UTILIZATION OF SIMULATION BY NURSE EDUCATORS AND LEARNER NURSES AT LIMPOPO COLLEGE OF NURSING LIMPOPO PROVINCE SOUTH AFRICA

by

FREEDOM NTSHUXEKO MATHEBULA

DISSERTATION

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SUPERVISOR: Prof M.N Jali

CO-SUPERVISOR: Prof M.E Lekhuleni

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DECLARATION

I, Freedom Ntshuxeko Mathebula declare that "**Utilization Of Simulation By Nurse Educators And Learner Nurses At Limpopo College Of Nursing Limpopo Province South Africa"** hereby submitted to the University of Limpopo for the degree Master of Nursing Science is my own work, and has never been submitted by me for any degree at this or any other institution, and all the sources used have been acknowledged both in the text and references list.

SIGNATURE **:** _____

DATE **:** _____

DEDICATION

The study is dedicated to my late father: Meshack Richard "Gaweni" Mathebula. My mother: Miesie Faniki Makhubela and my four sisters: Nomsa Mathebula, Fortunate Mathebula, Dephcy Gift Mathebula and Amukelani Brilliant Mathebula for their support throughout the study. Most of all I would like to dedicate this study to my sons: Nkateko Delton Mathebula and Elton Hlulani Ntshovelo Mathebula as this research project will serve as a motivation to them.

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ABSTRACT

The aim of the study was to determine the utilization of simulation by nurse educators and learner nurses at LCN. The objectives of the study were to describe the utilization of simulation by nurse educators and learner nurses at the LCN and to develop strategies that would improve the utilization of simulation by nurse educators and learner nurses at the LCN.

A qualitative research method and exploratory, descriptive and contextual research design was used with a purposive sample of fourty two participants from LCNCs. Tesch's eight steps of qualitative data analysis were followed. The study found and concluded that there was poor utilization of simulation in clinical laboratories by both the nurse educators and learner at LCNCs.

The results of the study recommends that LCNCs should have clinical laboratories managers, to be conducive in order to accommodate the number of learner nurses, to have sufficient and useful simulators, and also accessed at any time of the year by learner nurses. To employ well advanced simulators at the college through buying. Simulation sessions should be given enough time and learner nurses to be allowed to do return demonstration, and continuous practice.

Keywords: Simulation, Utilization, Nurse Educators, Learner nurses.

ABBREVIATIONS

DoH:	Department of Health
HFM:	High Fidelity Manikin
LCN:	Limpopo College of Nursing
LCNCs:	Limpopo College of Nursing Campuses
MFS:	Moderate Fidelity Simulation
MREC:	Medunsa Research Ethics Committee
NLN:	National League for Nurses
NWU:	North West University
RSA:	Republic of South Africa
UFS:	University of Free State
UK:	United Kingdom
USA:	United States of America

DEFINITION OF CONCEPTS

Clinical laboratory:

A facility or place where learner nurses acquire new clinical skills and knowledge as they observe nursing practice informed by nursing theory, with the involvement of nurse educators, and where clinical equipment (manikins) are kept for simulation activities (Limoges, 2009). In the study, it refers to the LCNCs rooms where clinical skills orientation is conducted prior contact with the real patient at clinical area.

Learner nurses:

A person undergoing education and training in nursing and registered as learner nurse or learner midwife (The Nursing Act 33 of 2005). In the study learner nurses refers to the student nurses at the Limpopo College of Nursing.

Manikins:

An anatomical model of the human body for use in teaching and learning for learner nurses (Bruce, Klopper and Mellish, 2011). It refers to the simulators being in a form of mankind using computers or not using computers. In this study, manikins refer to the dolls or models used in clinical laboratories by nurse educators and learner nurses for simulation purposes.

Nurse educator:

A registered nurse who's primary area of interest, competence and professional practice is the teaching of nurses at a nursing College (Bruce, et al., 2011). In the study nurse educators refer to the qualified registered nurse with additional qualification in nursing education who works at the Limpopo College of Nursing.

Simulation:

An imitation or representation of potential situations or in experimental testing (Bastable, 2008). In this study, simulation refers to the method whereby an artificial experience is

created and the learner nurses are actively involved in an activity that reflects the real life condition of a patient.

Simulator:

One that simulates, especially an apparatus that generates test conditions approximating actual or operational conditions (Como, Kress and Lewental, 2009). In the study refers to computerized or non - computerized manikins in the clinical laboratory for simulation purposes.

Utilization:

The act of using something or model during simulation, in this study it refers to the use of simulators to simulate or mimic during learning and teaching in nursing curriculum (Bastable, 2008).

CONTENT

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

OVERVIEW OF THE STUDY

1. 1 Introduction and Background

The utilization of simulation in nursing education is not new. It was started in the 1950s with low-technology simulation (LTS). The first simulators were introduced in the United Kingdom (UK) in different trademarks and the other trademarks such as Harvey were also introduced in the 1960s. Since the 1980s, the utilization of simulation has been growing well, and many nursing colleges are now utilizing it as a teaching strategy worldwide (Nagle, McHale, Alexander and French, 2009; Wilford and Doyle, 2006).

Bimray, Roux and Fakude (2013) in a study conducted at the University of Western Cape, South Africa, reports that simulation is commonly used in especial skills in laboratories for clinical teaching and clinical evaluation. It is also used for ensuring that learner nurses are exposed to real life encounter in a structured environment, and this enables the learner nurses to perceive the simulated patient encounter as an opportunity to connect and make a difference in the life of the patient, and not to be skill performers.

Nxumalo (2011) in a study conducted at a Nursing College in the Limpopo Province found that there was inadequate use of simulation laboratory for skill demonstration. Nxumalo (2011) further indicated that 82% of learner nurses reported that General Nursing Science (GNS), was always given attention during simulation was particularly with its clinical aspects (Nxumalo 2011).

According to Weller, Nestel, Marshall, Brooks and Conn (2012) the utilization of simulation and clinical laboratories in nursing education is imperative as it has the potential to provide greater efficiency and rigour compared with learning through

opportunistic clinical experiences. Simulation in nursing education enables nurse educators to schedule, observe and even repeat an event so as to consolidate learning. It also ensures that learner nurses have a degree of clinical competence before exposure to real patients in the clinical area. This has positive implications for both patient safety and training time (Childs and Sepples, 2006).

A study conducted by Kelly (2014) at the University of Pittsburgh outlined that the complexity of training new nurses has led to many schools of nursing incorporating various form of high fidelity simulation into the curriculum. The study further reports that the nursing schools experienced lack of knowledge and have discomfort with the implementation of simulation in the curriculum due to lack of simulation equipment as are expensive. Kelly (2014) further emphasized that despite the complexity in the utilization of simulation, for the comprehensive and effective utilization of simulation at school of nursing, simulation need to be well established to develop clinical aspects which are closely related to the hospital experiences. There has been limited research focusing on determining the utilization of simulation by nurse educators and learner nurses at schools of nursing.

1.2 Problem Statement

The Limpopo College of Nursing (LCN) was established in terms of Northern Province College of Nursing Act, Act 3 of 1996, in amalgamations of the former Gazankulu, Groothoek and Venda Colleges of nursing. It offers a four year diploma programme for education and training of a nurse in (General, Psychiatric & Community) and Midwifery which leads to registration with the South African Nursing Council (SANC) Regulation R425 (22 February 1985), as amended.
The aim was to produce sufficient number of competent nurses that would serve the citizens of SA, particularly the communities of the Limpopo Province.

The Limpopo College of Nursing utilizes a variety of teaching and learning strategies to ensure that learning occurs. Utilization of simulation is inclusive, particularly during

clinical skills orientation in clinical laboratories. Despite the use of this teaching strategy, nurse educators and learner nurses seem to lack skills in the implementation of effective simulation.The researcher has observed this during LCNCs clinical skills orientation or demonstration at the beginning of each year, the interaction of nurse educators - learner nurses with simulators or manikins during simulation is minimal. Ober (2009) reports that there is limited research on the use of simulation, particularly with patient simulation (PS).Therefore, this study will determine the utilization of simulation by nurse educators and learner nurses at the Limpopo College of Nursing.

1.3 Research Question

The following question guided the study:

- How is the simulation utilized by nurse educators and learner nurses at Limpopo College of Nursing?

1.4 Aim of the Study

The aim of the study was to determine the utilization of simulation by nurse educators and learner nurses at Limpopo College of Nursing, South Africa.

1.5 Objectives of the Study

The objectives of the study were to:

- Describe the utilization of simulation by nurse educators and learner nurses at the Limpopo College of Nursing.
- Make recommendations and develop strategies that will improve the utilization of simulation by nurse educators and learner nurses at the Limpopo College of Nursing.

1.6 Theoretical Framework

1.6.1. Kolb Experiential Learning Model

This study was based on Kolb Experiential Learning Model and its application to nursing education. The model is described as a conceptualization of the description of a phenomenon through concepts and statement and it is represented in a logical format (Bruce, Klopper and Mellish, 2011). Kolb Experiential Learning Model is described as the four steps cycle which incorporate the four learning modes, which are: concrete experience (CE), reflective observation (RO), abstract conceptualization (AC) and active experimentation (AE).

According to Kolb (1984) learning is described as the process whereby the knowledge is created through transformation of experience.

Nurse educators have a huge role in utilizing a variety of teaching strategies and also of evoking learner nurses' mind during teaching and learning by the implementation of quality lessons. Nurse educators are also expected to create a learning environment that will stimulate the learner nurses, especially during simulation sessions for transformation of experience (Killen, 2010; Othman and Amiruddin, 2010; Lee, 2007).

Kolb Experiential Learning Model focuses on the process by which knowledge is created through the transformation of experience, which is accomplished through four learning styles, namely: divergers, convergers, assimilators and accommodators (Frankel, 2009; Bastable, 2008; Hodges, 1988), and it entails the following:

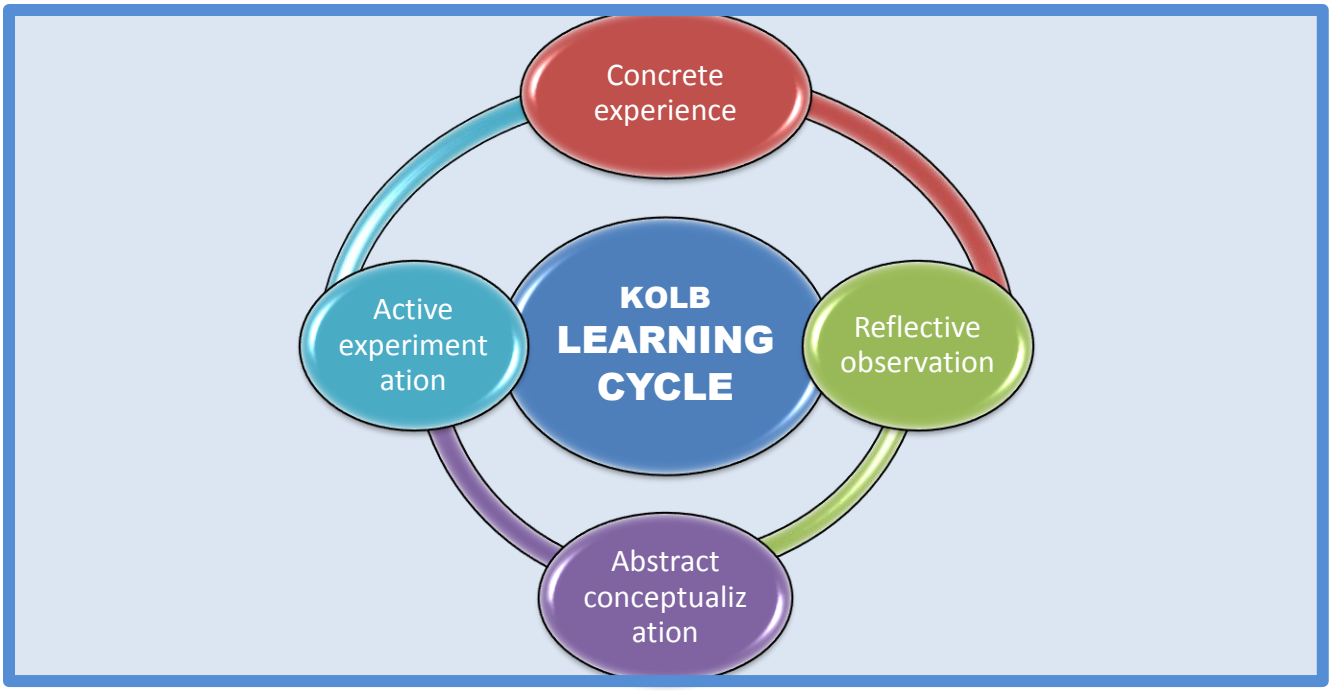
- **The experience:** it embraces knowledge, skills and standards that nurse educators expect learner nurses to attain and should also be brought to their attention during learning by means of teaching and learning strategies, such as in simulation laboratories where the learner nurses will observe the manikins when simulating for a certain medical/surgical condition and manage it (Bruce, *et al*., 2011).

- **Reflection:** for its existence, experience should be regarded as the foundation during learning process (stimulus, response, motivation & reward) such as utilizing structured or unstructured form, hence reflective learning (Bruce, *et al*., 2011; Bastable, 2008).
- **The action:** in this element, Kolb believes that learner nurses should be given enough time or opportunity to practice or experiment what was taught as a result of experience and reflection, such as kinesthetic learner nurses for doing return demonstration (Bastable, 2008).
- **Revisit:** the learner nurses should also revisit the experiences acquired from the nurse educator in order to be more motivated and gain more interest with regard to clinical skill or content that has been taught using simulation as a teaching and learning strategy (Bruce, *et al*., 2011).

1.6.1.1. Schematic presentation on Kolb's learning cycle

Kolb experiential learning model was used as a theoretical framework on the study of the utilization of simulation by nurse educators and learner nurses at Limpopo College of Nursing South Africa. The model is conceptualized as a four - stages cycle, namely: concrete experience (CE), reflective observation (RO), Abstract conceptualization (AC) and active experimentation (AE) (Bruce, *et al*., 2011; Uys and Gwele, 2006).

This model is described as the four steps cycle which incorporate the four learning modes in figure 1.1.



Adapted from Bastable (2008)

Figure 1.1 Schematic presentations on Kolb Experiential Learning Model

1.6.1.1.1. Concrete experience (CE)

According to Quinn and Hughes (2007) and Kolb (1984) concrete experience is the basis for observation and reflection from which concepts are assimilated and actively tested. CE is the first stage on the cycle, wherein learner nurses are actively experiencing an activity, such as in clinical laboratory for simulation activities. This stage incorporates the three learning domains; as it actively involves an experience, feeling and emotions.

Kolb reports that learning starts when a learner nurse responds to this stage by being involved in a certain skill or experience that is for future use in the clinical setting, especially when encountering a dilemma in nursing (Burton, 2006). Divergers and Accommodators learn best in CE because it includes reflective observation (Bastable, 2008).

Learner nurses in CE are good at viewing the concrete situation from many points of view. For example in clinical laboratory, learner nurses will observe the simulator

simulating a certain medical condition and perceive and process it differently, hence active imagination. The nurse educator should anticipate on utilizing simulation as a teaching strategy and in order to motivate them, since learner nurses like to ask "*why"?* This is a best practice in order to gain attention of the learner nurses during teaching and learning (Bruce, *et al*., 2011; Billings and Halstead, 2009; Bastable, 2008).

The accommodator as the fourth learner type in accordance to Kolb's experiential learning theory, their strength lies in doing things or perceives concretely and process actively as is CE/AE in nature. Accommodators learn by trial and error, and interested in self – discovery and enthusiastic about new things. Learner nurses are regarded as risk takers since they tend to solve real life problems in an intuitive manner. A learner nurse who falls under CE/AE is perhaps the most challenging to educators because they demand new and exciting experiences (Bastable, 2008). The educator in this regard may anticipate in utilizing any form of simulation in order to gain more of them, such as computer gaming or models for simulation purposes (Lee, 2007).

1.6.1.1.2. Reflective observation (RO)

Reflective observation is anticipated in socializing or orientating the learner nurses to effective utilization of theoretical principles in solving problems. As learner nurses they reflect back on acquired experience through observational ability. The focus and orientation towards reflection observation is based on understanding the meaning of ideas and situations by carefully observing and impartially describing them (Kolb, 1984). According to Burton (2006), reflection observation creates an opportunity that allows learner nurses to learn from practice in a more-in-depth way that enhances practice. Hence, integration of both theory and practice, and utilization of simulation and interpretation of very experience in particular. The learner nurses who belong in this category are divergers and assimilators. A diverger combines the learning modes of concrete experience and reflective observation (Bastable, 2008). The learner nurses in RO are good at viewing the concrete situation from many points of view.

The assimilator combines the learning modes of abstract conceptualization and reflective observation (Bastable, 2008). In this type, the learner nurses demonstrate the ability to understand large amounts of information by putting it into concise and logical form (Bastable, 2008). The assimilator learners are less interested in people, but focus more on abstract ideas and concepts. They also need more time to reflect on what is being learned and how information can be integrated into their past experience (Bradshaw and Lowenstein 2011; Bastable, 2008; Kolb 1984). Therefore, the utilization of simulation and its related scenarios assist them to think critical and try to solve problems using scientific approach (Quinn and Hughes 2007).

1.6.1.1.3. Abstract conceptualization (AC)

According to Žorga (2002) cited in Nxumalo (2011), described AC as a process of searching the meaning of experience and trying to link with the theoretical knowledge. In this stage, the learner nurses rely on logic and ideas rather than on feelings to deal with problems or situations, hence learning by thinking, which may be achieved through the reflective observation and concrete experience acquired during simulation in a clinical laboratory (Nxumalo, 2011; Bastable, 2008). According to Kolb (1984) the focus in this regard is on building theories and solving problems using or through a scientific approach. The learner nurses that fall under this category includes: assimilators and convergers. Assimilators demonstrate the ability to understand large amounts of information by putting it into concise and logical form (Bastable, 2008). They love ideas, detailed oriented and exhibit intellectual competence in traditional classroom 9Childs and Sepples, 2009). The learner nurses learn best through demonstration, return demonstration and simulation. They find practical application of ideas and theories and have an ability to use deductive reasoning to solve problems. They see things from different perspectives and interested in people and broad cultural interests (Kolb, 1984).

1.6.1.1.4. Active experimentation (AE)

Active experimentation it is also called the doing mode, whereby the learner nurses are trying to test the model or theoretical content based on simulation scenario, hence active learning (Bastable, 2008; Bandura, 1994; Kolb, 1984). The learner nurses in AE

like to test the implications of theories and concepts in solving problems, which in turn assist them in trying to integrate both theory and practice (Quinn and Hughes 2007). For example, in utilization of simulation, where the nurse educator will have to stimulate the minds of learner nurse with a certain theoretical scenario and expect them to simulate based on given instructions or observes the simulator to simulate based on given scenario or settings (Bastable, 2008). The learner nurses in this category are accommodators and convergers.

According to Kolb and Fry (1975), the learning cycle can start at any of the four modes or points, and the learner nurses need to be guided by the nurse educators throughout the learning process in order to ensure that the cycle is completed effectively. Therefore, the learner nurses will be able to meet the goal in integrating both the theory and practice during learning (De Jong, 2006).

1.7 Summary of the research methodology

A qualitative exploratory, descriptive and contextual research design was used to describe the utilization of simulation by nurse educators and learner nurses at the Limpopo College of Nursing, Limpopo Province. Detailed information regarding the methodology of the study is discussed in chapter 3.

1.8 Significance of the study

It is anticipated that the study might yield information that might contribute to effective utilization of simulation by nurse educators and learner nurses at the Limpopo College of Nursing. This study might also assist in identifying possible challenges faced by nurse educators and learner nurses in the utilization of simulation during teaching and learning at the nursing college. It is hoped therefore, that this study might assist in developing strategies for the utilization of simulation at Limpopo College Nursing.

1.9 Conclusion

This chapter described the introduction and background of the study, problem statement, aim and the objectives as well as the theoretical framework and significant of the study in a summary form. The following is chapter 2, which is on literature review.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This chapter incorporates a literature review on the utilization of simulation by nurse educators and learner nurses. This was done to gain more understanding on what is already known and also to identify the gaps about the phenomenon under study.

2.2 The establishment of simulation in nursing education as teaching strategy

Simulation technology or technique was introduced to nursing education in 1950, and since then it has gained popularity and currently it is widely used in various nursing colleges worldwide (Nickerson, Morrison and Pollard, 2011; Como, Kress and Lewental, 2009).

The utilization of simulation in nursing education began with low-technology simulation (LTS) in the 1950s and included four common types, namely:

- Written simulation (use case studies about real situations, whereby the learner nurse will have to respond to the given scenarios)
- Clinical simulation (can be set up to replicate complex care situations, such as mock cardiac arrest)
- Model simulation (used to teach a variety of audience) (Nickerson, *et al*., 2011; Como, *et al*., 2009).
- Simulation technique it has been utilized for orientation programs, continuing education, certification courses, and staff development (Yuan, Williams and Fang, 2012).

Nursing education incorporates both teaching and learning activities, which involve the interaction of a nurse educator and a learner nurse. This process is fulfilled through the utilization of a variety of integrated teaching and learning strategies. These strategies include the following:

- Demonstration
- Simulation
- Lecturing
- Storytelling
- Role play and many more

The utilization of simulation as a teaching strategy has become part of undergraduate nursing programs and it assist in orientation of learner nurse on the responsibilities are to be attained by them after completion of the training program at clinical area (Kelly and Zewe, 2013; Aebersold, Tschannen and Bathish, 2012).

2.3 The utilization and importance of simulation in nurse education and nursing

Utilization of simulation teaches learner nurses how to feed a helpless patient or position changing using a model: Sim-man, and computer simulation. This is used in learning laboratories to mimic situations whereby the feedback and feed-forward is given to the learner nurses for future improvement. This enables them to develop decision making skills for better nursing care (Gates, Parr and Hughen, 2012; Bastable, 2008).

As the nursing profession is characterized by a variety of innovative techniques, therefore nurse educators should keep on updating their skills as well, based on the utilization of simulation through the support of the nursing college (Wagner, Hallmark, Farrar & Overstreet, 2008).

According to Lapkin, Levett-Jones, Bellchambers and Fernandez (2010), utilization of simulation in nursing education improves critical thinking skills, knowledge acquisition and the ability to identify a clinical emergency such as hypoglycemia. Harder (2010) also outlined that the utilization of simulation in nursing education has shown a great difference when compared with the other teaching strategies in improving the learner nurses' skills in the majority of studies examined. Morgan, Cleave-Hogg, Desousa and Lam-McCulloch (2006) in their study conducted at University of Toronto in Canada,

found that simulation is a valuable learning experience and bridges the gap between theory and practice.

Gosselin (2013) in the study that was conducted at the University of New Hampshire using high fidelity simulation (HFS) revealed that as the effectiveness increased regarding the utilization of simulation, the anxiety levels decreased among learner nurses. Its report of the effectiveness of simulation reflects a positive correlation with high scores of self-efficacy. It further outlined that low reports of anxiety correlate with high reports of self-efficacy (Gosselin, 2013).

Duvall (2012) also conducted a study at the University of Alabama, in the United States of America and found that nurse educators were highly motivated, autonomous and competent. They also relied on co-workers for a sense of belonging at work.
The study also found that there were challenges that nurse educators experienced regarding the utilization of high fidelity simulation (HFS) and these included lack of funding, faculty support, lack of time and fear of technology. With regard to technological readiness, the study further found that there was a significant mean difference between self-identified experts and novice for optimism (Duvall 2012).

Another study was conducted in Australia; the participants were nurses who work in haemodialysis unit. The aim was to provide an overview of a haemodialysis simulation program. The study also revealed that simulation training bridges the theory-practice gap in nursing (Dunbar-Reid, Sinclair and Denis, 2011).

Dunber-Reid, et al (2011) in their study further revealed that utilization of simulation assists in preparing learner nurses to be competent nurses and to be able to function well in the multi-sectoral society. This assists in the acquisition and development of new skills, such as managing a patient on hemodialysis.

Hayden cited in (Gosselin, 2013) reported that, in the national survey (Nursing Simulation Experience: *Self Efficacy, State Anxiety, Locus of Control and Simulation*

Effectiveness), in 2010, one thousand and sixty (1060) surveyed registered nursing programs recounted their utilization of simulation laboratories.

The data revealed eighty one (81%) percent of the surveyed nursing programs engaged learner nurses in medium or high fidelity nursing simulation. Simulation experiences were mostly incorporated in surgical course work. More than fifty (50%) percent of the responding survey participants also reported simulation utilization in five or more core courses within the nursing curriculum.

Hayden cited in (Gosselin, 2013) further reported that, eighty one (81%) percent of the sample, reported a need to incorporate more simulation hours in their curriculum. Whereas the remaining eighteen (18%) percent was satisfied with their present utilization of simulation. As this offers the testimony to the type of experience the learner nurses can have with the proper utilization of clinical simulation in nursing.

Another study was done at University of Port Harcourt in Nigeria by Arigbede, Denloye and Dosumu (2014) which revealed that there was insignificant correlation between the outcomes at both examinations in clinical skills laboratory and real life practice. As most of the respondents (62.5%) agreed that teaching in skills laboratory was tiresome and most (75.0%) strongly agreed that the number of students constitutes a serious challenge to learning (Arigbede, *et al.,* 2014).

According to Arigbede et al (2014) the performance of students in simulator learning environment do not have a significant relationship with their performance in real life clinical practice and that the students – staff ratio appeared to make teaching experience at clinical skills laboratory unpleasant.

Furthermore, the study conducted by Young and Burke (2010), at Washington state university – college of nursing and Yakima Valley Memorial hospital revealed that the utilization of simulation overwhelmed the participants and felt that the course on use of simulation helped them to be better prepared for independent practice within the

hospital. It further indicated that it helped them to develop critical thinking skills, better defined the participant's role as registered nurses as it fostered communication skills and prioritizing skills (Young and Burke, 2010).

According to Schafer (2013) in Egypt, the SIU-Edwardsville Nursing Simulation Laboratory at Lindegren Hall provides the learner nurses with an opportunity of hands – on practice without a risk of injuring a human by using computer simulated "patients." Therefore, this is done to boost program interest.

Ober (2009) conducted a study at University of Massachusetts Worcester, United State, titled: Student Nurses' Experience of Learning with Human Patient Simulation (HPS), revealed that the findings showed that participants felt that structure was critical to optimize learning opportunities and students expressed a need to repeat, or view a simulation situation performed correctly, to reinforce learning, and verbalized that HPS helped them to develop critical thinking (Bray, Schwartz, Weeks and Kardong, 2009).

In the Republic of South Africa (RSA), the North-West University's (NWU) Potchefstroom Campus is the first recipient of a medical simulation dummy in the country. This dummy is used to train learner nurses, as it is able to simulate any medical condition for learning purposes. It further allows for clinical skills, such as venepuncture or finger prick for diabetes mellitus tests (Scheppel, 2011).

Botma (2014) conducted a study at University of Free State titled: "Nursing student's perceptions on how immersive simulation promotes theory – practice integration" which concluded under theme theory – practice integration that utilization of simulation brings theory into practice, retains knowledge longer and helps nursing student to think critically and apply current knowledge.

A study was also done in SA by Archer (2010) at the University of Stellenbosch. This study reported that the critical care (CC) tutors involved in the programme reached consensus that 10 of the 12 practical procedures would be appropriate to be taught and

assessed in simulation in the clinical skill centre (CSC). It further reported that the students have valued the simulation sessions as they would repeat practical procedures in the CSC without causing harm to their patients and it also helped them to be more confident and competent to perform these same procedures on real patients (Archer, 2010).

Powell (2012) conducted a study in SA that was aimed at determining the effectiveness of simulation training in improving the clinical competency of pupil nurses. The study revealed that although there was proof that clinical training in simulation improves the competence levels of the experimental group in the procedure of administration of oral medications over a period of time, there was no proof that this was true for the procedure observation of patients' neurological functions. However, the study could not give a definite conclusion about the effectiveness utilization of simulation training in nursing (Powell 2012).

According to Powell (2012) in the study done at Private hospital group's Learning Centre in Gauteng SA, revealed that utilization of simulation in the country is in progress, although more still need to be done. Since it further indicated that, the study could not bring forth the valuable results. But strongly believe that utilization of simulation can bring or have valuable implications for nursing education and practice for the learner nurses.

This is well achieved through the active involvement of the nurse educators, by adopting and encouraging clinical simulation as an orientation teaching strategy during experiential learning. Furthermore, the author recommended that, further studies can be done with similar research with a larger group to discover if learner nurses really benefits from the utilization of simulation during learning (Powell, 2012).

2.4 Perceptions and benefits of simulation utilization

According to Gatti-Petito (2011), in the study, and the purpose was to describe and measure nursing students' perceptions of caring before and after simulation experiences with high-fidelity human patient simulators, and also to evaluate how they change found that the significant change was marked on learner nurses' caring and the study further outlined that due to learner nurses' active and passive role in simulation experiences there were no significant change.

Ober (2009) conducted a study at University of Massachusetts Worcester, United State, titled: Student Nurses' Experience of Learning with Human Patient Simulation (HPS), revealed that the participants felt that structure was critical to optimize learning opportunities and students expressed a need to repeat, or view a simulation situation performed correctly, to reinforce learning, and verbalized that HPS helped them to develop critical thinking (Ober, 2009).

The utilization of simulation in nursing education assists learner nurses to integrate theory and practice through the transference of theory and development of skills in specific patient situations (Banner, 2010; Johnson, 2009).

According to the study done by Lasater (2007) on high fidelity simulation (HFS) with learner nurses who enrolled in nursing care of adult course, were given simulation activities for a week, after completion of the course eight learner nurses derived from fifteen learner nurses, participated in a focus group and were allowed to discuss their experiences on interaction with HFS. The study identified the following themes:

- Simulation integrates learning
- It increased the breadth of experiences the students were exposed to

2.5 Conclusion

The literature review covered a number of activities, roles, benefits and aspects (perceptions/experiences) that concerns the utilization of simulation in nurse education and nursing. The utilization of simulation as teaching and learning strategy in nurse education remains a strong pillar when it comes to the integration of theory and practice. Both the nurse educators and learner nurses should realize the role played by utilization of simulation, and implement it as another teaching and learning strategy.

The reviewed studies in this chapter gave a clear picture on how simulation was used and the distinction was marked from university level to college level worldwide. All the approaches used at above indicated institutions aimed at achieving one goal during utilization of simulation in clinical laboratories. Chapter 3 follows with detailed information on methodology used in this study.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

This chapter described in detail the research design and methods that were used in the study in order to achieve the study objectives and answer the research question.

3.2 Research setting

The Limpopo College of Nursing is a post- secondary educational institution which offers professional nursing education at a basic and post basic level where such nursing education has been established in terms of section 15 and Section 2 of the Government Notice No. R425 South African Nursing Council (SANC, 1997). It offers a four year diploma programme for education and training of a Nurse in (General, Psychiatric & Community) and Midwifery which leads to registration with the South African Nursing Council (SANC) Regulation R425 (22 February 1985), as amended. The LCN consists of five Campuses which are Giyani, Sovenga, Thohoyandou, Sekhukhune and Waterberg, and are situated in different districts.

The study was conducted at the three well established campuses, namely, campus A which is situated in the Capricorn district and it is about 30 km from Polokwane city. Campus, B is situated in the Mopani district and it is about 158 km from Polokwane city and campus C. is situated in the Vhembe district and is about 149 km from Polokwane city.

3.3 Research design and Methods

A qualitative research method was used to describe the utilization of simulation by nurse educators and learner nurses at the Limpopo College of Nursing, Limpopo province. Qualitative method is the study about human experiences or perceptions and

it is often conducted in natural settings. It uses data that can be in a form of words or text and not numbers, in order to describe the experiences or perceptions that are being studied (LoBiondo-Wood and Haber, 2010; DiCocco-Bloom and Crabtree, 2006).
Through qualitative enquiry, the researcher was able to explore the utilization of simulation by nurse educators and learner nurses at LCN (Polit and Hungler 2013; Babbie and Mouton, 2011; Newell and Burnard, 2006).

3.4 Research design

A qualitative exploratory, descriptive and contextual research design was used to describe in- depth the utilization of simulation by nurse educators and learner nurses at the Limpopo College of Nursing Limpopo province.

3.4.1. Exploratory research design

The exploratory research design was used to explore the utilization of simulation by nurse educators and learner nurses at the Limpopo College of nursing. The exploratory research design enabled the researcher to gain insight on how the nurse educators and learner nurses utilize simulation in order to find a meaning from the data to be collected at LCNCs (Jolly and Mitchell, 2010). De Vos, Strydom, Fouche and Delport (2011) define the exploratory research design as a study that explores the areas that are unknown with the aim of investigating the full nature of the phenomenon as it will provide with the in-depth information.

3.4.2. Descriptive research design

A descriptive research design was used to describe in detail the utilization of simulation by nurse educators and learner nurses at the LCN. The descriptive research design enabled the researcher to give participants an opportunity to describe in detail their utilization of simulation at the Limpopo College of Nursing. De Vos, et al (2011) and Pilot and Hungler (2013) define a descriptive research design as a research study that has as its main objective the accurate portrayal of the characteristics of persons, situations or groups.

3.4.3. Contextual research design

The contextual research design enabled the researcher to describe in detail the utilization of simulation by nurse educators and learner nurses at the Limpopo College of nursing where teaching and learning take place. A thick and detailed description of lived experiences with selected anecdotes and comments from the participants was provided. Through this design, the researcher aimed at describing and understanding events within the concrete, natural context in which they occurred, which in this case was the utilization of simulation by nurse educators and learner nurses at LCNCs. In this case it was the Limpopo College of Nursing where the nurse educators utilize simulation as one of the teaching strategies during the teaching and learning process. Learner nurses use it as the way of acquiring new information (learning strategy) during their learning process (Babbie and Mouton, 2009).

3.5 Population

Babbie and Mouton (2011) define population as the theoretically specified aggregation of study elements, while Brink (2006) state that, population is a complete set of participants that possess some common characteristics that is of interest to the researcher hence nurse educators and learner nurses. The population of the study consisted of 79 nurse educators working at LCNCs and facilitating in clinical component from second level to fourth level, and 885 learner nurses registered at Limpopo College of Nursing as learner nurses under R425 regulation relating to the approval of the minimum requirements for the education and training of a nurse (General, Psychiatry & Community) and Midwife, at the LCNCs in clinical component from second level to fourth level of their study.

3.6 Sampling

Non-probability purposive sampling was used to obtain sample size of 15 participants (nurse educators) from clinical component facilitating from second level to fourth level of study at the College. In each LCNC sampling was done using staff establishment list obtained from Human resource department per clinical component at the LCN, and this was done until data redundancy or saturation was reached (De Vos, Strydom, Fouche and Delport, 2011). On the list the nurse educators are listed according to the LCNCs and clinical components.

According to de Vos, et al (2011) sampling is defined as a small portion of the total set of objects from whom a representative sample of participants is made. They further indicated that purposive sampling is entirely based on the judgement of the researcher, as the sample composed of participants typical of the study phenomenon (de Vos, *et al.*, 2011).

Table 3.1: Category for nurse educators

Campus	Number of participants
1. Campus A	5 nurse educators
2. Campus B	10 nurse educators

Sampling was further done to obtain 27 participants (learner nurses) from second level to fourth level of their study at the three well established LCNCs. Nine learner nurses were sampled from each campus making total of 27 learner nurses who were sampled from the main population through the use of learner nurses class register, obtained from class teachers from second level to fourth level of learning in the three LCNCs. Sampling was continued until data redundancy or saturation was reached (Grove, Burns and Gray, 2013; de Vos, *et al*., 2011).

Table 3.2: Category for learner nurses

Campus	Number of participants
1. Campus A	9 learner nurses
2. Campus B	9 learner nurses
3. Campus C	9 learner nurses

3.6.1. Inclusion criteria

- All nurse educators from clinical component facilitating from second level to fourth level of learning at LCNCs selected campuses were included in the study.
- Learner nurses at LCNCs selected campuses from second level to fourth level of study were included in the study.

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3.6.2. Exclusion criteria

- All learner nurses in the first year of study were excluded from the study because of their limited exposure in the clinical area and also with the utilization of simulation LCNCs.

3.7 Data collection

3.7.1. Preparation and information sessions

The researcher communicated with LCN acting principal and LCNCs vice-principals telephonically and by sending letters regarding the study, which entailed the topic, aims, objectives and significant of the study in order to obtain permission to conduct the study. The letters were augmented with the approval letters from MREC, DoH research ethics committee and Limpopo Province Nursing Directorate.

The permission to meet with nurse educators and learner nurses (participants) was therefore granted by DoH research ethics committee and Limpopo Province Nursing Directorate, and this was achieved purposively since the researcher is a nurse educator at LCN, and involved in the integration of theory and practice in the clinical area.

The researcher further met physically with (participants) prior focus group discussion and semi-structured in -depth interview in order to provide information regarding the aim and objectives of the study together with central research question. Data collection instruments were also explained together with consent form prior to the commencement of data collection sessions.

3.7.2. Data collection instruments

3.7.2.1. Semi-structured in-depth interview

Semi-structured in depth- interviews were conducted at LCNCs (campus A and B) with fifteen (15) participants (nurse educators). At the beginning of each interview the researcher greeted the participants and followed by self-introduction. The researcher further outlined and explained the aim, objectives and significance of the study to them. The use of voice recorder and taking of field notes was also indicated prior the interview and used to gather verbal and non-verbal data. The one to one interviews were conducted in a private, quiet, well ventilated room that was free from destructions (LoBiondo-Wood and Haber, 2010).

Open-ended questions that allowed participants to speak freely were used to enable participants to describe in details the utilization of the simulation by learner nurses and nurse educators at the Limpopo College of Nursing. The central question that guided the interview was: **How is the utilization of simulation by nurse educators and learner nurses at the Limpopo College of Nursing?**

The researcher was listening to the participants attentively in order to gain more understanding on each and every idea indicated during the interview regarding the utilization of simulation at LCNCs. This was done through voice recording and taking of field notes. Each interview lasted for about 30-60 minutes. Probing questions were also used for clarification purposes. According to Babbie and Mouton (2011) and Brink (2006) probing is the act of seeking more clarity from the participant's said unclear idea.

In this study the researcher was able to probe during the interview to encourage the participant to elaborate more regarding the utilization of simulation at LCNCs. Through probing, the researcher was able to get more data or information and also gain more understanding on hidden ideas. Data collection continued until data saturation was reached (Babbie and Mouton, 2011; Newell and Burnard, 2006).

3.7.2.2. Focus group discussion session

Three focus groups discussions were conducted at LCNCs (campus A, B and C) with twenty seven (27) participants (learner nurses) and each focus group discussion consisted of nine (9) participants. At the beginning of each session; the researcher greeted the participants, welcomed all warmly and introduced self. The researcher further explained the aim, objectives and significance of the study to them.

Open-ended questions that encouraged participants to become more active during the discussions were used. An interview guide was also used to aid in data collection. A voice recorder and field notes were also used in data collection. Data was collected until saturation was reached.

The environment where the sessions were conducted was well ventilated and free from any obstacles (LoBiondo-Wood and Haber, 2010). This allowed participants to explain how they utilize simulation at LCNCs freely. During the session the researcher allowed participants to answer all questions in a relaxed manner. The researcher listened attentively to each participant. Each FGD lasted for about 30-60 minutes.

The researcher considered observation during data collection as it was believed that all actions displayed by participants are systematically and related to the answers provided. According to Munden (2006) reflection is regarded as repetition of idea(s) said by the participant(s) aiming at gaining understanding and to ensure that the participant meant what was said. The researcher achieved this through evocation whereby the said idea was directed back to the participant during data collection.

3.8 Bias

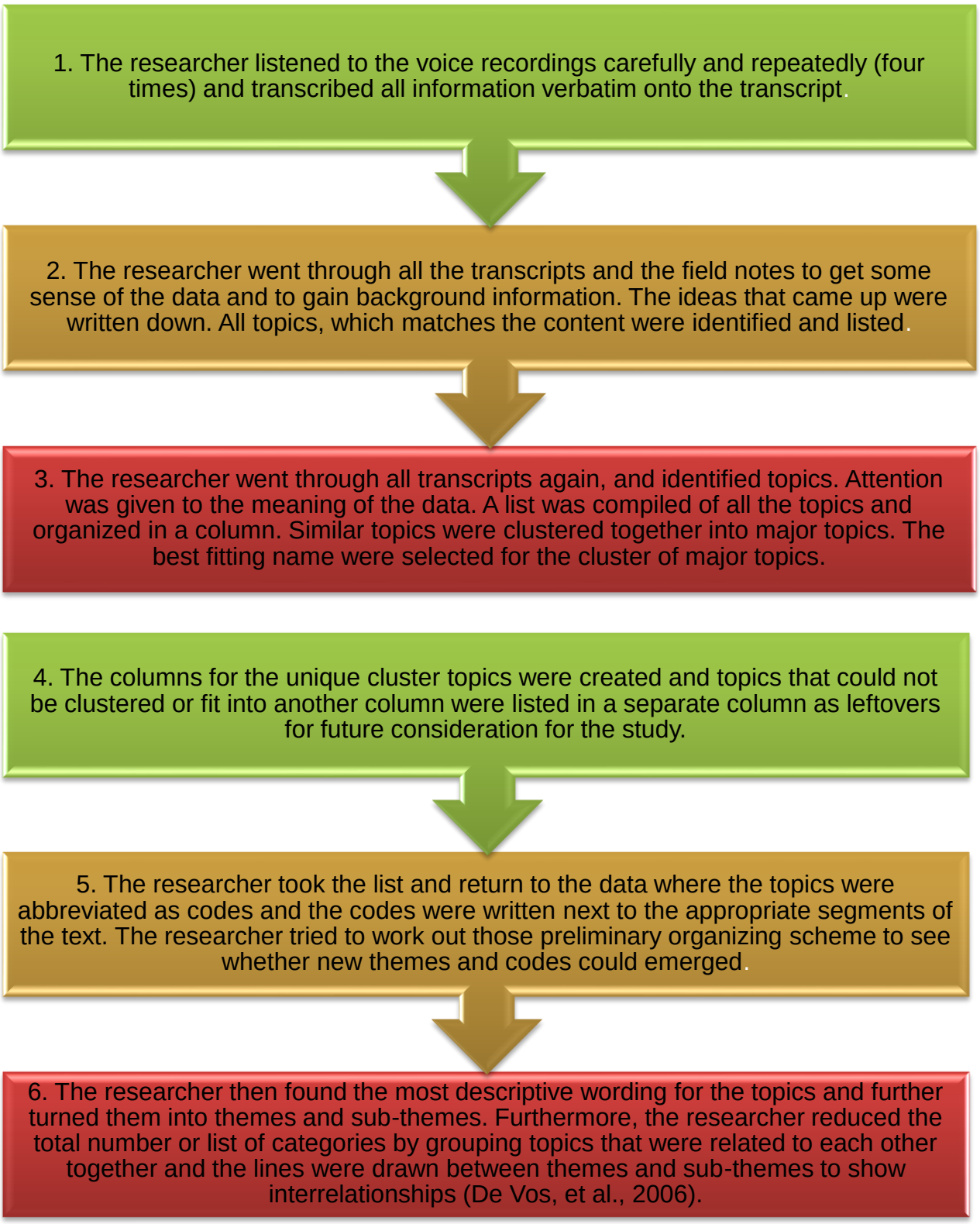
Bias is regarded as any influence that produces a misrepresentation in the results of a study (Penwarden, 2013; Babbie and Mouton, 2011; Polit and Hungler, 2013). Bias was minimised as follows:

- The researcher held back the preconceived ideas about utilization of simulation in nursing education.
- Non probability purposive sampling was used to sample the participants who are nurse educators from clinical components and learner nurses from level two to level four of study at LCNCs.
- Probing was done to seek more clarity regarding the ambiguous responses or answers and no leading questions were used nor asked during data collection
- Field notes and voice recorder were used during data collection and analysis in order for the researcher to stick on what was verbalized by the participants.
- During data collection, observation of the participants was done to register any important reaction: verbal and non-verbal responses.
- During data analysis, transcripts were carefully read and coded using themes and sub-themes. The external coder verified the themes and sub-themes that emerged from the data

3.9 Data Analysis

Tesch's eight open coding approach of data analysis as described in Creswell (2009) were used in this study for both semi-structured and focus group discussion. The researcher achieved this through transcribing the taped verbatim into transcripts. According to Babbie (2013) data analysis in qualitative research is regarded as a method for exploratory social research data without converting them to a numerical format for the purpose of discovering underlying meanings and patterns of relationship.

STEP AND PROCESS



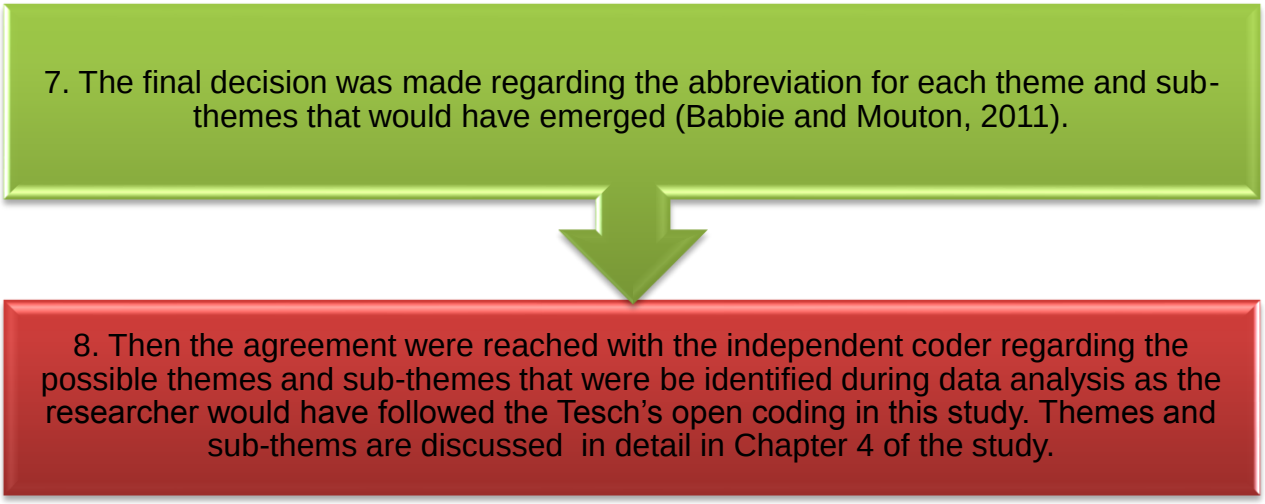


Figure: 3.1: The summary of the Tesch's open coding approach followed during data analysis

3.10 Measures to ensure trust worthiness

The researcher adhered to the following principles in order to ensure trustworthiness:

3.10.1. Credibility

Credibility was ensured by prolonged engagement-staying at the field until data saturation occurred. Credibility is described as the compatibility between the constructed realities that exist in the mind of the participants and with those that are attributed to them (Babbie and Mouton, 2011).

3.10.2. Confirmability

Confirmability was ensured in this study with the use of a tape recorder and field notes to support the semi-structured interviews as a point of reference (de Vos, et al., 2011; Brink, 2006). Furthermore confirmability was ensured by creating audit trial whereby the documents such as transcript, voice recordings and fields' notes were done, compiled and handed over to the supervisor, co-supervisor and Independent coder to make conclusions about the data. Babbie and Mouton (2011) describe confirmability as

the degree to which the research findings are the products of the focus of the enquiry and are also far from biases of the researcher in relation to the topic of study.

3.10.3. Transferability

Transferability was ensured by the thick description of research methodology and also by purposive sampling. Transferability is described as the extent to which the research findings can be applied in other context or with other participants. The task of the researcher in this case was to describe the research context that is central to the research topic (Brink, Van der Walt and Van Rensburg, 2012; Babbie and Mouton, 2011).

3.10.4. Dependability

Dependability refers to the consistency of research findings in the qualitative study approach and that if it was to be repeated with the same participants the findings would be the same. Dependability was ensured by a detailed description of the research method in this chapter (Babbie and Mouton, 2011).

3.11 Ethical Considerations

The researcher adhered to the following ethical considerations when conducting this study:

3.11.1. Permission

Ethical clearance to conduct the study was obtained from the University of Limpopo Medunsa Research Ethics Committee (MREC) (Appendix A). Permission to conduct the study was obtained from the Department of Health Limpopo Province (Appendix B).

3.11.2. Informed consent

Informed consent was obtained from nurse educators and learner nurses after the purpose and the objectives of the study were explained to them. Participants were also informed that participation was voluntary and that they have rights to withdraw from the

study without victimization or coercion (LoBiondo-Wood and Haber, 2010). Permission to use a tape recorder and field notes was also obtained from the participants.

Informed consent is defined as the legal principle that governs the participant's ability to accept or reject the request of the researcher to participate in the study (LoBiondo-Wood and Haber, 2010). While Wiles, Crow, Charles and Heath, (2007) and Davis, (2006) describe informed consent as one of the main responsibilities of the researcher that the researcher should have towards the research participants, whose right should be respected at all the times or it is central to ethical research practices (Koch and Kralik, 2006).

3.11.3. Justice

Justice in this study was ensured through careful and fair selection of participants and all participants were asked the same question. Furthermore, the researcher conducted face to face interviews and focus group discussions with participants in a safe and private room throughout data collection, thus treating participants fairly and protecting them from unintended harm. It was also ensured by respecting the time and date for the meeting, and also any idea rose during data collection, and each session was terminated at agreed time with participants.

3.11.4. Anonymity and Confidentiality

Anonymity was ensured by the use of code numbers instead of real names of the participants. The names of the campuses of the LCNCs were omitted and each campus was given a code name. According to LoBiondo-Wood and Haber (2010), anonymity is described as a research participants' protection in a study so that no one, not even a researcher can link the participants with information given. According to Brink et al (2012) anonymity refers to the act of keeping individual names in relation to participation in the research.

Brink et al (2012) refers to confidentiality as the researcher's responsibility to protect all data gathered within the scope of the project from being divulged or made available to

any person. The participants' point of view was kept between the researcher and participant, and was not disclosed in association with their identity. According to LoBiondo-Wood and Haber (2010), confidentiality is the assurance that a research participants' identity cannot be linked to the information given to the researcher. The field notes draft and the typed research transcripts together with voice recorder were always kept under lock and key in a locker at the researcher's office and no one could access them. According to Schwandt (2007) cited in Guest, Namey and Mitchel, (2013) data management is described as an method for regulating and filling research materials in a safe place so that in future can be retrieved.

3.11.5. Privacy

Privacy in this study was ensured through conduction of face to face interviews and focus group discussions in a safe and private room throughout data collection process, this was done to ensure limitation of destructors. The tape recording, transcripts and field notes were kept under lock and key in the researcher's office (Brink, et al., 2012).

Privacy of the participants is described as the freedom of a person to determine the time, extent and circumstances under which private information is shared or withheld from others inside and outside the study (LoBiondo-Wood and Haber, 2010).

3.12 Conclusion

The researcher in this chapter has discussed briefly how the study was conducted. Further explained the research approach and research design used, he further discussed how the data was collected and analysed followed by explanation on research setting, ethical aspects and measures to ensure trustworthiness and the discussion on how population and sampling methods were applied in this study. The following chapter is on discussion of research findings.

CHAPTER 4
RESULTS AND DISCUSSION

4.1 Introduction

The presentations of the results are those of the semi-structured in depth- interviews carried out with fifteen (15) participants (nurse educators – face to face interviews) and FGD with 27 participants (learner nurses) who utilize simulation at Limpopo College of Nursing Limpopo Province, South Africa. The themes and sub-themes identified from data are supported by a literature control that strengthen the study findings and participants' verbatim statements which are used and presented in the study in an italic format.

4.2 Themes and sub-themes

Three (3) themes and six (6) sub-themes categorised as emerged from the results of the study. The themes were: Access versus lack of access to clinical laboratories by learner nurses; Difficulties experienced with the use of manikins and Time for simulation of skills. The identified themes and associated sub-themes are outlined below in table 4.1.

Table 4.1: Themes and sub-themes identified through data analysis

Theme	Sub-theme
1. Access versus lack of access to clinical laboratories by learner nurses	1.1. Lack of access to clinical laboratories versus utilization of clinical laboratories is limited to specific period 1.2. Limited resources resulting in compromised clinical Learning
2. Difficulties experienced with the use of manikins	2.1. Available manikins not relevant to performed procedures 2.2. Shortage of manikins versus number of learner nurses In clinical laboratories

3. Time for simulation of skills	3.1. Skills laboratory space not accommodative to the large classes Versus total number of existing groups affects quality skills demonstration 3.2. Lack of feedback versus feedback demonstration by Learner nurses

4.2.1. Theme 1: Access versus lack of access to clinical laboratories by leaner-nurses

The study found that at LCNCs the clinical laboratories are accessed by learner nurses at the beginning of each year when nurse educators demonstrate clinical skills for orientation purposes, and also during observed structured clinical assessment (OSCA) examination. The idea above has been evident by the following sub-themes:

4.2.1.1. Sub-theme 1.1: Lack of access to clinical laboratories versus utilization of clinical laboratories is limited to specific period

The findings of this study revealed that clinical laboratories at LCNCs are always kept under lock and key and learner nurses also do not access the simulators in order to practice clinical skills through the use of manikins for clinical skills betterment.

Participant one [1] (nurse educator) said the following:

"*We usually use clinical laboratory when we orientate learner nurses to new clinical skills once at the beginning of each year*".

Participant one [1] (nurse educator) further said:
"*We use simulation once when we orientate learner nurses to new skills, then later they go to the clinical area for application on real patient*".

Participant three [3] (nurse educator) added:
"*Both nurse educators and learner nurses not keen to utilization of simulation as we only use them once a year, particularly when need arises, one other thing is that are kept under-lock and key, learner nurses are unable to practice clinical skills till they develop self-confidence and become competent*".

Participant four [4] (nurse educator) also added:
"We use simulation at times, but not always; With Psychiatric Nursing Science (PNS) skills, we usually use support staff at the Campus to act like a Mental Health Care User (MHCU) and we coach them before simulation starts".

Participant eleven [11] (nurse educator) said:
"Learner nurses do not access the clinical laboratories and there is no one to manage the laboratories"

Participant five [5] (learner nurse) also added:
"*We (nurse educators & learner nurses) do not utilise simulation well, because they (nurse educators) only use dolls to show us clinical skills once or twice or thrice at the beginning of the year and not all learner nurses are given time to do return demonstration".*

Participant three [3] (learner nurse) concurred:
"We have laboratories and use them for simulation activities following procedure manual, and we treat manikins like real patient. We do it once at the beginning of each year".

Participants twenty one [21] and twenty three [23] (learner nurses) also said:
"The clinical laboratories are always kept under lock and key, so it's difficult to use them and manikins cannot be accessed"

Participant five [5] (learner nurse) said:
"*Nurse educators do not really utilize simulation; they only utilize dolls once or twice a year only when they want to demonstrate a skill and learner nurses do not utilize them since are not given chance to do return demonstration"*. "*We utilize simulation once, and more simulation rooms should be available to accommodate all of us and to allow us practice skills more often*".

The sentiments above are backed by the study conducted at a College of nursing in the Western Cape following qualitative enquiry by Abrahams-Marra (2013), which stated that access to clinical laboratories is limited due to the large numbers of learner nurses, and this leads in lack of time and opportunity for learner nurses to practice clinical skills.

Hayden cited in (Gosselin, 2013) also reported that, eighty one (81%) percent of the sample, reported a need to incorporate more simulation hours in their curriculum. Whereas the remaining eighteen (18%) percent was satisfied with their present utilization of simulation. A study conducted by Arigbede, Denloye and Dosumu (2014) at University of Port Harcourt in Nigeria also revealed that there was insignificant correlation between the outcomes at both examinations in clinical skills laboratory and real life practice. 62.5% of the respondents agreed that teaching in skills laboratory was tiresome and 75.0% of the respondents strongly agreed that the number of students constitutes a serious challenge to learning (Arigbede, at el., 2014).

Bimray, Roux and Fakude (2013), concurred that the use of simulation is commonly on especial skills in laboratories for clinical teaching and clinical evaluation. It was also outlined that utilization of simulation ensures that learner nurses are exposed to real life encounter in a structured environment. So the effective utilization of simulation throughout the academic year will enhance learning, and learner nurses will perceive the simulated patient encounter as an opportunity to connect and make a difference in the life of the patient, and not to be skill performers.

Kolb Experiential Learning Model outlines that, CE is the basis for observation and reflection from which concepts are assimilated and actively tested. Learner nurses (divergers and accommodators) observe in the simulation laboratory a simulator simulating a certain medical condition and they may perceive it differently, hence active imagination (Bruce, *et al*., 2011; Billings and Halstead, 2009). Therefore, experiential learner nurses respond by being involved in a certain skill or experience that is for future use in the clinical setting.

4.2.1.2. Sub-theme 1.2: Limited resources resulting in compromised clinical learning

The findings of this study reported that there is shortage of clinical laboratories at LCNCs. The study also revealed that the laboratories are small for the number of learner nurses during demonstrations or orientation of clinical skills at the beginning of the year. It further revealed that clinical laboratories have old and non-functional simulation equipment. These sentiments are expressed as follows:

Participant one [1] (nurse educator) said the following:

"*At the college campuses clinical laboratories are not enough and the dolls we use do not match or fit well on certain skills, in midwifery and community nursing science. This is because in 3rd level learner nurses are currently 82, so if you are using one doll in a demonstration room which is not conducive, simulation become compromised*".

Participant ten [10] (nurse educator) added:

"Here at LCNC, simulation laboratory is commonly used by General Nursing Science. This is because with Biological and Natural Science and Midwifery clinical skills, the simulation rooms are not conducive to learning and cannot meet the component standard for clinical activities".

Participant seven [7] (nurse educator) also added:

"Clinical laboratories need some improvement so that the space can tally with the number of learner nurses which are high"

Participant fourteen [14] (nurse educator) said:
"Our laboratories are old and need some renovations, and also with the computerized laboratories".

Participant five [5] (learner nurse) support as follows:
"*Enough simulation rooms may allow learner nurses to practice clinical skills more often, so simulation rooms here at this campus are not conducive and the dolls are old and not tallying with the number of learner nurses during clinical skill orientation*".

Participant six [6] (learner nurse) concurred:
"The laboratories are not conducive, equipment are also broken. This makes simulation to be more difficulty".

Participant three [3] (nurse educator) also added:
"*It's not utilized accordingly due to lack of resources and learner nurses do not have enough time for simulation because we only utilizes simulation once at the beginning of each academic year and when a need arises*".

The findings of this study were supported a study done by Wellard, Solvoll and Heggan (2009), that found that there was insufficient simulation equipment in clinical laboratories to support the learning of the learner nurses. The study further found that the limited available simulation equipment were outdated.

Reese, Jeffries and Engumm (2010) concurred and stated that the degree of fidelity and complexity of the simulation need to be well established, and this establishment should be based on the available simulation equipment and learner nurses factors. In the study done by Abrahams-Marra (2013), found and concluded that the resources in the simulation laboratory are insufficient and had negative impact on the teaching and learning for both nurse educators and learner nurses.
According to Kolb Experiential Learning Model, the strength of learner nurses (accommodators), lies in doing things or perceives concretely and process actively as is

CE and active experimentation (AE) (Bastable, 2008; Lee, 2007). The availability and utilization of simulation resources in clinical laboratories assist learner nurses to acquire skills which will help them to deal with any clinical challenge in an intuitive manner, hence integration of theory and practice (Quinn and Hughes 2007).

4.2.2. Theme 2: Difficulties experienced with the use of manikins

The study findings revealed that nurse educators and learner nurses (participants) were experiencing difficulties in the utilization of simulation at LCNCs. Two (2) sub-themes emanate from this theme, namely: Available manikins not relevant to performed procedures and Shortage of manikins versus number of learner nurses in clinical laboratories.

4.2.2.1. Sub-theme 2.1: Available manikins not relevant to performed procedures

The study found that, participants were experiencing challenges during simulation when utilizing the available low fidelity manikins in clinical laboratory. They further reported that the available manikins do not assist them to achieve clinical learning objectives during simulation with learner nurses during clinical skills orientation at the beginning of the year. This is due to their current status which is not in line with new innovations in nursing education today. The study further revealed that the LCNCs laboratories do not have high fidelity manikins but low fidelity manikins and that the available manikins in the clinical laboratories are lifeless and do not meet the standard of innovations in nursing education today as far as simulation is concerned. These notions were expressed as follows:

Participant two [2] (nurse educator) said:
"*Utilization of simulation is not 100 % effective, because we have manikins which do not meet the standard of midwifery"*. She further said that; "*the manikins we have do not have life, cannot simulate any condition because are low fidelity manikins"*.

Participant three [3] (nurse educator) indicated that:
"It's difficult to classify the dolls, which make it difficult also to allocate dolls for certain clinical skills in midwifery".

Participant four [4] (learner nurse) also concurred:
"*In the clinical laboratory doll is there but it cannot talk, it's in use but not effective which brings no link between the clinical area as we use real patients who can talk and in clinical laboratory as we use doll which cannot talk".*

Participant twenty [20] (learner nurse) added the following:
"*Dolls cannot communicate and need to be manipulated in order to do clinical skill and it frustrate because we have to keep on assuming throughout the procedure, and the utilization of simulation is compromised in that way*".

Participant sixteen [16] (learner nurse) concurred:
"The use of such manikins is frustrating, instructing a manikin who does not communicates during assessment not easy"

Participate seven [7] (nurse educator) supported and said that:
"*We do use clinical laboratories for simulation, but it's good if we have proper models. With the ones we have are not user-friendly"*

Participant four [4] (learner nurse) added the following:
"*With such dolls you cannot withdraw blood due to their level"*

Participant twenty [20] (learner nurse) further said that:
"*With the current dolls is difficult to do some clinical skills, such as giving of oral medication because cannot talk back nor swallow*".

Duvall (2012) found that there were challenges that nurse educators experienced regarding the utilization of high fidelity simulation (HFS) and these included lack of

funding, faculty support, lack of time and fear of technology. As the nursing profession is characterized by a variety of innovative techniques, therefore nurse educators should keep on updating their skills as well, based on the utilization of simulation through the support of the nursing college (Duvall, 2012).

Abrahams-Marra (2013) also found that simulation laboratory resources at the College of nursing in the Western Cape were not of the same standard as compared to the equipment used at clinical area. Further indicated that this variance caused confusion among learner nurses, and they failed to manage the situation they found themselves in. Maginnis and Croxon (2010) concurred with the above studies, and reported that the concept of parity and consistency between what is taught and what is experienced is imperative in ensuring safe practice for novice learner nurses.

According to Kolb Experiential Learning Model, concrete experience (CE) and reflective observation (RO), learners reflect back on acquired experience during CE through observational ability. The focus and orientation towards reflection observation is based on understanding the meaning of ideas and situations by carefully observing and impartially describing them (Bastable, 2008; Kolb, 1984).

According to Burton (2006), reflection observation creates an opportunity that allows learner nurses (divergers, accommodators and assimilators) to learn from practice in a more-in-depth way that enhances practice. Hence, integration of both theory and practice, and utilization of simulation and interpretation of very experience in particular. The simulation resources in clinical laboratories should always be in line with the clinical skill need to be witnessed by learner nurses, this will ensure that they acquire relevant and useful knowledge during simulation for integration purposes (Bradshaw and Lowenstein, 2011; Bruce, et al., 2011; Billings and Halstead, 2009; Bastable, 2008).

4.2.2.2. Sub-theme 2.2: Shortage of manikins versus number of learner nurses in clinical laboratories

The study revealed that nurse educators and learner nurses at LCNCs use simulation as a teaching and learning strategy especial during clinical skill orientation. The study further revealed that the number of learner nurses during simulation session exceeds the space in clinical skill laboratories which makes it difficult for the nurse educators to conduct effective simulation sessions.

Furthermore, the study findings indicated that the effectiveness of utilization of simulation at LCNCs is compromised by the shortage of manikins in the clinical laboratories when demonstrating the variety of clinical skills. These sentiments were expressed as following:

Participant one [1] (nurse educator) said the following:

"*The laboratories are not many and we do not have much (dolls) as compared to the number of learner nurses (e.g.: 82 3rd level learner nurses)"*. She further said: "*We use the little ones we have in clinical laboratories, but its time consuming as it can take the whole day or a number of days trying to finish demonstrating to all learner nurses"*.

Participant two [2] (nurse educator) added the following:

"We have only one manikin which is used to simulate fetal heart and two which are used to simulate deliveries, but now are no longer working or functional because some accessories got lost and some have been spoiled or damaged and are not fixed".

Participant three [3] (nurse educator) continued:

"simulation is not utilized effectively here at the college due to lack of resources and lecturers only when the need arises, and in that way learner nurses do not have enough time for simulation"

Participant four [4] (learner nurse) concurred:

"*Limited resources do not make learner nurses to understand taught skill in a clinical laboratory but only a clue you ge*t".

Participants five [5] (learner nurse) continued:
"*Laboratories are not conducive and the dolls are old and few for the number of learner nurses during simulation session"*.

Bimray, Roux and Fakude, (2013) in a study conducted at the University of Western Cape, South Africa, also found that simulation was commonly used in special skills in laboratories for clinical teaching and clinical evaluation. It was also used for ensuring that learner nurses are exposed to real life encounter in a structured environment. This enables the learner nurses to perceive the simulated patient encounter as an opportunity to connect and make a difference in the life of the patient, and not to be skill performers (Bimray, et al., 2013).
A study conducted Abrahams-Marra (2013) at the Western Cape College of nursing found that the simulation resources are not enough and that the clinical laboratories space is not adequate for the number of learner nurses. The study further indicated that lack of time and learner nurses overcrowding in the clinical laboratories remains a negative factor for their learning.

According to Kilmon, Brown, Ghosh and Mikitiuk (2010) accommodating a smaller number of learner nurses could be beneficial to both nurse educators and learner nurses during clinical skill teaching and learning either at simulation laboratory or clinical area.

Kolb Experiential Learning Model indicates that learning starts when a learner nurse responds to learning by being involved in a certain skill or experience that is for future use in the clinical setting (Bastable, 2008; Quinn and Hughes, 2007). The learner nurses in this category are accommodators and convergers. These learner nurses learn

best when acquired new knowledge and implement based on have given scenario, so with shortage of simulation resources and lack of simulation time will hinder their clinical learning right.

4.2.3. Theme 3: Time for simulation of skills

The study revealed that nurse educators and learner nurses at LCNCs use simulation as teaching and learning strategy especial during clinical skill orientation. Furthermore, the study revealed that the use of simulation at LCNCs is time consuming because one nurse educator is expected to demonstrate several skills in one day. This idea has been evident by the following sub-themes:

4.2.3.1. Sub-theme 3.1: Skills laboratory space not accommodative to large classes versus total number of existing groups affects quality skills demonstration

The study found that at LCNCs during clinical skills orientation the nurse educators had to demonstrate skill several times to large group of learner nurses and the clinical laboratory environment was not conducive to learning. The study further found that repeated demonstration of a clinical skill was time consuming and learner nurses were not granted equal opportunity to do return demonstration. These notions are expressed in the following excerpts.

Participant one [1] (nurse educator) said:

"*Laboratories are not adequate and learner nurses are many, such as 82 in 3rd level (in 2014), so space not enough to accommodate such number".* Further said: "*We use simulation and we group learner nurses and each group consists of four members, so when it comes to real simulation in this case is difficult and time consuming because you have to repeat one thing throughout for a number of hours or days, this is managed by grouping them in small groups and it is time consuming*".

Participant twelve [12] (nurse educator) also said:
"We use laboratories for skills from level one to level fourth. The number of learner nurses remains a challenge, so we divide them into groups which may consist of fifteen members. Demonstrating a skill to all groups is tiring, which leads to distortion of ideas and we end up not doing the skill the same way to all groups"

Participant fifteen [15] (nurse educator) concurred:
"We integrate as clinical components when it comes to simulation, and we utilize simulation to show learner nurses how to do a clinical skill, although in Community Nursing Science (CNS) most skills are done at the clinics".

Participant twelve [12] (learner nurse) said:
"*We do it in groups, so it's difficult to follow, so more time is needed. It's also imperative to reduce the number of learner nurses during simulation sessions according to the numbers of dolls and the skills, and should be included in college time table*"

Participant five [5] (learner nurses) said the following:
"*Nurse educators do not real utilize simulation, and if by chance been done or utilized all learner nurses are not given times to do return demonstration, but only one maybe given the opportunity to do so"*.

According to Lana cited in Limoges (2010), simulation laboratory is a place where the nurse educators can level the learning experience to give all learner nurses an opportunity to observe nursing practice as directed by nursing theory, and also that it has a potential to give a space wherein nursing specific knowledge can be transferred and implemented. A study conducted by Abrahams-Marra (2013) at a Western Cape College of nursing also found that time that is allocated for simulation laboratory was not optimally utilized for learning and teaching purposes.

Strand, Naden and Slettebe (2009), in their study reported that time and space arrangement should be collaboratively established by fellow learner nurses for the

learning purposes. Schussler and Imsen cited in Strand et al (2009) concurred and indicated that learner nurses after being demonstrated a clinical skill by a nurse educator, he or she leaves them without doing supervisory role to them during practice in the simulation laboratory, and it was concluded that such practice cause frustration among learner nurses.

According to Baillie and Curzio (2009), proper supervision during simulation is perfectly achieved through grouping learner nurses into small groups, hence equal ratio of nurse educators and learner nurses. A study conducted by Alinier, Hunt, Gordon and Harwood (2006) concurred, and reported that intermediate fidelity training to be a useful technique in allowing small groups of students to develop knowledge of how to react in a critical care situation whilst being in a safe environment. According to Billings and Halstead (2009), in response to the challenges of clinical space and practice adequacy, their study reports that nurse educators have started to revitalize traditional methods for learner nurses' skill development; this may include utilization of high fidelity simulation.

4.2.3.2. Sub-theme 3.2: Lack of feedback versus feedback demonstrations by learner nurses

The study found that at LCNCs simulation sessions were conducted only during orientation of clinical skills demonstration at the beginning of each year by nurse educators with learner nurses. The study further found that the practice makes learner nurses to be granted unequal opportunities to do return demonstration, and learner nurses find it difficult to cope due to condition in clinical laboratories and their large numbers. These sentiments were expressed as follows:

Participant three [3] (nurse educator) said:

"*It's not utilized accordingly due to lack of resources and learner nurses do not have enough time for simulation because nurse educators only utilizes simulation once at the beginning of each academic year and when a need arises*".

Participant seven [7] (nurse educator) also said:
"We divide learner nurses into a number of groups, which maybe twenty per group, and this allow them to be able to do return demonstration because the doll we use does not get tired".

Participant twelve [12] (nurse educator) added:
"We do not have enough resources in our laboratories, when it comes to changing under water drainage system we have to use a lot of resources during feedback per group and its ideal to use a new pack".

Participant five [5] (learner nurse) also added:
"Even learner nurses do not use simulation room for return demonstration because after demonstration by the nurse educator, only allow one learner nurse to do return demonstration".

Participant twenty [21] (learner nurse) concurred:
"Nurse educators after demonstration in the laboratory should give us enough time to do return demonstration and also to continue practicing during the year and before OSCA"

Schussler and Imsen cited in Strand et al (2009) in their study, maintain that a lack of feedback by learner nurses after nurse educator has demonstrated the clinical skill during simulation leads into the development of frustration. Strand et al (2009) concurred, and said that learner nurses during simulation need more time for guidance, as the process of knowledge transformation need solid integration of theory and practice. Haigh (2007) also concurred, and reported in her study that no enough time spent on clinical skill, and relating this to theory especial to labour ward skills. Eraut in Haigh (2007) states that the nature of time can be manipulated to suit learner nurses learning needs.
Kolb Experimental Learning Model indicates that learner nurses (assimilators and convergers) learn best through demonstration and return demonstration of a clinical skill

during simulation. These learner nurses prefer application of ideas and theories as they have an ability to use deductive reasoning to solve problems.

4.3 Conclusion

In this chapter, three main themes were identifies, namely; Access versus lack of access to clinical laboratories by learner nurses; Difficulties experienced with the use of manikins and Time for simulation of skills. These themes were discussed in details with the use of sub-themes in order to determine the utilization of simulation by nurse educators and learner nurses at LCNCs. Chapter 5 follows with the summary, limitations, strategies, recommendations and the conclusions of the study.

CHAPTER 5
SUMMARY, LIMITATIONS, STRATEGIES, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

This chapter presents the summary of the findings of the study. It also presents the extent to which the objectives of the study have been achieved and the limitation of the study. Recommendations were drawn from the findings of the study as discussed in chapter 4. And strategies to improve utilization of simulation by nurse educators and learner nurses at LCNCs were developed.

5.2 Aim of the study

The aim of the study was to

- Determine the utilization of simulation by nurse educators and learner nurses at Limpopo College of Nursing, Limpopo Province.

5.3 Objectives of the study

The objectives of the study as outlined in chapter 1 were achieved and evaluated as follows:

Objective 1:

- Describe the utilization of simulation by nurse educators and learner nurses at The Limpopo College of Nursing.

This objective was achieved as outlined in the summary of the findings (section 5.4) and recommendations (section 5.6).

Objective 2:

- Develop strategies that will improve the utilization of simulation by nurse educators and learner nurses at The Limpopo College of Nursing.

→ **This objective was achieved as discussed in the strategies (section 5.5)**.

5.4 Summary of the Findings of the Study

Both nurse educators and learner nurses (participants) explained clearly how utilization of simulation is conducted at LCNCs as identified in the three (3) major themes and six (6) sub-themes that emerged from data analysis.

5.4.1. Access versus lack of access to clinical laboratories by learner nurses

5.4.1.1. Lack of access to clinical laboratories versus utilization of clinical laboratories is limited to specific period

Participants reported that clinical laboratories are kept under lock and key, and learner nurses do not have access to simulators during the course of the year for the betterment of their clinical skills for OSCA and future clinical practice.

They further indicated that the laboratories at LCNCs are not conducive to learning. There are old and non-functional simulation equipment and limited space in the clinical laboratories to accommodate the large groups of learner nurses during clinical demonstration.

Participants further reported that some clinical laboratories are used as store rooms for old LCNCs documents and other equipment. Due to such conditions, they therefore find it difficult to conduct simulation activities effectively during clinical skills orientation at the beginning of each academic year.

According to Schafer (2013) in Egypt, the SIU-Edwardsville Nursing Simulation Laboratory at Lindegren Hall provides the learner nurses with an opportunity of hands – on practice without a risk of injuring a human by using computer simulated “patients.” According to Bastable (2008) the environment where clinical skills are conducted should be conducive enough and encourage learning of learner nurses in all domains of learning: cognitive, psychomotor and affective.

The finding of this study agrees with the study conducted by Arigbede et al (2014) also indicated that the performance of students in simulation learning environment do not have a significant relationship with their performance in real life clinical practice and that the students – staff ratio appeared to make teaching experience at clinical skills laboratory unpleasant.

5.4.2. Difficulties experienced with the use of manikins

5.4.2.1. Available manikins not relevant to performed procedure

This study on utilization of simulation by nurse educators and learner nurses at LCNCs revealed that the participants do use manikins for simulation activities. The participants further indicated that the manner in which utilization of simulation is done does not meet the standard of simulation as a teaching strategy as explained in theme two (available manikins not relevant to performed procedure and shortage of manikins versus number of learner nurses in clinical laboratories).Furthermore, the study also singled out the fact that the manikins used at the College do not meet the standard for clinical components such as Midwifery and Biological and Natural Science due to poor status of simulation equipment, lack of functional resources and limited space in clinical laboratories.

Both the nurse educators and learner nurses do not have enough time for manikins-simulation activities as they only utilize it once at the beginning of each academic year. In order for the simulation to be interesting and effective during learning and teaching nurse educators should treat and regard it as process and not a once off teaching strategy, and this is achieved through the use of manikins. Therefore, there is also poor

utilization of simulation at LCNCs due to shortage of manikins and the large groups of learner nurses in the clinical laboratories.

A study conducted by Rystedt and Lindstrom (2001) also agrees with the findings of this study that the utilization of simulation has been growing well from the year 1980s onwards. Many nursing colleges are now utilizing simulation as a teaching strategy. Participants expressed that the availability of well advanced manikins at LCNCs in clinical laboratories for simulation purposes will assist in implementation of simulation activities using manikins, as teaching strategy as it has become part of undergraduate nursing programs for the past decades (Aebersold, *et al*., 2012).

Edgecombe, Seaton, Monahan, Meyer, LePage and Erlam (2013) assert that simulation and simulation utilization is regarded as teaching and learning strategy used in nursing education aimed at preparing learner nurses for clinical workplace. Decker, Sportsman, Puetz and Billings (2008) further indicate that simulation utilization offers opportunities to practice rare and critical events in a safe and controlled environment, it further affords learner nurses with unlimited practice without risk to patients at the clinical area.

5.4.3. Time for simulation of skills

5.4.3.1. Skills laboratory space not accommodative to large classes versus total number of existing groups affects quality skills demonstration

This study revealed that learner nurses at LCNCs after simulation demonstration by nurse educator are not given time to do return demonstration due to the large number of learner nurses in clinical laboratories. The study further revealed that the use of simulation at LCNCs is time consuming because one nurse educator is expected to demonstrate one skill several times because of large group of learner nurses. The study also found that the repeated demonstration of clinical skills was time consuming and learner nurses are not granted the same opportunity to do return demonstration.

According to Weller et al (2012) the utilization of simulation in nursing education is imperative as it has the potential to provide greater efficiency and rigour compared with learning through opportunistic clinical experiences. This idea was supported by the study conducted by Yuan et al (2012) which indicated that simulation technique is utilized for orientation programs, continuing education, certification courses, and staff development.

According to Aebersold et al (2012) the utilization of simulation aims at providing the learner nurses with an opportunity to practice their skill in a safe environment, allowing for skills refinement with repeated exposure over time.

5.4.3.2. Lack of feedback versus feedback demonstration by learner nurses

This study found that simulations at LCNCs were conducted only during clinical skills orientation at the beginning of each year. Learner nurses were also not given equal opportunities to do return demonstration because of their large groups. Clinical laboratories were also not conducive to learning because they cannot accommodate all learner nurses. There is also shortage of simulation and other related resources at LCNCs.

5.5 Strategies for the betterment of utilization of simulation at LCNCs

Table: 5.1. Strategy 1: Availability of clinical laboratory manager at all LCNCs

Theme one: **Access versus lack of access to clinical laboratories by learner nurses**	
SUB-THEME	Lack of access to clinical laboratories versus utilization of clinical laboratories is limited to specific period
OBJECTIVE	To have access to clinical laboratories and manikins
STRATEGY	Availability of clinical laboratory manager at all LCNCs
APPLICATION	• The employment and presence of clinical laboratories managers at LCNCs is imperative. These clinical laboratories managers will play a vital role when it comes to all clinical laboratory activities, particularly utilization of simulation and access to clinical laboratories. • The availability of these personnel can be addressed with the use of current available nurse educators in different LCNCs. These managers may also liaise with the coordinator or chief clinical laboratories manager and to be situated at central college. If employment of trained clinical laboratories chief manager (at central level) and managers (at campus level) is not easily attained due to financial constraints, the LCN can follow and use the experienced retired or non-retired nurse educators from clinical components to be employed at above indicated post. • LCN can also consider employment of clinical facilitators per LCNC clinical component; these facilitators will have to be responsible for the access, conditions and control of clinical laboratories and clinical activities at the hospital. This can be done without the chief clinical laboratories manager at central college. • The clinical laboratory managers may support the nurse educators and learner nurses by accessing the simulators at any time of the year to ensure that learning objectives that need to be achieved in simulation

	environment are well accomplished through the use of this teaching strategy. • The role may also include ensuring availability of useful and important resources; such as high fidelity manikins (HFM). • With the availability of HFM, clinical laboratory managers will assist learner nurses and nurse educators for their use, and will further assist by establishing a clinical laboratory access form that will have to be filled every time when clinical laboratory users need to access them at any time of the year, and the learner nurses will then be able to manipulate the manikins for learning purposes with close monitoring and supervision of a trained clinical laboratory managers at campus level. • The learner nurses may have more time in simulation sessions or laboratory which will assist in eliciting more understanding and lead to far betterment in terms of all clinical skills. This will further benefit the learner nurses as they will develop confidence on nursing or clinical skills and for the patients at the clinical area with quality patient care. • The learner nurses may also access simulators prior OSCA , this will ensure that when assessments commences learner nurses do not memorizes the procedure manual, but are able to do a clinical skill with understanding. Simulation utilization effectiveness comes from prolong engagement. • The LCN has partnership with universities such as Nelson Mandela Metropolitan University (NMMU) and University of Limpopo. This partnership can be used as an opportunity to seek help with regard to the management activities of clinical laboratories, resources and clinical laboratory users thereof. As this is anticipated on safe keeping of clinical laboratories and resources, and this will last for a number of decades.

Table: 5.2. Strategy 2: Renovation and use of all clinical laboratories for simulation activities only

Theme one: **Access versus lack of access to clinical laboratories by learner nurses**	
SUB-THEME	Limited resources resulting in compromised clinical learning
OBJECTIVE	To improve conditions in clinical laboratories at LCNCs
STRATEGY	Renovation and use of all clinical laboratories for simulation activities only
APPLICATION	• The renovation of currently used clinical laboratories is imperative; this can be done using the following: - LCN learner nurses funds. - It's also ideal to do a formal requisition regarding the funds from Limpopo Provincial treasury via Provincial Department of health with the involvement of the nursing directorate in order to procure all necessary materials needed for the betterment of the clinical laboratories or to offer a tender to a registered and certified service provider from supply data base. This is done base on available budget or funds. - Application of donors national and international will also play a great role in the betterment of the clinical laboratory rooms at LCNCs. • The renovated clinical laboratory will be conducive and promote active learning in all domain of learning. • The Vice-principals at LCNCs have to address the issue of shortage of clinical laboratories through opening of currently unused clinical laboratories. • These clinical laboratories which are currently used as store rooms for the old LCNCs documents and also teaching aids need to be renovated as well, and to be available for the demonstration of skills during simulation. • The renovation and opening of clinical laboratories will enhance the

	utilization of simulation as teaching strategy at LCNCs, as their conditions will be well improved and conducive enough for simulation session irrespective of the number of learner nurses since it will be safe environment. • The LCNCs old document and teaching aids have to be stored in a store room designed for them. This is done to creat more conducive space in clinical laboratories for the use by nurse educators and learner nurses during simulation session. • The LCNCs vice-principals together with nurse educators from or heads of clinical component will have to ensure that the currently used clinical laboratories with other none clinical equipment are also kept safe in a stored designed for them for the betterment of renovation process.

Table: 5.3. Strategy 3: Use of current and well advanced manikins

Theme two: **Difficulties experienced with the use of manikins**	
SUB-THEME	Available manikins not relevant to performed procedures
OBJECTIVE	To have current and well advanced manikins
STRATEGY	Use of current and well advanced manikins
APPLICATION	• Nurse educators from clinical component should motivate for new and well advanced manikins (HFM) in clinical laboratories in order to improve the current available status of manikins, for effective utilization of simulation at LCNCs. • Nurse educators should be encouraged at all times to utilize simulation as teaching strategy. This will reduce the chances of reluctance among them. • The LCN management will also support the motivation made by nurse

	educators so as to call to mind the Limpopo Province DoH together with nursing directorate office to seek assistance in terms of donations from abroad or other well established school of nursing (Universities & Colleges in SA). • The vice-principals, clinical component heads and nurse educators from clinical components should include in their business plans the funds that could be needed for procuring the HFM and other resources in laboratories. • The college management can also visit the nursing schools, college of nursing and universities nationally and internationally for benchmarking purposes regarding the how they managed to attain and use HFM. • LCN can also liaise with well-established tertiary or academic hospitals in South Africa which has HFM and make arrangement in terms of borrowing or utilizing them when a need arises.

Table: 5.4. Strategy 4: Increase the number of currently used manikins

Theme two: **Difficulties experienced with the use of manikins**	
SUB-THEME	Shortage of manikins versus number of learner nurses in clinical laboratories
OBJECTIVE	To have enough current and well advanced manikins
STRATEGY	Increase the number of currently used manikins
APPLICATION	• The LCN management can improve the quality and number of manikins by associating with well-established nursing schools: Colleges and Universities in SA and abroad, this will allow room for benchmarking which is believed that will elicit more understanding, reasons and benefit of having well advanced manikins in preparation of the upcoming level of operation at LCN

	(moving to higher education) as this will supplement the requirement for that operation. • The availability of enough manikins at LCNCs should be budgeted and included in a business plan – in it should be stipulated under medical equipment; this will also help in inviting donors from abroad to assist with those manikins. • The old HFM at LCNCs which are no longer used due to their status may need some technical attention or intervention. This will also assist in improving the number of manikins so as to tally with the number of learner nurses during simulation activities. • The utilization of independent business men with regard to the availability of new and well advanced manikins will benefit the LCN by ensuring that all LCNCs have HFM.

Table: 5.5. Strategy 5: Inclusion of simulation activities in LCN curriculum and LCNCs time table

Theme three: Time for simulation of skills	
SUB-THEME	Skills laboratories space not accommodative to large class versus total number of existing groups affects quality skills demonstration
OBJECTIVE	To allocate enough time for simulation activities
STRATEGY	Inclusion of simulation activities in LCN curriculum, calendar and LCNCs time table

APPLICATION	• The LCN management may adopt the practice of in-service training for nurse educators regarding the variety of teaching strategies, and also how to incorporate simulation in the curriculum and its application or use in the clinical laboratory. Its integration in the curriculum will also assist by eliciting more understanding among nurse educators and will make them use it zealously. • The inclusion of simulation as teaching strategy in LCN calendar and LCNCs time table may evoke the nurse educators to ensure that the needs for utilizing simulation is necessary, and this will improve the learner nurses' psychomotor skills, and also to assist them to reflect on their experiences when they come across any medical condition that will need immediate medical attention. • The vice-principals in all LCNCs should encourage nurse educators to consider simulation activities when establishing block time tables at the beginning of each year. • Following a well-developed time table and calendar which would have indicated well when to do simulation activities is imperative in this regard. This will assist the nurse educators to prepare themselves and learner nurses for simulation, and this will further assist in ensuring that there is enough time for learner nurse to acquire all clinical skills during simulation.

Table: 5.6. Strategy 6: Establishment of LCN simulation time table

Theme three: **Time for simulation of skills**	
SUB-THEME	**Lack of feedback versus feedback demonstrations by learner nurses**
OBJECTIVE	To manage time effectively during simulation
STRATEGY	Establishment of LCN simulation time table
APPLICATION	• All LCNCs heads of components and nurse educators from clinical component should meet and formulate a simulation time table which will be followed to achieve simulation needs at campus level. This will assist in closing the gap between the learner nurse and clinical area (patients). • A well-developed time table will further assist in allocating equal periods for all clinical components in a month, which will allow components to utilize simulation effectively on different days and learner nurses may recover lost periods missed during experiential learning at clinical area. • LCNCs should adhere to its time table and ensure that all simulation principles are followed. • It should be taken into consideration that with every demonstrated skill learner nurses are given equal time to do return demonstration as this allow for skills refinement with repeated exposure over time. Time for return demonstration could be awarded all learner nurses through effective use and management of time during orientation of clinical skills as it will be stipulated in the LCN simulation time table. • The nurse educators may also involve learner nurses in the utilization of simulation in class and clinical laboratory. This enables the learner nurses to perceive the simulated patient encounter as an opportunity to connect and make a difference in the life of the patient, and not to be skill performers.

5.6 Recommendations

The researcher wishes to make the following recommendations based on the findings of this study:

5.6.1. Proper utilization of clinical laboratories

- The opening and use of clinical laboratories which are currently used as store rooms at LCNCs will ensure that clinical laboratories are used for the purposes for which they are meant for.
- This availability of clinical laboratories will promote the utilization of simulation by nurse educators and learner nurses at LCNCs. The renovation of currently used clinical laboratories is imperative as it will assist in promoting and ensuring a conducive environment in the clinical laboratories for the effective utilization of simulation at LCNCs.
- Hiring and the presence of full-time clinical laboratories managers at LCNCs will assist the LCN in maintaining and running the clinical laboratories activities effectively and efficiently and Learner nurses will also be able to have access to the clinical laboratories during the course of each year. This will further assist them in continuing to practice any given clinical skills during their spare time. It will further assist the LCN in terms of regulating the use of equipment and also to ensure that necessary medical equipment are always available for the use by the nurse educators and learner nurses during utilization of simulation and OSCA.
- At LCN central office there be a chief clinical laboratory manager, this office will ensure that there is standardization in all LCNCs.

5.6.2. Difficulties experienced with the use of manikins

- There should be in-service education programs for nurse educators that are conducted at regular intervals regarding the utilization of manikins for simulation purposes. Furthermore, the availability of enough and suitable life-like manikins in nursing clinical laboratories promotes acquisition of knowledge and new skill through all domain of learning: *cognitive, psychomotor and affective.*

- Each clinical component should have adequate and relevant manikins which range from moderate to high fidelity in addition to the currently used low fidelity manikins.

5.6.3. Time for simulation of skills

- Proper and well established time table or schedule of simulation activities is imperative. It is recommended that all LCNCs, especial the three well established LCNCs that they should equally share learner nurses from the two LCNCs: Waterberg and Sekhukhune. This will ease the burden experienced by nurse educators during utilization of simulation, unmanageable large number of learner nurses in clinical laboratories.
- The use of central or standard video on certain clinical skills is imperative, this will further assist nurse educators to manage and control the large number of learner nurses during skill orientation before placement at health facilities for experiential learning.
- It is recommended that the learner nurses during simulation of clinical skills be given enough time. The utilization of simulation at LCNCs also needs to be allocated enough time for clinical skills to be attained well by the learner nurses following Kolb Experiential Learning model. Enough time allocation on utilization of simulation will also assist nurse educators to meet the clinical learning needs of the learner nurses to be competent future registered nurses.

5.6.4. Further research

- It is recommended that a nationwide study should be conducted on utilization of simulation by nurse educators and learner nurses. This will assist in determining the utilization of simulation by nurse educators and learner nurses at national level in South Africa.

5.7 Limitations of the study

The study was conducted at the main three LCNCs with a sample of 15 nurse educators and 27 learner nurses. Therefore, the findings of this study cannot be generalized to other nursing colleges. Notwithstanding the limitation, these findings gave some valuable insight on how simulation is utilized by nurse educators and learner nurses at LCNCs.

5.8 Conclusion

The study found that there was poor utilization of clinical laboratories by both the nurse educators and learner nurses at LCNCs. There were limited learning resources and the clinical laboratories were not big enough to accommodate the large groups of learner nurses. The clinical laboratories were not accessible to the learner nurses as these were kept locked. High fidelity manikins were not available thus the learning of learner nurses was compromised.

Several participants expressed their feeling with regard to the importance of simulation in nursing and nurse education, and also raised their concerns regarding the clinical laboratories' conditions and the status of equipment. This led them in failing to utilize simulation effectively, and compromised the rights of learner nurses as far as utilization of simulation is concerned.

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7. APPENDICES

APPENDIX A

ETHICAL CLEARANCE CERTIFICATE

UNIVERSITY OF LIMPOPO
Medunsa Campus

UNIVERSITY OF LIMPOPO

MEDUNSA RESEARCH & ETHICS COMMITTEE

CLEARANCE CERTIFICATE

MEETING:	**01/2014**
PROJECT NUMBER:	**MREC/HS/34/2014: PG**
PROJECT:	
Title:	Utilization of simulation by nurse educators and learner nurses at Limpopo College of Nursing, Limpopo Province, South Africa
Researcher:	Mr FN Mathebula
Supervisor:	Prof NM Jali
Co-supervisor:	Prof ME Lekhuleni
Department:	Nursing & Human Nutrition
School:	Health Sciences
Degree:	Master of Nursing Science

DECISION OF THE COMMITTEE:

MREC approved the project.

DATE: 04 February 2014

UNIVERSITY OF LIMPOPO
Medunsa Campus
2014 -02- 04
MEDUNSA RESEARCH ETHICS COMMITTEE
MREC CHAIRPERSON

PROF GA OGUNBANJO
CHAIRPERSON MREC

The Medunsa Research Ethics Committee (MREC) for Health Research is registered with the US Department of Health and Human Services as an International Organisation **(IORG0004319),** as an Institutional Review Board **(IRB00005122),** and functions under a Federal Wide Assurance **(FWA00009419)**
Expiry date: **11 October 2016**

Note:
i) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
ii) The budget for the research will be considered separately from the protocol.
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

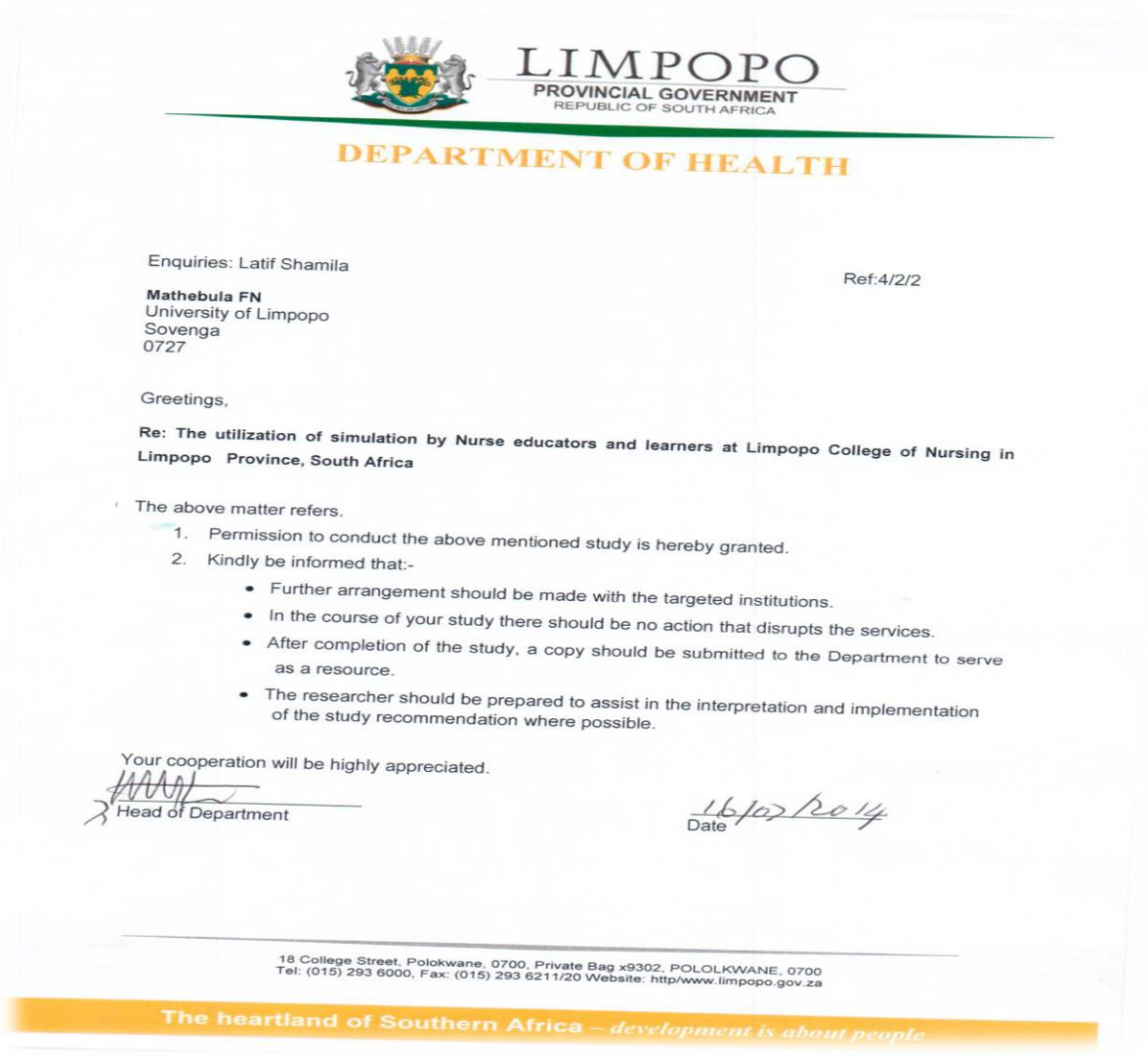
Finding Solutions for Africa

PROUDLY SOUTH AFRICAN

APPENDIX B

PERMISSION TO CONDUCT THE STUDY: LIMPOPO PROVINCIAL DEPARTMENT

OF HEALTH



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

Enquiries: Latif Shamila

Ref:4/2/2

Mathebula FN
University of Limpopo
Sovenga
0727

Greetings,

Re: The utilization of simulation by Nurse educators and learners at Limpopo College of Nursing in Limpopo Province, South Africa

The above matter refers.

1. Permission to conduct the above mentioned study is hereby granted.
2. Kindly be informed that:-
   - Further arrangement should be made with the targeted institutions.
   - In the course of your study there should be no action that disrupts the services.
   - After completion of the study, a copy should be submitted to the Department to serve as a resource.
   - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.

Your cooperation will be highly appreciated.

Head of Department

Date 16/03/2014

18 College Street, Polokwane, 0700, Private Bag x9302, POLOLKWANE, 0700
Tel: (015) 293 6000, Fax: (015) 293 6211/20 Website: http/www.limpopo.gov.za

The heartland of Southern Africa – *development is about people*

APPENDIX C

PERMISSION TO CONDUCT THE STUDY FROM THE NURSING DIRECTORATE

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

Enquiry: nursing education
Tel 015 2913 6081/2
Fax 0862157745

TO : MATHEBULA F N
LIMPOPO COLLEGE OF NURSING
GIYANI CAMPUS

SUBJECT: REQUEST TO CONDUCT A RESEARCH STUDY ON UTILISATION OF SIMULATION BY NURSE EDUCATORS AND LEARNERS AT LIMPOPO COLLEGE OF NURSING.

1. Your letter of request dated 12 August 2014 is acknowledged.
2. You did not submit the aim of the study as it appears in your research proposal.
3. You are requested to adhere to the departmental research committee point 2 of your letter.
4. The copy of the research result should also be submitted to the college as your context of research.

Wishing you well in your studies.

SENIOR MANAGER
NURSING EDUCATION

Private Bag X9302 Polokwane
18 College Str., Polokwane 0700. Tel: 015 293 6000. Fax: 015 293 6211. Website: http/www.limpopo.gov.za
The heartland of Southern Africa - development is about people

APPENDIX D

APPROVAL LETTER FROM CAMPUS A

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

Ref:St/No 200522483

Enq: Mafalo E.P

To Mr F.N Mathebula

From The Vice-Principal

Re: request to conduct research study: Yourself

Dear Sir,

This serves to acknowledge receipt of your letter dated 15 September 2014.

It is further noted, permission to conduct the stated study has been granted by the Head of Department and the Senior Manager Nursing Education has make remarks to that end.

You are therefore with humility, accepted to come and venture into your study at our Campus as soon as you deem it fit.

Kind regard.

Mr E.P Mafalo

The Vice-Principal

Department of Health & Social Development
Limpopo College of Nursing
The Vice Principal
Sovenga Campus
Private Bag X 1122
Sovenga 0727
Section:.....The Vice Principal.....
Tel: 015 287 1114/1120 Fax: 015 287 1202

APPENDIX E

APPROVAL LETTER FROM CAMPUS B

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH
LIMPOPO COLLEGE OF NURSING: GIYANI CAMPUS

TO: Mr Mathebula F N

FROM: The Vice Principal (Giyani Campus)
DATE: 13/ 10/ 2014

REQUEST TO CONDUCT A RESEARCH AT GIYANI CAMPUS

Your letter of the above request is acknowledged

You are hereby informed that your request to collect data at the campus has been granted. However the collection of data should be done during your own time and not to interfere with the campus activities.

PP.....
Mrs Rikkhots E T
Vice Principal

Private Bag X9658 GIYANI, 0826
Tel: (015) 812 0330/1/2 or (015) 812 0123/0213 Fax: (015) 812 0123
Website; http/www.limpopo.gov.za
The heartland of Southern Africa – Development is about people!

APPENDIX F

APPROVAL LETTER FROM CAMPUS C

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH
LIMPOPO COLLEGE OF NURSING: THOHOYANDOU CAMPUS

Enq: Mokgawa MJ
Cell: 082 4011 394
01596 41876
Fax: 01596 41517

Date: 30 September 2014

Mr. FN Mathebula
Giyani Campus

Sir

REQUEST TO CONDUCT RESEARCH STUDY: YOURSELF

Receipt of your request dated 15 September 2014 is hereby acknowledged

The Campus has no objection to your request

You are requested to inform the Campus of your visit details so that the possible respondents could be informed of your visit

The Campus also request that you provide a copy of your research report as the result are of interest to the Campus

Wishing you good luck in your activity

Yours faithfully

.....
LIMPOPO COLLEGE OF NURISNG: THOHOYANDOU CAMPUS
VICE-PRINCIPAL

Private Bag X919, SHAYANDIMA, 0945, Vhembe District
Next to Tshilidzini Hospital along Punda Maria Road
Tel: (015) 964 1516/8 . Fax: (015) 964 1517
Website; http/www.limpopo.gov.za

The heartland of Southern Africa - Development is about people!

APPENDIX G

INFORMED CONSENT

Consent form
Name of Project: Utilization of simulation by nurse educators and learner nurses at Limpopo College of Nursing Limpopo Province, South Africa

Contact details:
Mr. FN Mathebula
Cell: 0834480335/0732613939
Email: mathebulafreedomn@yahoo.com/delton.star.nd@gmail.com

I have read the information and heard the aims and objectives of the proposed study and was provided the opportunity to ask questions and given adequate time to rethink the issue. The aim and objectives of the study are sufficiently clear to me. I have not been pressurized to participate in any way.

I know that sound recordings will be taken of me. I am aware that this material may be used in scientific publications which will be electronically available throughout the world. I consent to this provided that my name and hospital number are not revealed.

I understand that participation in this Study / Project is completely voluntary and that I may withdraw from it at any time and without supplying reasons. This will have no influence on the regular treatment that holds for my condition neither will it influence the care that I receive from my regular doctor.

I know that this Study / Project have been approved by the Medunsa Research Ethics Committee (MREC), University of Limpopo (Medunsa Campus). I am fully aware that the results of this Study / Project* will be used for scientific purposes and may be published. I agree to this, provided my privacy is guaranteed.
I hereby give consent to participate in this Study / Project.

Name of patient/volunteer: _____ Signature of patient or guardian: _____

Place: _____ Date: _____ Witness: _____
Statement by the Researcher:

I provided verbal and/or written* information regarding this Trial / Study / Project*
I agree to answer any future questions concerning the Trial / Study / Project* as best as I am able.
I will adhere to the approved protocol.

Name of Researcher	Signature	Date	Place
_____	_____	_____	_____

APPENDIX H

RESEARCH INTERVIEW GUIDE

The following research questions guided the study throughout the research process:

- Can you please tell me about the utilization of simulation laboratory by both nurse educators and learner nurses in this Campus?
- How is simulation utilized by nurse educators and learner nurses at Limpopo College of Nursing?
- Tell me about the importance of simulation for the education of learner nurses?
- How can the utilization of simulation be improved at the Limpopo College of Nursing?

Addition of probing questions which during the research process:

- How is the simulation laboratory even though the resources are not enough
- Can you please explain more

APPENDIX I

LETTER FROM INDEPENDENT CODER

Qualitative data analysis

Degree Master of Nursing

MATHEBULA FN

THIS IS TO CERTIFY THAT:

Professor Tebogo Maria Mothiba has co-coded themes and sub-themes in the discussion of findings chapter for qualitative data collected from:

15 Educators and 27 learner nurses

For the study:

UTILISATION OF SIMULATION BY NURSE EDUCATORS AND LEARNER NURSES AT LIMPOPO COLLEGE OF NURSING LIMPOPO PROVINCE, SOUTH AFRICA

I declare that data saturation was achieved as evidenced by repeating themes and their sub-themes.

Prof TM Mothiba

Prof TM Mothiba (PhD)

APPENDIX J

SEMI-STRUCTURED INTERVIEW

NURSE EDUCATOR ONE

Interviewer: Mr. F.N. Mathebula (researcher)

Interviewee: Nurse Educators

Interview setting: Office, on 18/11/2014 at 14h30 on Tuesday

Interview duration: 34 minutes and 35 seconds

Interviewer: Good morning mam

Interviewee: Good morning sir

Interviewer: Since we now done with the first phase of the interview, and shown you all necessary documents and consented me, can we start with the second phase.

Interviewee: Yes, we can start.

Interviewer: Be free so that you are able to follow all the questions to be asked.

Interviewee: ok

Interviewer:

Can you please tell me about the utilization of simulation laboratory by both nurse educators and learner nurses in this Campus?

Interviewee:

We use them when we demonstrate skills e.g. physical examination of a new born baby. Students get to understands when are at clinical area.

Laboratories are not many or we do not have much since students are many-82 in 3rd level. The space in laboratory is small, hence few students are taken. This leads to more time in laboratory doing one skill for all students (*was using her hands to emphasize the idea*).

Probe: we do use them but its time consuming as it can take a number of days trying to do one skill (her left leg was itching & facial expression was seen).

Interviewer:

How is simulation utilized by nurse educators and learner nurses at Limpopo College of Nursing?

Interviewee:

Are used once when we orientate at the beginning of each year when we show students skills. The doll's fontanels are used to show students during skill orientation. Then they go to clinical area where they see on real patient.

Probe: doll is useful in this regard because with real new born, cannot expose the head for a longer period due to hypothermia.

Interviewer:

Tell me about the importance of simulation for the education of learner nurses?

Interviewee:

Simulation is important, like in suturing; need proper practice before coming into contact with real patients. Assist students to use equipment well at the clinical area; such a handling of needle when giving IMI injection. Simulation utilization assists students to develop self-confidence before treating the real patients.

Probe: yes simulation is safe as our patients are free from any harm. Students can do a certain clinical skill without nurse educator and become competent on it.

Interviewer:

How can the utilization of simulation be improved at the Limpopo College of Nursing?

Interviewee:

The use of video is imperative, where by the nurse educator can make a video doing a clinical skill, then later play it for learning of students as it promote understanding among them (*she was emphasizing the point by indication of the right hand on the wall*).

Probe: we can also develop standardized video for the college in order to ensure that students get one idea on skills. Nurse educators should also meet and discuss issues that concern the tools to ensure that students in all campuses are equally trained.

THANKS FOR YOUR TIME AND PARTICIPATION

NURSE EDUCATOR TWO

Interview setting: Office, on 20/11/2014 at 13h00 on Thursday

Interview duration: 29 minutes and 20 seconds

Interviewer: Good afternoon mam

Interviewee: Good afternoon sir

Interviewer: You are speaking to Mathebula Freedom, student nurse researcher

Interviewer: Welcome and thanks for wiling to participant in this study and I'm going to call you participant one

Interviewer: since we now done with the first phase of the interview, and shown you all necessary documents and consented me, can we start with the second phase.

Interviewer: are you ready?

Interviewee: Yes

Interviewer:

Can you please tell me about the utilization of simulation laboratory by both nurse educators and learner nurses in this Campus?

Interviewee:

We do have simulation laboratory. It's used for various clinical skills. When we do clinical demonstration we start with theory part of the skill. When at the laboratory, we encourage students treat dolls with respect and as real patients. After demonstrating to them, we allow time for return demonstration by students (*her voice sounded slow*).

Probe: simulation is used at any-time, when a need arises.

Interviewer:

How is simulation utilized by nurse educators and learner nurses at Limpopo College of Nursing?

Interviewee:

We ensure that dolls are in a good working condition e.g. In midwifery, when we palpate pregnant women we make sure that the doll present like a pregnant one in order for students to see and treat like a real patient. When it comes on suturing wounds, we normally use things that resemble the real situation or patient.

Probe: the way we do simulation is not proper or 100% well or effective. This is because we do not have simulators which can meet the standard of midwifery. The ones we have cannot simulate well since are lifeless. The use of high fidelity is imperative during facilitation of learning. It's not easy to classify them, and in midwifery we do not have enough equipment for our skills. We only have one electronic doll for pregnancy skills, which used when we need to teach students how to listen to the fetal heart but not working now. We also have one doll that can deliver a baby but its accessories are not available (*her voice sounded active or normal*).

Interviewer:

Tell me about the importance of simulation for the education of learner nurses?

Interviewee:

Simulation use is important because it orientate students to skill before meeting with a real patient. It also allows them to practice continuously for competency sake. Helps nurse educators as it grant them enough time to spend with students at the clinical laboratory.

Interviewer:

How can the utilization of simulation be improved at the Limpopo College of Nursing?

Interviewee:

The college needs to buy more current simulators. The infrastructure should be extended especial clinical laboratories side. I will also suggest that the lecturers should be trained on simulation utilization today in order to have simulation skills.

Probe: it's not easy to use simulation during clinical demonstration if the group of students is huge. Due to that, more time will be needed to achieve set demonstration objectives. The LCN should ensure that its campuses has proper clinical equipment

THANKS FOR YOUR TIME AND PARTICIPATION

NURSE EDUCATOR ELEVEN

Interview setting: Office, on 11/12/2015 on Friday

Interview duration: 23 minutes and 52 seconds

Interviewer: Good morning mam

Interviewee: Good morning sir

Interviewer: You are speaking to Mathebula Freedom, student nurse researcher

Interviewer: Welcome and thanks for wiling to participant in this study and I'm going to call you participant one

Interviewer: since we now done with the first phase of the interview, and shown you all necessary documents and consented me, can we start with the second phase.

Interviewer: are you ready?

Interviewee: Yes

Interviewer:

Can you please tell me about the utilization of simulation laboratory by both nurse educators and learner nurses in this Campus?

Interviewee:

Simulation laboratories are used for skills demonstration to learner nurses when we show them skills for the first time and we follow the schedule. It's done before placing them for clinical exposure. Supposed to be used for skill demonstration, it's done quite often and to be competent enough before going to meet with patients. We also have a challenge with the use of simulation laboratories here at the college; such as improper equipment, because most of the time we have to compromise and it affect the learning of the students, therefore, students tend to copy wrong things. This makes students to get use to compromising even when the equipment is available at the hospital. When it comes to the use of clinical laboratories, our students do not really access them since we do not have laboratory controller (*was preparing her eye glasses*).

Interviewer:

How is simulation utilized by nurse educators and learner nurses at Limpopo College of Nursing?

Interviewee:

We usual follow the schedule, and then they go to laboratories where skills are demonstrated to them. Students are given time to do return demonstration. Use simulation to teach and show skills especial with psychomotor ones.

Interviewer:

Tell me about the importance of simulation for the education of learner nurses?

Interviewee:

Simulation is very important, our students do not like been at the hospital, but they do not real know what is real done there. In simulation, students get chance to practice clinical skills quite often and they become competent. Simulation in the education of students assists them to avoid harm to real patients as there they use dolls to learn. Even with us, we tend to know our students well when it comes to clinical skills in simulation and even before we place them at the clinical area (*her right leg was moving left and right while seated on a chair*). Simulation as teaching method, also assist with work, nursing skills and hospital environment readiness. This allows and assists them to interact well with the clinical stuff, and students during simulation are able to make mistakes and be able to correct such mistakes. Nurse educators are during simulation able to control the environment particularly when discovered that student did a mistake on a doll, remember dolls do not get tired so our students can use them at any time. With rare conditions at the clinical area, we are able to creat a scenario during simulation and teach them how to do the skill (*paused and had a sip of water)*.

Interviewer:

How can the utilization of simulation be improved at the Limpopo College of Nursing?

Interviewee:

Our clinical laboratories need to be maintained and equipped with resources. I suggest that we have laboratories manager so that our students can access them for practicing skills. This person will assist with control and ordering of medical equipment and keep

inventory. The vials, ampules and other medication used during simulation need to be checked well for expiry date (*her left hand had a pen and was playing with it*).

NURSE EDUCATOR TWELVE

Interview setting: Office, on 11/12/2015 on Friday
Interview duration: 30 minutes and 43 seconds
Interviewer: Good morning mam
Interviewee: Good morning sir
Interviewer: You are speaking to Mathebula Freedom, student nurse researcher
Interviewer: Welcome and thanks for wiling to participant in this study and I'm going to call you participant one
Interviewer: since we now done with the first phase of the interview, and shown you all necessary documents and consented me, can we start with the second phase.
Interviewer: are you ready?
Interviewee: Yes
Interviewer:
Can you please tell me about the utilization of simulation laboratory by both nurse educators and learner nurses in this Campus?
Interviewee:
We use laboratories for skills from level one to fourth level, but we are challenged by the number of students. So we divide them into fifteen (members per group), and to demonstrate skill for such number is tiring and it leads to distortion of ideas and not been fair for the other groups when we demonstrate the skills because we become tired. This makes us to demonstrate one skill for two days. With skills, sometimes it's challenging because we become forced to do all skills in a level within a week, and with integration of theory-practice we compromise due to the large number of students as we do not have enough resources in our laboratories. This may include the resources used when demonstrating under water drainage system skill, and in it, we have use a number

of things; such as sterile pack. We tend also to group them into eight or ten or even six in a group and this does not work because of lack of resources.

Interviewer:

How is simulation utilized by nurse educators and learner nurses at Limpopo College of Nursing?

Interviewee:

Simulation is utilized in all levels of learning here at the campus. Usual we allow the senior group before we allocate them to clinical area. ***Probe:*** yes we do use simulation for orientation of skills and for them to do return demonstration, especial under supervision, as are not allowed to be in alone. The problem is that we do not open laboratories for students to access and use them as we do not have enough resources (*was drying her face using facecloth*).

Interviewer:

Tell me about the importance of simulation for the education of learner nurses?

Interviewee:

Simulation is good. In it or during it we are relaxed. It allows room for mistakes and students are able to manipulate the dolls and feel comfortable when at the hospital after simulation session. This feels is due to the knowledge gained during simulation, and some students reported that they feel good when at the clinical laboratories when we simulate.

Interviewer:

How can the utilization of simulation be improved at the Limpopo College of Nursing?

Interviewee:

I would like to suggest the following:

- → The availability of videos which will be used to teach students skills, our own videos (product) and other necessary resources.
- → To have and use technology in clinical laboratories for simulation activities
- → To have enough resources in order to avoid distortion of ideas or miss critical point from the procedure manual
- → If we can have enough laboratory rooms so that it tally with the number of students we have, and to have laboratory operators

→ The availability of at least one clinical facilitator will assist students a lot during simulation, this person work also work with them even in weekends or per appointment
→ There be a budget for the clinical things and laboratories (*manipulated air-conditioning remote control*)

THANKS FOR YOUR TIME AND PARTICIPATION

APPENDIX K

FOCUS GROUP SESSIONS

Focus group session one: 2nd level learner nurses

NB: Here learner nurses are allocated numbers: e.g. P_1

CAMPUS B

Interviewer: Mr. F.N. Mathebula (researcher)

Interviewees: Learner nurses

Interview setting: Class room. On 01/11/2014

Interview duration: 58 minutes and 49 seconds

Interviewer: Good morning ladies and gentlemen

Interviewees: morning sir

Interviewer: Iam Mathebula freedom a student nurse researcher

Interviewer: Since we now done with the first phase of the interview, and shown you all necessary documents and consented me, can we start with the second phase.

Researcher:

Can you please tell me about the utilization of simulation laboratory by both nurse educators and learner nurses in this Campus?

Learner nurses:

P_4: simulation laboratories do not have enough resources or equipment. Sometimes we only have one or nothing at all (*the left hand was moving up & down when answering the question with no facial expression*). **Probe:** how is simulation laboratory although the resources are not enough? In the laboratory dolls are there but cannot talk. This makes their use not to be effective. In clinical are we use real patient which communicate, so it makes it difficult especial when been demonstrated clinical skill such as administration of oral medication and when you try to link simulation use and real clinical area e.g. withdrawing blood from the real patient and not applicable to dolls we use in the clinical laboratory (*Participant was trying to seat well on the chair while his right hand holding the voice*

recorder). **Probe:** How is that utilization of the little resources you have at the laboratory? The ones we have do not give a clear picture or understanding of what is anticipated.

P_5: nurse educators do not real utilize simulation; they only use dolls twice a year especial when they want to demonstrate a skill. Even us as students do not utilize simulation since we not given time to do return demonstration. **Probe:** Kindly try to be clearer. Students use simulation once, there should be more simulation room and we be allowed to practice skill more often. Simulation rooms at our campus are not conducive, since are having old dolls and that are not in line with our numbers as students.

P_3: I agree with previous speaker. Simulation room at the campus should allow students to practice more often to be perfect future nurses.

Researcher:

How is simulation utilized by nurse educators and learner nurses at Limpopo College of Nursing?

Learner nurses:

P_4: Simulation is done, but the way it's done does not give a clear picture, because you only get the clue since are not effectively done.

P_5: our nurse educators do not real utilize simulation. Here we only use simulation when they want to show us a certain clinical skill e.g. three times a year, time for return demonstration not enough because only one student will be allowed to do so. As from me, students should be allowed to utilize those rooms in order to keep on practicing the skill. The problem with our college is that those rooms are always kept under lock and key so we are unable to utilize simulation effectively.

P_3: I agree with P_5, at times the dolls are not enough and this affect us because we are unable to follow during simulation. Another thing is that there is no consistency between what is done in simulation and what is happening at the clinical area.

Researcher:

Tell me about the importance of simulation for the education of learner nurses?

Learner nurses:

P_3: it's important as it allow me to learn a lot during its use. It also help when one need to practice taught skill. When I'm at the hospital able to see that something is not done well on patients.

P_2: we are able to practice and help us to integrate both theory and practice due to simulation utilization (*her voice was calm and slow*).

P_3: during simulation we learn more on nursing basics, such as respect of patients and professional conducts. It gives us that opportunity to practice those skills.

P_5: with empathy and sympathy in simulation not well demonstrated. During simulation the nurse educator will only communicate with us as students and not the lifeless doll. Therefore we need to be taught empathy and sympathy so that we able to respond well to different situations of our patients.

Researcher:

How can the utilization of simulation be improved at the Limpopo College of Nursing?

Learner nurses:

P_5: the skills like those in biological and natural sciences (BNS) simple dolls should be used, but those for nursing actions should be real patients or high fidelity dolls. I also like to say that with fundamental of nursing science (FNS) we should only use real patients and not dolls. If possible, the college can establish a mini-hospital where we can do all necessary clinical skills, such as suturing of real wound. **Probe:** you said to have mini-hospital and educators are to monitor you when doing clinical skills. Yes, I mean we should simulate dogs or cats. The station commander will have to inform the college about patients with minor ailments or injuries, so those patients will be sent to college mini-hospital for our learning purposes.

P_4: the college should ensure that clinical laboratories have enough equipment, such as doll. The availability of plasma TV screen is imperative for the videos to be used during simulation. With skills like suturing the wound, we can be provided with live rates.

THANKS FOR YOUR TIME AND PARTICIPATION

Focus group session two: 4th level learner nurses

NB: Here learner nurses are allocated numbers: e.g. P_1

CAMPUS A

Interview setting: Class room. On the 13/06/2015

Interview duration: 28 minutes and 45 seconds

Interviewer: Good morning ladies and gentlemen

Interviewees: morning sir

Interviewer: Iam Mathebula freedom a student nurse researcher

Interviewer: Since we now done with the first phase of the interview, and shown you all necessary documents and consented me, can we start with the second phase.

Researcher:

Can you please tell me about the utilization of simulation laboratory by both nurse educators and learner nurses in this Campus?

Learner nurses:

P_3: we have clinical laboratories. The educators and us use them to do clinical skills following procedure manual where we treat dolls as like a real patient once at the beginning of each year.

Researcher:

How is simulation utilized by nurse educators and learner nurses at Limpopo College of Nursing?

Learner nurses:

P_6: it's frustrating at times because we tend to forget more important things during simulation with such dolls in laboratory.

$P_{7\ \&\ 8}$: yes it's, here we have to instruct the doll and it's not easy. With real patients is easy because they follow the instruction.

Researcher:

Tell me about the importance of simulation for the education of learner nurses?

Learner nurses:

P_2: it's good to use dolls, especial with skill like IV line medicating during simulation, help us to be competent with the skill before the encounter with the real patients.

P_4: the use of simulation is imperative as it helps us to get enough information during orientation of skill, therefore the key to medico-legal hazards reduction at clinical area.

Researcher:

How can the utilization of simulation be improved at the Limpopo College of Nursing?

Learner nurses:

P_5: practice makes perfect, therefore simulation allow us to practice more and this will make us become more competent on nursing skills.

P_1: we should be given more time to practice the skills in simulation (*his legs were crossed while seated on a chair*).

P_3: since we are doing simulation in huge groups, more time need to be allocated for simulation so that every student will be able to taste it and also the group reduction during simulation is important. Simulation should also be included in college timetable.

P_2: I suggest that we be divided into the doll numbers.

P_6: the current dolls should be improved, through the use of new ones e.g. high fidelity manikins.

$P_{3\ \&\ 8}$: with simulation, technology is needed for its advancement so that the dolls can communicate with the user during simulation.

THANKS FOR YOUR TIME AND PARTICIPATION

Focus group session three: 3rd level learner nurses

NB: Here learner nurses are allocated numbers: e.g. P_1

CAMPUS C

Interview setting: Class room. On the 18/07/2015

Interview duration: 27 minutes and 3 seconds

Interviewer: Good morning ladies and gentlemen

Interviewees: morning sir

Interviewer: Iam Mathebula freedom a student nurse researcher

Interviewer: Since we now done with the first phase of the interview, and shown you all necessary documents and consented me, can we start with the second phase.

Researcher:

Can you please tell me about the utilization of simulation laboratory by both nurse educators and learner nurses in this Campus?

P_6: laboratories are not conducive and equipment not in a good working condition; are broken. This makes simulation difficult or not done effectively.

$P_{5\ \&\ 7}$: the clinical laboratories are always kept under lock and key. So it is difficult to use them and dolls (since we cannot access them at all).

Researcher:

How is simulation utilized by nurse educators and learner nurses at Limpopo College of Nursing?

P_4: during simulation, with the use of doll, we regard them as like with real patients.

P_7: at our campus the dolls that we have do not communicate, especial during continues assessment which makes it difficult because it cannot communicate during assessment.

P_4: yes, it's true, dolls do not communicate, this make us to keep on assuming and pretend as if are communicating – results in frustrations.

Researcher:

Tell me about the importance of simulation for the education of learner nurses?

P_8: simulation activities good in time management. Its preparation is totally different from that of dealing with a real patient. At the hospital we usual interfere with ward routines when we want to use patients for certain skills.

P_5: it's important as it allow us to practice skills in order to be competent and to develop confidence.

$P_{7\ \&\ 9}$: it allows time for corrections as we practice and identify our mistake (when given opportunity to access dolls).

P_2: simulation assist us a lot as it empowers students with clinical skills so that when we at the hospital we are able to prevent medico-legal hazards.

P_7: during simulation we get an opportunity to learn more about medical conditions, especial if at the clinical there is no patient with condition to supplement our learning. So the nurse educator can try to use the doll to simulate the condition, the challenge is that the dolls cannot give the clear message to us (*his head was nodding*).

P_1: utilization of simulation teaches us what to prepare when you want to do a certain skill on a real patient at the hospital.

Researcher:

How can the utilization of simulation be improved at the Limpopo College of Nursing?

$P_{1\ \&\ 4}$: I will suggest that we have high fidelity simulators

P_6: betterments or advancement on current dolls is needed to meet the current level of nursing. This may include the use of cardavos and not sponge.

$P_{2,\ 3\ \&\ 7}$: the current dolls are old, so new ones need to be in place.

P_5: lecturers need to give us enough time to do return demonstration. We be given time to access dolls for OSCA purposes (*appeared emotional and his hands were resting on a table*).

THANKS FOR YOUR TIME AND PARTICIPATION

APPENDIX L

CONFIRMATION BY LANGUAGE EDITOR

Dr J R Rammala
Box 4019
Sovenga
0727
01/04/2016

To whom it may concern

Confirmation letter for editing of a research mini-dissertation for Mathebula F N

Dear Sir/Madam

This serves to confirm that the above named candidate's research report entitled: Utilization of simulation by nurse educators and learner nurses at Limpopo College of nursing: Limpopo Province, South Africa, was edited by me for both language and technical appearance. The editing was done in track changes so that the changes made or suggested can be viewed from the copy I requested him to keep for that purpose. I then accepted changes that I effected and produced a clean document which I recommended may be submitted as such for assessment. The table of contents was reworked as some headings and sub-headings shifted to other pages when I accepted changes effected. I then produced a new table of contents which is in line with the main document.

Most mistakes were on the typology and technical appearance of the document. For example main topics, subtopics and further topics which have to be differentiated. The font type had to be varied for example in cases where there are third subtopics they have to be unbolded, small case and Italicised. Generally there were some mistakes on the language usage concerning concord, tense and punctuation. I am convinced that the document is now in a better position to be submitted for assessment.

Thanks

Dr J R Rammala 0822198060