service training on the use of simulation for qualified staff members. All hospitals should have small simulation laboratories that can be used to conduct simulation for qualified staff. As is the case with obstetrical emergencies, hospitals should be equipped to conduct multi-disciplinary simulation involving all members of the multi-disciplinary team.

5.4.4 Implications for Teaching and Learning

The training institutions should incorporate simulation as part of the curriculum, for the benefits have been clearly demonstrated, and it is already practised globally. Furthermore, simulation in obstetrical emergencies should be made mandatory in all training institutions as it may contribute to reducing maternal and child mortality rates. To acquire the highest fidelity models involves funding; the national government should set aside funding that can be used to equip training institutions so that they are able to provide such simulation. There should be commitment from both learners and educators on the use of such simulation centres to achieve set goals

REFERENCES

Aggar,C.& Dawson,S. (2014). Evaluation of student nurses' perception of preparedness for oral medication administration in clinical practice: A collaborative study. *Nurse Education Today*. 34(6) :899-903.

Aggarwal, R., Mytton, O.T., Derbrew, M., Hananel, D., Heydenburg, M., Issenberg, B., MacAulay, C., Mancini, M.E. et al. (2010). Training and simulation for patient safety. *Quality & Safety in Health care.* 19 : 34–43.

Akhu-Zaheya, L.M., Gharaibeh, M.K. & Alostaz, Z.M. (2013). Effectiveness of simulation on knowledge acquisition, knowledge retention, and self-efficacy of nursing students in Jordan. *Clinical Simulation in Nursing*. 9(9) : 335–342.

Al-Kloub, M. I., Salameh, T.N. & Froelicher, E.S. (2014). Nursing students' evaluation of problem based learning and the impact of culture on the learning process and outcomes: A pilot project. *Nurse Education in Practice*. 14 :142–147.

Ameh, C. A. & Van den Broek, N. (2015). Making It Happen: Training health-care providers in emergency obstetric and new born care. *Best Practice & Research Clinical Obstetrics & Gynaecology*. :1–15.

Anderson, E. R., Black, R. & Brocklehurst, P. (2005). Acute obstetric emergency drill in England and Wales: A survey of practice. *International Journal of Obstetrics and Gynaecology*. 112 : 372–375.

Anderson, L. W. (1999). Rethinking Bloom's taxonomy: Implications for Testing and Assessment. Report-descriptive. Columbia. University of South Carolina. Available at https//eric.ed.gov/?id=435630 [Accessed 22/09/2016]

Andrighetti, T., Knestrick, A., Marowitz, A., Martin,C., & Engstrom, J.L. (2012). Shoulder dystocia and postpartum hemorrhage simulations: Student confidence in managing these complications. *Journal of Midwifery & Women's Health*. 57(1) : 55-59.

Antony, K.M. & Dildy, G. A. (2013). Postpartum hemorrhage: The role of the maternal-fetal medicine specialist in enhancing quality and patient safety. *Seminars in Perinatology.* 37 : 246–256.

Archer, E. (2010). Fresh simulation options in critical care nursing education. *African Journal of Health Professions Education*. 2(2) : 29–32.

Argani, C, Eichelberger, M, Deering, S. & Satin, A. (2012). The case for simulation as part of a comprehensive patient safety program. *The American Journal of Obstetrics & Gynaecology*. 2006. 451–455.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review*. 84(2) : 191–215.

Bandura, A. (1993) Perceived self-efficacy in cognitive development and functioning. Educational Psychology. 28(2) : 117–148.

Bandura, A. (2006). Guide for constructing self-efficacy scales in self-efficacy beliefs of adolescents. 307–337.

Available at http://www.uky.edu/Bandura/Banduraguide2006.pdf [Accessed 10/11/2016].

Barry, M. & Edgman-Levitan, S. (2012). Shared decision making the pinnacle of patient-centered care. *New England Journal of Medicine.* 366(9) : 780–781.

Basak, T., Unver, V., Moss, J., Watts, P. & Gaioso, V. (2016). Beginning and advanced students' perceptions of the use of low- and high- fidelity mannequins in nursing simulation. *Nursing Education Today*. 36 : 37–43.

Benner, P. (2005). Using the Dreyfus model of skill acquisition to describe and interpret skill acquisition and clinical judgment in nursing practice and education. *The Bulletin of Science, Technology and Society*. 24(3) : 188–199.

Berragan, L. (2011). Simulation: An effective pedagogical approach for nursing? *Nurse Education Today*. 31(7) : 660–663.

Bimray, P.B., Le Roux, L.Z. & Fakude, L.P. (2013). Innovative education strategies implemented for large numbers of undergraduate nursing students: The Case of one South African university nursing department. Journal of Nursing Education and Practice. 3(11) : 116–120.

Bland, A.J. & Tobbell, J. (2016). Towards an understanding of the attributes of simulation that enable learning in undergraduate nurse education: A grounded theory study. *Nurse Education Today*. 44: 8–13.

Bland, A. J., Topping, A. & Wood, B. (2011). A concept analysis of simulation as a learning strategy in the education of undergraduate nursing students. *Nurse Education Today*. 31(7) : 664–670.

Bloomfield, J.G., Cornish, J.C., Parry, A.M., Pegram, A. & Moore, J.S. (2013). Clinical skills education for graduate-entry nursing students: Enhancing learning using a multimodal approach. *Nurse Education Today*. 33(3) : 247–252.

Bosse, H.M., Nickel, M., Huwendiek, S., Jünger, J., Schultz, J.H. & Nikendei, C. (2010). Peer role-play and standardised patients in communication training: A comparative study on the student perspective on acceptability, realism, and perceived effect. *BMC Medical Education*. 10(27) : 1–9.

Brink, H., Van der Walt, C. and Van Rensburg, G. (2012) *Fundamentals of research methodology for health care professionals*. 3rd ed. Cape Town: Juta.

Brady, S., Bogossian, F. & Gibbons, K. (2015). The effectiveness of varied levels of simulation fidelity on integrated performance of technical skills in midwifery students - a randomised intervention trial. *Nursing Education Today*. 35 : 524–529.

Brock, D, Abu-Rish, E, Chiu, C.R, Hammer, D, Wilson, S, Vorvick, L, Blondon, K, Schaad, D. et al. (2013). Interprofessional education in team communication: Working together to improve patient safety. *Postgraduate Medical Journal*. 89 : 642–651.

Brown, D. & Chronister, C. (2009). The effect of simulation learning on critical thinking and self-confidence when incorporated into an electrocardiogram nursing course. *Clinical Simulation in Nursing*. 5(1):45–52.

Carolan-Olah, M., Kruger, G., Brown, V., Lawton, F. & Mazzarino, M. (2016). Development and evaluation of a simulation exercise to prepare midwifery students for neonatal resuscitation. *Nursing Education Today*. 36:375–380.

Carr, K.C. (2015). Using the unfolding case study in midwifery education. *Journal of Midwifery & Women's Health.* 60(3) : 283–290.

Carter, A. G., Sidebotham, M., Creedy, D. K., Fenwick, J. & Gamble, J. (2014). Using root cause analysis to promote critical thinking in final year Bachelor of Midwifery students. *Nurse Education Today*. 34(6) : 1018–1023.

Carter, J.T. & Welch, S. (2016). The effectiveness of unfolding case studies on ADN nursing students' level of knowledge and critical thinking skills. *Teaching and Learning in Nursing.* 11 : 143–146.

Cass, G.K.S., Crofts, J.F. & Draycott, T.J. (2011). The use of simulation to teach clinical skills in obstetrics. *Seminars in Perinatology.* 35 : 68–73.

Chan, Z.C.Y. (2013). Critical thinking and creativity in nursing learners' perspectives. *Nurse Education Today.* 33 : 558–563.

Chang, M.J., Chang, Y., Kuo, S., Yang, Y. & Chou, F. (2011). Relationships between critical thinking ability and nursing competence in clinical nurses. *Journal of Clinical Nursing.* 20 : 3224–3232.

Cheng, S. & Lew, E. (2014). Obstetric haemorrhage-Can we do better? *Trends in Anaesthesia and Critical Care.* 4 : 119–126.

Choi, E., Lindquist, R. & Song, Y. (2014). Effects of problem-based learning vs. traditional lecture on Korean nursing students' critical thinking, problem-solving, and self-directed learning. *Nurse Education Today.* 34 : 52–56.

Choi, Y. (2012) Exploring experiences of psychiatric nursing simulations using standardized patients for undergraduate students. *Asian Nursing Research.* 6 : 91–95.

Christian, A. & Krumwiede, N. (2013). Simulation enhances self-efficacy in the management of preeclampsia and eclampsia in obstetrical staff nurses. *Clinical Simulation in Nursing.* 9 : 369–377.

Cooper, C. & Carver, N. (2012). Problem based learning in mental health nursing: The students' experience. *International Journal of Mental Health Nursing.* 21 : 175–183.

Crofts, J.F., Winter, C. & Sowter, M.C. (2011). Practical simulation training for maternity care-where we are and where next. *British Journal of Obstetrics and Gynaecology.* 118 : 11–16.

Crofts, J.F. D, Teclar, M., Murove, B.T., Mhlanga, S., Dube, M., Sengurayi, E., Winter, C., Jordan, S. et al. (2015). Onsite training of doctors, midwives, and nurses in obstetric emergencies, Zimbabwe. *Bulletin of the World Health Organization.* 93 : 347–351.

Daley, B.J. & Torre, D M. (2010). Concept maps in medical education: An analytical literature review. *Medical Education*. 44 : 440–448.

Davies, M. (2011). Concept mapping, mind mapping and argument mapping: what are the differences and do they matter? *Higher Education*. 62(3) : 279–301.

Deering, S., Johnston, L.C. & Colacchio, K. (2011). Multidisciplinary teamwork and communication training. *Seminars in Perinatology*. 35 : 89–96.

Devine, P.C. (2009). Obstetric hemorrhage. *Seminars in Perinatology*. 33 : 76–81.

Dlamini, C.P., Mtshali, N.G., Dlamini, C.H., Mahanya, S., Shabangu, T. & Tsabedze, Z. (2014) New graduates' readiness for practice in Swaziland: An exploration of stakeholders' perspectives. *Journal of Nursing Education and Practice*. 4(5) : 148–158.

Dwyer, C.P., Hogan, M.J. & Stewart, I. (2014). An integrated critical thinking framework for the 21st century. *Thinking Skills and Creativity*. 12 : 43–52.

Epstein, R.M., Fiscella, K., Lesser, C.S. & Stange, K.C. (2010). Why the nation needs a policy push on patient-centred health care. *Health Affairs*. 29(8) : 1489–1495.

Epstein, R.M., Franks, P., Fiscella, K., Shields, C.G., Cleveland, G., Meldrum, S.C., Kravitz, R.L. & Duberstein, P.R. (2005). Measuring patient-centred communication in patient–physician consultations: Theoretical and practical issues. *Social Science & Medicine.* 61 : 1516–1528.

Facione, P. (1990) Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction. *Report-Research/Technical*. Fullerton. California State University. Available at https//eric.ed.gov/?id=ED315423 [Accessed 22/09/2016].

Fay-Hillier, T.M., Regan, R.V & Gallagher M.G. (2012). Communication and patient safety in simulation for mental health nursing education. *Issues in Mental Health Nursing*. 33(11) : 718–26.

Frank, K., Lombaard, H. & Pattison, R. (2009). Does completion of the Essential Steps in Managing Obstetric Emergencies (ESMOE) training package result in improved knowledge and skills in managing obstetric emergencies? *South African Journal of Gynaecology*. 15(3) : 94–99.

Freeth, D., Gubby, A., Berridge, E.J., Mackintosh, N., Norris, B., Sadler, C. & Strachan, A. (2009). Multidisciplinary Obstetric Simulated Emergency Scenarios (MOSES): promoting patient safety in obstetrics with teamwork focused interprofessional simulations. *Journal of Continuing Education in the Health Professions.* 29(2) : 98–104.

Fuselier, J., Baldwin, D. & Townsend-Chambers, C. (2016). Nursing students' perspectives on manikins of color in simulation laboratories. *Clinical Simulation in Nursing.* 12(6) : 197–201.

Gaba, D.M. (2004). The future vision of simulation in health care. *Quality & Safety in Health Care.* 13 : 2–10.

Gerdeman, J.L., Lux, K. & Jacko, J. (2013). Using concept mapping to build clinical judgment skills. *Nurse Education in Practice.* 13 :11–17.

Goodstone, L., Goodstone, M., Cino, K., Glaser, C., Kupferman, K. & Dember-Neal, T. (2013). Effect of simulation on the development of critical thinking in associate degree nursing students. *Nursing Education Research.* 34(3) : 159–163.

Grable, I.A. & Ochoa, P. (2011). Simulations in obstetrics. *Disamonth.* 57(12) : 763–774.

Gray, M. & Aspland, T. (2011) Midwifery practice in the university context: Perspectives of postgraduate students on the effectiveness of case-based learning in preparation for the workplace. *Teaching and learning in Nursing.* 6 : 38–45.

Guba, E.G. (1981). Criteria for Assessing the Trustworthiness of Naturalistic Inquiries. *Educational Communication and Technology.* 29(2) : 75–91.

Guise, J. & Segel, S. (2008). Teamwork in obstetric critical care. *Best Practice & Research Clinical Obstetrics & Gynaecology.* 22(5) : 937–951.

Gundrosen, S., Solligård, E. & Aadahl, P. (2014). Team competence among nurses in an intensive care unit: The feasibility of in situ simulation and assessing non-technical skills. *Intensive & Critical Care Nursing.* 30 : 312–317.

Hall, S.W. (2015). High-fidelity simulation for senior maternity nursing students. *Nursing Education Perspectives.* 36(2) : 124–126.

Harder, B.N. (2009). Evolution of simulation use in health care education. *Clinical Simulation in Nursing.* 5 : 169–172.

Hawthorne, H., Cohen, T., Cammon, W., Bingerner, J., Hallbeck, S., Santrach, P., Elliott, S., Lindeen, K. et al. (2017). Assessing SBAR during intraoperative handoff. *Perioperative and Operating Room Management.* 6 : 7–10.

Herrmann, E.K. (2008). Remembering Mrs Chase. Before there were smart hospitals and sim man, there was 'Mrs Chase'. *Imprint.* 55(2) : 52–55.

Hofmeyr, G.J. & Qureshi, Z. (2016). Preventing deaths due to haemorrhage. *Best Practice & Research Clinical Obstetrics & Gynaecology.*1–15.

Hohenhaus, S., Powell, S. & Hohenhaus, J.T. (2006). Enhancing patient safety during hand-offs. *American Journal of Nurses.* 106(8) : 8–10.

Hsu, L. & Hsieh, S.I. (2005). Concept maps as an assessment tool in a nursing course. *Journal of Professional Nursing.* 21(3) : 141–149.

Hung, W., Jonassen, D.H. & Liu, R. (2008). Problem-based learning. *Handbook of research on educational communications and technology.* 485–506.

Hunt, E.A., Shilkofski, N.A., Stavroudis, T.A. & Nelson, K.L. (2007). Simulation: Translation to improved team performance. *Anaesthesiology Clinics.* 25 : 301–319.

Hunter, S., Pitt, V., Croce, N. & Roche, J. (2014). Critical thinking skills of undergraduate nursing students: Description and demographic predictors. *Nursing Education Today.* 34 : 809–814.

Jeffries, P.R. Ed. (2007). *Simulation in nursing education from conceptualization to evaluation.* New York*:* National league for nursing.

Jenerette, C. & Brewer, C. (2011). Situation, Background, Assessment, and Recommendation (SBAR) may benefit individuals who frequent emergency departments: adults with sickle cell disease. *Journal of Emergency Nursing.* 37(6) : 559–561.

Johnson, M., Magnusson, C., Allan, H., Evans, K., Ball, E., Horton, K., Curtis, K. & Westwood, S. (2015). 'Doing the writing' and 'working in parallel': How 'distal nursing'

affects delegation and supervision in the emerging role of the newly qualified nurse. *Nurse Education Today*. 35 : 29–33.

Jyothi, N.K., Cox, C. & Johanson, R. (2001). Management of obstetric emergencies and trauma (MOET): regional questionnaire survey of obstetric practice among career obstetricians in United Kingdom. *Journal of Obstetrics and Gynaecology*. 21(2) : 107.

Kable, A.K., Arthur, C., Levett-Jones, T. & Reid-Searl, K. (2013). Student evaluation of simulation in undergraduate nursing programs in Australia using quality indicators. *Nursing & Health Sciences*.15 : 235–243.

Kaddoura, M.A. (2011). Critical thinking skills of nursing students in lecture-based teaching and case-based learning. *International Journal for the Scholarship of Teaching and Learning*. 5(2) : 1–18.

Kaddoura, M., Vandyke, O., Smallwood, C. & Gonzalez, K.M. (2016). Perceived benefits and challenges of repeated exposure to high-fidelity simulation experiences of first degree accelerated bachelor nursing students. *Nurse Education Today*. 36 : 298–303.

Kalisch, B.J., Weaver, S.J. & Salas, E. (2009). What does nursing team work look like? A qualitative study. *Journal of Nursing Care Quality*. 24(4) : 298–307.

Kantar, L.D. (2014). Assessment and instruction to promote higher order thinking in nursing students*. Nurse Education Today*. 34 : 789–794.

Kaplan, B.G., Connor, A., Ferranti, E.P., Holmes, L. & Spencer, L. (2011). Use of an emergency preparedness disaster simulation with undergraduate nursing students. *Public Health Nursing*, 29(1) : 44–51.

Khalaila, R. (2014). Simulation in nursing education: An evaluation of students' outcomes at their first clinical practice combined with simulations. *Nursing Education Today*. 34 : 252–258.

Khatiban, M. & Sangestani, G. (2014). The effects of using problem-based learning in the clinical nursing education on the students' outcomes in Iran: A quasi-experimental study. *Nurse Education in Practice*. 14 : 698–703.

King, S. & Scrutton, M. (2010). Obstetric emergencies. *Anaesthesia and Intensive Care Medicine*. 12(3) : 102–107.

Kneebone, R., Nestel, D., Wetzel, C., Black, S., Jacklin, R., Aggarwal, R., Yadollahi, F., Wolfe, J. et al. (2006). The human face of simulation: patient-focused simulation training. *Academic Medicine.* 81(10) : 919–924.

Kohn, L.T., Corrigan, J.M. Donaldson, M.S. (2000*). To err is human: Building a safer health system.* Washington DC: National Academy Press. Available at http://www.nap.edu/catalogue/9728.htm [Accessed 31/05/2017]

Kolb, D. (1984). *Experiential learning experience as the source of learning and development.* New Jersey: Prentice Hall.

Kominiarek, M.A. & Kilpatrick, S.J. (2007). Postpartum hemorrhage: a recurring pregnancy complication. *Seminars in Perinatology.* 31 : 159–166.

Kowitlawakul, Y., Chow, Y.L., Salam, Z. H.A. & Ignacio, J. (2015). Exploring the use of standardized patients for simulation-based learning in preparing advanced practice nurses*. Nurse Education Today.*1–6.

Kripalani, S., Lefevre, F., Phillips, C.O., Williams, M. & Baker, D.W. (2007). Deficits in communication and information transfer between hospital-based and primary care physicians. *Journal of the American Medical Association.* 297 : 831–841.

Kruger, D. (1988). *An introduction to phenomenological psychology.* 2nd ed. Johannesburg: Juta & Co Ltd.

Kurrek, M.M., Morgan, P., Howard, S. & Kranke, P. (2015). Simulation as a new tool to establish benchmark outcome measures in obstetrics. *Plos One.* 10(6) : 1-10.

Lapkin, S. & Levett-Jones, T. (2011). A cost–utility analysis of medium vs high-fidelity human patient simulation manikins in nursing education. *Journal of Clinical Nursing.* 20 : 3543–3552.

Lapkin, S., Levett-Jones, T., Bellchambers, H. & Fernandez, R. (2010). Effectiveness of patient simulation manikins in teaching clinical reasoning skills to undergraduate nursing students: A systematic review. *Clinical Simulation in Nursing.* 207 : 222.

Larkin, M., Watts, S. & Clifton, E. (2006). Giving voice and making sense in interpretative phenomenological analysis. *Qualitative Research in Psychology.* 3 : . 102–120.

Lee, Y. & Lin, J.L. (2010). Do patient autonomy preferences matter? Linking patient-centered care to patient physician relationships and health outcomes. *Social Science & Medicine.* 71 : 1811–1818.

Levett-Jones, T., Andersen, P., Reid-Searl, K., Mcallister, M., Lapkin, S., Palmer, L. & Niddrie, M. (2015). Tag team simulation: An innovative approach for promoting active engagement of participants and observers during group simulations. *Nurse Education in Practice.* 15(5) : 345–352.

Levett-Jones, T., Gersbach, J., Arthur, C. & Roche, J. (2011). Implementing a clinical competency assessment model that promotes critical reflection and ensures nursing graduates readiness for professional practice. *Nurse Education in Practice*. 11(1) :64–69.

Levett-Jones, T., Lapkin, S., Hoffman, K., Arthur, C. & Roche, J. (2011). Examining the impact of high and medium fidelity simulation experiences on nursing students' knowledge acquisition. *Nurse Education in Practice*.11 : 380–383.

Levinson, W., Lesser, C.S. & Epstein, R.M. (2010). Developing physician communication skills for patient-centred care. *Health Affairs*. 29(7) : 1310–1318.

Lietz, C. A., Langer, C. L. & Furman, R. (2006). Establishing trustworthiness in qualitative research in social work: implications from a study Regarding Spirituality. *Qualitative Social Work*, 5(4) : 441–458.

Lilley, G., Burkett-St-Laurent, D., Precious, E., Bruynseels, D., Kaye, A., Sanders, J., Alikhan, R., Collins, P.W.et al. (2015). Measurement of blood loss during postpartum haemorrhage. *International Journal of Obstetric Anesthesia*. 24 : 8–14.

Lin, C., Han, C., Pan, I.J. & Chen, L. (2015). The teaching-learning approach and critical thinking development: A qualitative exploration of Taiwanese nursing students. *Journal of Professional Nursing*. 31(2) : 149–157.

Lo, B.M., Devine, A S., Evans, D.P., Byars, D.V., Lamm, O.Y., Lee, R.J., Lowe, S.M. & Walker. L.L. (2011). Comparison of traditional versus high-fidelity simulation in the retention of ACLS knowledge. *Resuscitation*. 82 : 1440–1443.

Lombaard, H. & Pattinson, R.C. (2009). Common errors and remedies in managing postpartum haemorrhage. Best Practice and Research: *Clinical Obstetrics and Gynaecology*. 23 : 317–326.

Lopez, K.A. & Willis, D.G. (2004). Descriptive versus interpretive phenomenology: their contributions to nursing knowledge. *Qualitative Health Research*, 14(5) : 726–735..

Luctkar-Flude, M., Wilson-Keates, B. & Larocque, M. (2012). Evaluating high-fidelity human simulators and standardized patients in an undergraduate nursing health assessment course. *Nurse Education Today*.32:448–452.

Maas, N.A. & Flood, L.S. (2011). Implementing high-fidelity simulation in practical nursing education. *Clinical Simulation in Nursing*. 7(6) : 229–235.

Maneval, R.E., Filburn, M.J., Deringer, S.O. & Lum, G.D. (2011). Concept mapping: Does it improve critical thinking ability in practical nursing students? *Nursing Education Research*. 32(4) : 229–233.

Maran, N.J. & Glavin, R.J. (2003). Low-to high-fidelity simulation–a continuum of medical education? *Medical Education*. 37 : 22–28.

McCaughey, C.S. & Traynor, M.K.(2010). The role of simulation in nurse education. *Nurse Education Today*.30(8) : 827-832.

Mckenna, L., Bogossian, F., Hall, H., Brady, S., Fox-Young, S. & Cooper, S. (2011). Is simulation a substitute for real life clinical experience in midwifery? A qualitative examination of perceptions of educational leaders. *Nurse Education Today*. 31(7) : 682–686.

Mckeon, L., Norris, T.L., Cardell, B. & Britt, T. (2009). Developing patient-centered care competencies among prelicensure nursing students using simulation. *Journal of Nursing Education*. 48(12) : 711–718.

Meakim, C., Boese, T., Decker, S., Franklin, A.E., Gloe, D., Lioce, L., Sando, C.R. & Borum, J.C. (2013). Standards of best practice simulation standard I: terminology. *Clinical Simulation in Nursing*. 9 : S3–S11.

Miller, B. & Carr, K.C. (2016). Integrating standardized patients and objective structured clinical examinations into a nurse practitioner curriculum. *The Journal for Nurse Practitioners*. 12(5) : 201–210.

Miller, K.K., Riley, W., Davis, S. & Hansen, H.E. (2008). In situ simulation: A method of experiential learning to promote safety and team behaviour. *The Journal of Perinatal & Neonatal Nursing*. 22(2) : 105–113.

Missen, K., McKenna, L. & Beauchamp, A. (2015). Work readiness of nursing graduates: current perspective of graduate nurse program coordinators. *Contemporary Nurse*. 51(1) : 27-38

Monod, C., Voekt, C.A., Gisin, M., Gisin, S. & Hoesli, I.M. (2014). Optimization of competency in obstetrical emergencies: A role for simulation training. *Arch Gynaecology Obstetric.* 289 : 733–738.

Moore, J. & Chandraharan, E. (2010). Management of massive postpartum haemorrhage and coagulopathy*. Obstetrics, Gynaecology & Reproductive Medicine*. 20(6) : 174–180.

Mukherjee, S. & Arulkumaran, S. (2009). Post-partum haemorrhage. *Obstetrics, Gynaecology and Reproductive Medicine.* 19(5) : 121–126.

Murphy, S., Hartigan, I., Walshe, N., Flynn, A.V. & O'Brien, S. (2011). Merging problem-based learning and simulation as an innovative pedagogy in nurse education. *Clinical Simulation in Nursing.* 7 : 141–148.

Noseworthy, D.A., Phibbs, S.R. & Benn, C.A. (2013). Towards a relational model of decision-making in midwifery care. *Midwifery.*29 : 42–48.

Novak, J.D. (2002). Meaningful learning: The essential factor for conceptual change in limited or inappropriate propositional hierarchies leading to empowerment of learners*. Learning.* 548–571.

Novak, K. & Fairchild, R. (2012). Bedside reporting and SBAR: improving patient communication and satisfaction. *Journal of Paediatric Nursing.* 27(6) : 760–762.

Nursing Act, No 50 of 1978. Regulation R425. Available at http://www.sanc.co.za/regulat/Reg-4yr.htm. Accessed [17/06/2017]

Nursing Education and Training Standards. 2005.South African Nursing Council. 1-125. Available at http://www.sanc.co.za/nursing/education/training/standards. [Accessed 25 May 2016]

Oiyemhonlan, B., Udofia, E. & Punguyire, D. (2013). Identifying obstetrical emergencies at Kintampo Municipal Hospital: A perspective from pregnant women and nursing midwives. *African Journal of Reproductive Health*. 17(2): 129–140.

Paloma, T., McCarthy, R.J., Hewlett, B.J., Fitzgerald, P.C. & Wong, C.A. (2007) 'The accuracy of blood loss estimation after simulated vaginal delivery. *Obstetric Anasthesiology*. 105(6) :1736–1740.

Papathanasiou, I.V, Kleisiaris, C.F., Fradelos, E.C., Kakou, K. & Kourkouta, L. (2014). Critical thinking: The development of an essential skill for nursing students. *ACTA Informatica Medica*. 22(4) : 283–286.

Partin, J.L., Payne, T.A. & Slemmons, M.F. (2011). Students' perceptions of their learning experiences using high-fidelity simulation to teach concepts relative to obstetrics. *Nursing Education Perspectives*. 32(3) : 186–188.

Phipps, M.G., Lindquist, D.G., McConaughey, E., O'Brien, J.A., Raker, C.A. & Paglia, M.J. (2012). Outcomes from a labor and delivery team training program with simulation component. *American Journal of Obstetrics and Gynaecology*. 206(1) : 3–9.

Pike, T. & O'Donnell, V. (2010). The impact of clinical simulation on learner self-efficacy in pre-registration nursing education. *Nurse Education Today*. 30(5) : 405–410.

Polis, S., Higgs, M., Manning, V., Netto, G. & Fernandez, R. (2015). Factors contributing to nursing team work in an acute care tertiary hospital. *Collegian*. 1–7.

Pollock, C. & Biles, J. (2016). Discovering the lived experience of students learning in immersive simulation. *Clinical Simulation in Nursing*. 12 : 313–319.

Popil, I. (2011). Promotion of critical thinking by using case studies as teaching method. *Nurse Education Today*. 31 : 204–207.

Potgieter, E. (2012). Clinical teaching: Developing critical thinking in student nurses. *Professional Nurse Today*. 16(2) : 4–8.

Raymond, C.L. & Profetto-McGrath, J. (2005). Nurse educator's critical thinking: reflection and measurement. *Nurse Education in Practice*. 5 : 209–217.

Reid-Searl, K., Happell, B., Vieth, L. & Eaton, A. (2012). High-fidelity patient silicone simulation : A qualitative evaluation of nursing students' experiences. *Collegian*. 19 : 77–83.

Reinhardt, A.C., Mullins, I.L., De Blieck, C. & Schultz, P. (2012). IV insertion simulation: confidence, skill, and performance. *Clinical Simulation in Nursing*. 8 : 157–167.

Reynolds, A., Ayres-De-Campos, D. & Lobo, M. (2011). Self-perceived impact of simulation-based training on the management of real-life obstetrical emergencies. *European Journal of Obstetrics Gynaecology and Reproductive Biology*.159 : 72–76.

Robinson, F.P., Gorman, G., Slimmer, L.W. & Yudkowsky, R. (2010). Perceptions of effective and ineffective nurse–physician communication in hospitals. *Nursing forum*. 45(3) : 206–216.

Roh, Y.S., Lee, W.S., Chung, H S. & Park, Y.M. (2013). The effects of simulation-based resuscitation training on nurses' self-efficacy and satisfaction. *Nurse Education Today*. 33 : 123–128.

Rosen, K.R. (2008). The history of medical simulation. *Journal of Critical Care*. 23: 157–166.

Rosenzweig, M., Hravnak, M., Magdic, K., Beach, M., Clifton, M. & Arnold, R. (2008). Patient communication simulation laboratory for students in an acute care nurse practitioner program. *American Journal of Critical Care*.17(4) : 364–372.

Rush, S., Acton, L., Tolley, K., Marks-Maran, D. & Burke, L. (2010). Using simulation in a vocational programme: Does the method support the theory? J*ournal of Vocational Education and Training*. 62(4) : 467–479.

Salas, E., Sims, D.E. & Burke, C.S. (2005). Is there a "big five" in team work? *Small Group Research*. 36(5) : 555–599.

Samawi, Z., Miller, T. & Haras, M.S. (2014) Using high-fidelity simulation and concept mapping to cultivate self-confidence in nursing students. *Nursing Education Perspectives*. 35(6) : 408–409.

Scholes, J., Endacott, R., Biro, M., Bulle, B., Cooper, S., Miles, M., Gilmour, C., Buykx, P. et al. (2012). Clinical decision-making: Midwifery students' recognition of, and response to post-partum haemorrhage in the simulation environment. *BMC Pregnancy and Childbirth.* 12(19) : 1–12.

Senita, J. (2008). The use of concept maps to evaluate critical thinking in the clinical setting. *Teaching and Learning in Nursing.* 3 : 6–10.

Shenton, A.K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information.* 22 : 63–75.

Shields, L.E., Smalarz, K., Reffigee, L., Mugg, S., Burdumy, T.J. & Propst, M. (2011) Comprehensive maternal hemorrhage protocols improve patient safety and reduce utilization of blood products. *American Journal of Obstetrics and Gynaecology.* 205(368) : 1–8.

Siassakos, D., Draycott, T., Montague, I. & Harris, M. (2009). Content analysis of team communication in an obstetric emergency scenario. *Journal of Obstetrics and Gynaecology.* 29 : 499–503.

Siassakos, D., Draycott, T., O'Brien, K., Kenyon, C., Bartlett, C. & Fox, R. (2010). Exploratory randomized controlled trial of hybrid obstetric simulation training for undergraduate students. *Simulation in Healthcare.* 5(4) : 193–198.

Siassakos, D., Hasafa, Z., Sibanda, T., Fox, R., Winter, C. & Draycott, T. (2009). Retrospective cohort study of diagnosis-delivery interval with umbilical cord prolapse: the effect of team training. *BJOG.* 116 :1089-1096

Simkins, I.L. & Jaroneski, L.A. (2016). Integrated simulation: A teaching strategy to prepare prelicensure nursing students for professional practice-the students' perspective. *Teaching and Learning in Nursing.* 11 : 15–19.

Smit, M., Chan, Kar-Li, L., Middeldorp, J.M. & Van Roosmalen, J. (2014). Postpartum haemorrhage in midwifery care in the Netherlands: Validation of quality indicators for midwifery guidelines. *BMC Pregnancy and Childbirth.* 14(397)

Smith, A., Siassakos, D., Crofts, J. & Draycott, T. (2013). Simulation: Improving patient outcomes. *Seminars in Perinatology.* 37 : 151–156.

Smith, J.A., Flowers, P. and Larkin, M. (2009) *Interpretative phenomenological analysis. Theory, method and research*. London: Sage Publications Ltd.

Smith, R., Gray, J., Raymond, J., Catling-Paull, C. & Homer, C.S.E. (2012) 'Simulated learning activities: Improving midwifery students understanding of reflective practice. *Clinical Simulation in Nursing*. 8 : 451–e457.

Spiers, J.A., Williams, B., Gibson, B., Kabotoff, W., Mcilwraith, D., Sculley, A. & Richard, E. (2014). Graduate nurses' learning trajectories and experiences of Problem Based Learning: A focused ethnography study. *International Journal of Nursing Studies.* 51(11) : 1462–1471.

Stirling, K., Smith, G. & Hogg, G. (2012). The benefits of a ward simulation exercise as a learning experience. *British Journal of Nursing*. 21(2) : 116–122.

Straub, H.L., Morgan, G., Ochoa, P., Grable, I., Wang, E., Kharasch, M. & Plunkett, B.A. (2013). Targeted obstetric haemorrhage programme improves incoming resident confidence and knowledge. *Journal of Obstetrics and Gynaecology*. 33 : 798–801..

Su, L.L. & Chong, Y.S. (2012). Massive obstetric haemorrhage with disseminated intravascular coagulopathy. *Best Practice & Research Clinical Obstetrics & Gynaecology*. 26 : 77–90.

Sweeney, J., Maietta, R. & Olson, K. (2015). 'Sim huddles' simulation obstetric emergency preparedness. *Nursing for Women's Health*. 19(1) : 18–25.

Taylor-Adams, S., Vincent, C. & Stanhope, N. (1999) Applying human factors methods to the investigation and analysis of clinical adverse events. *Safety Science*. 31 : 143–159.

Terzioglu, F., Yucel, C., Koç, G., Simsek, S., Yasar, B.N., Sahan, F.U., Akin, R., Ocal, S.E. et al. (2016). A new strategy in nursing education: From hybrid simulation to clinical practice. *Nurse Education Today*. 39 : 104–108.

Thidemann, I. & Söderhamn, O. (2013). High-fidelity simulation among bachelor students in simulation groups and use of different roles. *Nurse Education Today*. 33 : 1599–1604.

Tiwari, A., Lai, P., So, M. & Yuen, K. (2006). A comparison of the effects of problem-based learning and lecturing on the development of the students' critical thinking. *Medical Education.* 40 : 547–554.

Tseng, H., Chou, F., Wang, H., Ko, H., Jian, S. & Weng, W. (2011). The effectiveness of problem-based learning and concept mapping among Taiwanese registered nursing students. *Nurse Education Today.* 31 : 41–46.

Tunçalp, Ö., Souza, J. P. & Gülmezoglu, M. (2013). New WHO recommendations on prevention and treatment of postpartum hemorrhage. *International Journal of Gynaecology and Obstetrics.* 123 : 254–256.

Tuzer, H., Dinc, L. & Elcin, M. (2016). The effects of using high-fidelity simulators and standardized patients on the thorax, lung, and cardiac examination skills of undergraduate nursing students. *Nurse Education Today.* 45 : 120–125.

Upadhyay, K. & Scholefield, H. (2008). Risk management and medico legal issues related to postpartum haemorrhage. *Best Practice & Research Clinical Obstetrics & Gynaecology.* 22(6) : 1149–1169.

Vadnais, M.A., Dodge, L.E., Awtrey, C.S., Ricciotti, H.A., Golen, T.H. & Hacker, M.R. (2012). Assessment of long-term knowledge retention following single-day simulation training for uncommon but critical obstetrical events. *The Journal of Maternal, Fetal and Neonatal Medicine.* 25(9) : 1640–1645.

Vyas, D., Ottis, E.J. & Caligiuri, F.J. (2011). Teaching clinical reasoning and problem-solving skills using human patient simulation. *American Journal of Pharmaceutical Education.* 75(9) : 1–5.

Walker, D.M., Cohen, S.R., Estrada, F., Monterroso, M.E., Jenny, A., Fritz, J. & Fahey, J.O. (2012). PRONTO training for obstetric and neonatal emergencies in Mexico. *International Journal of Gynaecology and Obstetrics.* 116(2) : 128–133.

Wang, W., Liang, Z., Blazeck, A. & Greene, B. (2015). Improving Chinese nursing students' communication skills by utilizing video-stimulated recall and role-play case scenarios to introduce them to the SBAR technique. *Nurse Education Today.* 35 : 881–887.

Watt, E. & Pascoe, E. (2013). An exploration of graduate nurses' perceptions of their preparedness for practice after undertaking the final year of their Bachelor of nursing degree in a university-based clinical school of nursing. International Journal of Nursing Practice.19(1) : 23-30.

Wheeler, L. & Collins, S.K.R. (2003). The influence of concept mapping on critical thinking in Baccalaureate nursing students. *Journal of Professional Nursing*. 19(6) : 339–346.

Williams, R.G., Silverman, R., Schwind, C., Fortune, J.B., Sutyak, J., Horvath, K.D., Van Eaton, E.G., Azzie, G. et al. (2007). Surgeon information transfer and communication factors affecting quality and efficiency of inpatient care. *Annals of Surgery*. 245(2) : 159–169.

Wolff, A.C., Pesut, B., Regan, S. & Black, J. (2010). Ready for what? An exploration of the meaning of new graduate nurses' readiness for practice. *International Journal of Nursing Education*. 7 : 1–11.

Woods, C., West, C., Mills, J., Park, T., Southern, J. & Usher, K. (2015). Undergraduate student nurses' self-reported preparedness for practice. *Collegian*. 22 : 359–368.

Yardley, S., Irvine, A.W. & Lefroy, J. (2013). Minding the gap between communication skills simulation and authentic experience. *Medical Education*. 47 : 495–510.

Yoo, M. & Park, J. (2014). Effect of case-based learning on the development of graduate nurses problem-solving ability. *Nursing Education Today*. 34 : 47–51.

Yuan, H.B., Williams, B.A. & Fang, J.B. (2012). The contribution of high-fidelity simulation to nursing students' confidence and competence: A systematic review. *International Nursing Review*. 59 : 26–33.

Zygmont, D. & Schaefer, K.M. (2006). Assessing the critical thinking skills of faculty: What do the findings mean for nursing education. *Nursing Education Perspectives*. 27(5) : 260–268.

APPENDICES

APPENDIX A: ETHICAL CLEARANCE CERTIFICATE

University of Fort Hare
Together in Excellence

ETHICAL CLEARANCE CERTIFICATE

Certificate Reference Number: RAL021SNTL01

Project title: **Effectiveness of medium fidelity simulation in enhancing clinical readiness of student midwives**

Nature of Project: Masters

Principal Researcher: Zukiswa Brenda Ntlokonkulu

Supervisor: Mrs NM Rala

Co-supervisor: Prof TD Goon

On behalf of the University of Fort Hare's Research Ethics Committee (UREC) I hereby give ethical approval in respect of the undertakings contained in the above-mentioned project and research instrument(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the UREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the document
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research

The Principal Researcher must report to the UREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

Special conditions: Research that includes children as per the official regulations of the act must take the following into account:

Note: The UREC is aware of the provisions of s71 of the National Health Act 61 of 2003 and that matters pertaining to obtaining the Minister's consent are under discussion and remain unresolved. Nonetheless, as was decided at a meeting between the National Health Research Ethics Committee and stakeholders on 6 June 2013, university ethics committees may continue to grant ethical clearance for research involving children without the Minister's consent, provided that the prescripts of the previous rules have been met. This certificate is granted in terms of this agreement.

The UREC retains the right to

- Withdraw or amend this Ethical Clearance Certificate if
    - Any unethical principal or practices are revealed or suspected
    - Relevant information has been withheld or misrepresented
    - Regulatory changes of whatsoever nature so require
    - The conditions contained in the Certificate have not been adhered to

- Request access to any information or data at any time during the course or after completion of the project.

- In addition to the need to comply with the highest level of ethical conduct principle investigators must report back annually as an evaluation and monitoring mechanism on the progress being made by the research. Such a report must be sent to the Dean of Research's office

The Ethics Committee wished you well in your research.

Yours sincerely

Professor Gideon de Wet
Dean of Research

09 June 2015

APPENDIX B. LETTER OF PERMISSION FROM THE HOD

FACULTY OF HEALTH SCIENCES

P.O. Box 1054
East London 5200
Tel: +27 (043) 7047574| Fax: 0866282026

Dear   Mrs Ntlokonkulu,

Regarding: *Permission to conduct a study using the Nursing Science students as participants.*

This is to inform you that you have been granted permission to go ahead with data collection for your study. It has been realized that you are in possession of a Clearance Certificate which bears No: RAL021SNTL01 from the Ethics committee of your academic institution. Wishing you all the best for your endeavours.

Kind Regards

AN Mbatha

The Coordinator of the basic Degree Programme

Lecturer at the University of Fort Hare

Nursing Science department

East London Campus

Work Telephone No: 043-704 7582

Email Address: ambatha@ufh.ac.za

APPENDIX C: CONFIDENTIALITY AND CONSENT FORM

University of Fort Hare
Together in Excellence

Ethics Research Confidentiality and Consent Form

Please note:

This form is to be completed by the researcher(s) as well as by the interviewee before the commencement of the research. Copies of the signed form must be filed and kept on record

(To be adapted for individual circumstances/needs)

Our University of Fort Hare / Department is asking people from your community / sample / group to answer some questions, which we hope will benefit your community and possibly other communities in the future.

I **Zukiswa Brenda Ntlokonkulu**- Master's degree student at the University of Fort Hare, School of Health Sciences, Department of Nursing Sciences is conducting research regarding **Research Project:** THE EFFECTIVENESS OF MEDIUM FIDELITY SIMULATION IN ENHANCING CLINICAL READINESS OF STUDENT MIDWIVES .
We are carrying out this research to help improve the quality of patient care. .

Please understand that you are not being forced to take part in this study and the choice whether to participate or not is yours alone. However, we would really appreciate it if you do share your thoughts with us. If you choose not take part in answering these questions, you will not be affected in any way. If you agree to participate, you may stop me at any time and tell me that you don't want to go on with the interview. If you do this there will also be no penalties and you will NOT be prejudiced in ANY way. Confidentiality will be observed professionally.

I will not be recording your name anywhere on the questionnaire and no one will be able to link you to the answers you give. Only the researchers will have access to the unlinked information. The information will remain confidential and there will be no 'come-backs' from the answers you give.

The interview will last around 60 minutes *(this is to be tested through a pilot).* I will be asking you a questions and ask that you are as open and honest as possible in answering these questions. Some questions may be of a personal and/or sensitive nature. I will be asking some questions that you may not have thought about before, and which also involve thinking about the past or the future. We know that you cannot be absolutely certain about the answers to these questions but we ask that you try to think about these questions. When it comes to answering questions there are no right and wrong answers. When we ask questions about the future we are not interested in what you think the best thing would be to do, but what you think would actually happen. (*adapt for individual circumstances*)

If possible, our organisation would like to come back to this area once we have completed our study to inform you and your community of what the results are and discuss our findings and proposals around the research and what this means for people in this area.

CONSENT

I hereby agree to participate in research regarding THE EFFECTIVENESS OF-MEDIUM - FIDELITY SIMULATION IN ENHANCING CLINICAL READINESS OF STUDENT MIDWIVES I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop this interview at any point should I not want to continue and that this decision will not in any way affect me negatively.

I understand that this is a research project whose purpose is not necessarily to benefit me personally.

I have received the telephone number of a person to contact should I need to speak about any issues which may arise in this interview.

I understand that this consent form will not be linked to the questionnaire, and that my answers will remain confidential.

I understand that if at all possible, feedback will be given to my community on the results of the completed research.

…………………………….
Signature of participant   **Date**:………………….

I hereby agree to the tape recording of my participation in the study

…………………………….
Signature of participant   **Date**:………………….

APPENDIX D: INTERVIEW GUIDE

INTERVIEW GUIDE

OBJECTIVE	POSSIBLE QUESTION	PROMPTS
	What does clinical readiness mean to you in terms of midwifery?	
Determine if the student midwife will be able to think critically in an obstetrical emergency.	What was going through your head when you saw the patient in that state? How did you apply your critical thinking in this scenario? How did the experience make you feel?	
Assess if the student midwife will be able to solve an obstetrical emergency within an acceptable period.	Do you feel that that you resolved the emergency within the acceptable time?	We were not in a real situation we were just simulating in a secured environment. How do you relate it to clinical
Ascertain if team work, student midwives' confidence, communication and satisfication increase after exposure to MFS.	How was teamwork during the scenario? How did you see communication between team members during the simulation? How was the communication with the patient? Did this simulation activity meet your expectation? How did you feel being a team leader?	How many people were in the team? Who controlled the team? How did you manage the team members? How does this mean to you the whole scenario in terms of team management, of competency, in terms of managing the whole scenario
	How do you feel about your clinical readiness after being exposed to this simulation?	

APPENDIX E: EDITING CERTIFICATE

ProsePerfect

54 Blakeway Road Mthatha 5100
Tel Nr. (047) 532 2303 or (071) 217 7489
e-mail Janemqamelo@gmail.com
http://janemqamelo.wixsite.com/proseperfect

---

23 June 2017

To Whom It May Concern

I, Peta Jane Mqamelo, ID Nr 611120 0014 08 1, do herewith confirm that I have conducted an English proofreading and grammar edit on a masters dissertation by Zukiswa Brenda Ntlokonkulu, being a study on the effectiveness of medium-fidelity simulation on the clinical readiness of student midwives.

Yours sincerely

Jane Mqamelo
ProsePerfect
Editing, proofreading, writing