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EVIDENCE-BASED SUPPORT MEASURES FOR SIMULATION-BASED NURSING: PARTICIPATORY ACTION RESEARCH FROM UNIVERSITIES IN SOUTH AFRICA

Degree of Doctor of Philosophy (PhD) in Nursing Science, University of Pretoria

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DECLARATION

I, **Pelegamotse Tabea Motsilanyane,** declare that the contents of this study are my original work. All literature from other studies has been appropriately acknowledged when compiling this study from the beginning to the end. This study has never been submitted to any other university until now, where it is submitted to fulfill the requirements of PhD in Nursing with the University of Pretoria, South Africa.

10 January 2025

Signature

Date

DEDICATION

I dedicate this thesis to my late husband, Matshidiso Samuel Motsilanyane. It is a testament to the support and encouragement you gave me. I will forever cherish your memories.

Also, I thank my parents, Mathilda Neo Lebethe, Andrew Butinyana Lebethe (my late father), and my late mother-in-law, Tsholofelo Motsilanyane.

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ABSTRACT

Introduction: Clinical time in nursing education has been augmented with simulation to accommodate many nursing students who need clinical experience. Students are exposed to the simulation laboratory to facilitate learning and enhance their preparedness for patient care. Depending on the degree to which they match reality, several simulators range from low-fidelity to high-fidelity. Both medium-fidelity and high-fidelity simulators are underutilised, and the lack of support for clinical facilitators is viewed as the key aspect of this problem.

Objectives of the study: The objectives of the study were achieved in different phases. Phase 1: To critically evaluate the available evidence regarding simulation-based nursing using an integrative literature review. Phase 2: To establish a working relationship with clinical facilitators participating in the study. Phase 3: To explore and describe the challenges of simulation-based nursing education in South African Universities; Phase 4: To identify the transformative values that contribute to the effective or ineffective simulation-based education in undergraduate nursing programmes; and Phase 5: To develop guidelines as evidence-based support for simulation-based guidelines for nursing education.

Research design and methods: An integrative literature review was conducted. Co-operative inquiry and Metens' transformative approach were used to conduct qualitative participatory action research with clinical facilitators from selected universities in South Africa. Transformative learning theory and transformative paradigm were used to ground the philosophical tenets of the study. The study was conducted at the selected Universities in South Africa. The researcher and the participants agreed on the data collection and analysis methods. Data were gathered through cooperative inquiry group meetings and analysed using thematic data analysis. The cooperative inquiry group decided on the outcome of the study. Ethical considerations were adhered to, and quality in the cooperative inquiry was achieved through eight proposed criteria.

Findings: Three themes emerged from phase two of the integrative literature review structure, process, and outcome. Four themes emerged from phase three, barriers in simulation-based resources, feeling of inadequacy, questioning one's assumption and perspective, and navigating shared experience through knowledge and practice. Five themes emerged from phase four as, exploring the relationships, simulation-based resources management, staff

capacitation, development of policies and procedures and adjustment of simulation-based roles.

Conclusion: The study findings and the transformative learning theory were used to develop the simulation-based guidelines. Qualtrics survey was used by experts to validate the guidelines.

Key concepts: clinical facilitator; cooperative inquiry group; guidelines: participatory action research; simulation

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LIST OF ABBREVIATIONS AND ACRONYMS	
ABBREVIATION	**MEANING**
CI	Cooperative Inquiry
CIG	Cooperative Inquiry Group
HFS	High Fidelity Simulator
LFS	Low Fidelity Simulator
MFS	Medium Fidelity Simulator
NEI	Nursing Education Institution
NWP	North West Province
PAR	Participatory Action Research
SA	South Africa
SP	Standardised Patient
TLT	Transformative Learning Theory

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CHAPTER 1: OVERVIEW OF THE STUDY

1.1 INTRODUCTION AND BACKGROUND

Simulation-based nursing is a pedagogical approach that supports students in improving and refining their clinical skills by practising decision-making in realistic, real-world scenarios (Kim et al. 2016:1). According to Campbell and Daley (2017:499), simulation-based education has entered mainstream nursing education and practice. Mannequins have supported clinical learning in nursing education since 1958 (Conrad, Guhde, Brown, Chronister and Ross-Alaolmolki 2011:189). The mannequins were used with no organised specific laboratory for clinical education and were mainly low-fidelity simulators (LFS). Simulation-based education was added to traditional models of clinical education to augment cognitive knowledge and refine clinical expertise. According to Wanless and Aldrige (2012:19), clinical educators can access various simulators, ranging from low to medium to high-fidelity electronic human patient simulators, based on how closely they reflect reality.

The first high-fidelity (computerised) simulator was developed in 1967 by a team of anaesthetic researchers in the United States of America (USA) and received recognition in 1993 (Levine, DeMaria, Schwartz and Sim 2014:695). Despite this, in South Africa (SA), using medium- and high-fidelity simulators is a new strategy only used by a few universities. Clinical facilitators are vital in guiding students and demonstrating skills to perfect their psychomotor skills, and technological advancement provides alternatives to actual patients. However, clinical facilitators in most universities receive once-off training from simulator suppliers. As a result, there are several challenges in the advancement of simulation, including an unwillingness of clinical facilitators to use them as an alternative to real-life experience (Ghareeb and Cooper 2016:208). The above author further states this is due to fear of technology and increased workload. The researcher has also observed instances where clinical facilitators hesitated to use medium and high-fidelity simulators. Consequently, nursing students are reluctant to use simulation effectively, citing that they were never introduced to most simulation equipment.

In health sciences education, the clinical time has been augmented with simulation to accommodate nursing students who require experience (Gaberson et al. 2015:188). Simulation-based learning enables the nursing student to integrate critical thinking, communication, and psychomotor skills, among others, while gaining self-confidence before entering the clinical setting (Gaberson et al. 2015:188). Clinical facilitators are expected to work towards ensuring that students are clinically competent before being allowed to care for patients to prevent medico-

legal hazards. The clinical facilitator must understand the theoretical aspects of student education to effectively clarify concepts and bring them to life through hands-on clinical experience.

A simulation laboratory is designed to conduct simulated events, debriefing and educational activities (Levine et al. 2014:695). An ideal simulation laboratory consists of a simulation room, skill testing area, demonstration room, and observation room (Daley and Campbell 2013:499). According to Mckimm and Edgar (2013:19), in North America, simulation laboratories were established after 1990, and they have expanded over the past two decades. A simulation laboratory brings about a variety of considerations regarding the use and management of resources (Daley and Campbell 2013:52). However, the situation has sparked much discussion about how much clinical time should be augmented with simulation or whether simulation should augment clinical time at all (Daley and Campbell 2013:11). Simulation-based learning provides nursing students access to practical hands-on application of their theoretical knowledge through training on tasks in a simulated environment (Massoth, Roder, Ohlenburg, Hessler, Zarbock, Popping and Wenk 2019:19).

Simulation-based learning provides nursing students access to practical hands-on application of their theoretical knowledge through training on tasks in a simulated environment and task simulation (Massoth, Roder, Ohlenburg, Hessler, Zarbock, Popping and Wenk 2019:19). A model of the human body is used as a tool to facilitate teaching and learning, three different types of simulators (low, medium and high-fidelity simulators). A low fidelity simulator (LFS) is a static model or task trainer primarily made of rubber body parts (Kim, Park and Shin 2016:3) aimed at replicating a particular anatomical body part, partially or entirely (Meska, *Mazzo*, Jorge, de Souza-Junior, Negri and Chayamiti (2016:832). According to Meska et al. (2016:832), LFS allows limited joint movement and is unresponsive to external stimuli. The simulators are mainly used to perform basic procedures that do not require the development of scenarios. Masson et al. (2019:6) confirmed that low-fidelity simulation provides more realistic student self-evaluations, although experience and learning outcomes are less compared to high-fidelity simulation. Medium Fidelity Simulator (MFS) is defined by Kim, Park and Shin (2016:3) as a full-body mannequin with embedded software that external handheld devices can control. Medium Fidelity Simulator provides only basic human responsive function (Munangatire and Naidoo 2017:1). Examples include the performance of urinary catheterisation and vital signs monitoring without scenario development. MFS is mainly used to demonstrate first- and second-year skills with the opportunity to practice under supervision and independently. High-fidelity simulators (HFS) produce a more realistic experience, have an outward appearance of reality, and react realistically to interventions (Gardner and Suplee 2010:170). HFS is fitted with software that allows the clinical facilitator to replicate the normal and abnormal body response to events and therapeutic intervention (Kim

and Shin 2015:60). An alternative use of simulations includes standardised patients (SP). The universities under study have different high-fidelity simulators, such as birth simulators, newborns, male surgical, female medical and many more that can simulate various conditions from minor to major.

According to McCaughey and Traynor (2010:827), SPs are healthy people trained to portray patients consistently and realistically. Standardised patients are viewed by Gardener and Suplee (2010: 171) as an excellent strategy to be incorporated into clinical teaching. Standardised patients are trained to consistently simulate an actual patient's physical signs, history, communication style, and emotional tone without placing stress upon them and on real patients (Levine, DeMaria, Schwartz and Sim 2014:175). In one of the simulation laboratories under study, students are trained to voluntarily substitute real life patients due to cost implications. According to Levine et al. (2014:174), the most notable advantages of using standardised patients include direct observation of trainees in clinical practice and the ability to provide feedback on multiple competencies.

Conrad et al. (2011:190) state that despite the availability of simulation technology, students require guidance and an environment that engages them in critical thinking. At the beginning of the simulation scenario, a team of nursing students is assigned specific roles by the clinical facilitator, who is responsible for providing nursing students with information relating to the scenario. Forrest et al. (2013:220) assert that the goal of creating a scenario is to provide students with enough information to understand the situation they are about to encounter to respond accordingly. The researcher developed tailored simulation-based guidelines to overcome the challenges experienced by the clinical facilitators regarding simulation-based nursing.

1.2 PROBLEM STATEMENT

Facilitation of learning through technological measures is among the core competencies identified by the South African Nursing Council (SANC) under the Competency Framework for Nurse Educators (2014:2). Thus, technology is gaining popularity in nursing education. One such technological measure includes clinical simulation embedded in the simulation laboratory. Simulation laboratories are usually equipped with high, medium, and low-fidelity simulators. A full-scale patient simulation, using the high-fidelity patient simulator, provides students with a sophisticated high level of interactivity and realism. A less sophisticated simulator involves a computer-based type (Oermann and Heinrich 2006:161). Clinical facilitators at the simulation laboratory are expected to conduct clinical teaching using low, medium, and high-fidelity simulators, as they have been taught to use the simulators mentioned earlier for effective simulation-based education.

A noteworthy concern is that underutilisation of the simulation laboratory has been observed in some of the universities selected for this study despite the ongoing training received by undergraduate clinical facilitators on different modes of simulators. Facilitators often use low and medium simulators only when teaching clinical skills, excluding high-fidelity simulators. When engaging with students, the researcher discovered that high-fidelity simulators were never used during clinical teaching. Munangatire and Naidoo (2017:44) point out some of the reasons for underutilisation, such as a lack of support for clinical facilitators. Lack of such support cascades into negative perceptions of high-fidelity simulation, eventually leading to underutilisation.

In simulation-based education, failure to demonstrate clinical skills using high-fidelity simulators (HFS) may deprive students of experience and confidence in performing such skills during care in a real-life situation. For example, the study by Basak et al. (2016:420) confirmed that high-fidelity simulation is more beneficial in learning, and students gain confidence from such a strategy. In addition, quality patient care may be compromised if students are never given an opportunity to gain experience and confidence through simulation using HFS. Equally, students exposed to underutilisation of HFS are deprived of the opportunity to practice such specific skills repeatedly towards mastering them, thus making it difficult for them to integrate theory and practice. According to Munangatire and Naidoo (2017:44), HFS uses advanced technology to produce human physiological responses in a mannequin, a learning opportunity for students in terms of technology. High-fidelity simulators are costly to purchase, and if they are bought and under-utilised, they negatively impact the budget of the concerned institution. Therefore, the researcher deemed it necessary to use participatory action research and work with Cooperative inquiry group to develop guidelines for simulation-based nursing education in selected South African universities.

1.3 AIM AND OBJECTIVES OF THE STUDY

As the initiator of the research, the researcher understood that participants as members of a cooperative inquiry group become co-subjects and co-researchers whose right to decide or divert the direction of the study is of utmost importance.

Thus, the aim and objectives of the study are as follows:

Table 1.1: ***Aim, objectives, and research questions***

The overall aim of this study was to develop the simulation-based guidelines in nursing education.	
Phase 1	
Research question:	What is the available evidence on simulation-based nursing?
Research objective:	To critically evaluate the available evidence regarding simulation-based nursing using an integrative literature review
Phase 2	
Research question:	How can a working relationship be established with clinical facilitators as co-researchers?
Research objective:	To establish a working relationship with clinical facilitators participating in the study.
Phase 3	
Research question:	What do you perceive as challenges regarding simulation-based education for students?
Research objective:	To explore and describe challenges perceived by clinical facilitators regarding simulation-based nursing.
Phase 4	
Research question:	What are the transformative values that can contribute to the facilitation of clinical simulation-based education?
Research objective:	To identify transformative values that contribute to simulation-based nursing.
Phase 5	
Research question:	How can the Guidelines for simulation-based nursing education be Developed as evidence-based support measure?
Research objective	To develop guidelines as evidence-based supports measure for simulation-based nursing in nursing education.

1.4 CONTEXT

Polit and Beck (2017:1046) define a study's context as the physical location and conditions in which data collection occurs when conducting a research study. Qualitative data collection is usually done in a real-world, naturalistic setting because the researcher may deliberately strive to study phenomena in various natural contexts (Polit and Beck 2014:568). In this study, the setting was the selected universities in South Africa offering Bachelor's degree programs in nursing and simulation laboratories. The simulation laboratory is expected to use low, medium, and high-

fidelity simulators. The researcher confirmed thirteen universities around SA using simulation-based nursing. Only clinical facilitators conducting simulation-based nursing education using all three modalities participated in the study. Nursing students did not form part of the study participants. See chapter four for further details.

1.5 THEORETICAL FRAMEWORK

The study was guided by the transformative learning theory (TLT), as outlined by Taylor (2008:5). According to Illeris (2015:49), Jack Mezirow first launched the concept of transformative learning in his study based on women returning to college after several years outside the education system. Transformation occurs through a series of cumulative transformed meaning schemes or because of social crises (Taylor 2008:5). In this study, transformation focused on clinical facilitators engaged in a dialogue on their experiences using simulation-based education. Transformative learning theory was chosen because it allows clinical facilitators to critically reflect on challenges in simulation to bring about transformative solutions to simulation-based education. See Chapter four for more details

1.6 PARADIGMATIC PERSPECTIVES

Flick (2014:540) defines a paradigm as a fundamental conception of conducting research in a specific field with consequences on the levels of methodology and theory. A transformative paradigm was used to guide the study. According to Leavy (2017:270), the transformative paradigm is a philosophical belief system developed in transdisciplinary contexts and draws on critical theory. According to Denzin and Lincoln (2018:877), the idea behind the transformative paradigm is that it contains a social intervention connotation, which, when applied to this study, can form a guide for the anticipated participatory action research whereby clinical facilitators at the selected from different universities, will come with the transformative solution to simulation-based education. The paradigm is explained in detail in Chapter 3.

1.7 CLARIFICATION OF KEY CONCEPTS

For the purpose of the study, the following concepts were used:

1.7.1 Clinical facilitator

The clinical facilitator is a registered professional nurse who provides academic leadership and professional guidance to students, mainly in the clinical learning environment (Gaberson, Oermann and Shellenbarger 2015:189). For this study, a ‘clinical facilitator’ is a nurse educator and a preceptor who facilitates clinical teaching through simulation.

1.7.2 Clinical teaching and learning

According to the Nursing Act (2005:2), clinical teaching and learning refer to the facilitation of experiential learning in various settings where the theoretical component is correlated with practice. In this study, clinical teaching and learning means using clinical simulation as a strategy for undergraduate nursing students in the simulation laboratory.

1.7.3 Cooperative Inquiry Group (CIG)

According to Reason (1999:208), cooperative inquiry is a way of working with other people who share similar interests and concerns to understand the world and learn how to act to change things and do things better. In this study, CIG refers to a group of clinical facilitators experienced in clinical simulation as co-researchers and the principal researcher who will be participating in the study.

1.7.4 Evidence-based support measure

Evidence-based support measures are interventions that have been shown to be effective in studies that use high quality evaluation methods and align with clinical expertise and patient needs. (Maranda et al 2022:364). In this study evidence-based support measure refers to guidelines that are grounded scientific research and validated by experts to be effective in achieving quality simulation-based nursing.

1.7.5 Participatory Action Research

Participatory Action Research is defined by Feldman et al. (2018:6) as the study of social situations to improve the quality of the action within it. In this study, participatory action research refers to social situations with a view to improve quality in simulation-based nursing.

1.7.6 Simulation

Simulation is defined as the imitation of the operation of a real-world process over time (Levine, DeMaria, Schwartz and Sim 2014:695). For this study, simulation is the technique used to replace real-life experience before the students are exposed to real-life situations.

1.7.7 Simulation-based nursing

In this study, simulation-based nursing is a purposeful and structured method of supplementing and enhancing the clinical education of undergraduate nursing students.

1.7.8 University

According to the Higher Education Act No. 101 of 1997 in South Africa, a university “means any higher-education institution established, deemed to be established or declared as a university under this Act”. In this study, universities will refer to the three institutions offering a 4-year Bachelor of Nursing Science and where the study will be conducted.

1.7.9 Guidelines

Cambridge Dictionary defines guidelines as information to advise people on how things should be done or what something should be. In this study, guidelines are recommendations that provide direction on how the clinical facilitators should conduct simulation-based nursing.

1.8 RESEARCH DESIGN AND METHODS

1.8.1 Research design

Research design is an overall plan to address the research question, including strategies to enhance the integrity of the study (William and Wilkins 2014:390. Participatory action research is one of the designs that should be understood and considered when conducting a qualitative research methodology. The researcher used the PAR research design in this study. See more details in section 1.9.

1.8.2 Research approach

In this study, the researcher employed a qualitative approach that used PAR. The qualitative research approach combines methods and observed techniques, interpreting characteristics, documenting patterns and attributes, and analysing the meaning of human phenomenon under study (McDonald 2012:34). The researcher and the CIG members chose this approach because it is collaborative and change-oriented. A qualitative approach explores how people understand their world and seeks to explain the meaning of social phenomena (Williamson and Whittaker 2020:212). The approach allows the researcher to collect open-ended emerging data to develop themes from such data (Creswell 2017:18). The Qualitative approach is aimed at describing rather than predicting; therefore, the research participants were able to describe the challenges regarding simulation-based education and the transformative values thereof. With the qualitative approach, the inquirer makes knowledge based on constructivist and participatory perspectives (Creswell 2017:18), meaning the researcher can collaborate with participants and interpret the data obtained. The qualitative approach assists the researcher in reaching the research findings.

1.9 PARTICIPATORY ACTION RESEARCH (PAR)

De Chesney (2015:2) considers PAR a participatory and cooperative inquiry that has increased in popularity in social science over the past two decades. The advantage of using PAR is that it emphasises problem-solving, and the research is directed towards greater understanding and improvement of their practice (Hawkins 2015:467). Thus, the PAR research design was considered since it is expected to be used to improve simulation-based education. The researcher chose PAR because it is a subset of action research, which is the “systematic collection and analysis of data to take action and make change” by generating practical knowledge (McDonald

2012:36). The cycles of PAR that were followed during data collection included reflection and action. As a field in PAR, a CIG was used to direct the study, as suggested by Mash (2014:3).

1.10 RESEARCH METHODS

According to Polit and Beck (2017:735), research method refers to the steps, procedures and strategies for gathering and analysing data in a study. A qualitative approach was used, emphasising PAR design. Qualitative research investigates phenomena, typically in a holistic and in-depth fashion, through a collection of rich data using a flexible design (Polit and Beck 2017:714)

Table 1.2: ***Summary of research methodology for phases 1,2,3 and 4***

Phase 1: To evaluate the literature regarding simulation-based nursing using an integrative literature review.				
Population	**Sampling**	**Sample size**	**Data collection**	**Data analysis**
Articles from Different database	Purposive sampling	21 studies on simulation-based nursing education.	Integrative literature review	Thematic data analysis
Phase 2: To establish a working relationship with participants.				
Population	**Sampling**	**Sample size**	**Data collection**	**Data analysis**
Clinical facilitators	All Clinical facilitators	6-12 clinical facilitators using low, medium, and high-fidelity simulators	Focus group interview.	Thematic data analysis
Phase 3: To explore and describe challenges clinical facilitators perceive regarding simulation-based learning.				
Clinical facilitators	All Clinical facilitators	6-12 clinical facilitators per focus group	Focus group discussion	Thematic data analysis
Phase 4: To identify transformative values that contribute to the study.				
Clinical facilitators	All Clinical facilitators	6-12 clinical facilitators per focus group	Focus group discussion	Thematic data analysis
Phase 5: To develop guidelines as evidence-based support measure for simulation-based nursing.				
Experts in simulation-based education and nursing education	Purposive sampling	10-15 experts in simulation-based education and nursing education	e-Delphi technique	Thematic data analysis

1.10.1 Initial population and sampling

This study's population consisted of clinical facilitators at the selected universities. Cooperative inquiry entails voluntary, democratic, and collaborative participation with equal participants' status; thus, the study sample comprised clinical facilitators who voluntarily decided to participate.

Table 1.3: *Population and sampling*

Population	Population is defined by Polit and Beck (2017:739) as the entire set of individuals or objects having some common characteristics. Clinical facilitators involved in conducting clinical teaching in simulation laboratories of the five universities in South Africa using low, medium, and high-fidelity simulators formed part of the population. Simulation laboratory managers and nursing lecturers with experience of 5years and more of simulation-based nursing participated in the study as expert participants.
Sampling	Sampling is the process of selecting a portion to represent the entire population (Polit and Beck 2017:1045). The importance of the sampling procedure in a qualitative research study is to select participants who have experience with the phenomena of interest (Chesney 2015:33). To this study, sampling meant selecting clinical facilitators using simulation to participate in the study.
Sampling method	Purposive sampling was used to recruit most relevant participants. Purposive sampling is a nonprobability sampling method in which a researcher selects participants based on a personal judgement about their knowledge of the situation under investigation (Polit and Beck 2017:741). Clinical facilitators involved in simulation-based education were selected to participate in the study.
Sample size	A Cooperative Inquiry Group, as outlined by Mash (2014:4), functions best with 10-15 participants. A sample size of 10-15 clinical facilitators from the selected universities using low-, medium-, and high-fidelity simulators were selected to participate in phases one to three of the study. 12-15 experts in simulation-based education nationally and internationally participated in Phase four of the study.
Eligibility criteria	Eligibility criteria*:* Participants were clinical facilitators employed by the universities under study, either in permanent or contract positions, and using simulation using low, medium, and high-fidelity simulators as one of the clinical teaching strategies.

Inclusion criteria	Inclusion criteria are the eligibility criteria that specify population characteristics (Polit and Beck 2017:250). Clinical facilitators who used simulation as a teaching and learning strategy for at least one year were selected to participate in the study. Clinical facilitators were undergraduate nursing educators and clinical preceptors with a degree in nursing science and nursing education and using simulation laboratory low, medium, and high-fidelity simulators. An additional Master's degree or PhD might not be compulsory for selecting clinical preceptors. Participants were registered with the SANC.
Exclusion criterion	Exclusion criteria specify characteristics a target population does not have (Polit and Beck 2017:250). Clinical facilitators from the universities that do not use low, medium and high-fidelity simulators were excluded from the study.
Selecting participant	The Cooperative Inquiry Group CIG) was formed to participate in the study. The principal researcher initiated the group. Recruitment was done through email and telephonic requests (See 10.2.1 and 10.2.2).

1.11 RESEARCH METHODOLOGY

Integrative literature review was conducted to achieve objective one of the study which was to evaluate the literature regarding simulation-based nursing. Refer chapter two for details.

Five phases of CIG were employed to achieve objectives two, three and four using PAR. One population and sample from the selected universities in South Africa were used throughout all the phases except Phase 4, where e-Delphi was used to validate the simulation-based guidelines.

1.11.1 Phase 1: Reflection phase

Objective: To establish a working relationship with participants.

Phase 1 focused on building relationships with universities under study.

Gatekeeping

Gatekeeping refers to an adult who controls a researcher's access to participants (McFadyen and Rankin 2016:82). Singh and Wassennar (2016:42) describe a gatekeeper as a person who is in charge of an institution or an organisation, such as a managing director or an administrator. The researcher wrote a letter to the individual heads of the university nursing departments to appoint them as gatekeepers. The letters were sent as attachments to their emails and included the study title, objectives, and brief information on different methods used to conduct the study.

Pre-entry phase: In this study, the researcher requested access from the management of the universities to conduct CIG meetings and workshops. The request was made in the form of a formal email with information that included the proposed research process, objectives of the study, benefits thereof, as well as issues of anonymity and confidentiality (Singh and Wassennar 2016:42). A follow-up telephonic call may be necessary to develop a rapport and to learn from the gatekeeper. A formal process of requesting access to the universities and understanding the operational hierarchy may maximise the possibility of being granted such access. According to Singh and Wassennar (2016:42), the researcher is ethically obliged to engage transparently when seeking access to an institution for research purposes. McFadyen and Rankin (2016:82) suggest that the researcher must identify the critical gatekeeper concerned to gain their support and cooperation. Thus, the researcher appointed a gatekeeper from each university.

McFadyen and Rankin (2016:87) argue that the researcher needs to be sensitive to the gatekeepers' position and inform them of their contribution to the study to gain their trust and convince them of the survey's integrity. Singh and Wassennar (2016:42) further state that institutions and organisations have the right to permit or deny access to their space, information, and service users for research purposes. The researcher shared the proposal with the gatekeepers, which included all the stages and procedures to follow.

Recruitment of participants

According to Polit and Beck (2017:261), recruiting participants involves identifying eligible candidates and persuading them to participate in the research project. In this study, recruitment of participants was done through telephonic calls to the universities that are using low, medium, and high-fidelity simulators (Johl and Renganathan 2010:44). A clear recruitment process that might attract a favourable decision of the gatekeeper included the study process and consideration of participants as outlined by the researcher (Singh and Wassennar 2016:42). The researcher conducted a formal online presentation to clinical facilitators who responded to the invitation as suggested by in Mash (2013:3). The presentation included a formal orientation to the study. Initial discussions with participants included self-introduction, introduction of the aim of the meeting, as well as the times and suitable dates. Proximity contacts with potential participants were adhered to, as restricted in the COVID-19 research risk assessment. At the university where the researcher is employed, it might be difficult for colleagues to decline to participate in the study; thus, such a decision could compromise the voluntariness of participation (Singh and Wassennar 2016:42). Therefore, the gatekeepers at different universities of nursing schools/departments appointed the mediators who worked as the simulation managers. The mediators assisted the researcher in recruiting the clinical facilitators as participants.

Cooperative inquiry process

Co-operative Inquiry is a systematic approach to developing understanding and action (Reason 1999:109). Reason (1999:208) explains that people with similar interests come together and contribute to the ideas that go into their work. Cooperative Inquiry is a form of person-centred participatory inquiry whereby the research is conducted with people and not on people or about people (Heron 1996:19). In this study, clinical facilitators were recruited to be part of the participatory group. They must agree to become members of the cooperative group inquiry and engage in simulation-based research meetings. The advantage of CIG is that all group members contribute to the idea and are also part of the activity that is being researched (Reason 1999:208). This method was selected to allow clinical facilitators to explore challenges regarding simulation-based education and decide on the solution with the researcher.

At the end of the study, the cooperative inquiry group will create four types of knowledge: experiential knowing, presentational knowing, propositional knowing, and practical knowing (Reason 1999:211). For this study, the researcher provided a preliminary process on the sequential stages of the study. Cooperative Inquiry, as an emergent movement from one phase to the other, will depend on participants' satisfaction with the completeness of the previous stage (Coughlan and Coghlan, (2002:229). The preliminary data collection process followed the six stages of CIG (Reason 1999:210). The stages are discussed below.

Stage 1: First reflection phase; Stage 2: First action phase; Stage 3: Full immersion in stage 2; Stage 4: Second reflection phase; and Stage 5: Subsequent stage continues with cyclic inquiry. The cyclical investigations will continue, depending on the variety of intentional procedures and unique skills in the action phase to enhance the validity of the process. Stage 6: Final reflection – conclusion of the CI. Stage 1 of the cooperative inquiry process will be applied in Phase 1 of the study as follows:

Stage 1: First reflection phase

This phase represented the first CIG meeting, where the researcher presented the statement of inquiry. The researcher and participants decided how to frame the statement to make it fruitful for the research process (Heron 1096:75). During this phase, the researcher established a working relationship with the participants.

Data collection method

Two focus group interviews were used to achieve the objective in phase 1.

The CIG agreed on the research questions, objectives, and methodologies used to conduct the study during its first meeting (Mash 2014:3). During the online meeting, the CIG formulated

questions with the principal researcher on the challenges related to simulation-based education. Members of the group, as co-researchers, decided on convenient schedules for subsequent CIG meetings that would not interfere with the normal duty work schedule. Some members of the CIG participated in Phases 1 to 3.

Data analysis

The researcher, together with the CIG member, participated in data analysis. Six phases of thematic data analysis, as outlined by Braun and Clarke (2017:52), were followed to analyse data as follows: *Familiarising with data*: This involves recording and transcribing during the CIG meeting and noting down the most important codes; *Generating initial codes*: Coding all interacting features obtained during the meetings and workshops; *Searching for themes:* Cooperative inquiry group will collate codes into themes; *Reviewing themes*: CIG members will need checked if the themes correspond with the code and information obtained; *Defining and naming themes:* Group members will have to reach consensus on themes developed, and *Producing a report:*

1.11.2 Phase 2: Action Phase

Objective: To explore and describe challenges clinical facilitators face regarding simulation-based education.

Phase 2 will be subdivided into the methodology, Stages 2 and 3 of the cooperative inquiry group process, focus group interviews and thematic analysis.

Methodology

Stage 2: First action phase

This stage involves the application of greedy action and recording one's own and other's reflections (Greenhood and Kelly 2020:222). The CIG explored challenges regarding simulation-based nursing, which included teaching and learning, as well as what needs to be improved when conducting simulation-based education in their second CIG meeting. The CIG meetings were conducted online using Microsoft Teams. Group members shared their experiences by writing the sticky notes, which were be used as data. The CIG reflected on what has been happening in the simulation laboratory regarding clinical simulation-based nursing to understand their experiences better and try out new forms of action.

Stage 3: Full immersion in stage two

Members of the Cooperative Inquiry Group became fully immersed in the issue of simulation-based education to explore and describe challenges perceived by clinical facilitators regarding the particular strategy in their third CIG meeting. The group enabled the deepening of experiences and allowed the development and elaboration of superficial understanding. The complete

immersion phase may lead to new action questions and create insights. New ideas led members of the Cooperative Inquiry Group from the original ideas and proposal into a new field, unpredicted action and creative insight. During this stage, the researcher and the CIG were able to establish the gaps related to simulation-based education and decide on the need for clinical facilitators to be trained on using all fidelity simulators.

Data collection method

Two focus group discussions were used to collect data. Polit and Beck (2017:729) define a focus group interview as an interview with a small group assembled to provide feedback on a given topic using semi-structured questions. CIG members had an opportunity to brainstorm on challenges related to simulation-based education. Polit and Beck (2017:51) further state that a typical 2-hour group session should include 12 semi-structured questions. As suggested by Polit and Beck (2017:511) from four universities, six to twelve participants formed part of one focus group interview to share their challenges regarding simulation-based education. The focus group interview method was considered because it will allow the researcher to obtain the viewpoints of many clinical facilitators within a short period.

Data analysis

As explained in 11.1.4, data was analysed using six phases of thematic data analysis outlined by Braun and Clarke (2017:52).

1.11.3 Phase 3: Action phase

Objective: *To identify the transformative values that contribute to the study.* Phase 4 will be subdivided into the methodology, transformative value, Stages 2 and 3 of the cooperative inquiry processes, focus group interview and content data analysis.

Methodology

Transformative values

The challenges explored in Phase 2 regarding simulation-based nursing education derived transformative values that contribute to simulation-based education. Transformative value is a social dimension of value creation that generates uplifting change for greater well-being among individuals and collectives (Blocker and Barrios 2015:265).

Stage 2: First action phase

Cooperative inquiry group was used to identify the transformative values that contributed to the study. To explore such challenges, four focus group discussions sessions were conducted to identify transformative values, using words from the discussions and grouping them into categories.

Stage 3: Full immersion in Stage 2

In their fifth meeting, members of the Cooperative Inquiry Group were fully immersed in issues that addressed challenges regarding simulation-based education, thus bringing transformation towards effective simulation-based nursing. The complete immersion phase led to new actions and questions and created some insights regarding simulation-based nursing. Members of the Cooperative Inquiry Group were led by new ideas from the original ideas and made proposals for a new field, unpredicted action, and creative insights.

Data collection method

Focus group interviews were used to identify values that would generate change in simulation-based education. Some members of CIG who participated in Phases 1 and 2 participated in the focus group interviews as well.

Data analysis

As explained in 11.1.4, data was analysed using six phases of thematic data analysis (Braun and Clarke 2017:52).

1.11.4 Phase 4: Reflection phase

Objective: *To apply the findings from the three phases to inform evidence-based support measures for simulation-based nursing education in all the universities in South Africa.*

Methodology

Population: The population comprised a group of experts with a sample size of 14 experts from different universities nationally.

Inclusion criterion: The experts were registered nurses and educators with experience in simulation-based nursing education. They are to be currently managing simulation laboratories, have also managed clinical simulation-based education for five years and above and have experience in simulation laboratories in nursing education.

Sampling: In this study, purposive sampling was used to select the experts. To reach a consensus, the experts were invited to participate in e-Dephi through telephone and email.

Data collection method: e-Delphi was used to achieve the objective in phase four. E- Delphi is defined as an interactive online strategy based on the scoring of a series of structured statements, which are revised and repeated until consensus is reached (Eleftheriandou et al. 2015:2). Experts in simulation-based education used the technique according to the four phases, namely preparatory phase, exploratory phase consensus phase and refinement of data as (Msibi et al. 2020:1).

- *Phase 1: Preparatory phase*. In this phase, the instructional designer and the University's Learning Management System administrator assisted the researcher in creating one e-Delphi platform. Experts in simulation-based education who did not affiliate with the university's e-Delphi platform also received access.
- *Phase 2: Exploratory phase.* The researcher posted outcomes of the evidence-based support measures from all three study phases for brainstorming with experts.
- *Phase 3: Consensus phase*. The validation tool reached a consensus based on the experts' comments, input, and suggestions.
- *Phase 4: Data refinement***.** This phase was based on the measures the experts and the researcher agreed upon.

Data analysis

The researcher developed the seven-point Likert scale using the AGREE 11 tool to measure consensus. A score of 1 was allocated for irrelevant information, and a score of 7 for perceived exceptional information.

1.12 QUALITY IN COOPERATIVE INQUIRY

Quality in cooperative inquiry was achieved through the following eight proposed criteria: (1) alignment with the purpose; (2) ownership of the inquiry process; (3) development of reflectivity; (4) democratic and collaborative group dynamics and facilitation; (5) commitment to practical action and experience; (6) documentation of the process; (7) transferability; and (8) construction of new knowledge (Mash 2014: 6), See chapter four for details.

1.13 ETHICAL CONSIDERATIONS

According to Pattern and Newhart (2018:32), ethical considerations are associated with right and wrong when research is conducted on people. Ethical principles guide the researcher in determining what must be considered in the research study process.

1.13.1 Ethical approval

Ethical clearance will be requested from the Research Ethics Committee of the University of Pretoria. Permission letters will be requested from the three universities selected for the study.

1.13.2 Ethical Principles

Three ethical principles most appropriate to this study have been identified: respect for persons, beneficence, and justice (Devlin 2018:111).

Respect for persons

The principle of respect for persons may also manifest through informed consent. Informed

consent means that participants have adequate information about the study, comprehend that information and have the ability to consent to or decline participation (Polit and Beck 2017:217). Informed consent also means participants' agreement is willingly provided to cooperate with research that has been explained to them and that they can understand. This is a requirement for ethically sound research (Flick 2014:538). It is a key principle in research ethics, which implies that prospective research participants should be given as much information as might be needed to make an informed decision about whether or not they wish to participate in a study (Bryman 2016: 545). In this study, written consent was signed by participants acknowledging that they understand the possible risks and benefits associated with their participation in the study, that their participation is voluntary and confidential and that they freely agreed to participate. A formal letter was written to the expert participants requesting them to participate in the study and indicating through signature that they received the letter.

Beneficence

Polit and Beck (2017:1005) define beneficence as an ethical principle that seeks to maximise benefits for study participants and prevent harm. Flick (2014:50) explains that research on human beings should produce some positive and identifiable benefit rather than be carried out for its own sake, which means that the research should strive not to harm, maximise possible benefits and use a research design that is best suited to minimise risks and maximise benefits (Pattern and Newhart 2018:32). Not all harm can be anticipated in research planning thus, it is the responsibility of the researcher to create a research plan that minimises the potential for harm and increase the potential for benefit (Pattern and Newhart 2018:32). An embarrassment during the discussion can lead to a certain degree of harm thus, damaging the reputation of participants. The researcher ensured that participants who reported doing things at odds in the simulation laboratory were not ridiculed. The study would benefit clinical facilitators involved in clinical teaching in the simulation laboratory and nursing students receiving clinical education in a simulation laboratory.

Justice

Another important principle within research ethics is justice. Justice means that research participants are treated equitably, and any benefits or burdens related to the study are shared (Pattern and Newhart 2018:35). CIG members and experts will receive information about the study, including their rights to withdraw from it without explanation.

Anonymity

The identity of participants should be revealed, neither in image nor in words, unless they have given specific written concern (Crane and O'Regan 2010:65). According to Crane and O'Regan (2010:65), the researcher needs to be careful not to reveal details that give away the details of participants when reporting PAR. For this study, members of CIG agreed that their names, identity

numbers, and images would not be revealed. Experts participating in e-Delphi were anonymous.

According to Kivunja and Kuyini (2017:28), implementing ethical principles focuses on the following four principles: Privacy, Accuracy, Property, and Accessibility.

- **Privacy:** The researcher and participants need to consider the type of information required about the organisation and the conditions under which data will be collected and analysed. Members of CIG will not be forced to reveal information they want to keep to themselves.
- **Accuracy:** The principle of accuracy concerns who is responsible for the accuracy, authenticity, and fidelity of information and how the researcher will cross-check with participants. It is also concerned with who will be held accountable should any errors occur in the data. Members of CIG ensured that the minutes of each meeting reflected what was discussed and agreed upon. Confirmability was assessed by maintaining a detailed description of the e-Delphi collection and analysis processes.
- **Property:** The principle of property is related to who will own the data and who will own the channels, such as the publication and media, through which it will be disseminated. CIG members, as co-researchers, were encouraged to develop a sense of ownership of the data collected.
- **Accessibility:** This principle concerns who will have access to data, how data will be kept safe, and how access to data will be gained.

1.14 LAYOUT OF THE STUDY

Table 1.4 ***Layout of the study***

CHAPTERS	LAYOUT OF THE STUDY
Chapter 1	Orientation to the study
Chapter 2	Integrative literature review phase one
Chapter 3	Theoretical and paradigmatic perspective
Chapter 4	Research design and methodology
Chapter 5	Findings for objectives one, three and four
Chapter 6	Discussion of Findings for the objective of phases one, three and four

1.15 CONCLUSION

Chapter one provided an overview of the study, including the problem statement, research questions, aim, objectives, and concepts used. This chapter also introduced the theoretical framework, research paradigm, and research methods used in the study. The study phases were

also introduced, and the ethical considerations were explained. Chapter two will focus on the integrative literature review on simulation-based nursing education.

CHAPTER 2: INTEGRATIVE LITERATURE REVIEW

2.1 INTRODUCTION

Chapter one provided an overview of simulation-based education, while Chapter 2 focused on an integrative literature review on simulation-based nursing education: Participatory Action Research from selected universities in South Africa. Integrative literature is research that critiques, reviews, and synthesises representative literature on a topic in an integrated manner to generate perspectives and frameworks (Torraco 2005). An integrative literature review is the broadest review method that allows for the simultaneous inclusion of experimental and non-experimental research to understand a phenomenon fully.

This approach was chosen because of its potential to build nursing science, practice, and information research (Whittemore and Knafl 2005:546). The advantage of a review is that it may combine data from theoretical and empirical literature. This review will assist nursing practice integrating nursing theory and practice, particularly simulation-based nursing. The researcher conducted an integrative literature review to explore aspects of simulation-based nursing, emphasising low, medium and high-fidelity simulation.

2.2 REVIEW QUESTION

The integrative review was conducted to answer the following review question: *What is the evidence-based support measure for simulation-based nursing? The* PICOTS tool was used to organise and assess the research question. Six elements of the PICOTS model were used: population, intervention, comparison, outcome, type, and setting.

- P (Population): Clinical facilitators
- I (intervention): Simulation (As teaching and learning strategy)
- C (Control): Simulation Laboratory
- O (Outcome): Measures to enhance effective simulation-based education
- T (Type): Type of study which is integrative literature review
- S (Setting): Simulation laboratory.

2.3 RESEARCH DESIGN

The researcher adapted five stages of integrative literature review as outlined by (Whittemore and Knafl 2005:546). The steps are illustrated in Figure 1.1

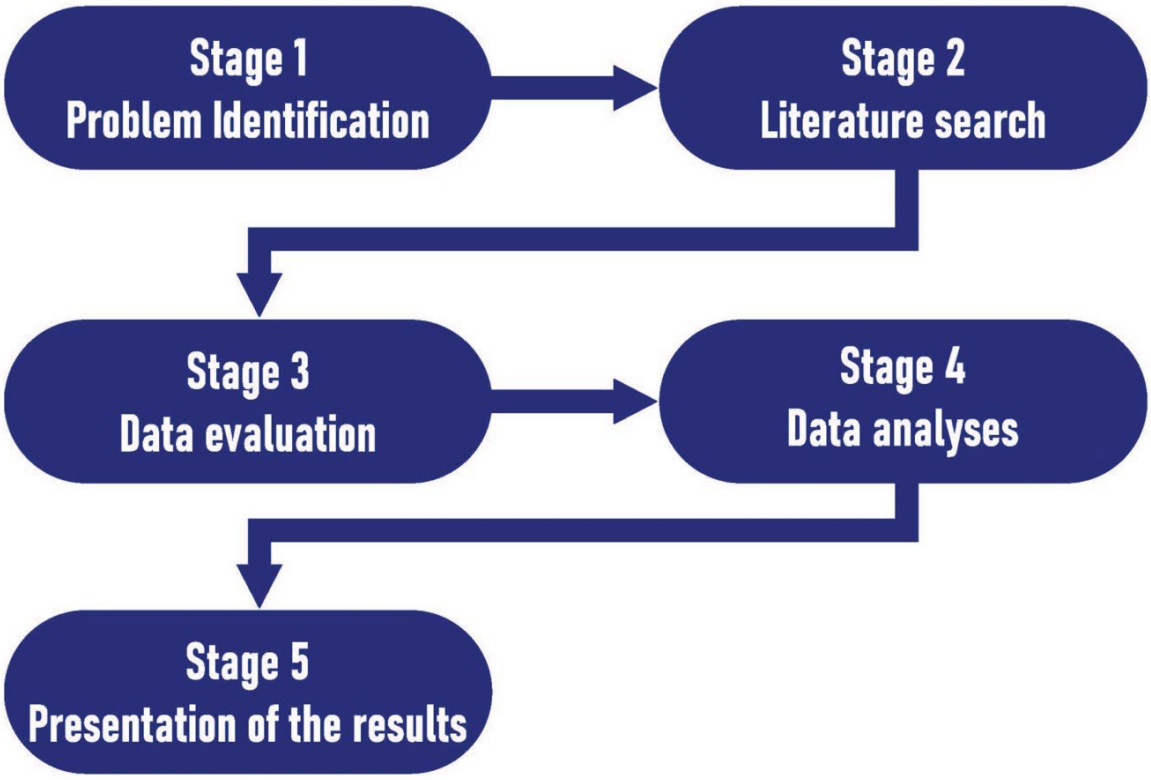


Figure 2.1: Stages of integrative literature review

2.3.1 Stage 1: Problem identification

Most studies on simulation-based education, using simulation modalities for undergraduate nursing students, revealed that repeated training and interventions bring confidence and satisfaction. Failure to receive training and engage in repeated intervention may lead to incompetence in skills performance and low self-esteem. Thus, an integrative literature review is necessary to keep e clinical facilitators up to date with fidelity technology for teaching and learning.

The purpose of this review was to critically evaluate the literature on simulation-based nursing using an integrative literature review. Variables considered in this literature review included simulation-based nursing, while the population consisted of studies retrieved from electronic databases. Simulation-based nursing involves using low, medium and high fidelity, specifically in a simulation laboratory.

2.3.2 Stage 2: Literature search

The researcher consulted a librarian on electronic databases that included grey literature sources on simulation-based education in nursing. The search for research articles for integrative review was achieved through a three-step method recommended in the JBI systematic review (Peters et

al. 2015:143). The first search was a limited search for the selection of relevant databases. The second search used all keywords identified, while the third comprised the reference list of all articles identified. There is a need for a narrative description of a search decision process, accompanied by a search decision flowchart (Peters et al. 2015:144).

The comprehensiveness of the literature search was ensured by including published literature. The researcher searched for evidence using different sources to achieve this objective. An electronic literature search of academic journal databases (Science Direct and PubMed Central, Sabinet, Cinahl, Cochrane and ProQuest) was purposefully done. Only articles on simulation-based nursing, written in English and published in peer-reviewed journals from 2018 to 2023, were considered. All abstracts were read to verify if they addressed simulation-based nursing. This phase was the first screening level, where only the title and abstract were reviewed to exclude articles that did not meet the minimum inclusion criteria. The first form was developed to identify the title and the abstract. The articles were taken to the next step of screening.

All databases used the following search terms to identify studies for review: *simulation-based nursing, low-fidelity, medium-fidelity, and high-fidelity simulators*. The final review included 21 reviews.

Table 2.1: Definition of terms used in the review

TERM	DEFINITION
Fidelity	The extent to which simulation models resemble live humans to achieve specific, defined objectives (Paige and Morin 2013).
High-fidelity simulator	A mannequin produces a more realistic experience, has the outward appearance of reality, and reacts realistically to interventions (Gardner and Suplee 2010:170).
Low-fidelity simulator	A static model or task trainer is primarily made of rubber body parts aimed at replicating a particular anatomical body part, partially or completely (Meska 2016:832).
Medium-fidelity simulator	A full-body mannequin that has embedded software and can be controlled by external handheld devices (Kim et al. 2016:3).
Simulation	Techniques used to substitute real experience with guided experience that replicates substantial aspects of the real world in a fully collaborative approach (Gaba 2004).

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) approach was used to conduct this review (see Figure 2.1). Page et al. (2020:1) state that PRISMA was

designed to help reviewers transparently report on why and how a study was conducted and the findings. The 2020 version of PRISMA replaced the 2009 statement by including the advanced method to identify, select and synthesise studies (Page et al. 2020:1). The review assists researchers in determining future research, addressing questions that individual studies could not answer, providing knowledge in the field of study; and identify problems that can be rectified in future research (Page et al. 2020:1).

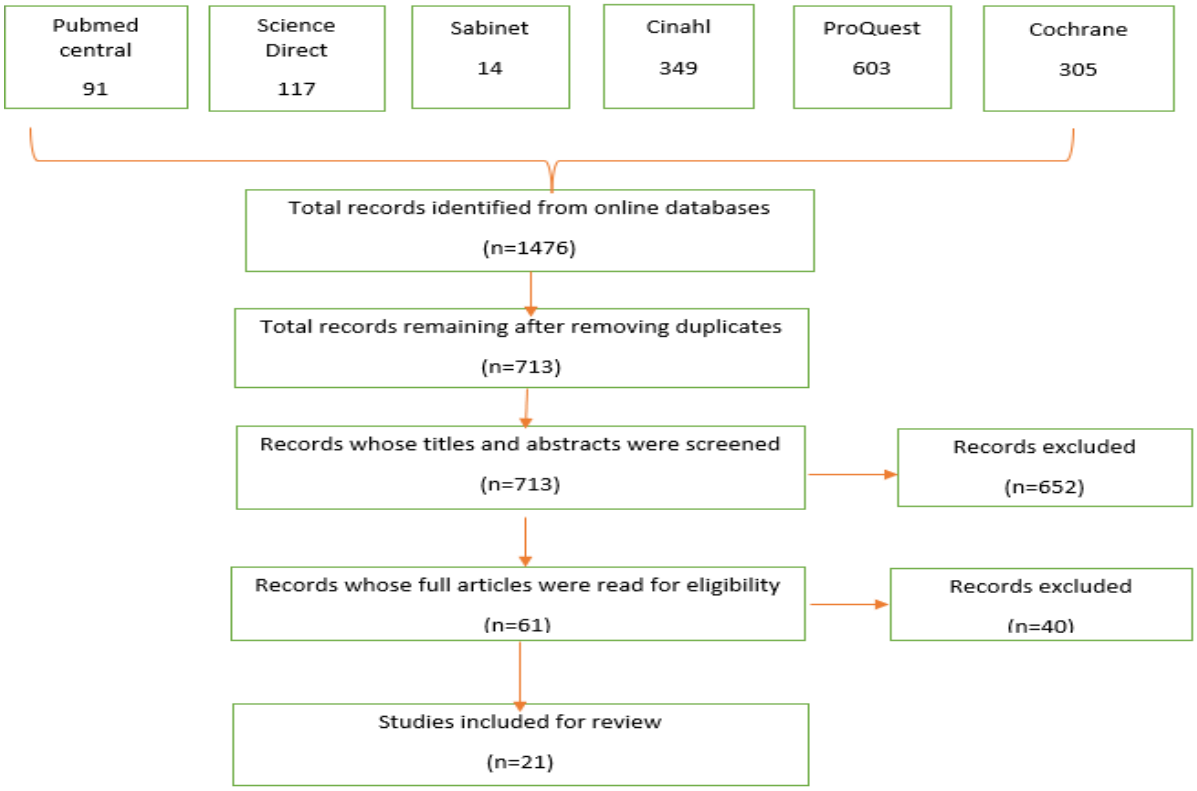


Figure 2.2: ***PRISMA chat flow used***

INCLUSION CRITERIA	EXCLUSION CRITERIA
Studies published in English	Studies not written in English
Evident-based studies related to simulation-based nursing	Exclude if not evidence-based or not review of other studies
Studies published from 2018 to 2022 to ensure the review of current practices	Exclude letters and commentaries

Critical appraisal

The researcher, supervisor, and co-supervisor independently conducted a critical appraisal. The Johns Hopkins Critical Appraisal Tool was used to assess the quality of the selected studies. The tool also assisted the researcher in deciding how to utilise evidence to support the topic of simulation-based nursing.

Table 2.2: ***Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) Research Evidence-Based Appraisal Strength and Quality Level of Evidence*** (Newhouse et al. 2007)

STRENGTH OF EVIDENCE	QUALITY OF EVIDENCE
I (Highest) randomised controlled trial (RCT) meta-analysis of RTCs II Quasi-experimental study III Nonexperimental study; qualitative study; meta-synthesis qualitative studies	A (High-quality) consistent result, sufficient sample size, adequate control, definitive conclusion, and a consistent recommendation based on an extensive literature review that includes thoughtful reference to scientific evidence. B (Good quality) reasonably consistent results, sufficient sample size, some control, fairly definitive conclusion, reasonably consistent recommendation based on a fairly comprehensive literature review that includes some reference to scientific evidence. C (Low qualities or major flaws) little evidence with inconsistent results, insufficient sample size, a conclusion cannot be drawn

Table 2.3: ***Summary of studies evaluating literature regarding simulation-based nursing***

NUMBER	AUTHOR/ COUNTRY/ YEAR	OBJECTIVE	DESIGN	SAMPLE	TYPES OF SIMULATION	RESULT	CONCLUSION	RIGOUR
1	Li, Au, Tong, Ng and Wang (2022) Denmark	Examine how different fidelity influences students' learning process	Obser-view (observation and interview)	Nursing students	High, Medium, and low fidelity	A lower degree of fidelity may reduce students' anxiety and develop their creative thinking. A higher degree of fidelity engages students in learning and allows them to try out practical skills.	Further research is required to specify the usage of different degrees of fidelity simulators. There is a need to adjust the degree of fidelity to the level of students' experience.	A
2	Amod and Brysiewicz (2019), South Africa	Describe how a human patient simulator can promote experiential learning, following postpartum haemorrhage	Descriptive qualitative research approach	Student midwives	High-fidelity human patient scenario	Categories that emerged from the study included: 1) Allowing students to review their role; 2) Allowing students to learn from their experience 3) Encouraging students to try what they learned in real-life situations; and 4) Offering students the opportunity to manage real-life emergencies.	High-fidelity simulators can be used in an emergency to manage a complex case scenario	B

3	Astbury, Ferguson, Silverthorne, Willis and Schafheutle (2021) Manchester UK	Synthesise evidence of review of best practices of simulation-based education in pre-registration programmes and contextualise findings.	Systematic review	Pre-registered healthcare programmes	High fidelity	Three themes emerged: curriculum-level integration and planning, simulation design, and delivery and resources.	Integration of simulation-based education enables the planning and implementation of best practice principles at the curriculum level.	A
	Alconero-Camarero, Cobo, González-Gómez, Ibáñez-Rementería and Alvarez-García (2020) Spain	Describe the grade of satisfaction of nursing students with clinical	Descriptive observational and cross-section	Nursing students	High fidelity	The results of questions in the questionnaire show that facilitators provide constructive feedback after each session (4.65), Simulation relates theory to practice (4.72), Debriefing helps reflection on cases (4.65) and practical utility (4.69)	Nursing students reported high satisfaction with HFS	A
4	Lavoie, Deschênes, Nolin, Bélisle, Blanchet Garneau, Boyer et al. (2020) Canada	Provide guidance in the design of high-fidelity authentic simulation	Scoping review	Educators and learners	High, medium, and low fidelity	Eight features were identified from 42 articles i.e., content drawn from real life, performance expectation, interaction and feedback, logic adaptative scenario, presence of an actual patient, sociological fidelity, cueing and preparation of the environment,	The article provides guidance in the design of high-fidelity, authentic simulation in the absence of technologically advanced simulators.	A
5	Craft-Blacksheare and Frencher (2018) USA	Explore the benefits of using high-fidelity simulators to teach maternal postpartum and newborn assessment skill.	Mix method	132 Third-year BNS nursing students	High-fidelity	Students valued the HFS at an average score of 3.82 on a Likert scale of 1-5. Three themes are identified: psychomotor learning, effective learning, and simulation restructuring.	Practising new assessment skills in a non-threatening environment gives students expertise and confidence while developing critical thinking skills.	A

6	Hanshaw and Dickerson (2020) New Yolk	Determine the state of science on the evidence of learning outcomes in HFS in undergraduate nursing students	Quantitative	Undergraduate nursing students	High-fidelity	Abstracts of 159 studies were reviewed. 95 were extracted. A full review of 64 studies led to the exclusion of 44	There is a need for a better understanding of the lived experiences of high-fidelity simulation in order to examine the retention of learning and transference into nursing clinical practice.	A
7	Guerrero, Ali and Attallah (2022) Egypt	Identify and compare the acquired critical thinking skills, satisfaction and self-confidence.	Qualitative	Nursing students and staff nurses	High-fidelity	Both groups of participants expressed a high level of satisfaction and confidence in the HFS experience.	HFS enhances critical thinking skills and fosters learning retention.	
8	Li et al. (2022) China	Explore the effectiveness of HFS in undergraduate nursing education.	Quazi-experiment	Undergraduate nursing students	High-fidelity simulation	HFS reveals larger effect sizes for knowledge, skill and learning interest when compared with other teaching methods.	HFS can more effectively cultivate the knowledge, skill and learning interests of undergraduate students.	A
9	Tong, Li, Au, Wang and Ng (2022) China	Explore the different lengths of pre-briefing, simulation and debriefing of HFS on knowledge and skill.	Systematic review and meta-analyses	Undergraduate nursing students	High-fidelity simulation		Shorter sessions are more effective in improving the knowledge of students, whereas longer sessions are most effective in improving skills.	A

10	Rajaguru and Park (2021) Korea	Synthesise research findings regarding the effects of SBL among nursing students from published scientific articles.	Integrative review	Nursing students	Low, medium and high-fidelity	Themes identified: knowledge and skills; Attitude (learning, efficacy, determination, competency, confidence, utilisation, satisfaction and communication), and (Perceptions and performance).	The findings revealed that simulation-based learning is positive, safe and effective for nursing students to improve client care skills.	B
11	Lei, Zhu, Sa and Cui (2022) China	Determine the effect of high-fidelity simulation teaching on nursing students' knowledge level, professional skill level and clinical ability.	Meta-analysis and systematic review.	Nursing students 15 studies	High fidelity	High-fidelity simulation significantly improved the levels of critical thinking ability.	High-fidelity simulation has strong educational effects in nursing education, assists nursing students to increase knowledge acquisition, enhances professional skills and cultivates their clinical practice ability (critical thinking ability, communication skills and clinical judgement ability). These findings can provide guidance for nursing educators, indicating that High-fidelity simulation teaching is an effective solution for transitioning students from the learning environment to clinical practice.	B
12	Labrague et al. (2019)	Appraise and synthesise articles that focused on the effects of using high-fidelity simulator on students' self-confidence and anxiety.	Systematic review	Nursing students	High-fidelity simulation	The review provided evidence on the efficacy of high-fidelity simulator in reducing anxiety and enhancing self confidence among nursing students	Simulation is effective in enhancing self-confidence of nursing students and reduces their anxiety when caring for patients.	A

13	Labrague (2021)		Integrative literature review	10 articles	Low, medium and high-fidelity	Four essential themes were identified from the content analysis: acquisition of skills or understanding of delegation; enhanced teamwork or collaboration capacities, improved decision-making and problem-solving skills, and increased communication skills.	Incorporation of simulation in the nursing management and leadership, courses have the potential to enhance the skills of nursing students regarding delegation, problem-solving capacities, decision-making, communication and teamwork.	B
14	La Cerra, Dante, Caponnetto, Franconi, Gaxhja, Petrucci et al. (2019)	Analyse the effectiveness of high-fidelity patient simulation (HFPS) based on life-threatening clinical condition scenarios.	A systematic review and meta-analysis were used.	Nursing students	High-fidelity patient simulation	HFPS sessions showed significantly larger effect sizes for knowledge and performance than other teaching methods.	Compared with other teaching methods, HFPS revealed higher effects on the knowledge and performance of nursing students	A
15	Mulli, Nowell and Lind, 2021 Canada	Complete an in-depth analysis of the concept of "reflection-in-action" during high-fidelity simulation.	A systematic approach to concept analysis	Nursing students	High fidelity simulator	Four defining attributes of the concept were identified: (1) reflection-in-action must occur during high-fidelity simulation and cannot be captured within post-simulation debriefing; (2) a critical learning juncture should occur and be identified by learners; (3) a pause in student action should occur during high-fidelity simulation; and (4) knowledge sharing should occur through out-loud discussion. Antecedents,	Concept analysis also establishes a foundation for reflection-in-action strategy development, as well as suggestions for future research in high-fidelity simulation nursing education.	A

						consequences and empirical referents of reflection-in-action were also identified.		
16	E. Powell, Scrooby and Van Graan (2020) South Africa	Explore the views of nurse educators on the use of high-fidelity simulators.	Qualitative descriptive design	Nurse educators	High fidelity simulators	The themes identified were limited resources and a lack of trained nurse educators using high-fidelity simulation.	Lack of implementation of high-fidelity simulation due to inadequate training of teachers in the field.	
17	Chabrera, Dobrowolska, Jackson, Kane, Kasimovskaya, Kennedy et al. (2021) 8 European countries	Describe and compare the level of implementation of simulation-based education in nursing curricula across different countries.	Quantitative and qualitative exploratory study	8 European experts in simulation-based education.	High-fidelity simulation	Differences found regarding: 1) simulation environment; 2) expert opinions: 3) simulation in nursing programme;	Universities should contribute to simulation-based education and evaluate national and international initiatives by investing in high-quality research.	A
18	Moabi and Mtshali 2021 Lesotho	Assess the readiness of nursing education institutions with regard to implementation. simulation-based education	Quantitative descriptive design	Nurse educators	Low, medium and high-fidelity simulators	Institutions are moderately ready to implement simulation-based education.	Factors related to management, administration and human resources have a major influence on institutions' readiness.	B

19	Moabi & Mtshali (2022) South Africa	Explore and describe student perceptions of active learning and support regarding simulation-based education in Lesotho.	Quantitative descriptive exploratory	Nursing students	Low, medium and high-fidelity simulators	Most participants perceived learning positively and reported positive support before, pre- and post-simulation.	Supporting students in simulation-based education promotes effective learning.	B
20	Sherwood and Francis (2018) UK	Examine if increasing equipment fidelity improves learning outcomes.	Quantitative experimental	Healthcare professionals	High, medium, and low fidelity	Training of HFS associated with improved performance immediately post-intervention when compared with that of LFS	HFS exhibited modest advantages when testing closely followed training. The need for more research using repeated interventions and extended timeframes before influenced sustained training.	A
21	Van Vuuren, Seekoe and Ter Goon (2018) South Africa	Determine the perceptions of nurse educators regarding the use of high-fidelity simulation.	Quantitative descriptive design	Nurse educators	High-fidelity	The results revealed all participants were at the same level as far as technology was concerned	The findings could be used as guidelines for the use of high-fidelity simulation.	A

2.3.3 Stage 3: Data Evaluation

This stage involved extracting data from primary sources to simplify and organise it into a manageable framework. The relevant data of each subgroup classification was extracted from all primary data sources and compiled into a spreadsheet. Each primary source was reduced to a single page with similar data extraction from individual sources (Whittemore *et al* 2009:549) Studies summarised in a data extraction tool.

2.3.4 Stage 4: Data analyses

Thematic analysis was used to analyse data, using the Donabedian quality of care model, which includes structure, process and outcome (Botma and Labuschagne 2019:370).

Table 2.4: Thematic analysis was used to analyse data, using the Donabedian quality of care model

THEME	SUB-THEME
Structure	Simulation laboratory structure Equipment (High, medium and low fidelity simulators), Cameras Competent staff Simulated patient
Process	Teaching and learning through simulation Empowerment of staff orientation Pre-briefing Debriefing
Outcome	Competencies - Psychomotor skill - *Critical thinking* - *Problem-solving* - *Decision-making* - *Communication* Desired outcome - *Student satisfaction* - *Patient satisfaction* - *System outcome* Collaboration, teamwork

2.3.5 THEME 1: Structure

Theme 1 refers to the setting where simulation-based education was conducted. The structure includes the simulation laboratory, equipment used for simulation and competent staff.

- ***Simulation laboratory***

Based on the need for quality and effective simulation-based education, an ideal simulation laboratory consists of physical spaces equipped with three functional modality simulators: competent clinical facilitators, well-trained simulated patients, and functional cameras and viewing screens. A well-developed simulation laboratory consists of several small rooms for small group discussions and high-fidelity simulation, a demonstration room, a well-equipped control room, a dressing room, a sluice room, a debriefing room and a storeroom. According to Barth et al. (2022:6), a simulation laboratory supports clinical teaching and learning and thus enhances skills and competencies required for professional nursing practice. The latter also indicates that a simulation laboratory provides an experiential environment where nursing students can practise different skills free from risks to patient safety.

- ***Equipment used in a simulation laboratory***

Equipment used in a simulation laboratory includes low-, medium-, and high-fidelity simulators and similar equipment used in a healthcare setting. Such equipment is used to teach and learn clinical skills. According to Amod (2019:6), high-fidelity simulators allow students to reflect on their learning and manage real-life situations. The decision on the degree of fidelity depends on the learning outcomes as well as the year level of students (Aarkrog 2019:2). According to the findings from a study conducted by E.Powel et al. (2020:218), low-fidelity simulators are used in one of the African countries selected for this study because nurse educators have limited experience in the use of high-fidelity simulators. Moabi and Mtshali (2021:2) reported using improvised equipment and non-functional simulators that are not attended to timeously, contrasting with well-equipped first-world countries. Insufficient and poorly maintained equipment and limited space to provide simulation-based education (Astbury et al. 2021:629).

- ***Competent staff***

Clinical facilitators are expected to be able to operate simulation equipment and master clinical skills, which need to be demonstrated to nursing students. Effective clinical facilitators should be creative in planning and maintaining a safe learning environment and professional values. Creating a safe clinical learning environment is a strength for simulation-based nursing education. According to Chabrera et al. (2021:1), dozens of European universities have built simulation centres by developing nursing competency projects funded by the European Union with the assistance of the European Social Fund. Contrary to the findings of studies conducted in developed countries, those performed in African countries revealed a lack of technological skills and experience of nurse educators, resulting in fear and resistance to using high-fidelity simulators (Powel et al. 2020:218). A review conducted by Asbury et al. (2021:630) revealed several barriers to simulation-based education, such as a lack of simulation-trained staff after

a lack of access to simulation-based training. Another study conducted in four African nursing education institutions revealed moderate readiness to implement simulation-based education where human resources have a significant influence (Moabi and Mtshali 2021:1).

2.3.6 Theme 2: Process

The process refers to the programme's implementation, which in this study is simulation-based education. It also refers to what is done to give and receive practical simulation-based nursing. The process includes teaching and learning through simulation, orientation, pre-briefing, and debriefing.

- ***Teaching and learning through simulation***

Recent studies on simulation-based education focus on high-fidelity simulation, while some include high, medium, and low fidelity. Chabrera et al. (2021:26) state simulation allows students to develop social and practical competencies by creating scenarios that assist them in experiential learning. Furthermore, the latter also states that high-fidelity simulation provides an excellent opportunity for students to practice skills in a physically and psychologically safe environment.

- ***Pre-briefing***

Pre-briefing is the initial stage of simulation-based nursing, during which students are orientated to aspects such as the environment, equipment and its use, tasks, objectives, and timing issues (Astbury et al. 2021:627). It is the starting point of the interaction between the clinical facilitator and the student in preparation for a simulation activity. This stage helps the students understand how they will integrate theory and practice and allows them to develop critical-thinking skills before commencing with the actual simulation.

- ***Debriefing***

One of the key elements of simulation-based nursing, as stated by Alconero-Camarero et al. (2020) 407), is the training of nurse educators since they are responsible for developing scenarios and conducting debriefing sessions. Moabi and Mtshali (2022) consider debriefing as an instructional support that needs to be undertaken by nursing students in post-simulation activities. Therefore, debriefing guides students through a reflection of how they performed their skills using different fidelity simulators. Debriefing sessions should focus on the positive performance of the student, followed by areas that need improvement, including the ones that need to be corrected. Both verbal and video-assisted feedback from the nurse educator to the nursing student post-simulation forms part of the debriefing session. A well-conducted debriefing session can build the confidence of nursing students. The results of studies conducted by Tong et al. *(*2022:7) and Li et al. *(*2022:10) revealed that debriefing sessions of

not more than 30 minutes can enhance students' knowledge significantly and improve their performance through discussions of simulated activities. Furthermore, studies have revealed that feedback promotes the integration of theory and practice and enriches critical thinking and experiential learning.

2.3.7 Theme 3: Outcome

An outcome is explained as a desirable and undesirable transition brought about by interprofessional training. Outcome refers to results, which in this study refer to the results of simulation-based education. The outcomes will include competencies, student satisfaction, and patient satisfaction.

- ***Competencies***

La Cerra et al. (2019:7) explain competence as knowledge, clinical performance, critical thinking and problem-solving skills. The findings from different studies show that high-fidelity simulation increases the critical thinking, communication and clinical judgement skills of nursing students (Lei et al. 2022:9; Hanshaw, 2020:5; Chabrera, 2021:28; Li et al. 2022:10; Amod and Brysiewickz 2019:8). The findings of the above authors are supported by Moabi and Mtshali (2022:114), who found that that simulation activities make clinical time more productive and enhances critical thinking and problem-solving skills. Immediate clinical judgement by a professional who received quality simulation-based education will enable them to act diligently in an emergency and save a patient's life. Collaboration and engagement with patients and other healthcare providers emerged as an essential outcome of simulation-based nursing (Labrague 2021:350).

- ***Student satisfaction***

According to Alconero-Camarero (2019:407), when simulation-based nursing is conducted correctly, it could lead to greater confidence, give satisfaction to nursing students, and assist in the acquisition of knowledge (Li et al. 2022:3). According to Labrague et al. (2019:365), high fidelity simulation plays a vital role in reducing anxiety in nursing students. The authors also state several factors that affect anxiety outcomes, such as the year level of students, pre-existing anxiety disorder and previous clinical experience. Reduced anxiety has the potential to bring student satisfaction and enhance confidentiality. Subsequently, the study by Aarkrog (2019:12) revealed a positive impact on reducing anxiety among students and improving their creative thinking, whereas high fidelity puts pressure on students.

- ***Patient satisfaction***

Patient satisfaction is the most desired outcome of simulated-based education. One of the advantages of simulation-based nursing, as stated by van Vuuren et al. (2018:3), is that it

allows students to practise skills where the patient is free from risk. The other advantage is that it enables students to be more competent and gain confidence as they continuously practise different skills. Students can also render quality patient care and save the lives of patients. According to Salifu et al. (2022:16), the benefits of simulation-based education to patients are positive clinical outcomes and self-reported patient satisfaction.

- ***System outcome***

Salifu et al. (2022:553) explain the system outcome as how simulation-based education contributes to cost-effectiveness and change in evidence-based practice.

2.3.8 Stage 5: Presentation of results

Findings of twenty-one studies from seven different countries were combined in this review. Most of the studies were reviews from other studies. All studies focus on simulation-based nursing education using fidelity simulators, either low, medium, high or all three different modalities. The choice of the degree of modality, in most cases, depends on the year level of student training. Most studies conducted in first-world countries have positive outcomes, while those undertaken in African countries have some shortcomings, as indicated in the findings. The findings are presented based on the positive outcomes and challenges that emerged from the three themes: structure, process and outcome of simulation-based nursing.

The structure included the simulation laboratory, equipment, laboratory staff, and simulated patients. The study conducted by Alconero-Camerero (2020:407) revealed that a simulation laboratory is a convenient place to prepare nursing students for clinical practice in a real-life environment. Some studies revealed structure-related challenges, such as the lack of implementation of high-fidelity simulators due to inadequate training of clinical facilitators.

The foundation of practical simulation-based nursing is training clinical facilitators since they are responsible for designing the scenario, demonstrating skills using all modalities and conducting debriefing sessions. There is a general lack of training and limited resources in Africa. Lack of readiness in the use of simulation-based nursing education is also a challenge in Lesotho, resulting from shortage of simulation facilities, lack of knowledge and skills, lack of management support and unavailability of funds (Mtshali 2018). There is a need for clinical facilitators to increase the use of high-fidelity simulators in the clinical teaching of nursing students to strengthen their critical thinking ability and develop them into safe and competent practitioners.

Communication and collaboration emerged as an important theme, characterised by intra-professional healthcare workers. According to several studies, simulation-based nursing

positively impacts students' ability to develop problem-solving and decision-making skills regarding patient care (Labrague 2021:350). Findings of the studies conducted by Lei et al. (2022:6) revealed students' acquisition of knowledge using high-fidelity simulators. Debriefing also brings out positive outcomes, as demonstrated in integrating theory and practice, thus increasing experiential learning. Contrary to the latter statement, as stated by students, one of the notable challenges related to simulation-based learning is integrating theory and practice (Alconero-Camerero 2020:408). These authors argue that students find it challenging to apply theory in a nonreal-life situation where they still need to be exposed to the real life setting to improve acquired skills and become competent. Debriefing positively impacts students by building their confidence and enhancing their knowledge and skills. Students who receive quality simulation-based nursing can act promptly in a real-life emergency. They are also able to save the lives of patients and promote health.

2.4 CONCLUSION

Nursing students must develop clinical skills before applying them to real-life environments and patients. Simulation-based education is a strategy used to improve learning in real-life environments. Thus, it benefits nursing students by strengthening their critical thinking and problem-solving skills and building confidence. This chapter reviewed and discussed 21 published articles. Chapter three will discuss the theoretical framework and paradigmatic perspectives.

CHAPTER 3: THEORETICAL FRAMEWORK AND PARADIGMATIC PERSPECTIVES

3.1 INTRODUCTION

The previous chapter focused on an integrative literature review of simulation-based nursing. This chapter provides an overview of the theoretical framework, including the paradigmatic approach to guide the study. Furthermore, this chapter explains theory as a crucial teaching component, providing systematic views of the learning process and a framework for constructing educational experiences and the theoretical framework used to guide the study.

3.2 THEORETICAL FRAMEWORK

The theoretical framework comprises theories into which the research is planned, thereby providing the structure for data analysis and interpretation (Kivunja 2018:46). It is a combination of ideas of experts in the field of research. It encompasses what the researcher demonstrates about the research problem, question, aim, the solution to the problem, and how to interpret the findings**.** The transformational learning theory (TLT) served as the theoretical basis for this study.

3.3 TRANSFORMATIVE LEARNING THEORY

The theoretical definition of transformation is centred around changes in frames of reference, which are forms of assumptions through which our experiences are understood (Briese et al. 2020:65). In addition, transformative learning is aimed at developing competency through adult learning. Therefore, Transformative learning is considered a strategy to develop the competencies required to participate effectively in a communicative action (Hoggan and Kloubert 2020:299). Transformative learning is a process that involves a reflection phase and an action phase that requires planning action, building new relationships, finding solutions and integrating them into real-life situations (Calleja 2014:121). For example, Taylor and Cranton 2013:41) regard adult educators as activists who should be free to participate in democracy and discourse. With transformative learning, the taken-for-granted frame of reference, which includes the mindset, the mind habits and the perspective, are being transformed to make them more capable of change so that they can generate opinions that will justify their true reflection (D'Mato and Krasny 2011:239). The key mechanisms of Transformative Learning Theory (TLT) and the focus of this chapter are instrumental learning and communicative

learning. In the same way, this study focuses on generating knowledge and understanding, which is communicative learning, and how to manipulate the simulation centre, which refers to instrumental learning for the benefit of student learning. During transformative learning, people can critically examine their assumptions, values, and beliefs and develop social and personal change by acquiring new knowledge (Kumi-Yeboah 2015:112). The central process of TLT is uncovering the distorted assumptions about using knowledge, language, reasoning, and social norms that cause pain. (Taylor and Craton 2013:40). What is similar about them is that transformation can never happen without instrumental learning and communicative learning, both critical to adult development. Similarly, in this study, the CIG engaged in two domains of transformative learning, which included communicating and instrumental learning in simulation-based nursing.

3.4 DOMAINS OF TRANSFORMATIVE LEARNING THEORY

3.4.1 Communicative learning

Communicative learning (dialogical learning) involves two or more people participating in a dialogue. Similarly, Mezirow (2008:91) explained that communicative learning is the ability to understand what a person means when communicating with others and assess the truth and accuracy behind what is being communicated, including the authenticity and qualifications of the one communicating. The latter interprets it as understanding concepts and values, which leads to a worldview change. As stated by Kurnia (2021:75), communicative learning is rooted in communicative interest, which is about understanding and being understood by others.

Communicative learning, as outlined by (Calleja 2014:123), allows individuals to interact with others, the environment, and one's feelings, desires, and intentions. Therefore, transformative learning and validity testing of effective communicative action is confirmed through reasoning with evidence to support arguments. Besides, the goal of communicative learning is the individual's ability to negotiate their own values, purpose, feelings and meaning rather than acting on those of others. This study involved the CIG members engaging in communicative learning to negotiate their values and feelings, which concerns simulation-based nursing. Mezirow (2018:117) outlines that critical self-reflection plays an important role in communicative learning. The clinical facilitators were able to relate their different challenges regarding simulation-based nursing to each other and to determine the transformative values related to such challenges. Therefore, Calleja (2014:123) suggests that an adult, as a communicative being, is responsible for interpreting and validating arguments made by others in a dialogue process instead of only accepting them as they are. As a result, this study involved CIG members participating in communicative learning to negotiate their values and

thoughts regarding simulation-based nursing. In addition, e-Delphi was used by simulation experts to validate the arguments made by CIG during the communicative learning process.

3.4.2 Instrumental learning

Mezirow (2008:91) outlined instrumental learning as the manipulation of the environment. Instrumental learning is about changing one's behaviour towards the environment. According to D'Amato and Krasny (2011:239), instrumental learning may also result in personal growth emanating from social interaction, critical self-reflection, planning for action and building self-confidence and competence. Fleming (2023:124) explains instrumental learning as learning that involves control over the physical environment. Learning is also about what a person predicts about the events in the environment, whether they are correct or not. This involves acquiring knowledge and skill, that is," *the know-how and what".* Similarly, instrumental learning, in this study, is built on instrumental interest, which addresses the manipulation of simulation-based nursing education to bring about transformation. The difference between communicative and instrumental learning lies in their process, purpose, and outcome (Quinn and Sinclair 2016:201), presented in Table 3.1.

Table 3.1 The difference between communicative learning and instrumental learning Mezirow 2003

	Communicative learning	Instrumental learning
Purpose	To advance our understanding of human communication. It involves critical self-reflection	To control and manipulate the environment with emphasis on improvement. It is task orientated
Process	It involves evaluating claims to sincerity, appropriateness, authenticity, and rightness rather than evaluating a truth claim.	This way of sharpening our skills and knowledge, thus able to anticipate the future outcome
Outcome	Generating knowledge into one's own and society's expectations, values and believes There is an understanding of the issue at hand.	Building skills and knowledge This is evidence acquired skill. Action is judged by its technical success

3.5 ASPECTS OF TRANSFORMATIVE LEARNING THEORY (TLT)

3.5.1 Origin of Transformative Learning Theory

The researcher adopted the concept of *"transformative learning",* officially launched in 1978 by Jack Mezirow, an adult education consultant in numerous developing countries (Mezirow 2008:90). His initial study focused on women returning to school. According to Illeris (2015:49), the concept of transformative learning was based on women returning to college after several years outside the education system. One of the things that influenced his development of the idea was observing the transformative experience of his wife, who returned to college to complete her undergraduate degree in adulthood. Other than his wife's experience, Mezirow's research was influenced by different concepts, including consciousness-raising, conscientisation and themes from philosophy (Schenepfleitner 2021:42). Transformation occurs through a series of cumulative transformed meaning schemes or as a result of social crises (Taylor 2008:5). In this study, transformation focuses on clinical facilitators engaged in a dialogue on their experiences about the use of simulation-based education. TLT was chosen because it allows clinical facilitators to critically reflect on challenges in simulation to bring about transformative solutions to simulation-based education.

3.5.2 Relationship (similarity and differences) between transformative and profound approach theories of learning

The purpose of comparing the two selected theories is to determine the extent to which they share similarities, with attention paid to the differences.

Leaning content: Both theories were appropriate to a more extensive range of learning content, even though deep approach theory targets a narrow content area, unlike transformative theory, in virtue of the educational area. Both maintain a meaningful focus on learning content. Regarding simulation-based nursing, both theories can offer a blended learning approach where TLT can be used for foundational knowledge, and DLT can deliver realistic nursing skills.

Learning context: Deep approach theory focuses on teachers' curriculum delivery in university settings, while TLT focuses more broadly on adult learning. Howie and Bagnall (2015:355) argue that the conditions under which people learn are necessary and how they affect the learners are essential in both theories. The latter highlighted that deep approach theory significantly impacts higher education disciplines, such as nursing, medical technology, and others. In contrast, transformative learning involves a diverse array of adult learning contexts. Both are aimed at developing student critical thinking. The same has been planned to assist

the student in developing critical thinking using simulation-based learning, although there are challenges to attend to first.

Place of the learner: In both theories, the learner is regarded as an autonomous, self-directed individual to a greater extent. Howie and Bagnall (2015:356) argue that teaching instruction in deep approach theory promotes profound educational outcomes for students, as TLT develops learner roles that can fit into different adult learning situations. Therefore, both theories are appropriate in simulation-based nursing, as learners are allowed to take control and responsibility for their learning and are encouraged to make decisions and solve problems related to their own knowledge to some extent.

Teacher's Role: The teacher's role in both theories is based on assisting learners. In the deep approach theory, the teacher encourages learners to immerse themselves in a deep learning process through various activities to obtain positive results by applying curriculum rules. The teacher facilitates and maintains a trusting and caring relationship in transformative learning. Along the same vein, the clinical facilitator plays a key role in both theories by encouraging students to self-directed learning and acting as a facilitator.

Place of intentionality: Place of cognition and rationality: Both theories consider the capacity to a cognitive. With DAL, learners need to learn the cognitive capacity to be successful, and with TLT, learners need a capacity for individual critical reflection on rational discourse and assumptions with others.

Learning outcomes: Howie and Bagnall (2015:360) outline that transformative learning theory aims to change the worldview, whereas deep approach theory depends on the institutional curriculum and focuses on descriptive knowledge and assessment of learning. Both theories can assist the learner in modifying how they behave towards different situations and how they think, including their coping mechanisms and cognitive styles. Deep approach theory creates high-quality learning and understanding since it involves enforcement of knowledge and active student participation (Rodrigues and Gomes 2020:42926). In contrast, transformative learning increases learners' capacities as agencies of change in the community (Harder et al. 2020:2). Rodrigues and Gomes (2020:42926) advocate for deep approach learning. Provides meticulous academic record. Contrary to what the above others stated, TLT develops competencies of adult learners to enable them to participate effectively in a communicative action (Hoggan and Kloubert 2020:299).

3.5.3 Examples of how transformative learning theory (TLT) has been used in nursing research to contribute to healthcare and nursing education

Ryan et al. (2022:6) conducted an umbrella review, reporting more than 770 articles from 16 reviews in which they applied TLT in nursing education and health professionals. Their review showed a change in healthcare education with advanced nursing skills. Furthermore, their study also confirmed that TLT can develop reflective nurses with the necessary skills to bring about change with improved creativity and communication skills. Rojo et al. (2023:69) conducted a scoping review where they applied TLT health professional education programs and nursing. Their review included 12 articles, 9 of which revealed transformation in student learning after completing the program, and those that did not achieve transformation were due to failure to apply all the 10 phases of TLT. Briese et al. (2023:66) conducted a healthcare education research study. They simulated TLT to students, exposing them to all the ten stages of TLT and engaging them in a debriefing session following the exercise. The latter strategy could help deal with issues related to this study, including debriefing sessions that were omitted due to limited time. The debriefing session allowed the students to reflect on their mistakes and develop a plan to minimise such errors during future experiences.

3.5.4 Key concepts and specific aspect(s) of TLT that are relevant to this study

In his establishment of TLT, Mezirow borrowed the concepts of emancipatory learning, critical reflection, and discourses from Jurgen Habermas as part of the pedagogical process leading to transformative learning:

- *Emancipatory learning*: Misconception and psychological distortions from prior unexamined knowledge.
- *Critical Reflection*: An evaluative process during which the appropriateness and validity of one's beliefs and assumptions and challenged (Stuckey and Taylor 2022:1462).
- *Critical self-reflection* involves being aware and critical of one's subjective perceptions of knowledge and the constraints of social learning (Cranton 2016:11). This study involved the clinical facilitators' ability as participants to examine their own feelings, recognise their strengths and weaknesses and identify areas for improvement.
- *Discourse* is a written or spoken orderly discussion using logical reasoning (Stuckey and Taylor 2022:1464). Discourse with others may trigger action. Likewise, a collaborative discussion among the CIGs from different universities may drive the clinical facilitators to make decisions about the actions needed to manipulate simulation-based nursing. It is conceptualised as a trigger and catalyst for one's experience of change and is considered the medium in which transformation is developed. It is also used when people question the appropriateness, truth, or comprehensibility of what is being asserted (Taylor 1998:10). As indicated by Mertens

(2008:116), it must have accurate information about the topic under discussion, be open to different points of view, and able to interpret arguments objectively.

Other core elements of transformative learning included frame of reference, dialogue and individual experience

- *A frame of reference* is the mindset, habits of the mind and perspectives. Mezirow (2008:116) states that a frame of reference is influenced by assumptions comprising codes, including feelings, actions, orientations, and ways of thinking. Transformation is encouraged when the frame of reference is experienced as not serving people well in some experiential situations. Therefore, transformation was necessary in this study based on the feelings of the clinical facilitators and the activities related to simulation-based nursing. According to Fleming (2018:123), the frame of reference is transformed through critical reflection. A reasonable frame of reference is characterised by being more open and capable of changing emotionally and more reflective to generate opinions that will be justifiable as a guide for action (Mezirow et al. 1990:14).
- *Dialogue* is a fundamental medium for developing and promoting transformation. It is also a means of putting critical reflection into action (Mezirow and Taylor 2009:1462). Stucky et al. 2021 explain dialogue as an exchange of information to express perception, share personal experience, develop solutions, and share viewpoints. In the same way, CIG was mandated to share its challenges regarding simulation-based nursing and develop guidelines to overcome such challenges.
- *Individual experience* consists of what each learner brings and what they experience within the context. It constitutes a resuming point for discourse and thus leads to a critical examination of normative expectations (Mezirow & Taylor 2009:9). Equally, each member of CIG needed to share their challenges that required transformation in simulation-based nursing.

As one progresses with transformative learning, other equally significant elements emerge, including awareness of context, holistic orientation, and authentic practice (Mezirow and Tailor 2009:4). All these elements are interrelated. For example, in this study, a clinical facilitator could not engage in a dialogue without awareness of a context, experience, and critical reflection. Furthermore, the clinical facilitators needed to recall previous discussions and interpret information actively. Self-awareness is also an essential element of transformation.

3.5.5 How will TLT be used in this study and why?

A holistic approach to transformative learning recognises other ways of knowledge and the importance of relationships with others in fostering transformative learning (Taylor 2008:11).

The theory also challenges educators and students to look beyond transformative learning and promote intellectual growth and understanding. For example, transformative learning theory provides an opportunity to debate, frame a large portion of research conducted in the field and provide a dialogue about potential adult education to make a significant change in people's lives (Hoggan 2016:56). In this study, clinical facilitators had an opportunity during their CIG meetings, to reflect on challenges regarding simulation-based nursing and focused on different solutions that may be effective to practice and benefit patient care. The steps of TLT were applied throughout the inquiry, as indicated below.

3.5.6 Steps of transformative learning theory

Transformative learning consists of ten steps in which people question their assumptions, beliefs, feelings, and experiences to improve their perception of the world and life (Sen et al. 2021;117).

***Step 1: Disorienting dilemma**:* This is the transformation's central and trigger point. It is defined as the events of cognitive dissonance that trigger a questioning of assumptions and worldviews (Stuckey and Taylor 2022:1464). It is the first step of the transformative journey when the problem is experienced, and ways of making sense must be established (Fleming 2018:124). The situation presents a dilemma that proposes alternatives, resulting in a person feeling emotionally disturbed. Consequently, the CIG pinpointed several simulation-based challenges that necessitated transformative intervention.

Step 2: ***Self-examination with feelings of guilt and shame:*** As Dirkx (2006:19) indicates, emotions are involved in transformative learning in two ways: as central to it and as an exploration of alternative ways of being in the real world. Feelings of guilt and shame may accompany people's reflection on their assumptions. At this stage, the clinical facilitators became exposed to guilt and shame because they failed to perform according to their expectations.

Step 3: ***Critical assessment of assumptions:*** Taylor (1998:16) explains that this is a question of the integrity of assumptions and beliefs based on prior experience. This is when people critically examine their previous assumptions and interpretations to form new meanings (Nesterova 2017:111). Cranton (2016:123) emphasised that change cannot occur if basic assumptions are not challenged. In the same way, this was the stage where clinical facilitators began to question how to transform their simulation centres after examining their previous assumptions regarding simulation-based nursing.

Step 4: Recognition that one's discontent and the process of transformation are shared and that others have negotiated similar change: Dissatisfaction in the workplace might lead to a sense of unfulfillment. Clinical facilitators were dissatisfied with simulation-based nursing education and sought to engage in a conversation about its transformation.

Step 5: Exploration of options for new actions, roles, and relationships: This step involves formulating a plan of action through which people acquire knowledge and skills. The clinical facilitators plan ways to improve simulation-based nursing by exploring options for new relationships, roles, and actions.

Step 6: Planning a course of action: People allow a plan of action for the next experience. For the facilitators to overcome simulation-based challenges, they need to shift from a narrow worldview to a wider one.

Step 7: Acquire the knowledge and skills to implement one's plan. This step involves considering the time it will take to implement the knowledge and skills necessary for transformation.

Step 8: Provisional trying of new roles: This phase occurs when people experience similar problems and try new roles provisionally. The clinical facilitators must have the knowledge and skills to implement new simulation roles to meet the students' learning needs.

Step 9: Building competence and self-confidence in a new role and relationship: As new roles are implemented and adjusted as necessary and transformation unfolds simultaneously, confidence and competence are built. Conversely, as clinical facilitators adapt to new roles, transformation will enhance their confidence and competence and that of the students through quality simulation-based nursing education.

Step 10: Reintegration into one's life based on conditions dictated by new perspectives: This step involves implementing all the agreed-upon solutions. At the end of it all, clinical facilitators will be mandated to follow the developed simulation-based guidelines.

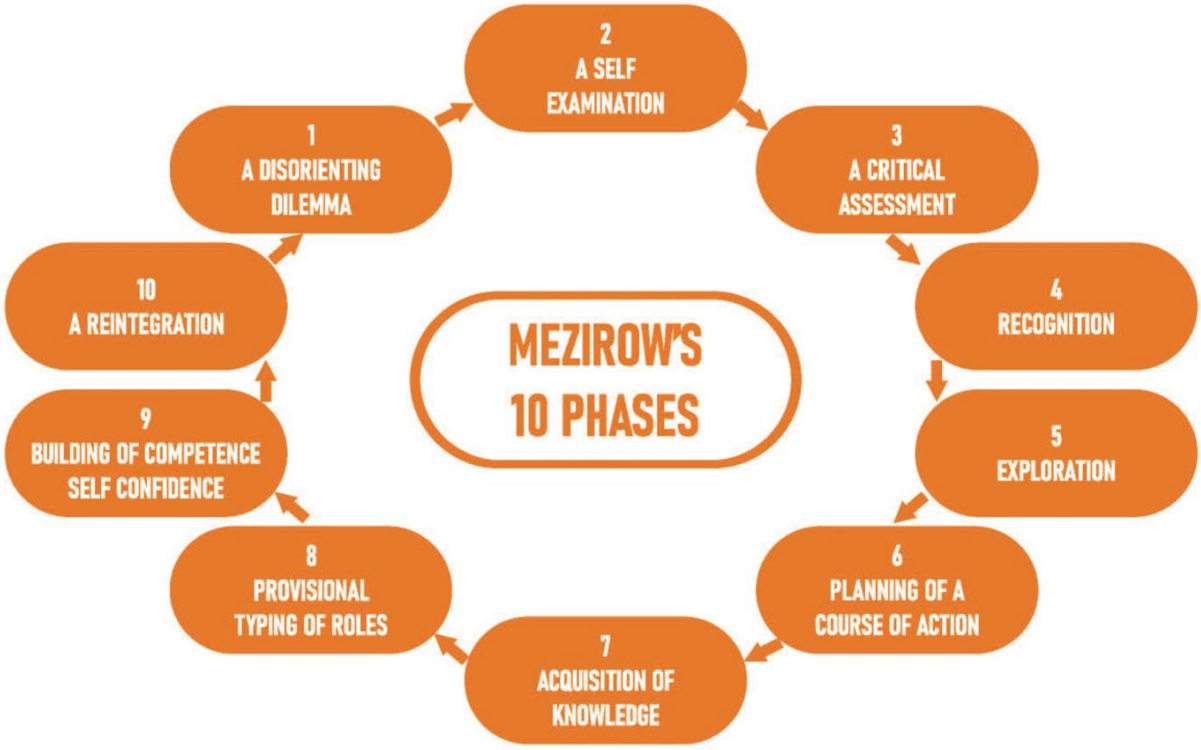


Figure 3.1: Mezirow's phases of transformative learning

3.5.7 Application of transformative learning in this study

In this study, a disorienting dilemma is characterised by the assumption that determines how the clinical facilitators know themselves and their surrounding environment, which is the simulation centre. During this stage, the clinical facilitators experience simulation-based challenges that require transformation and may not perform as expected. In simulation-based nursing, transformative learning was triggered by several challenges (*disorienting dilemmas*) experienced by the clinical facilitators, explored during the CIG meetings. Such triggers expose them to frustrations as they find their perspectives limited to giving meaning to a new situation. The situation they were faced with was coupled with negative emotions that included *guilt and shame* as they could not function to the best of their ability. Based on the challenges they experienced, they started to question the *integrity of their assumptions and beliefs*.

Consequently, they searched for alternatives in the subsequent meetings and explored the new roles, actions, and relationships with like-minded people. The CIG members then integrated their new perspectives into the existing beliefs about teaching and learning through simulation. After integration, the CIG members embarked on bringing about change. They explored the transformative values regarding simulation-based nursing by planning a course of action and acquiring simulation-based knowledge, enabling them to try new roles and thus

build their confidence and competence. As a principal facilitator, the researcher learned how to facilitate dialogue and critical reflection and create a safe and conducive online environment for the CIG members (Ryan et al. 2022:6).

3.5.8 Clinical facilitators as transformative learners

For the clinical facilitators to establish a conducive simulation-based nursing, they must engage in reflection, critical thinking, and transformative learning. They need to reflect on their practice to fully understand how and why simulation-based nursing has come to constrain. Clinical facilitators are learners who learn about the best practices regarding simulation-based nursing. The four views of the transformative paradigm, as adapted from Taylor (2008:9), namely, neurobiological perspective, cultural-spiritual, race-centric and planetary, were applied in this study as discussed below.

- ***The neurobiological perspective*** suggests that transformative learning requires experience and interest and demands that educators understand the unique knowledge of the neurobiological system. To this end, clinical facilitators knowledgeable and experienced in clinical simulation were recruited to participate in the study.
- ***The cultural-spiritual view*** of the transformative paradigm concerns the connection between individuals and social structure. According to Taylor and Cranton (2012:234), the starting point for spiritual and cultural transformation is the foundation on which the adult learner engages in educational interaction with others. In this study, the social view concerns the connection of clinical facilitators with the simulation laboratory and activities performed in the laboratory.
- ***The race-centric view*** of transformative learning is a view that puts the people of Africa at the centre because they had systems of education that were transformative (Taylor 2008:90). In this study, transformative learning puts clinical facilitators, who are using simulation as a clinical teaching strategy, at the centre, irrespective of their race and gender. The three key concepts fostering learning include giving voice to the silent, promoting empowerment and learning to negotiate effectively. Clinical facilitators involved in this study may be empowered with knowledge and use their voices during CIG meetings, thus promoting transformation regarding simulation as a teaching strategy.
- ***The planetary view*** addresses fundamental issues in the field of education. The goal of the planetary view is a reorganisation of the educational system. In this study, the planetary view will address issues around clinical simulation in nursing education to reorganise the strategy by developing a simulation-based programme.

3.6 PARADIGMATIC PERSPECTIVES

Flick (2014:540) defines a paradigm as a fundamental conception of conducting research in a specific field with consequences on the levels of methodology and theory. Polit and Beck (2017:31) state that paradigms for human inquiry are commonly characterised by how they respond to philosophical concerns, such as the nature of reality and the relationship between the inquirer and those being studied. A transformative paradigm was used to guide the study. According to Leavy (2017:270), a transformative paradigm is a philosophical belief system developed in transdisciplinary contexts and draws on critical theory. According to Denzin and Lincoln (2018:877), the idea behind the transformative paradigm is that it contains a social intervention connotation, which, when applied to this study, can form a guide for the anticipated participatory action research whereby clinical facilitators at the selected universities, came with the transformative solution to simulation-based education.

3.6.1 Transformative paradigm

By transformative paradigm, Cram and Mertens (2016:163) symbolise the worldview based on the assumptions the researcher and the participants have on the ethical responsibilities and the issues of human rights and social justice. The transformative paradigm is participatory and change-oriented (Romm 2015:413; Creswell and Poth 2018: 25). Thus, the researcher invited clinical facilitators to participate in the study to bring change by applying the findings that informed evidence-based support measures for simulation-based nursing education. The paradigm depends on the individual's ability to interpret events and how they interact with others based on beliefs, thoughts and values embedded in their life world (Qutoshi 2015:169). In this study, the principal researcher and clinical facilitators shared their thoughts on bringing meaningful change to simulation-based nursing education. Transformative paradigm has been discussed in detail under the paradigm's origin, relationship focusing on similarity and differences to other paradigms, theories, methodologies, examples of how the paradigm has been used in nursing research and value or unique contribution of transformative paradigm to nursing research.

3.6.2 The origin of the transformative paradigm

According to Mackenzie and Knipe (2006:3), the transformative paradigm originated during the 1980s and 1990s due to dissatisfaction with existing and dominant paradigms and practices. The transformative researcher felt that the interpretivist and constructivist approach to research did not adequately address social justice issues. Social justice is a commitment ingrained in the design and execution of PAR (De Chesnay 2014:26), the method considered

for the study. The transformative paradigm in this study was aimed at developing simulation-based guidelines to improve clinical teaching and learning through simulation.

3.6.3 Relationship between similarity and differences of transformative paradigm to other paradigms

Compared to the pragmatic paradigm, the transformative paradigm tends to include a broader set of stakeholders with more variety and power differences for a longer time and deeper involvement in practically all aspects of the evaluation process (Denzin & Lincoln 2018:878). In this study, more clinical facilitators who are almost involved in clinical simulation will participate in research meetings and the development of simulation-based programmes. A transformative paradigm builds new, alternative platforms, while a pragmatic paradigm works within the existing organisational structure (Denzin and Lincoln 2018:878). In this study, new alternatives were used to develop a simulation-based programme.

3.6.4 Application of transformative paradigm in this study

A transformative paradigm in health-related research is used where two categories work together as partners and users who will demand influence and involvement in their interaction with the healthcare system (Clemenson et al. 2017:780). According to Mertens (2010:88), transformative paradigms do not provide research instructions but a helpful framework for raising questions about assumptions that underlie research and enhance human rights. The researcher will ensure that facilitators co-participate in the research, characterised through partnerships and the development of trust relationships. In this study, clinical facilitators will have an opportunity, during their CIG meetings, to reflect on challenges regarding simulation-based nursing education. They will agree on different solutions/actions that may be effective to practice and benefit the patient.

3.6.5 Value or unique contribution of transformative paradigm to nursing research

Transformative paradigm is a psychologically centred model that recognises the role of feeling and knowing, that is, intuition and somatic, which are elements that give value to nursing research (Taylor 2008:11). In addition, the same author asserts that the transformative paradigm emphasises sexual orientation, the holistic approach and contributes to nursing research. The study added value to nursing education research, particularly clinical simulation teaching and learning. The transformative paradigm provides a framework for addressing inequality in society. However, in this study, a transformative paradigm guides the researcher to address issues of simulation-based education about the use of high-, medium--, and low-fidelity simulators, including simulation-based activities.

3.7 ASSUMPTIONS OF TRANSFORMATIVE PARADIGM APPLIED IN THE STUDY.

Four transformative assumptions applied in the study included axiological, epistemological, ontological, and methodological transformation.

3.7.1 Axiological transformation

Axiology is beliefs about moral behaviour and ethics (Qutoshi 2015:804). It relates to the ethics brought to the practice, which provides a foundation for the assumptions, including ontology, epistemology, and methodology. The axiology of the paradigm is explained as the principle of value for research (Phelps 2021:207). It involves acknowledging norms and history in cases where the research has the potential to promote social justice. One of the characteristics of the axiological assumptions in qualitative research is that the researcher ensures that their values are acknowledged in the study (Creswell 2013:20). Axiological assumptions in this study influenced the researcher's decision on how to incorporate the voices of the clinical facilitators who were not involved when the simulation-based decisions were initially made. Simulation experts contributed to developing simulation-based guidelines by providing feedback on the assertions presented.

3.7.2 Epistemological transformation

Epistemology refers to the acquisition of knowledge and the relationship between the knower and the reality of the situation. Creswell (2013:20) suggests that the researcher must establish a rapport with participants to assemble subjective evidence based on their views. Dialogical relationships between the CIG members allowed them to learn with each other and from each other (Carrillo 2023:524) and to explore different ways of acquiring simulation-based knowledge. Cram and Metens (2016:174) outlined three kinds of knowledge that can increase thinking capacity: traditional knowledge that moves down to generation, empirical knowledge that is gained through observation and revealed knowledge acquired through vision. Epistemology in this study considers what constitutes knowledge regarding simulation-based nursing and the role played by the clinical facilitators to shape that knowledge to benefit them and the students. Epistemological transformation, therefore, means bringing change in simulation-based nursing through acquiring knowledge.

3.7.3 Ontological transformation

Ontology refers to views of reality and its characteristics as experienced by the individual (Gunnlaugson et al. (2023:95) with awareness of power imbalance where certain groups of individuals occupy higher positions, and others are marginalised from decision-making (Room 2015:415). In this study, ontological transformation refers to views of reality experienced by the clinical facilitators in a simulation-based experience. Being immersed in cooperative

Inquiry Group meetings allowed the clinical facilitators to shift in frame of reference and enable ontological transformation. As stated by Mertens (2012:806), ontological assumptions include the meaning of concepts related to identifying dimensions of diversity relevant to the context. In qualitative research, ontology concerns discussing concepts about semantics (Goertz & Mahoney (2012:207). The evidence of reality in this study included themes derived from actual words from different CIG members and perspectives. Goertz and Mahoney (2012:208) state that qualitative researchers believe that specific data must not influence the concepts defined but must be theoretically grounded. In this study, elements of diversity include simulation-based education and related concepts, as well as clinical facilitators' beliefs and trust in their own opinions. Therefore, the researcher seeks to explore the limitations of simulation-based nursing that clinical facilitators face due to a lack of power.

3.7.4 Methodological transformation

Methodology concerns beliefs about the process of systematic inquiry. The methodology is defined by Leavy (2017:263) as a plan for how the research will proceed and how the researcher will combine different elements of research into a plan that indicates how the specific project will be carried out. Transformative methodological assumptions suggest that researchers start with qualitative data collection moments to learn about the community of choice and begin to establish trusting relationships (Mertens 2012:809).

The three assumptions mentioned earlier lay the foundation for the methodological paradigmatic assumption. The axiological assumption allows the researcher to plan their research according to the guidelines formulated by the group itself. In contrast, the ontological assumption influences the researcher to look for different versions of reality through the development of strategies (Mertens 2012:808). Epistemological assumption encourages the researcher to develop collegial relationships with like-minded people to find ways for the study to be culturally sensitive. In the transformative paradigm, the researcher, in partnership with the CIG as a coresearcher, is responsible for adjusting methods to accommodate cultural complexity, recognise oppression and discrimination and address power issues (Phelps 2021:210).

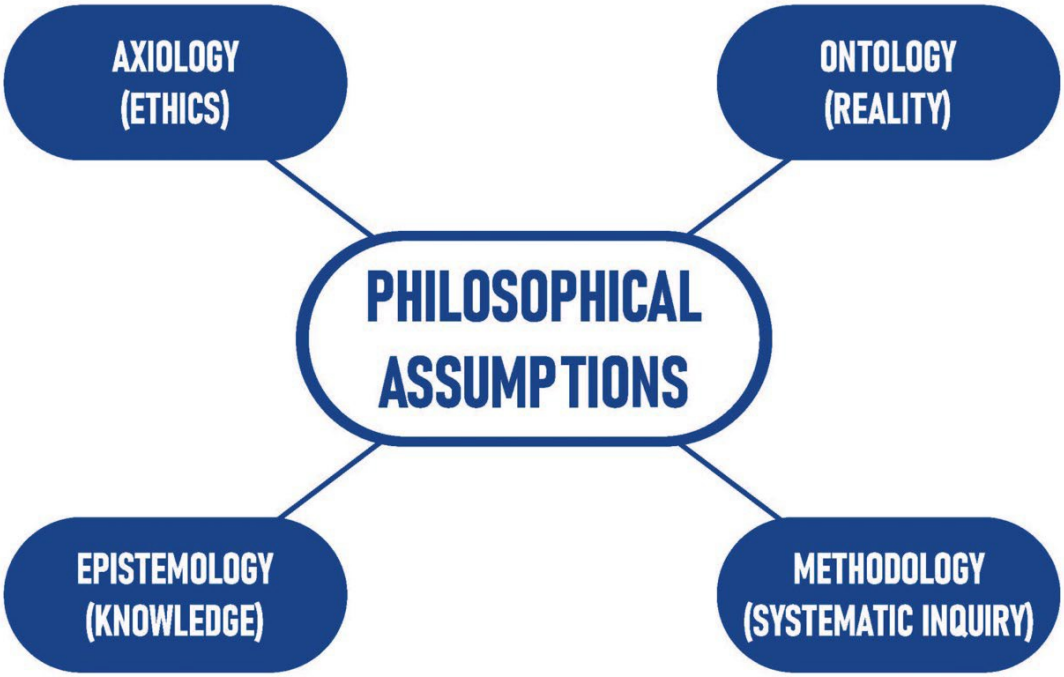


Figure 3.2: Philosophical assumptions of transformative paradigm (Phelps 2021:207)

3.7.5 Willingness to change

Transformative learning is change-oriented. Transformation cannot be imposed on people, meaning that they should engage voluntarily in activities that can shift the way they perceive things (Mezirow 2008:91). For transformation to be in action, clinical facilitators need to realise their potential for becoming responsible, autonomous, and liberated change being and work towards participation in discourse. Taylor and Cranton (2013:14) realised that the authors write about teaching and engaging learners in a transformational experience and ignore the initial phase of willingness to change. Many authors focus on preparedness to change while ignoring the desire. For example, a clinical facilitator may be prepared to change because change is necessary, but he or she may not be motivated to change.

3.7.6 Relationship between transformative learning theory and transformative paradigm

Qutoshi (2015:164) asserts that the key promoter of TLT is the process that led to the experience of a paradigm shift that will transform the way of thinking, knowing, believing and being in the world. This process raised the consciousness of the CIG members by activating their knowledge and critical thinking in deliberating transformative values regarding simulation-based nursing. Relationships with others influence both transformative learning theory and

transformative paradigm, and the qualitative approach as a methodological assumption is necessary to obtain data from a group of participants.

Transformation in TLT is based on a change in the frame of reference, and the paradigm defines how knowledge should be produced to establish change; that means knowledge plays a significant role in shaping and expanding the frame of reference. TLT and the transformative paradigm define the errors that should be transformed in the scientific process. The challenges related to simulation-based nursing were explored and described, and the transformation process was followed using the steps of transformative learning theory. Mertens (2012:202) argues that the transformative paradigm incorporates researches which value change towards social relationships, which are associated with action research, participatory, emancipatory, and feminist theories (Romm 2014:138), all characteristics of transformative learning theory.

In transformative learning, knowledge is explored through epistemological transformation. Therefore, the transformative paradigm was mandatory to provide an interactive link among the CIG members (Romm 2014:138) as researchers of PAR within the transformative learning theory. Transformation in how things are done depends on how things are understood or assumptions that condition the understanding. The clinical facilitators' perceptions of simulation-based challenges are influenced by the epistemic assumptions that shape the system of thought. The approaches used in the investigation are based on one or more paradigms. Transformative learning theory is the correct tool for dealing with various kinds of oppressive behaviour and thinking (Qutoshi 2015:162), such as simulation-based disorienting dilemmas whereby the transformative paradigm addresses the issues of power.

3.8 SUMMARY

This chapter discussed the theoretical framework of transformative learning theory (TLT) and the transformative paradigm. It defined the related concepts of TLT and discussed the two domains: communicative and instrumental learning. The steps of TLT were outlined. The assumptions of the transformative paradigm were explained in this chapter. Chapter 4 will focus on research design and methodology.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

Chapter three focused on the theoretical framework. A transformative paradigm is ideal for the study, as it seeks a change-oriented solution. This study had five phases. Phase 1 focused on an integrative literature review; Phase 2 featured establishing a relationship with the participants; Phase 3 explored the challenges related to simulation-based nursing; Phase 4 was associated with the transformative values regarding simulation-based nursing; and Phase 5 was the development of simulation-based guidelines. This chapter discusses the methodologies adopted for all four phases. Furthermore. this chapter aimed to develop a deeper understanding of the research design and methodology to be used in the study.

4.2 CONTEXT OF THE STUDY

The context of this study was chosen based on its objectives rather than convenience (Davison and Martinsons 2016:246). In this chapter, the context is classified into human, organisational, and geographic characteristics.

4.2.1 Human context

The human context in this study is specific to clinical facilitators conducting simulation-based nursing using low, medium, and high-fidelity simulators, including all the simulation activities for one year and more and experts in simulation-based nursing. The clinical facilitators participating in the study have been conducting simulation-based nursing for five years or more. Nursing students did not form part of the human context as they were excluded based on the exclusion criterion. The statement of inquiry in this study emanated from the researcher's interest in understanding the challenges related to simulation-based nursing and what could be the solution to such difficulties.

4.2.2 Organizational context

In this study, the setting was the selected universities in South Africa with a four-year nursing degree program and using simulation-based nursing as a teaching and learning strategy in the simulation laboratory. These universities are governed by the South African Nursing Council (SANC) and operate according to the governing body's regulations. The South African Nursing Council is also responsible for establishing and maintaining nursing education and training. Polit and Beck (2017:1046) define the setting as the physical location and the

conditions where data occur in the study. The simulation laboratories selected were only those using low-, medium-, and high-fidelity simulators.

4.2.3 Geographic context

In this study, the internet was used to disperse geographic information. The geographic internet context included two universities in North-West Province, two in Gauteng Province and one in Western Cape. The distance between University in North-West and the one in Gauteng Province is approximately 260km, whereas the one in Gauteng Province and Western Cape is approximately 1.300km. With internet geographic dispersion, the distance and geographic location can be disregarded to communicate inexpensively and instantaneously with the study participants. Cooperative inquiry group members could join the online meeting simultaneously, irrespective of their geographic location, and share their experiences (Markham 2004:101). Gauteng Province is in the northeast of South Africa, and North-West Province is bordered by Botswana country to the North, whereas the Western Cape is in the Southwestern part of the country.

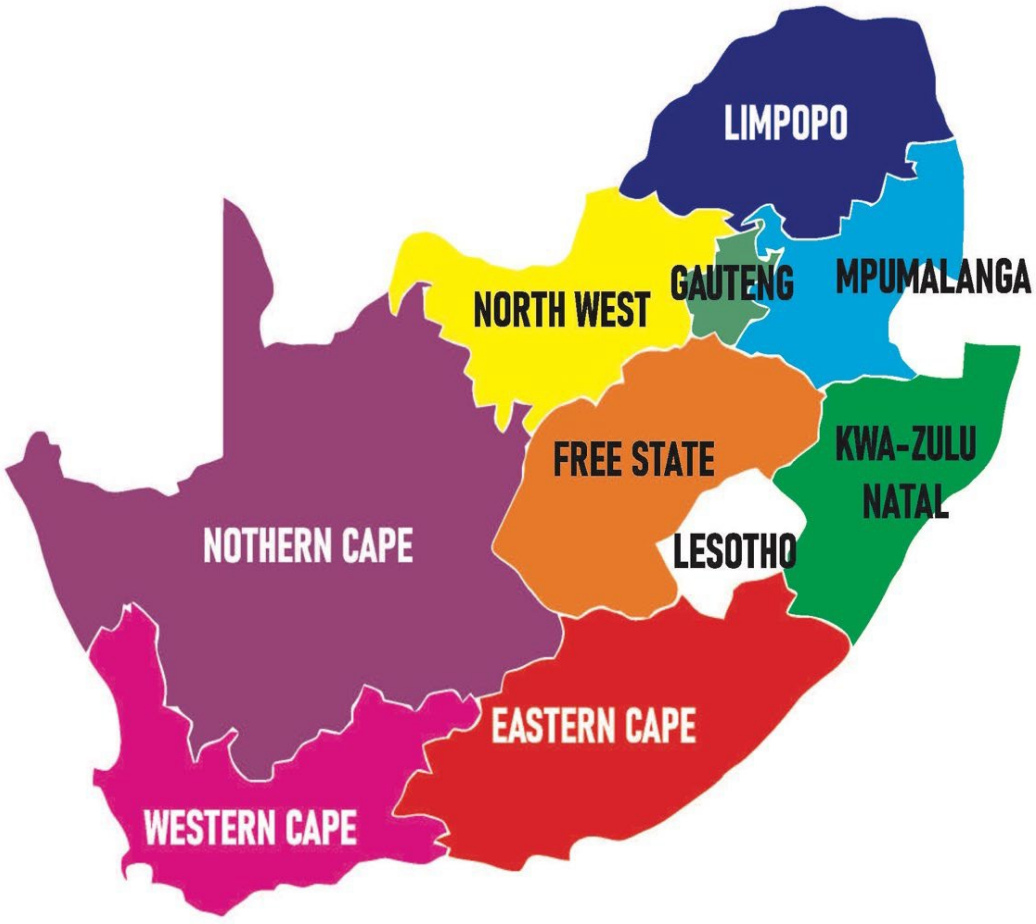


Figure 4.1 Map of South African provinces, (Oxford Primary Atlas for South Africa)

4.3 RESEARCH DESIGN AND METHODS

4.3.1 Research design

Polit and Beck (2017:743) define design as an overall plan that addresses the research question, including the specifications for enhancing the integrity of the study. The research design assisted the researcher in deciding on how to select the participants, how data should be collected and analysed, which variables should be included and how such variables should be manipulated (Dannels 2018:1). The decision regarding the choice of the design was made based on the type of a research approach. This study employed a qualitative approach (refer to Chapter One) using Participatory Action Research (PAR) as a study design to formulate simulation-based guidelines.

- ***PARTICIPATORY ACTION RESEARCH***

Creswell and Gutterman (2019:626) define PAR as a design in action research to improve the quality of family and community life, including the people's organisation. According to Reason (1999:12), PAR aims to produce knowledge to share experiences and actions directly to society that will benefit them. To empower people to construct and use their expertise in a manner that will help them. It begins with a problem in society and the need for empowerment. The researcher used PAR to inform this study, which focuses on simulation-based nursing at universities in South Africa. The researcher chose the PAR design based on its benefit, as discussed below.

Figure 4.2: Participatory Action Research

- **BENEFITS OF PAR**

To the researcher: Watters (2010:11) states that the first phase of participatory action research (PAR) involves a group of people coming together to address a common issue. Participatory Action Research allows a researcher to develop in-depth knowledge and skills of the research process (Watters 2010:7). Watter (2010:7) further states that the researcher's critical thinking skills, self-empowerment, and increased comfort are other benefits of PAR.

To the participants: Participatory Action Research voices people's perceptions and shifts their views on what constitutes valuable knowledge (Baldwin 2012:470). People using PAR can identify similar issues and challenges they face, thus increasing support for one another and the likelihood of their voices being heard. It is practical and collaborative in that the inquiry is completed with others rather than with others (Creswell 2017:11). Watters (2010:8) states that people involved in PAR can meet and learn from each other. Team members do not only connect to the topic under investigation but also collaboratively connect. Therefore, the participants can reflect on their experience, agree on the new knowledge and concepts, and plan to experiment with the latest knowledge in a cycle of action and reflection.

To practice: According to Creswell (2017:11), PAR focuses on changing practices because of its logical discussion of ideas. At the end of participatory action research, an action agenda for change is always needed. PAR may enhance facilitator-student interaction in a simulation-based environment through improved interprofessional collaboration and communication skills. This collaborative effort may enhance clinical facilitators' professional development.

- **TYPES OF PARTICIPATORY ACTION RESEARCH (PAR)**

Mash (2014:2) outlined three types of PAR: empowering PAR, organisational PAR, and Professional PAR.

- **Empowering PAR**

According to Mash (2014:2), Empowering PAR is community-based. Community-based PAR brings together members of the community and academics into a research partnership (Stack and McDonald 2018:80) to empower, liberate, and emancipate the community (Mash 2014:2). The empowering PAR is concerned with the how it is applied within the community-oriented primary care, and the engagement of the community in solving their health care problems. To mention a few examples, A PAR on how to tackle tobacco health inequities in poor urban populations by Jama and Phakale (2021) and Naidoo and Chimberengwa (2020) engaged in the use of PAR in improving and managing hypertension in communities.

- **Organisational PAR**

Organisational is business-related. Hamzeh et al. (2019:116) define organisational PAR as a mixture of action and research in which the organisation members partner with academic researchers to improve the organisational practice by providing health and social care services, the two groups partner to share their experiential managerial, clinical and research knowledge. Organisational PAR aims to produce knowledge that can inform the organisation, the service, and the healthcare practices. Bush et al. (2017) is one example of organisational PAR in health, where health organisation members engage in research decisions with academic researchers from the university. Bush and Tremblay (2017:8) state that organisational PAR can be time-consuming to develop because it involves building a relationship of trust, including forming partnerships and development agreements.

- **Professional PAR**

Professional PAR is concerned with professionals interested in bringing change to the practice. Mash (2014:2) asserts that the principles of PAR are critical collaborative inquiry by reflective professionals to bring change in their inquiry. The fundamental principles of professional PAR are encapsulated in the CRASP model, which combines educational theory and practical teaching in action research (Mash 2014:3). This study focuses on simulation-based nursing, which is identified as professional PAR. Concisely, the **CRASP** elements are applicable where critical ***C***ollaboration within the cooperative inquiry group members who are the ***R***eflective practitioners as the clinical facilitators. The principal researcher within the cooperative inquiry group is ***A***ccountable and transparent in the methods and outcome of the inquiry. The CIG members and the principal researcher ***s***elf-evaluated their practice and engaged in ***P***articipatory problem solving, which is the development of simulation-based guidelines with expert participants.

Table 4.1: Characteristics of Participatory Action Research (Creswell and Guetterman (2019:596)

CHARACTERISTIC		APPLICATION TO THE STUDY
1	*It is a practical focus*	The aim of the research is to address the problems in the educational setting, which is the simulation laboratory. The clinical shared their experience on practical issues that will benefit simulation-based nursing.
2	*It is the researcher's own practice*	The clinical facilitators were examining their own practice in simulation-based nursing education rather than examining someone else's practice. The clinical facilitators study their own situation, reflect on what they perceived as well as how they can improve the simulation-based practice
3	*It is collaborative*	It involves participants from different universities. All participants are involved in a simulation-based nursing education. The participants established a cooperative relationship
4	*A dynamic process*	The clinical facilitators spiral back and forth with the entire process of action and reflection.
5	*A plan of action*	The researcher agreed on the development of guidelines as a plan of action based on the identified challenges regarding simulation- based nursing.
6	*Sharing research*	The clinical facilitators shared both their challenges and transformative values regarding simulation-based nursing

4.4 PHASE 1: INTEGRATIVE LITERATURE REVIEW

Phase one of the study addressed objective one: evaluate the literature regarding simulation-based nursing using an integrative literature review. Phase one did not form part of the stages of CIG.

4.5 PHASE 2: REFLECTION PHASE

The initial focus was building relationships with the participants from different universities under study as co researchers. and then establishing a working relationship with the clinical facilitators as participants. Building relationship included gatekeeping, the pre-

entry phase and the recruitment of participants. Refer to Chapter One.

Research question: How can a working relationship be established among clinical facilitators as co-researchers?

A cooperative inquiry group (CIG) was used to conduct professional PAR in the simulation-based nursing

4.5.1 Cooperative Inquiry Group

Reason (1999:208) defines cooperative inquiry (CIG) as a form of self-centred, participatory inquiry conducted with people rather than on them or to them. John Heron created the idea of CIG in 1968-1969 (1996:1). Seventeen clinical facilitators from five different universities participated in the study as members of the CIG. In this study, the CIG comprised clinical facilitators who use simulation-based nursing as one of their clinical teaching strategies for undergraduate nursing students.

The objective for phase two was to establish a working relationship with clinical facilitators participating in the study. In this study, a group of co-inquirers engaged in collaborative action and reflection cycles to develop a working relationship. Data was collected by the six CIG stages, as Reason (1999:210) outlined. These stages were applied: *Stage 1***:** First reflection phase; *Stage 2***:** First action phase; *Stage 3:* Full immersion in stage 2; *Stage 4***:** Second reflection phase; and *Stage 5*: Subsequent stage continues with cyclic inquiry. The cyclical inquiry continued based on the variety of intentional procedures and unique skills in the action phase to enhance the validity of the process. *Stage 6:* Final reflection – conclusion of the CI**.** Stage 1 of the cooperative inquiry process was applied in phase 1 of the study as follows:

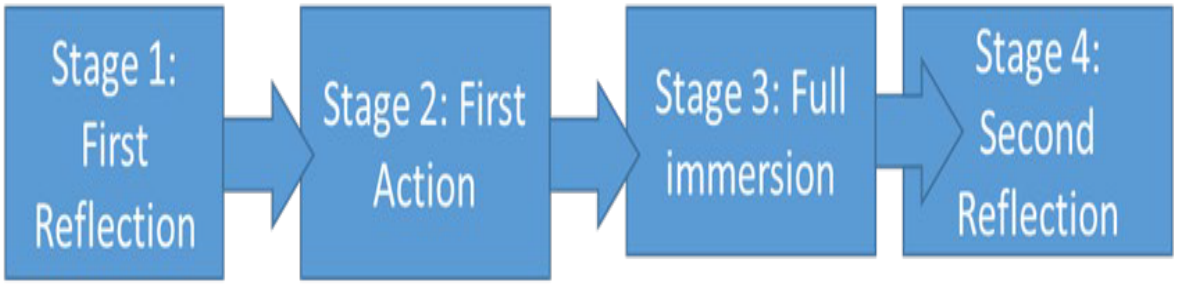


Figure 4.3 Stages of Cooperative Inquiry Group

Table 4.2 Summary of cooperative inquiry meetings in phase 2

COOPERATIVE INQUIRY MEETING IN PHASE 2							
Research Question	How can a working relationship be established among clinical facilitators as co-researchers?						
Research Objective	To establish a working relationship with clinical facilitators participating in the study						
Data collection method	Workshop						
Number of participants	**Meeting**	**U1 NW**	**U2 NW**	**U3 GP**	**U4 GP**	**U5 WC**	**TOTAL**
	1st	3	2	1	0	**0**	**6**
	2nd	**7**	**1**	2	**0**	**0**	**10**
Observers	**2 Promoters**						

- ***THE FIRST REFLECTION PHASE (STAGE 1)***
  - **WORKSHOP**

The principal researcher officially opened the workshop with a warm welcome and thanked the potential participants for availing themselves of the meeting. During this stage, the researcher conducted a formal PowerPoint presentation to the five universities' clinical facilitators who responded to the meeting invitation. The workshop was conducted online using Microsoft Teams. The presentation included the statement of inquiry and the general overview of the study. See Annexure G1. After the presentation, the participants agreed on the proposed title and objectives. The clinical facilitators were allowed to decide whether they were interested in being part of the CIG, as participants are also regarded as co-researchers. The consent form to participate in the study was presented during the meeting, and those who agreed to become part of CIG signed for phase 1.

In the same workshop, the participants deliberated on how to frame the statement in a way that would be fruitful for the research process.

- **Sub-questions post the presentation**

Question 1:

1.1. How do you feel about the following?

- Statement of Inquiry
- Preliminary research questions

- Preliminary research objectives

1.2. Do you feel comfortable with them? (Please feel free, and let's create a sense of ownership of the study).

1.3. OR do you feel we should rephrase them?

NB: Should you want to write down your comment, you are free to do so

Question 2:

Based on the presentation, what do you think could be the solution? Remember, this can change based on explored challenges or how we want to transform Simulation-based nursing education. See more details of comments from the participants in Chapter 5, Section A.

Ground rules

The cooperative inquiry group agreed to establish ground rules to maintain confidence among its members and establish equal contributions, as suggested by Reason (1999:215). The ground rules were also set to accommodate subsequent CIG meetings.

Table 4.3: *Ground rules were as set by the CIG members*

Meetings	Meetings are to be held on Thursday's after-hours, preferably between 16h00 and 16h30
Duration for meetings	Meetings should not exceed 1 hour
Punctuality	CIG members to log in on time to avoid re-explanation to members who joined the meeting long after the starting time
Discussions	Each member is to be allowed to share their experience without being interrupted
Respect for human	CIG members should respect one another and avoid being judgmental
Confidentiality	Names of CIG members are not to be used. Only initials will be used during the meeting to maintain privacy.

4.6 PHASE 3: ACTION PHASE

Phase 2, the action phase, was conducted using the research question as follows:

***Question for phase 2*:** What do you perceive as challenges regarding simulation-based education for students?

The CIG meeting was attended by clinical facilitators from four universities conducting simulation-based nursing for undergraduate nursing students. The group became more immersed in this stage and more open to their experience (Reason 1999:210). Participants were concerned about the depth of the difficulties they experienced regarding simulation-based nursing.

4.6.1 Sample of phase 2

Putman and Roch (2018:254) define sampling as the method used to select participants from entities or populations that share characteristics that are a focus of the research. The sample of phases 2 and 3 were the clinical facilitators who used a simulation-based teaching method. The researcher attempted to contact all the South African universities that offer four-year nursing degrees. Thirteen universities in SA were identified, and not all used high, medium, and low-fidelity simulators. Some universities that use the three modalities did not respond to the invite. The university's contact numbers and email addresses were obtained from the Forum of the Universities Deans (FUNDISA) booklet, whereby the managers referred the researcher to the relevant facilitators using Simulation-based education.

4.7 DATA COLLECTION METHOD USED IN PHASE 3

World café was a suggested as data collection method for objective 1. World café is a method that brings together participants' knowledge and personal experience with the potential to ensure that these conversations are productive and provide rich data and insights into issues under discussion (Lewis, 2016). As the participants rotate, they build upon each other's knowledge, experience, and ideas. The World Café method was attempted in this phase, though it could not be applied as the number of participants did not accommodate the different groups. Therefore, data in phase 3 was collected by using focus group interviews.

4.7.1 Focus group interview

A focus group is used in qualitative research and is important in participatory action research (Polit and Beck 2017:721). This study's focus group aims to uncover various experiences and challenges regarding simulation-based nursing and find solutions to address such challenges.

Table 4.4 Summary of cooperative inquiry meetings in phase 3

COOPERATIVE INQUIRY MEETINGS 1 AND 2 IN PHASE 3							
Research Question	What do you perceive as challenges regarding simulation-based education for students?						
Research Objective	To explore and describe challenges perceived by clinical facilitators regarding simulation-based education						
Data collection method	Focus Group Interview						
Number of participants	**Meeting**	**NW**	**NW**	GP	**GP**	**WC**	**TOTAL**
	1st	3	2	2	0	**0**	**7**
	2nd	**7**	**1**	2	**0**	**0**	**10**

- ***Characteristics FGI***

***Participants*:** As outlined by Devlin (2018:264), participants should be selected based on their shared based on their experience and similar backgrounds. As in CIG, the chosen participants were mainly homogeneous groups to encourage a comfortable group dynamic and to promote a relaxed environment for expressing perceptions and ideas. (Beck 2017:721). In this study, clinical facilitators were selected based on their experience in simulation-based nursing education. Devlin (2018:264) further advocates for several 6-8 participants for each FGI. Participants should be encouraged to discuss during the interview to gain their responses.

Moderator: A trained moderator should facilitate the interview to gain an in-depth response from the participants. The moderator should facilitate the CIG meeting according to the planned objectives. The moderator was responsible for designing the questions that stimulated the discussion, was able to probe the participants, and was able to identify all the views of the participants. (Delvin 2018:214). It is the moderator's responsibility to determine whether certain notions need to be explained or if there is any need to elaborate on a specific point (Gawlik 2018:108). In this study, the moderator was the principal researcher.

Types of FGI

Traditional face-to-face and online interview

Traditional face-to-face FGI has been a standard method of collecting qualitative data. However, internet-based data collection is increasingly popular due to escalating costs, including travel, accommodation, and refreshments for participants. A shift from face-to-face FGI to an internet-based method was also warranted during the COVID-19 pandemic. An online interview can be in a synchronous or asynchronous format (De Chesney 2015:13). In

this study, an online FGI was used in a synchronous format.

Online synchronous focus group interview

De Chesney (2015:13) stated that for people who participate in synchronous online FGI, the moderator and the participants log in simultaneously and interact within a scheduled timeframe. Meanwhile, FGI is not required to respond immediately to questions sent online in asynchronous online. In this study, the CIG was involved in an online synchronous FGI.

- **Advantages of online synchronous FGI**

An online FGI is cost-effective, and participants can engage in an ongoing dialogue with greater anonymity (Coe et al. 2017:194). The method saves time and effort when travelling and arranging the venue. Online FGI is not restricted to a particular area or computer (De Chesney 2015:13). According to Creswell and Guetterman (2019:218). FGI is when the participants are similar and able to cooperate. An online interview is a suitable method of accessing hard-to-reach groups for discussing sensitive subjects (Gerrith and Lathlean 2016:407). This method gives people who are ill, disabled, and housebound an opportunity to participate in the study. In this study, clinical facilitators in one of the universities were on strike but managed to participate in an online FGI. According to Gerrith and Lathlean (2016:407), greater equality of participation may be achieved through online FGI as the participants feel more comfortable sharing their experiences and ideas in an anonymous online environment.

The researcher chose this method for data collection as it was convenient during COVID-19 when social distance had to be maintained and because of its closest approximation to face-to-face discussions. Real time communication among participants was achieved across different geographical areas where internet service was available (Tuttos 2014:123). For example, in this study, all CIG members could join the meeting online because they all had stable internet connections. The method allowed for innovative communication such as text-based charts, screen sharing, breakaway sessions, meeting recording, attendance register, read and reply during the meeting.

- **Disadvantages of online synchronous FGI**

Unstable internet connectivity may minimise participant engagement. It was time-consuming as other participants were unaware of the meeting platform's features. In addition, the principal researcher and other members of the CIG could not notice the visual and non-verbal cues. Furthermore, as indicated by Stewart and Shamdasani (2017:56), participants are more likely to drop out if they feel unengaged or do not feel the facilitator is involved. Subsequently, this was not the case.

Conducting an online synchronous FGI

- ***Testing the technology***

The researcher used Microsoft Teams to conduct the online synchronous FGI. Together with the technology expert, the researcher familiarised self with the features of technology by performing several practice sessions to develop competency.

- ***Preparation for online synchronous FGI***

According to Willemsen et al. (2023:1813), the most important part of the process is preparing for conducting online synchronous FGI. A day before the meeting, an email containing a link was sent to invite the participants. They were informed that they would receive the link on the set date. A consent form to participate in the meeting was also sent as an attachment, which the participants were to sign and send back to the researcher before the meeting.

- ***Timing***

The researcher chose the time of day that is convenient for the type of participants (Polonsky and Waller 2015:183). The researcher and the participants were comfortable with the time after working hours to avoid interfering with their working schedules. Extra time was allocated to accommodate all CIG members' logging in to allow time to greet, welcome, introduce, set up, or review the ground rules. The researcher announced the grace period and the starting time in each one of the meetings. Part of conducting focus group interviews involves sharing information about the study and a few minutes of ice-breaking small talk to overcome nervousness for the participants and the researcher Beck (2017:721). The latter strategy may have assisted both parties in settling in and refraining from the anxieties of knowing that the interview was being recorded. An allowance of 5 to 10 minutes was allocated to round up the group. Gerrish and Lathlean (2015:406) state that timekeeping is crucial as it contributes to respect for participants' time.

- ***Conducting the meeting***

Following the introduction, the facilitator asked a planned open-ended question in each meeting. Consequently, the facilitator should promote debate by probing for more detail on interesting points. Follow-up questions such as "*Can you tell us more?"* or *"What else?"* encouraged participants to interact and reflect on the questions. According to Gerrish and Lathlean (2015:406), such techniques encouraged participation and assured participants that their points were valued.

- ***Clore***

Polonsky and Waller (2018:154) suggested that the participants recap the issues during the discussion. After each meeting, the facilitator thanked the group to show appreciation and encourage participation in subsequent sessions.

4. 7.2 Data analysis

The researcher and the CIG member participated in data analysis using thematic data

analyses.

Thematic data analyses

Thematic data analysis is an approach used for coding and categorising contextual information to determine the pattern and trends of used statements and words (Vaismoradi et al. 2013:200). Two sets of themes were developed, one for phase three, which was to explore the challenges regarding simulation-based education and the other set from phase four, which was to identify the transformative values contributing to the study. Six phases of thematic data analysis, as outlined by Braun and Clarke (2017:52), were utilised to analyse data as follows:

- ***Familiarising with data***

Familiarisation with data is common in all qualitative data analyses (Clarke and Braun 2013:121). I immersed myself in the transcribed data, reading and re-reading until it became intimately familiar. I also listened to the audio-recorded data and noted down the imported codes.

- ***Coding***

Creswell defines coding as segmenting and labelling data to form broad themes based on their description (Creswell 2019:243). The main objective of coding is to narrow data by selecting specific information and disregarding the information that does not provide evidence. This involves coding all interacting features obtained during the cooperative inquiry meetings. Clarke and Braun (2013:212) explain coding as an analytic process that captures data's connotations and conceptual readings. The researcher coded every data item by collating all their codes and relevant data extracts.

- ***Searching for themes***

Themes are more comprehensive than codes and represent a degree of cogitation. The themes were formed by identifying and examining the codes the group discussed most frequently and had the most evidence to support them. The CIG members avoided many themes to give detailed support for each one, thus providing a quality report. Clark and Braun (2013:121) explain that searching for themes is similar to coding codes to identify similarities in the data. Searching for themes is an active process that requires the researcher to construct the themes and collate all coded data relevant to each theme.

- ***Reviewing themes***

This phase focuses on refining the identified themes. The themes were reviewed at two levels. Reviewing the themes involves checking the relationship between them and the codes, including the relationship between themes. CIG members ensured that themes corresponded with the code and information obtained. Themes were evaluated to determine whether they were sufficiently similar and with enough data. At the second level, the researchers reviewed all transcripts and examined whether the themes accurately reflected what the CIG members

said.

- ***Defining and naming themes***

At this stage, the researcher analysed each theme in detail, providing convincing information to show how they fit into the data obtained. Then, group members reached a consensus on the themes developed.

- ***Producing a report:***

Clark and Braun (2013:121) argue that writing up is about weaving together the analytic narratives and data extracts to help the reader understand the story behind the data and contextualise it with the existing literature.

4.8 Phase 4: Reflection phase

During this phase, the CIG reflected on the challenges explored in phase three, which assisted them in identifying the transformative values that contributed to the study.

- ***Research Question*:** What transformative values can contribute to the facilitation of clinical simulation-based education?
- ***Research Objective*:** To identify transformative values that contribute to simulation-based nursing.

4.8.1 Data collection and analysis

Data collection and analysis were conducted using the same methods as in Phase 3. See page 73. During this phase, four CIG meetings were held, as indicated in table 4.5.

Table 4.5 Summary of cooperative inquiry meetings in phase 4

COOPERATIVE INQUIRY MEETINGS IN PHASE 4							
Research Question	What are the transformative values that can contribute to simulation-based nursing						
Research Objective	To identify transformative values that contribute to simulation-based nursing						
Data collection method	Focus Group Interview						
Number of participants	**Meeting**	**NW**	**NW**	GP	**GP**	**WC**	**TOTAL**
	1st	3	2	2	0	**0**	**7**
	2nd	**7**	**1**	2	**0**	**0**	**11**
	3rd	**0**	**2**	0	**4**	**0**	**6**
	4th	**0**	**0**	0	**0**	**12**	**12**
Observers	**2 Promoters**						

4.9 Phase 5: Action phase

Phase five was the last phase of the study that focused on developing simulation-based guidelines. 13 Experts in simulation-based nursing education participated in three rounds of e-Delphi survey aimed at developing guidelines.

4.9.1 Research question in phase 5

- ***Research Question***: How can the guidelines for simulation-based nursing education be developed?

4.9.2 Data collection in phase 5

E-Delphi was used to achieve the objective in phase four. e-Delphi is defined as an interactive online strategy based on the scoring of a series of structured statements, which are revised and repeated until consensus is reached (Eleftheriandou et al. 2015:2). Experts in simulation-based education used the technique under the four phases, namely the preparatory phase, exploratory phase consensus phase and refinement of data (Msibi et al. 2020:1).

- ***Phase 1: Preparatory phase***

In this phase, the instructional designer and the system administrator of the university's learning management system assisted the researcher in creating one e-Delphi platform.

Access was also provided to experts in simulation-based education who did not affiliate with the university.

- ***Phase 2: Exploratory phase***

The researcher posted outcomes of the evidence-based support measures from all three study phases for brainstorming with the expert.

- ***Phase 3: Consensus phase***

The validated tool was used to reach a consensus through the experts' comments, inputs, and suggestions.

- ***Phase 4: Refinement of data***

Data was refined based on the measures the experts and the researcher agreed upon.

4.9.3 Data analyses in phase 5

The researcher developed two types of Likert scales: the two-point and the seven-point Likert scale. The two-point Likert scale was used in rounds one and two, while the seven-point Likert scale was used in round three, using the AGREE 11 tool to measure consensus, where a score of 1 was allocated for irrelevant information and a score of 7 for information perceived as exceptional. The wording used on the seven-point Likert scale was “Strongly Agree, Agree, Agree Somewhat, Undecided, Disagree Somewhat, Disagree, and Strongly Disagree.” On the other hand, the two-point scale focuses on agreeing and disagreeing.

4.10 QUALITY IN COOPERATIVE INQUIRY

Quality in cooperative inquiry was achieved through the following eight proposed criteria: (1) alignment with the purpose; (2) ownership of the inquiry process; (3) development of reflectivity; (4) democratic and collaborative group dynamics and facilitation; (5) commitment to practical action and experience; (6) documentation of the process; (7) transferability; and (8) construction of new knowledge (Mash 2014: 6).

4.10.1 Alignment with the purpose

Mash (2014:6) states that alignment with the purpose of research involves aligning group members with the purpose of research. Furthermore, alignment drives the process and acts as the contract between members. Members of CIG aligned themselves with the purpose of the study, which is to develop simulation-based guidelines that will guide the facilitation of clinical teaching and learning rather than to align with the particular outcome or personal intentions of members.

4.10.2 Ownership of the inquiry process

Clinical facilitators' ownership of the research process is crucial to the quality of inquiry. The principal researcher transferred knowledge of the research methodology, power, process, and ownership of the research question to participants as co-researchers. Transfer of expertise prevented researchers from dominating the established group (Mash 2014:6).

4.10.3 Development of reflexivity

Denzin & Lincoln (2018:143) define reflexivity as reflecting critically on the self as a researcher and human as an instrument. According to Polit and Beck (2017:561), reflexivity involves awareness that the researcher brings to the inquiry as a set of values, unique inquiry, and a social and professional identity that can affect the research process. Mash (2014:6) states that heightened awareness, critical questions, open-mindedness, critical questioning, and commitment to dialogue characterise the reflective stance. In this study, members of the cooperative inquiry group were the researchers and the researchers, and they have all experienced the same phenomenon, which is the use of simulation in their clinical teaching. The clinical facilitators who participated in the study were expected to possess all the characteristics mentioned above to achieve reflexivity.

4.10.4 Democratic and collaborative group dynamics and facilitation

The principal researcher must strive for a democratic, collaborative process and build a relationship of trust by being truthful and non-judgemental and always staying within the purpose of the research study (Mash 2014:6). The same author further suggests that the principal investigator must guard against breaking of contract within members of the group, which can easily lead to loss of commitment and relationship of trust. In this study, the researcher, as the principal investigator, ensured that the CIG stays focused on the agreed objectives, methodologies and solutions to address challenges regarding simulation-based education.

4.10.5 Commitment to practical action and experience

According to Mash (2014:6), participants must all be committed to maintaining a balance between action and reflection, indicating that it should be equally easy for them to take action as it would be to pause for reflection and documentation. Clinical facilitators involved in clinical simulation must act and reflect on simulation activities to develop a simulation-based programme that will enhance clinical teaching and learning.

4.10.6 Documentation of the process

Mash (2014:6) identifies three aspects that must be documented: a) the individual experience and action, the group process and dynamics, and developing learning, reflections and final

consensus. Clinical facilitators must document a thick description of the research process, including how consensus was reached.

4.10.7 Transferability

Leavy (2017: 201) and Polit & Beck (2017:747) define transferability as the ability to transfer the qualitative research findings from one context to another group analogue to generalisability. According to Grove & Gray (2019:484), the term transferability is used to describe the qualitative findings as they are applicable in other settings with similar participants when the study has a thorough description of the sample, and the reader has confidence in the credibility, dependability, and confirmability of findings. Transferability is another aspect of quality whereby the CIG's findings and context during focus group interviews and focus group interviews should be sufficiently and clearly described to enable readers to understand what aspects of the inquiry can be appropriated to their context. Therefore, the reporting of this research should describe the context in some detail so that readers can judge to what extent their own context is similar to or different from the study context. (Mash 2014:5). Verification of findings applicable to e-Delphi will be used to establish transferability.

4.10.8 Construction of New Knowledge

Mash (2014:6) states that the purpose of cooperative inquiry is to construct new knowledge through action and reflection cycles and the practical use of such new knowledge. The (ibid) further suggests that the new knowledge derived from participants is being implemented in how the final consensus was reached to reflect the quality of inquiry. Napan, Green, Thomas, Stent, Julich, Lee and Patterson (2018:264) recommend CI as a valuable personal and professional transformation method. As clinical facilitators, new knowledge that translates into the development of simulation-based programmes will be created and will be a valuable instrument to improve clinical teaching and learning.

4.11 CONCLUSION

This chapter addressed the research design and study methods, including population, sampling, context, and methodology. Two sets of population of cooperative inquiry groups and a set of expert participants were used during data collection. Chapter five will focus on the study findings and the interpretations thereof.

CHAPTER 5: PRESENTATION AND INTERPRETATION OF FINDINGS

5.1 INTRODUCTION

Chapter four discussed the research design and methodology. This chapter focuses on the findings of Phases 2, 3, and 4 of the study. Subsequently, the chapter is divided into three parts: Sections A, B, and C. Section A, presents the findings of Phase 2, to establish a working relationship among clinical facilitators participating in the study. Section B presents the findings of objective three, namely, to explore and describe the challenges regarding simulation-based nursing. Section C presents the findings of Phase 4, to identify transformative values that contribute to simulation-based nursing. The transformative values were identified from the challenges that emerged from Phase 3 of the study. The findings of each phase will be discussed and supported by the quotes.

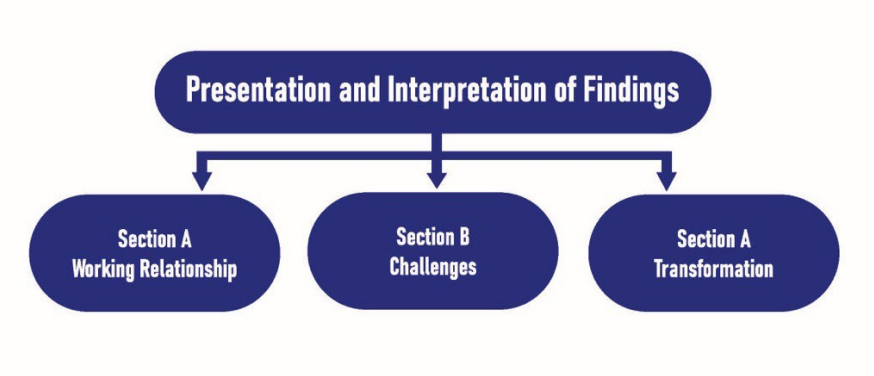


Figure 5.1: Sections of interpretation of findings

5.2 SECTION A: FINDINGS OF PHASE 2

Research question: How can a working relationship be established among clinical facilitators as co-researchers?

5.2.1. Participatory Action Research

As explained in Chapter Four, professional PAR was used as a study design because it involves people interested in bringing change. Clinical facilitators interested in bringing change to simulation-based nursing participated in the study as co-researchers. As stated in Chapter Four, the clinical facilitators who agreed to form part of the CIG followed the principles of PAR, including critical collaborative inquiry to bring change to simulation-based nursing.

5.2.2 Rapport building and application

The initial focus was building relationships with the universities under study and establishing a working relationship with the participants. The process followed during rapport building included gatekeeping, the pre-enter phase, recruitment of participants and a cooperative inquiry group, as discussed in Chapter Four. This process ensured that the Cooperative Group functioned efficiently and effectively.

5.2.3 Cooperative Inquiry Group

Clinical facilitators from five diverse universities converged virtually to form a cooperative inquiry group. All clinical facilitators were seasoned in using simulation-based nursing, which was required for effective collaboration within the cooperative inquiry group. Mezirow (2019:92) outlines that clinical facilitator who engage in discourse must have accurate and complete information about their simulation-based activities, be able to withhold judgements and be empathetic and open to alternative points of view. The author states that they must also be free from immobilising anxiety, distorting self-deception, and coercion, be able to assess arguments objectively, weigh evidence based on their understanding, and reflect critically on their assumptions, including those of others.

In this study, a group of co-inquirers engaged in collaborative action and reflection cycles to establish a working relationship and agree on the issue that needs to be explored. Data was collected per the six stages of CIG (Reason 1999:210). These stages were applied: *Stage 1***:** First reflection phase; *Stage 2***:** First action phase; *Stage 3:* Full immersion in Stage 2; *Stage 4***:** Second reflection phase; and *Stage 5*: Subsequent stage continues with cyclic inquiry. The cyclical investigations will continue, depending on the variety of intentional procedures and unique skills in the action phase to enhance the validity of the process. *Stage 6:* Final reflection – conclusion of the CI**.** Stage 1 of the cooperative inquiry process will be applied in phase 1 of the study.

The Cooperative Inquiry meeting

- **Stage One: First reflection**

Reflection in PAR was explained in chapter four as an evaluative process during which the appropriateness and validity of one's beliefs and assumptions and challenged (Stuckey *et al* 2022:1462), and *Critical self-reflection is* being aware and critical of the subjective perceptions of knowledge and the constraints of social learning (Cranton 2016:11). The group of clinical facilitators were invited to the online meeting. After identifying the challenges in Phase 2, during the reflection phase, the cooperative inquiry group members as co-researchers agreed that there was a need for the development of simulation-based guidelines as support for evidence-based measures which informed Phase 3.

The process of the meeting

The principal researcher officially opened the meeting with a warm welcome and thanked the potential participants for availing themselves of the meeting. During this stage, the researcher conducted a formal PowerPoint presentation to the five universities' clinical facilitators who responded to the meeting invitation. The meeting was conducted online using Microsoft Teams. The presentation included the statement of inquiry and the general overview of the study. After the presentation, the participants agreed on the proposed title and objectives. The clinical facilitators were allowed to decide if they were interested in being part of the co-operative inquiry group (CIG) as participants who are also regarded as co-researchers. The consent form to participate in the study was presented during the meeting, and those who agreed to become part of CIG signed for phase 1. See Annexure G1 PowerPoint.

In the same meeting, the participants deliberated on how to frame the statement in a way that would be fruitful for the research process.

Comments from the CIG members

The GIG members accepted the statement of inquiry even though they identified the gap where there was no mention of the literature review for the evidence-based measure for simulation-based nursing. Both the researcher and the CIG members, in the presence of the promoters who joined the meeting as observers, agreed that the researcher should include a literature review to support the evidence-based measure with related literature. The contribution was accepted, and the researcher embarked on an integrative literature review as Chapter Two, Phase 1 of the study, before continuing with subsequent CIG meetings.

5.3 SECTION B: FINDINGS OF PHASE 3 The objective of the study, 'To explore and describe challenges experienced by clinical facilitators regarding simulation-based nursing'

Introduction

This section addresses challenges regarding simulation-based nursing and the transformative values thereof. The study findings yielded nine significant themes, four of which emerged from Phase 3 and five identified in Phase 4. The themes were formulated in accordance with the steps of Mezirow's transformative learning theory, as outlined in Chapter 3. According to Mezirow (1994:105), not all ten steps are required for transformation. Therefore, four themes of phase 3 were developed and aligned with the first four steps, and five themes were aligned with steps 5 to 9 of Mezirow (1994). Figure 5.1 below summarises the themes and sub-themes for phase 3.

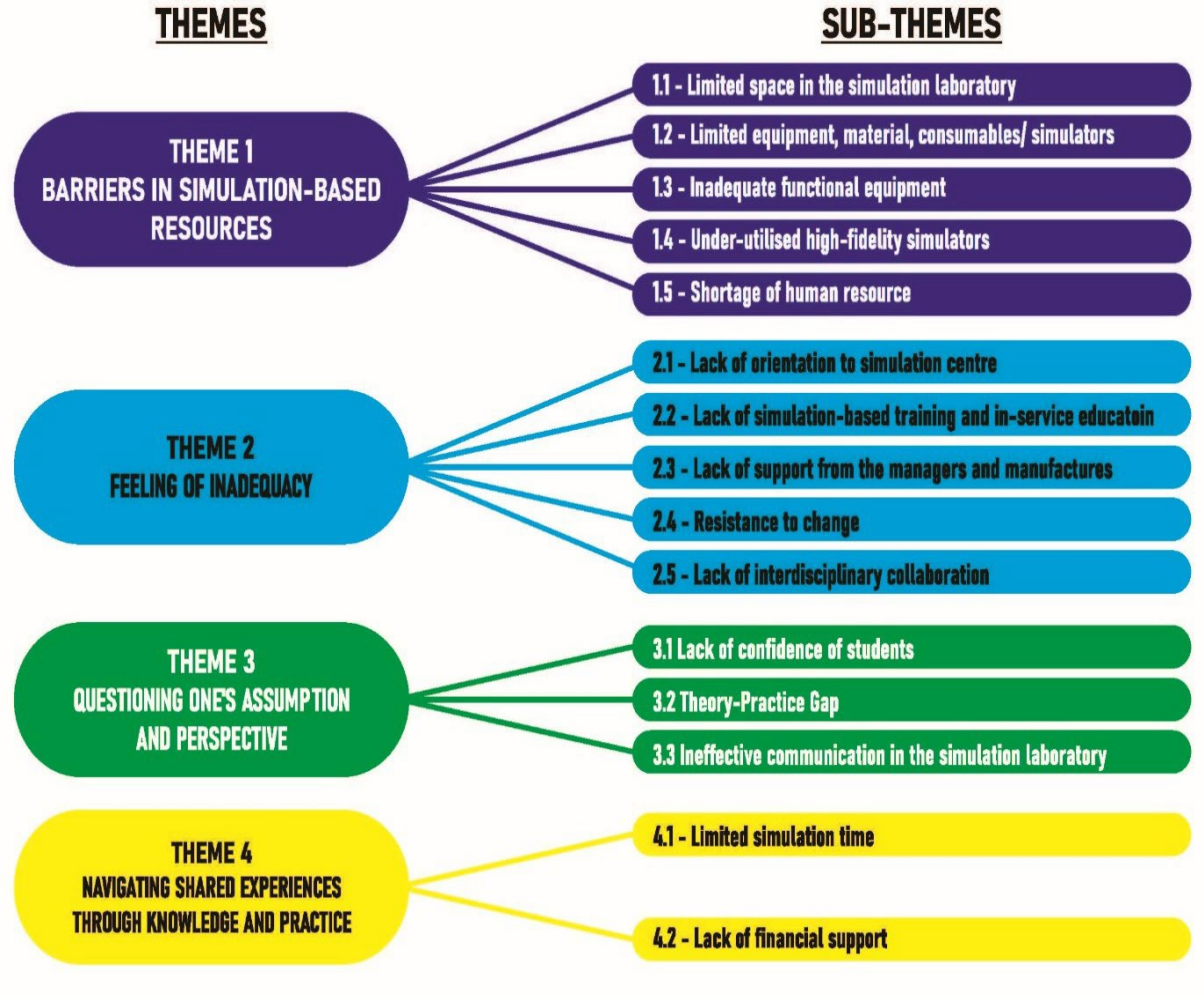


Figure 5.2 Themes and sub-themes for phase 3

5.3.1 Theme 1: Barriers in simulation-based resources.

Barriers to simulation-based resources emerged as the first theme. The following sub-themes were identified namely, limited space in the simulation laboratory, limited equipment, material, consumables, and simulators, inadequate functional equipment, underutilised high-fidelity simulators

N.B the following key was used: Participant Initials, for example

OM=Participant Initials

M1=Meeting No.1

M2=Meeting No. 2

Figure 5.2 Theme 1 Barriers in simulation-based resources

Barriers in simulation-based resources emerged as theme 1. The following sub-themes were identified are, 1) limited space in the simulation laboratory, 2) limited equipment, material, consumables/simulators, 3) inadequate functional equipment, underutilised simulators, and 4) shortage of human resources.

Sub-Theme1.1: Limited space in the simulation laboratory

Limited space in the simulation laboratory emerged as the first sub-theme. The findings show that the main resource, which is the infrastructure, is not yet at the level of an ideal simulation laboratory with all the necessary space available to accommodate the number of students and different activities. Below are some of the excerpts that confirm the challenges related to the space in the simulation laboratory:

> *"Except in this instance, you would have limited resources or space for students to give you feedback or for simulation to be productive or effective".* ***OM: (M1)***

> Another participant reflected on the limited space in the simulation laboratory and said:

> *"Yeah, the space is a bit of a problem for me, and the extremes to which you have to go actually to make it work for yourself".* ***AV: (M2)***

> Another one said:

> *"There is no control room; the technician comes and sets, which has some challenges because it's new".* ***ASM: (M3)***

The perceived challenge regarding the physical learning space in the simulation laboratory is that it is limited, preventing students from breaking down into small groups to practice and give feedback after the demonstration.

Subtheme 1.2: Limited equipment, material, consumables, and simulators

A shortage of equipment is also a barrier to providing quality simulation-based nursing. Below are the supportive quotes that relate to the limited material resources and equipment:

> *"We lack a lot of equipment. So sometimes you might want to teach a skill like the emergency trolley, but because you do not have a lot of that equipment and even the medications, they emergency medications that are supposed to be in those trolleys, so you end up verbalising so most of the time you may just improvise with slides to tell the students that."* **SR: (M2)**

The clinical facilitators expressed their frustrations when they sometimes had to demonstrate the skill yet had no equipment for that particular skill or a limited amount of equipment for many students. The following was expressed:

> "*if you want maybe a pregnant mannequin, they are not enough, the wounds that are not enough, even with the mannequins itself that we use, we have to assume a lot, which is a concern to the students because I think in the simulation we should be as close as we can as to what they are supposed to be seeing in nursing in actual clinical settings*". ***MAS: (M3)***

And another participant said:

> "*So we'll be thinking that, OK, fine, because we are lacking this equipment, this site, then maybe when I go for my accompaniment, I can also demonstrate the skill only to find out that when you get to the clinical facilities, they lack the very same equipment that we don't have. And then, yeah, we end up presenting. Still, there's no demonstration due to issues of shortage of equipment that we are expected to use to demonstrate their skills for students before going to the clinical facilities". **TD: (M4)***

The high-fidelity simulators were also a challenge in terms of the number of universities that participated in the study. The situation could not allow for parallel stations or for students to practice or give feedback in different groups at the same time.

Sub-Theme1.3 Inadequate functional equipment and Under-utilised high-fidelity simulators

The enquirer perceived the other challenge of available mannequins not being used, and some of them not in good working order. The following quotes illustrate the CIG members' frustrations regarding the equipment:

> *"I think one of our issues is the mannequins, those that were supposed to be high functioning mannequins, like who can deliver a baby. Maybe you can also practise a couple of skills, but most of them are not working at the moment. I think to use the labour mannequin, who is able to deliver a baby, but before we did try, but it was not working." **RT: (M2)***

Another participant echoed:

> *"Into the high tech specifically, yes, there are mannequins there and anything that we might need, but we are unable to use them fully because some of them are not functional." **OMG: (M2)***

The above findings revealed that high-fidelity simulators can no longer be used for simulation of skills because they are not in good working order and the following was expressed:

> *"I can say, for example, the defibrillator, not all of them are serviced. Some are working with the battery, so if you find you want to use it, and the battery was not charged, it will be a challenge". **ASM: (M3).***

And this was confirmed by one participant in another meeting

> *"We do simulate, and sometimes we find that some of the Instruments are not working".*

MBL: (M6)

Other perceived challenges included equipment that was available but not functioning because it was not serviced and some non-functional instruments. The equipment's inadequacy compromises some procedures, including the emergency procedure. The participant said:

> *"And I think for me, I will say the high-fidelity mannequins, I will say maybe they are under-utilised because I've never maybe witnessed any of the of the preceptors or any lecturers, maybe using the high-fidelity mannequins."* ***MS: (M2)***

And another participant added.

> *"…there are some equipment that are there, and we are unable to use them because we are not familiar with them, and we have not yet been in serviced on them, so we cannot use those equipment that are in the high tech."* ***ONT: (M4)***

The CIG members recognised the underutilisation of the high-fidelity simulators and attested that they had never seen some of them in use. The following was echoed:

> "*And the last one from me is, the equipment's, or the consumables, the consumables most of the time they are not what we want them it be, for example, if we do a demonstration for maintaining sterility, with dressing tray, they order different ones from different companies, this year we have the one that doesn't have a towel that makes sterile area, last year we had one so it's not consistent."* ***ASM: (M3)***

And the following was mentioned:

> *"I agree with consumables. We have to make sterile, unsterile, and unsterile sterile where we can find them practicing. We do not get enough, and like what AM have said, when you go to the hospitals that we allocate our students, they have never seen, they will not see, and I think it's a struggle that will have to be dealt with maybe from the institutions and the university that we are under."* ***MAS: (M3)***

The cooperative inquiry group members revealed that the type of consumables used for demonstrations, such as dressing packs, differs from one order to the next because they are purchased from different companies. One participant shared the following experience:

> "*Let me start with understocking; if you find that you want to do a simulation lab, then certain material or certain equipment is not there. For instance, maybe if I could talk about the skin traction set, which came late, you wouldn't find it. It's difficult for you to simulate talking or showing pictures to the students because they wouldn't have a real feel of the real material. Then the other issue is the over-stocking of materials; they expire and are inefficient to use. In that case, it's not going serve the purpose of teaching and learning.*" ***KR: (M4)'***

Sub-Theme1.4 Under-utilised high-fidelity simulators

The inquiries raised concerns about the underutilisation of high-fidelity simulators, as the respondents were unsure of how to operate them and were afraid to damage them. Below are the exact quotes shared by the CIG members:

> *"Yes, because they are costly, they need high maintenance, so now it limits us because we don't want to… sometimes you are scared that you may break or damage it. You'll see that sometimes you'll need someone more experienced in using them to be there and operate it for you while you are teaching the students."* ***NC: (M7)***

The following was further mentioned:

> *"I can say there is limited training for using the high fidelity mannequins, which makes me scared to fully maybe do it because they have lot of….like they are high fidelity mannequins, so sometimes I'm not used to most of those machines, sometimes they use computers to operate the mannequins, and you'll need to teach the students at the same time you need to operate or to…. I don't know how to put it, yah."* ***GB (M1)***

One participant shared her frustration and said:

> *"This makes us end up not utilising, you know, the dummies to the fullest. So, I still feel that the mannequins are not utilised adequately to benefit us as clinical facilitators, nor are they beneficial to our students who need to practice before they can go to the real practical areas."* ***SL: (M1)***

Another participant's perspective was:

> *"And I think for me, I will say the high-fidelity mannequins, maybe they are under-utilised because I've never witnessed any of the preceptors or lecturers maybe using the high-fidelity mannequins. Maybe it's out of ignorance, but I can say that even if you have a lot of equipment there, some of it, like the high-fidelity mannequins, is under-utilised. One other thing that I can say with regard to utilisations is allowing the students to be on their own at the high-tech side."* ***MS: (M2)***

To further explain under-utilised high-fidelity simulators the following was highlighted:

> *"So now when we speak of lack of resources, looking into the high tech specifically, yes, there are mannequins and anything that we might need, but we cannot use them fully because some are not functional."* ***OMG: (M2)***

Multiple justifications for underusing equipment were provided, including a lack of training on using HFS, a lack of maintenance of such simulators, and a fear of using them because of their cost-effectiveness. The reasons provided indicate that the clinical facilitators and the students do not benefit much from HFS.

Sub-Theme 1.5: Shortage of human resource

Evidence from the data collected suggests that staff shortage is one of the major challenges experienced by clinical facilitators. Human resources also included a shortage of IT technicians who should be permanently employed in the simulation centre for support with high-fidelity simulators. Below are some of the quotations that link to the shortage of staff.

> *"…and then again, we have the challenge of staff shortage, so you find that I am responsible for that module. It's very demanding because I have to assist my students in the Skills Lab and the facility. But you find that I'm one person and I'm on part time".* ***SR: (M2)***

And following participant said:

> *"There is a shortage of personnel in the workplace, which inconveniences students and leads them to be in the simulation lab longer".* ***OM (M3)***

And shortage of human resource was echoed as follows:

> *"…me teach from first year to fourth level. You teach all the levels in the simulation lab. We should not be doing theory, but at the end, sometimes it starts with like she is saying the time will be taken by trying to find a base and trying to find"* **ASM: (M3)**

The CIG members mentioned the shortage of staff as one of the barriers to simulation-based nursing education.

> *"For example, maybe we could have an IT technician in this simulation lab to use those mannequins, and students will be able to use them. You know, after having maybe a good theory, then when they have to integrate theory and when they use the high tech, it is much better"* ***SL (M1)***
>
> *"It's not like you depend on a technician to use the mannequin, no. But they are there for support, always available for support".* **ASM: (M3)**

The findings from the data collected raised an important issue regarding the need for an IT technician who could be permanently employed to assist with the programming of the high-fidelity simulators and the control room.

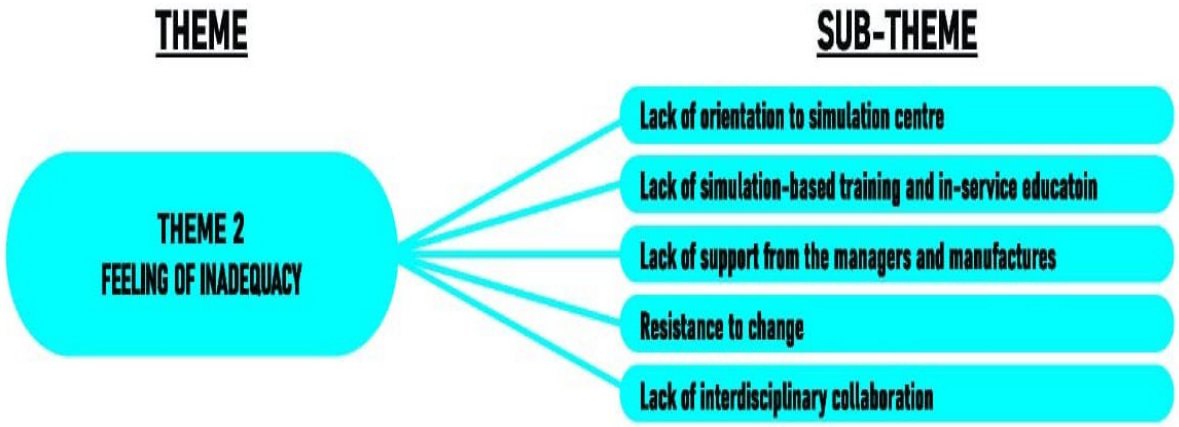


Figure 5.3: Theme 2 Feeling of inadequacy

5.3.2 Theme 2: Feeling of inadequacy

Feeling of inadequacy was identified as ty, which aligns with the second step of transformative learning theory. Three sub-themes emerged from Theme 2: lack of knowledge and skill, resistance to change, and lack of support from managers and manufacturers.

Sub-Theme 2.1 Lack of orientation to the simulation centre

Another challenge indicated by the CIG was the lack of orientation to the simulation laboratory, where they had to figure out how things operate without being shown. The following are some quotations from the CIG members that show a lack of orientation.

"Yes, I think it's the issues of orientation also… I think most of us preceptors were not orientated in terms of how to use the HITECH mannequins." ***RT (M2)***

And:
"They were not aware that there's a mannequin that can be used in the simulation lab, and they even prefer to go to the facilities because of lack of that equipment; I will agree with RI when he says maybe it's lack of equipment or orientation. I will say orientation; it's a challenge or handing it over to the next person. It's a challenge". ***MS: (M2)***

Another participant echoed:
"Things are being done there, the type of technology that they have in place, so if you are not orientated or if you don't get orientation when you arrive as a new employee, it becomes a challenge going forward to know that there are things that might be useful to you, and then another issue, the issue of or another challenge, the issue of human resource." ***TD: (M2)***

"*I have noticed that if you are being hired and you are a new clinical preceptor in terms of the sim lab, there is no orientation being arranged for us to take us through, but we are expected to go to the sim lab and perform some duties. So, we just feel like we are left out so that one can also be looked at"* ***LM: (M4)***

It is recognised that most universities face a challenge in orienting newly appointed clinical facilitators in the simulation laboratory.

Sub-Theme 2.2 Lack of simulation-based training and in-service education

The clinical facilitators lacked simulation-based knowledge and skills because of a lack of simulation-based training, in-service education, and orientation to the simulation centre.

"So also, we don't have the necessary skills to operate all of those mannequins as clinical facilitators were not some of us have not been empowered to be able to use those mannequins uh properly." ***SL: (M1)***

"So, I can say there's limited training for using the fidelity mannequins, which makes me scared to use it because they have a lot of fidelity fully, so sometimes I'm not used to most of those. Sometimes they use computers to operate the manikins, and you need to teach the student at the same tim.e" ***NM: (M7)***

"Now you mentioned the damage to the equipment because of lack of knowledge." ***TD: (M4)***

Clinical facilitators raised concerns about the lack of formal training on high-fidelity simulators, as they felt the need to acquire the necessary skills to operate such sophisticated manikins.

Sub-Theme 2.3: Limited support from the managers and suppliers

The participants expressed concern about managers' and manufacturers' lack of support. The quotes below clearly indicate frustrations from the voices of CIG members and the limited support from the managers.

"Sometimes we are just frustrated, you go down, you go to your department. You talk about it. You think somebody will address it, and then it ends up there. And then you come again. You find the same mistake. So, there is no platform where we meet with them; actually, I mean the end users. They need to be given time to talk about the service that they are providing. So, we cannot even say the end users are their students. It's us who's using it for the student.t" ***MB: (M4)***

The clinical facilitators lack satisfaction at the workplace because they do not receive the expected support from the managers.

The absence of support from the suppliers of the high-fidelity simulators was mentioned as a barrier to operating such mannequins. The quotations that are linked to limited support are discussed below:

"Yes, I was saying we lack support from the manufacturers; maybe it might be because now you are too far from most companies that have supplied us with the mannequins". ***SL: (M1)***

"But now, if I have to come in there, that may be the advantage on their side. We don't have immediate support that we can rely on when we have a challenge operating any mannequins

that we feel are complex." ***GB: (M1)***

The clinical facilitators felt that the suppliers were not interested in supporting their learning about operating high-fidelity simulators and were unsure of the reasons for not offering support.

Sub-Theme 2.4: Resistance to change

The findings suggest that clinical facilitators conducting simulation-based nursing for a long time are not ready for change and prefer to continue using their old methods.

"I know that people who've been in the field for long tend to have ownership of the environment, and they're not open to new suggestions at most because they've been here, they know what has to be done, how it should be done and when it should be done. So, if you and you come up with new suggestions, sometimes there is resistance to accepting new things from new people because you don't have experience in the field. ***ON: (M5)***

Another participant added:

"Unfortunately, even if we are in an education and research environment, there are those people who are resistant to change, especially if it's initiated by new people ***OM: (M5)***

"Yeah, some people are not willing to know to use the SIM lab." ***SL: (M1)***

"Yeah I stand to be corrected, but some facilities don't want to stay relevant with what's currently happening". ***OM: (M1)***

The clinical facilitators noticed that other colleagues resist embracing the current simulation-based modern practices, especially when young facilitators master such changes.

Sub-Theme 2.5: Lack of interdisciplinary collaboration

From the issues raised by the clinical facilitators, it is evident that the nursing department experienced unfair treatment from the simulation managers regarding interdisciplinary collaboration. This issue seems to be experienced by the different universities where the simulation laboratory is shared amongst the nursing, medical team, and other medical team. Some of the quotations that support the unfair treatment are as follows:

"Then again, also the Skills Lab is utilised by all the faculties, so maybe they might want to go there in their free time, but then the skills lab manager will tell you, oh, sorry, we can't accommodate them because we have medical students here. So you find that it becomes a big challenge for them to follow up practises outside the module time. The only time they have

is during the module time, which is limited." ***SR: (M2)***

One participant added:
"Even if you book in advance sometimes and then you find that there's a doctor's exam, or what do they call it? HPSA is coming, and then they will move you, or they can take those slots as much as you have booked in advance. We had a booking, but this health professional cancelled… Then you are all moved to I don't know whether they after us, booked before us, or there's double booking." ***MAS: (M3)***

And:
"Yes, even if you book in advance, they will tell you that no, the doctors are having exams on this day or the doctors, blah blah, blah blah. So, I think change will be better if nursing has their own skill or simulation labs. However,… is economical, and I'm unsure if it won't be feasible. So that's where I see the change. If we have our simulation lab as nurses, but I'm not sure how it works in the colleges with the simulation because, in the university, we share the space". ***ASM: (M6)***

CIG members who shared the simulation centre with the medical team expressed dissatisfaction with the priority given to the medical team over the nursing team. They feel they need their simulation centre for nurses, separate from the medical school.

" …they have their frustration which they tell us that the students this and this the student this and this, but it's the numbers that we need to control as you can put. Thirty students or more than 30 students in one room. However, we have only two hours to get a tent. And they gave you two rooms. What do you… what do you do?"

The above quotations attested to a lack of collaboration between nursing and the medical team and to simulation management favouritism on the part of the medical team.

5.3.3 Theme 3: Questioning one's assumption and perspective

The third theme from the data obtained was questioning one's assumptions and perspective. This theme corresponds with step 3 of the TLT, "critical assessment of assumptions."

Figure 5.4: Summary of theme 3: Questioning one's assumption and perspective

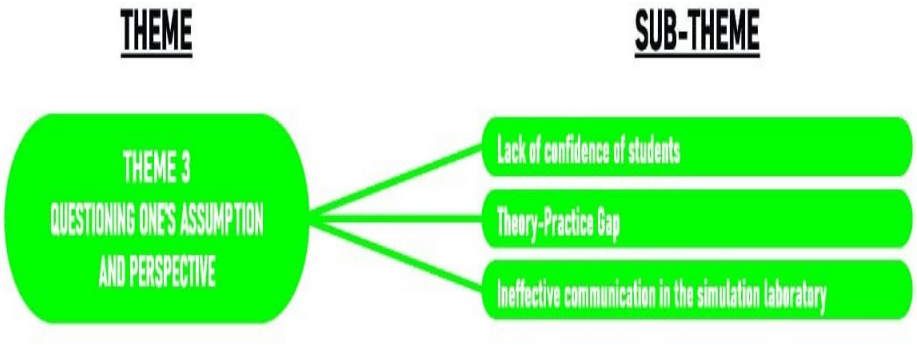


Figure 5.4 above indicates the theme related to clinical facilitators' self-reflection on their assumptions and perspectives based on how simulation-based nursing impacts their personal growth and self-awareness. Three sub-themes from Theme 3 included lack of confidence, theory-practice gap, and ineffective communication.

Sub-Theme 3.1: Lack of confidence of students

The findings are conclusive that students lack confidence because they lack skill and resort to absenting themselves from duty. The problem results from a lack of knowledge and skill. Below are quotes linked to the students' lack of confidence, as observed by the clinical facilitators.

> *"The other point I've noticed is that even the students lack that confidence."* ***GB (M2)***
>
> *"Lack of self-confidence for our students that results to them absenting themselves to the clinical facilities, because if you lack a skill, if you are not confident enough to perform a skill, you don't look forward to a new day to say yes, I must have this skill now I'm going to practise it on this real-life patient"* ***TD: (M2)***
>
> *"The lack of practice for the students because of the number that they are and that it is a centre that all nurses use, physiotherapists, doctors hence they lack confidence."* ***MAB: (M3)***
>
> *Another participant concurred:*
> *"Some students lack confidence when using simulation-based learning* ***OM: (M1).***

Data obtained from the clinical facilitators gave a clear indication of why students lack confidence, which is because they do not get enough practice, absent from the clinical services where they can practice what they have learned in the simulation laboratory.

Sub-Theme 3.2: Theory-Practice gap

One of the significant challenges, as observed by the clinical facilitators on the side of the students, was a lack of coordination between theory and practice. Below are the quotes that are linked to the theory-practice gap.

> *"Sometimes also would want students to link theory to practice neh, so sometimes what I've noticed It's not always transferable in real-world situation."* ***OM: (M1)***

> *Another participants said;*

> *"Self-directed learning in the SIM lab is also lacking. Uh, I'm saying this because based only on my experience, the students should be used to self-directed learning in the SIM lab to demonstrate the skill and book the procedures with the support of the SIM lab manager."* ***MS: (M2)***

> *The theory practice gap was further explained as follows:*

> *"…so, I feel self-directed learning is lacking. I second my colleague, and then one more thing: sometimes, we get requests from a few students who want to practice the skills after we've demonstrated them outside the module time. Still, sometimes it's a challenge because the timetable is packed with other modules, so you'll find that time is a challenge for them to do so because as much as they might want, the skills lab might be there, but the timetable doesn't allow them because they have to attend other modules."* ***SR: (M2)***

> *Another participant echoed;*

> *"I can say with regard to utilisation, it allows the students to be on their own at the high-tech side. To be on their demonstrating procedures and maybe you lecture us watching them from the other side of maybe in your office, just to give them free space for them to be being able to practise independently."* ***SL (M2)***

The clinical facilitators indicated that they noticed a gap between theory and practice and believed that a lack of self-directed learning could be one contributory factor. Students receive initial demonstrations from the clinical facilitators but do not practise repeatedly on their own.

Sub-Theme 3.3: Ineffective communication in the simulation laboratory

The participants mentioned that, at times, communication between them and the students during simulation sessions becomes a challenge because of a lack of understanding of the concepts used. Below are the exact words uttered by the CIG members.

> *"The language was a challenge for me. … because whatever I explained to them, they couldn't get what I wanted to teach them regarding simulation. This is where skills lab comes in; it becomes more challenging because now you have the student in front of you. It's a safe environment for them, yet they don't bring their part."* ***NM: (M7).***

Participant OM's thoughts on ineffective communication were:

> *"It seems as if they think when you demonstrate procedures in the simulation lab, it's not that serious because sometimes when you expect them to give feedback, they will skip other things to say how the doll will respond to me, ma'am. As a lecturer or facilitator, you have demonstrated how the procedure has been done from one up to Z. Still, smallanyana (little bit small) things the student will skip them to say. I cannot communicate with the doll where else "wena" (you) did everything so that smallanyana (little bit tiny) things that they miss, in the end, the student is not competent enough to demonstrate such a procedure.* ***OM: (M3)***

Another participant's perspective was:

> *"So, if the students say something else or I just find that the student lacks empathy when it comes to communication because if you see them in the skills lab when you see them in a real-life situation, they don't know how to communicate with the patient. The other thing I wanted to mention is. The level of integration during simulation. Everything is taught separately, but it is never actually brought together. So, if you teach a skill, what about the information behind that skill?* ***MMN: (M5)***

Participant SMS's remarks were:

> *"If we do mention things, but whether they have been taken over to simulation or sometimes we are just frustrated, you go down, you go to your department. You talk about it. You think somebody will address it, and then it ends up there. And then you come again. You find the same mistake. So, there is no platform where we meet with them, actually, what I mean is the end users".* ***SMS (M6)***

It is clear that clinical facilitators are disappointed and feel helpless when they continue to discuss the challenges they experience in the simulation centre, yet their issues are not addressed.

5.3.4 Theme 4: Navigating shared experiences through knowledge and practice

The participants constantly highlighted challenges shared by all the universities participating in the study, such as limited time for simulation sessions and financial support.

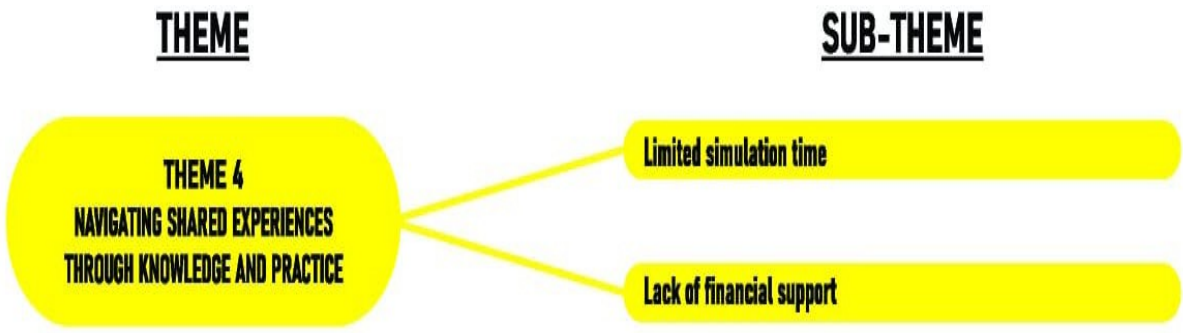


Figure 5.5 Theme 4 Navigating shared experiences through Knowledge and Practice

THEME 4: **Navigating shared experiences through knowledge and practice**

The participants constantly highlighted challenges shared by all the universities participating in the study, such as limited time for simulation sessions and financial support. The following sub-themes were identified, 1) limited simulation time, and 2) lack of financial support.

Sub-Theme 4.1: Limited simulation time

The findings show that clinical facilitators do not get enough time to perform all related activities for a particular skill in one session. The following are the actual voices of the clinical facilitators:

> *"The only thing is time is a problem when we want to utilise the high fidelities to actually give the students a learning opportunity in that regard because all the year groups want to use the SIM lab, so we have to have certain days that we can like 2 days per group".* ***AV: (M2)***

Participant GB also commented on the issue of limited time

> "*I just want to conquer with the previous participant or speaker when she says limited time. So, the time frame is a challenge for us. Maybe at least we can give individual students feedback so that you can attend to them because they are different; they don't capture at the same time all of them".* ***GB (M1)***

The clinical facilitators indicated that the allocated time for each simulation session for all the activities, including skill demonstration, student feedback, debriefing, and reflection, is insufficient. The following was expressed:

> *"Yeah. Maybe we can start with the challenges that we face as facilitators. Time versus the number of students that do not have time to practise the skill after it has been demonstrated. We have many students, and the time allocated to us in the simulation sometimes does not make sense. You demonstrate, and then it is time to go, so as we practice, it becomes a concern".* ***ASM: (M3)***

Another participant pointed out:

> *"Okay, they don't get enough time to practice the skill because they are allocated a limited amount of time. Then they demonstrate. Few will manage to give you feedback. Maybe one or two students will manage to give feedback, but others don't."* ***MAS: (M3)***

The findings demonstrated that the allocated time for students to give feedback after an initial demonstration of a particular skill is insufficient.

> *"We have such a diverse number of responsibilities. If you think of it, you think you'll be fine for the day. You'll do this and this and accomplish a lot, and office life comes along the way. If I can say it like that.* ***AV: (M2)***

The extract above suggests that the clinical facilitators do not cope with various responsibilities that do not only include simulation-based nursing.

Sub-Theme 4.2: Lack of financial support

Clinical facilitators identified budget constraints as a significant challenge in conducting simulation-based nursing. The data obtained show a need for financial support. Clinical facilitators also mentioned that dividing the students into smaller groups is impossible due to the limited number of simulators and other equipment.

> *"And divided into two groups and smaller groups to come into the same lab to do high fidelity training, and it is hilarious, but also such a learning curve for them, and they grow from that, but with our budget constraints, yes, we want a new high-fidelity mannequin. The budget doesn't allow that at all".* ***AV: (M2)***

Another participant highlighted:

> *"The cost implications will be that the equipment there will be ruined more because we do not know how to use them and rather than new equipment being bought, the old ones will need to be replaced, meaning that we will be just walking backwards".* ***OM: (M2)***

One clinical facilitator felt that the already available equipment gets damaged because people lack knowledge of how to use it. This negatively impacts the budget, as replacements will be needed rather than purchasing new ones to supplement the existing ones.

5.4 SECTION C: FINDINGS FOR PHASE FOUR

Section C presents the objective of Phase 4, which is to identify transformative values that contribute to simulation-based nursing. The transformative values were determined based on the challenges from phase three of the study. The CIG got emersed in Section C of data

collection by answering the following question: "*What are the transformative values that can contribute to the facilitation of clinical simulation-based education?"* Five significant themes comprising fifteen sub-themes were identified in phase four of the study. See figure 5.6 for a summary of themes and sub-themes for phase four.

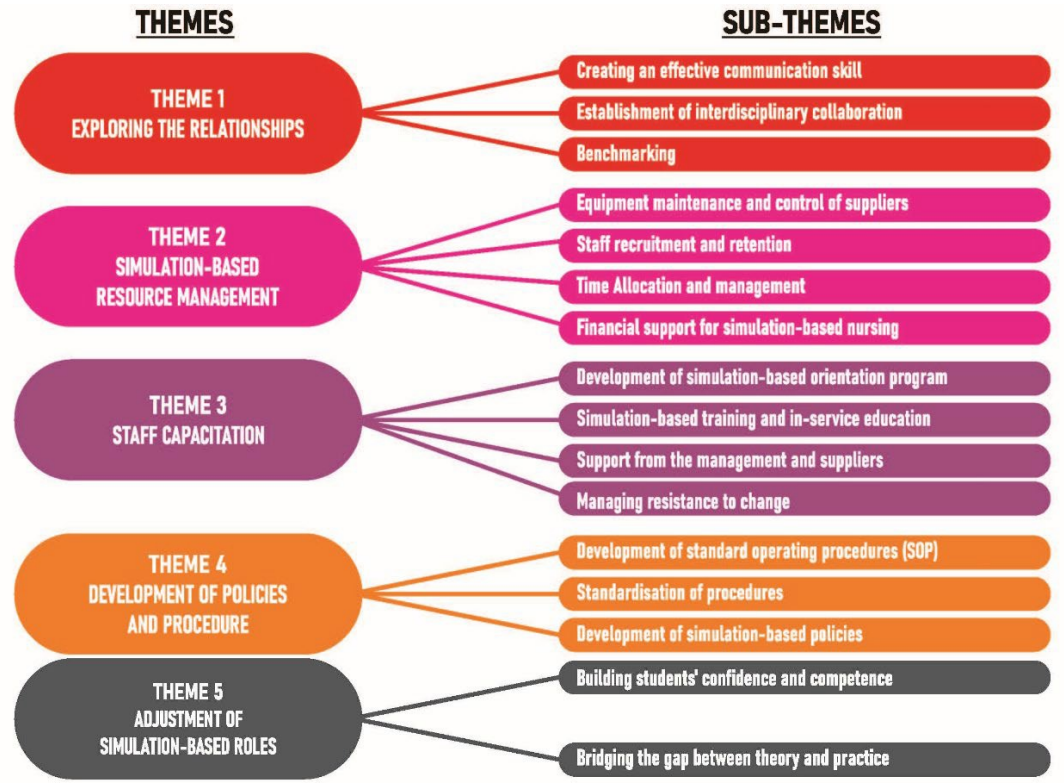


FIGURE 5.6 THEMES AND SUB-THEMES FOR OBJECTIVE FOUR

5.4.1 Theme 1: Exploring the relationships

Exploring the relationships emerged as the first theme of Phase 4, which was aimed at bringing about transformation in response to the findings of Phase 3. Three sub-themes emanating from theme one of phase four included 1) creating practical communication skills, 2) establishing interdisciplinary collaboration, and 4) benchmarking. See Figure 5.7 for more details on theme 1 and sub-themes for phase four.

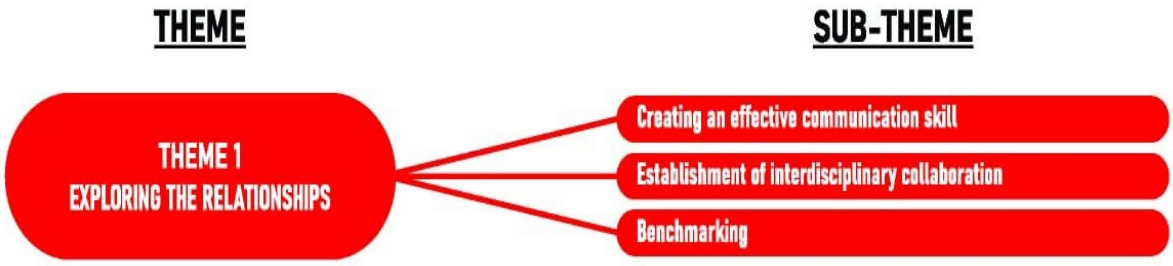


Figure 5.7 Theme 1 and sub-themes for phase 4

Sub-theme 1.1: Creating a practical communication skill

The results highlighted the need for effective communication, which could benefit all universities that use simulation-based nursing.

> *"And maybe then communicating or being in liaising with the simulation manager, to allocate, you know, the times, but I think it must be done not only with him, he must be……. we need to be together, all of us who are going to use simulation lab and sit down and discuss and agree. Another thing that I was thinking about was that it might not be now.* ***SL: (M1)***

Another participant added:

> *To abide by transformative values, we must unite as different institutions, sit down, and talk in one language. I know that, currently, we differ in various things in institutions. It can be in our human resources. It can be in the equipment and so forth. But I think when we can come together and sit down and discuss the strengths and understand that this is what is expected from all the institutions of higher learning, and then when we say an institution, it's compliant, it must have this* ***GB:(M1)***

Sub-theme 1.2: Establishment of interdisciplinary collaboration

Clinical facilitators from different universities supported each other on the issue of collaboration. Below are the exact statements made about collaboration.

> *"I think the best way is to collaborate with other institutions to check if they are doing something different from us, or maybe we can share knowledge of how we can improve between these institutions. Then I think that can help to transform our SIM lab high-tech simulation"* ***RT: (M4)***

Participant OM added:

> *"I was saying that collaborating with universities, I was adding on KR to say that collaborating with other universities will help. As I mentioned, one of the institutions has layers…"* ***OM (M3)***

Another participant suggested:

> *"…then, I think that to abide by transformative values, we must come together as different institutions, sit down, and then talk in one language. I know that currently, we differ in different institutions. It can be in our human resources. It can be in the equipment and so forth. But I think when we can come together and sit down and discuss the strengths and understand that this is what is expected from all the institutions of higher learning, and then when we say an institution, it's compliant,"* ***MS: (M2)***

Participant added:

> *"And the other thing is, I'm not sure if the simulation department does go to hospitals to see what in the hospital they're doing, because we seem there and the student goes to the hospital, they do some different things"* ***GB: (M2)***

Creating collaborative simulation-based nursing among universities will strengthen simulation-based nursing, thus enhancing student clinical learning.

Sub-theme 1.3: Benchmarking

The CIG felt that building relationships through benchmarking could be beneficial. Universities, especially those less advanced, would have an opportunity to learn from one another.

> *"But from best practices or benchmarking with other universities, we find that, let's say that they are teaching the very same day the way their allocation has been done, it makes, for example, if you are teaching antenatal care, I'm just making an example. In the first hour, from maybe 8:00 to 9:30 or from 9:30 to 11:00, you go to the SIM lab and do the same thing you have done in theory. So immediately, you are relating the, or we are integrating theory and practice."* ***SL: (M1)***

Another participant in a different meeting suggested benchmarking.

> *"I think what can also assist is the benchmarking, learning good practices from each other. So, if other universities can benchmark from the other, I would say so good. Other universities that are doing well or have systems in place, so by benchmarking, they can benefit from that because akere (isn't it) we are different institutions, different, I would say background, uhhh ka Setswana ga re lekane (In Setswana we say we are not equal) different institutions, so other institutions are advanced, others are sort of lacking behind.* ***OM: (M2)***

Participant OM stressed on the on the issue of benchmarking

> *"if we benchmark and learn from others that are more advanced, then we can find ways to improve as the new coming or new developing universities, And then, I don't know if I make sense".* ***OM: (M5)***

The above statements suggest that, given the disparity of the simulation centres, benchmarking could promote knowledge sharing among the universities under study.

5.4.2 Theme 2: Simulation-based resource management

Research findings highlighted the need to manage the resources used in simulation, including material, human, financial, and time resources, to optimise teaching and learning outcomes. The following sub-themes emerged from theme 2, 1) Equipment maintenance and control, 2) Staff recruitment and retention, 3) Time allocation and management, 4) and financial support for simulation-based nursing.

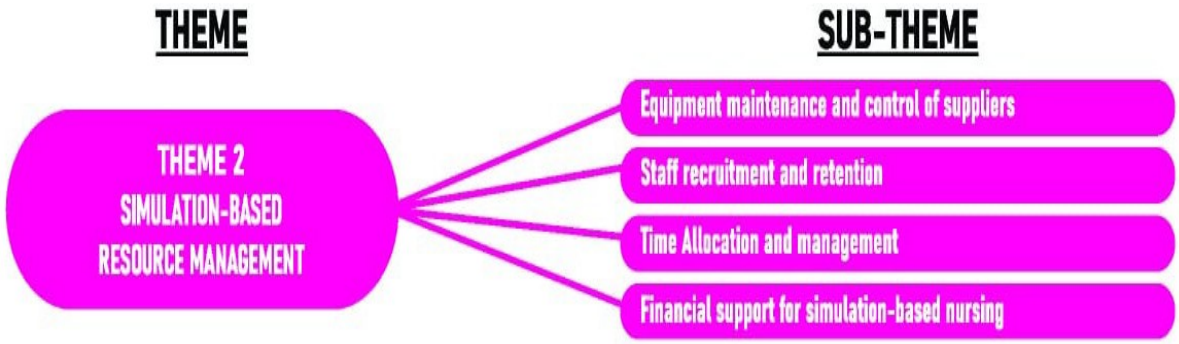


Figure 5.8: Theme 2 Simulation-based resource management

Sub-theme 2.1: Equipment maintenance and control of suppliers

It is evident from the findings that maintenance and control of equipment is a crucial concern that requires intervention to ensure functionality and prevent a shortage of supplies or overuse.

> *"I think simulation remains lacking a lot of resources and consumables. Why? Because they don't do any evaluations. So, they have to do evaluations every time. They can do it monthly, and then after six months, they review all those evaluations to see what is lacking and what can be improved around the simulation room. So, if they can do evaluations, they will be able to fix it. Such problems of lack of resources, some resources not working because they won't know".* ***MB: (M6)***

Another participant suggested:

> *" …the people who are working in who is running the simulation department are supposed to compile this evaluation form so that they check the quality of equipment or resources that they are having and they can also fix the ones that they are not functioning, and they can also add to the ones that were written because, on the evaluation form, there can be any addition of equipment that you think might help the simulation department to buy or to run the department you can add".*

One participant added to the suggestions on control of equipment

> *"…So, as Mam ML was saying, evaluation. I think she meant that if we are having a session and then we're going to use the simulation, there must be an evaluation form at the end. Was the lighting correct? Was the equipment working all those things so that they could work on them? So, there's nothing like that"* ***ASM: (M6)***

The participants felt that simulation managers should constantly monitor and evaluate the simulation resources, either monthly or for six months in a row. They also believed that managers should compile an evaluation form to assist in identifying needed resources and those that need to be fixed, including the lights and infrastructure were expressed as follows:

> *"…so there has to be proper communication and buying in of consumables before the procedures are done, so it comes again in terms of the two departments talking because they each has a budget and as a facilitator, you would know".* ***MS: (M6)***

Another participant said:

> *"…so, editions, reporting of non-functional equipment or non-functional resources can also assist the simulation department to review your department and improve. As an end user for the simulation lab, simulation lab, we have never met with the people from the simulation skill lab".* ***ASM: (M6)***

The inquiries suggested that proper communication between the simulation managers and the clinical facilitators would be very important for buying consumables and reporting non-functional equipment. This was expressed as follows:

> *''So I'm thinking that even after that in-service, every computer that is there, every machine that is in the simulation lab should be functional enough for us to meet the requirements of teaching their students''.* ***MM: (M4)***
>
> *Another participant said to expressed the following:*
>
> *"The one that I can think of is if the mannequins are serviced regularly to enable us to do the skills properly for the student without simulating, especially in high tech. For example, some mannequins can deliver".* ***KR: (M4)***

Participants unanimously agreed that equipment and simulators should be regularly serviced to maintain optimal functionality and support simulation-based teaching and learning.

Sub-theme 2.2: Staff recruitment and retention

The inquirers expressed a need for extra personnel to alleviate the workload demand. They were of the opinion that even those who can be recruited on a contract basis and they said:

''The institution can recruit more people to come and assist either on contract basis or either on request because some of them they don't mind on request.''

Another one said:"At this point, I'm thinking that more personnel should come in, especially since they will also assist in removing the expired stuff, and then to also ensure that everything that we have is up to standard and every time a student or maybe a staff member needs to do a procedure or to freshen up their mind on a certain clinical part, they will always find someone there to assist them, and we know who to go to for a specific thing". ***OM: (M4)***

The above quotes are examples of tasks and activities that the supplementary staff could facilitate to ensure the readiness and maintenance of the simulation centre and reduce the workload of clinical facilitators.

Sub-theme 2.3: Time Allocation and management

The results highlighted the need for managing time, as the scheduled simulation sessions do not accommodate all the activities that need to be covered in each session, including self-directed learning. The participant said:

"…I think as we know that for simulation SANC requirements, we cannot say we will exceed them. Then, the set I was for a demonstration and simulation. I think the student, uh, there should be a scheduled time for self-directed learning so that we should cover the aspect of that" ***MS: (M5)"***

In pursuit for change, one participant added:

"Yes, there should be a timetable with times because different categories attend the simulation department, so all the categories should be given a schedule. And they are supposed to book according to those time schedules". ***ASM: (M3)***

Another participant emphasised the importance of time management.

"OK, orientation is important because if you orientate people, you save even more time for them to come and say, can you come, please help me here, come and help me here so they have like a specialist, who is simulating the computers and the mannequins, and the what and people should be orientated on those things."

The above quotations show that the participants constantly request support during sessions, resulting in unnecessary time wastage. Orientation and proper training could save time, as the participants would be familiar with how things work. One participant said:

"Divide our students into smaller groups to let them go into the different venues, and then also we have to adjust the time frame so the specific group will come to sim lab from 8 to 12; everything will be demonstrated, and they will practice it, they will get peer evaluated there and then in the meantime you have to be busy with the other

> *group demonstrating something for the next session while the others are practicing. You know, it's something that you have to put your mind on, and you have to plan it very well.* ***AV: (M2)***

One of the CIG members indicated that dividing students into small groups can save time, as all the intended activities, including initial demonstration, practice, and peer evaluation, will be achieved.

Sub-theme 2.4: Financial support for simulation-based nursing

The findings propose soliciting funding and donations from private and external sources to augment the simulation-based needs.

> *"Then again, on the budget issues constrained budget and that, I think we can request donations and funding from the private or external stakeholders as an institution.*

Another participant suggested the following strategy for financial support

> *"So again, the last issue we can also request the accountant of this institution to put more effort on the clinical side because I guess the institution's main aim is to produce nurses who are clinically competent, so we should put more sight of the budget on the side of clinical and if we can advocate for that.*

One participant suggested that the university accountant should consider allocating sufficient funds to the simulation centre in their financial planning to accommodate simulation-based requirements, to produce nurse practitioners.

5.4.3 Theme 3: Staff Capacitation

The findings suggest various approaches to enhancing staff capacity, including offering them training and orientation, reductions in in-service time, and assistance in overcoming resistance to change.

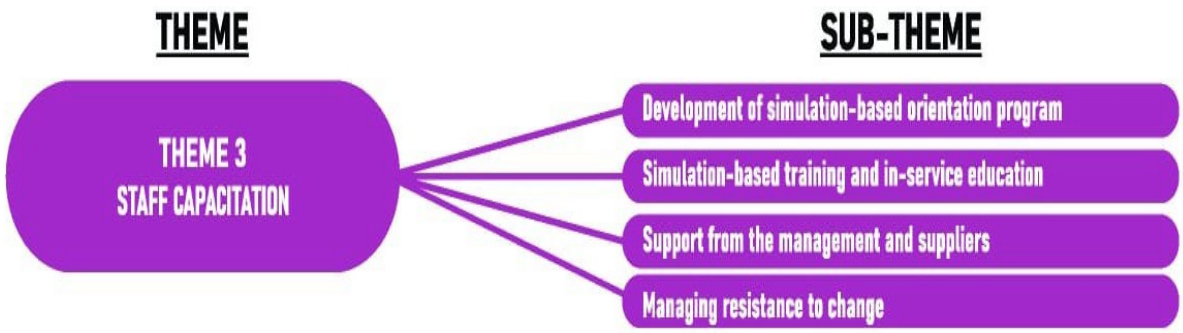


Figure 5.9: Summary of theme 3 and subthemes

Sub-theme 3.1: Development of a simulation-based orientation program

Considering the lack of orientation uncovered in phase three, the CIG recommended developing an orientation policy to facilitate significant simulation-based transformation.

> *"…but baseline umm factors applicable across all borders across all universities. For example, if orientation was held for six months at North-West University, would it be the same in UCT? Is it the same at the University of Free State, or do they have different orientation programs?"* ***ON: (M5)***

To inspire positive change, one participant encouraged:

> *"it must be there in our policy, who needs to be orientated, how and for how long the when we talk about the resources, all the resources that are expected to be in the simulation lab, they should be there and then also with the space and then the time policy it will include everything that we have talked about. So, I would like to proceed with"* ***GB: (M4)***

The quoted texts suggest that a universal orientation policy should be developed and applied across all the simulation centres for nursing schools in South Africa.

Sub-theme 3.2: Simulation-based training and in-service education

The findings reveal a dire need for simulation-based training. Below are the quotes from the clinical facilitators

> *"…..I was thinking about the transformative values as they were talking about it. If I saw someone, one of the universities introduced this simulation course for professionals. So, if we can, maybe umm, and not necessarily be taken, but SIM lab must be run or operated by people with such qualifications. Hence, as they know how to know how to deal with the environment itself effectively".* ***KR: (M5)***

> *Another participant said:*

> *"So maybe training of some sort needs to be done, even if it can take a week or so, just for us to understand every mannequin and how it works, including the machinery and equipment that are nearer the mannequins so that you know how to operate it so that we are even aware to notice if the computer that's near it is not working* ***OM: (M3).***

One participant suggested a one-week intensive training to provide orientation on using simulators and equipment. Furthermore, the findings reveal uncertainty regarding simulation methodologies. The participants need clarity and guidance on effective simulation techniques to develop clinical teaching skills.The participant said:

> *"Simulation methodologies must be well understood for us actually to educate through simulation. "The problem also was the impact on our skills level methodology,*

> *especially during COVID.""…if it's not working, then you won't be able to do your skills due to methodology. That's why it was also challenging for me when I was engaging with the students* ***NJD: (M6)***

Despite the simulation-based training recommended by the CIG, data reveal that ongoing training is still needed to enhance knowledge and skills. The following was expressed:

> *"Thank you, mam. Based on the training regarding the technology in the simulation lab, my suggestion is that there should be continuous monitoring of the training provided to the simulators, such as if they are trained on high tech or any training technology in the simulation lab. There should be in-service training or review, maybe on a six-month basis, to check if we are competent enough to use the technology in the simulation lab. After the training, there should be an assessment that they have been provided to the simulators"* ***MMM: (M4)***

One participant provided the following insightful guidance for transformation.

> *"I think there's a lot of technology in the simulation lab that we need to be workshopped on. So, after the in-service training, I think we will be able to understand how to navigate throughout the simulation lab, including the high tech''* ***OM: (M4)***

Another participant added on the need for in-service education.

> *''…but then, after thorough in-service training, I think it will be best to use those technologies or those mannequins regularly because we can get in-service training, but then if we don't use them regularly, it's no use, we are going to end up going to back to square 1 whereby we are going to forget how these equipment are being utilised'* ***TD: (M4)***

The statements above indicate that regular training updates are required to enhance clinical facilitators' technological competencies.

Sub-theme 5: Overcoming resistance to change

Data indicate that, for transformation to occur, clinical facilitators must be receptive to innovative simulation methodologies.

> *"So for us to transform, we should be open to change. We should be open to innovations. We should be open to new activities. For example, we are moving towards the 5th industrialisation of technology in the fourth, and students are using chat GPT."* ***ON: (M5).***

Participant ON proposed the following strategy for growth**:**

> *"They are using a whole lot of AI activities for them to progress in their learning, but if you are resistant to using technology as an older, uhm, lecturer, it becomes difficult for you to acclimatise or to get in par with what is currently happening."* ***ON: (M5).***

One participant uttered a striking comment that shows that failure to keep pace with technological advancement may compromise the ability to align with recent simulation practices.

5.4.4 Theme 4: Development of policies and procedure

Data identified the need for developing simulation-based policies and standard operating procedures, which would standardise procedures, establish expectations, and serve as reminders of how things are done in the simulation centre. The following themes emerged from theme 4, 1) development of standard operating procedure, 2) standaisation of the procedure, 3) development of simulation-based policies. See Figure 5.10 for more details.

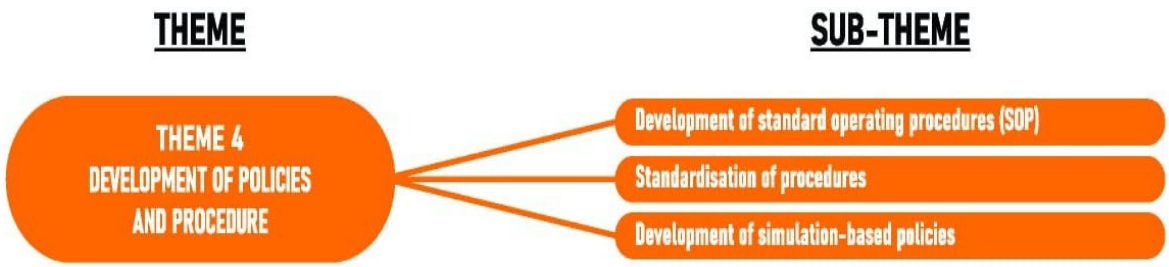


Figure 5.10 Theme 4 Development of standard operating procedure (SOP)

Sub-theme 4.1: Development of standard operating procedures (SOP)`

The findings suggest that developing standard operating procedures can facilitate clinical facilitators' performance by providing structured simulation-based guidance. The following was echoed:

> *"I still recall that we suggested that maybe we can have SOPs that are in place to say this is what is expected when you are going to utilise your high-tech fidelity, and then they are there for everyone to access and then to refresh or always to refer if they forget something after thorough in service or orientation when you are employed as a member or as a new employee of a School of Nursing. Yes, thank you."* ***TD: (M5).***

Another participant suggested:

> *''I think there could be that kind of SOP in place whereby we may be guided on how many students can go in at a time and how many personnel we need. Firstly, I think that will assist us in covering the issue of space.''* ***MS: (M2)***

Another participant said:

> 'Can't we develop an SOP that will guide us from different modules on how to use the simulation lab? **GB: (M1)**

The participants indicate that the SOPs could be of guidance in terms of activities such as high-fidelity simulators and managing the number of students per scheduled period per facilitator.

Sub-theme 4.2: Standardisation of procedures

One participant indicated the need for Standardisation of procedures that should be aligned with SANC requirements. The following was echoed:

"…I think as we are to comply with the SANC requirements somewhere, we should link the procedures to a specific module. I think the SANC requirement standardisation applies to all." ***MS: (M5)***

Sub-theme 4.3: Development of policies

The participants highlight that different policies must be developed, implemented, and enforced for simulation-based operational efficiency. The following was expressed:

> *"I recommend that you know, in simulation, either high-tech, low-tech, and medium, we need to have policies and guidelines on, you know, or maybe the books or manuals to use the mannequin should be in place so as when you don't know, or maybe there's no person to orientate you or to give you information about they can easily go through the manual or the policy or the guideline maybe."* ***MS: (M2)***

Another participant emphasised the issue of the need for the development of policies:

> *"There are some principles when you're learning, especially in theory. But in practice, we operate without, you know, having the proper knowledge to say that it is effective for one procedure, at least."* ***SL: (M1)***

As a catalyst for transformation, another participant shared:

> *"Yes, they need to have those principles. The simulation department. They need to have those principles whereby they give all the people using the simulation room to the simulation department."*

The participants suggested that developing policies should be accessible to all clinical facilitators from the orientation phase.

5.4.5 Theme 5: Adjustment of simulation-based roles for clinical facilitators

The findings suggest that adjusting the roles of the clinical facilitators will enhance student

confidence and bridge the gap between theory and practice. The following sub-themes were identified: 1) building students' confidence and competence, 2) bridging the gap between theory and practice. See figure 5.11 for more details.

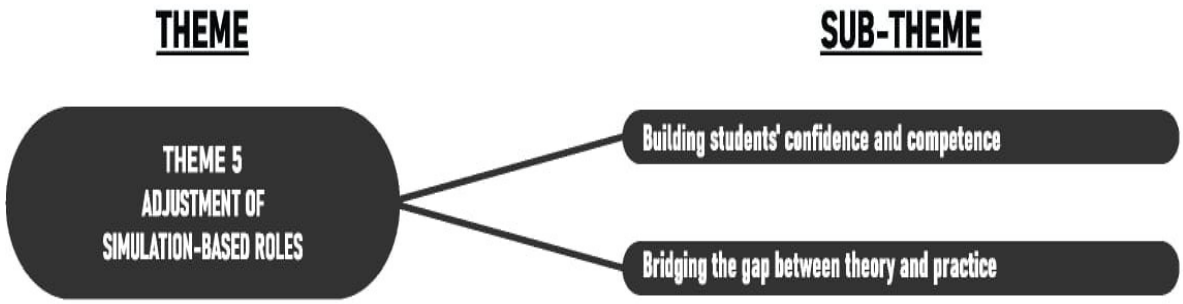


Figure 5.11: Theme 5 Adjustment of simulation-based roles and sub-themes

Sub-Theme 5.2: Building students' confidence and competence

Data suggest that students need more time to practice repeatedly through simulation to gain confidence and become competent in their clinical practice.The following was expressed:

> *"If they get enough time to practice, they can gain confidence, and then if they do again, they can also. Be able to integrate theory and practice not unless they have got something else to do"* ***MAS: (M5)***

Another participant echoed the following words to bring about change:

> "Okay, so I am talking about the scenarios that can be helpful today, and then they can be maybe positive, build their attitude and confidence in doing things" ***MJ: (M7)***

Sub-Theme 5.2: Bridging the gap between theory and practice

The results reveal that theoretical components should be synchronised with practical applications to enhance simulation-based competencies, thus preparing students for real-world readiness with developed critical thinking and problem-solving skills.

> *"The level of integration during simulation. So, if you teach a skill, what about the information behind that skill? We need to improve that so that our students can get the best in the simulation because that's what causes the challenge when they go out in real life... "More often than not, we tell our students that whatever they learn from the simulation, they must integrate it with practice.* ***MN (M3).***

The participants recommended encouraging the students to foster self-directed learning by integrating simulation learning with real-life situations and related theories.

Table 5.1: Alignment of transformative learning theory with the developed themes from Phases 3 and 4

NO.	STEPS OF TLT	THEMES IN RELATION TO THE TLT
CHALLENGES REGARDING SIMULATION-BASED NURSING		
1	***Disorienting dilemma:***	Barriers to simulation-based resources
2	***Self-examination with feelings of guilt and shame:***	Feeling of inadequacy
3	***Critical assessment of assumptions***	Questioning one's assumption and perspective
4	***Recognition that one's discontent and the process of transformation are shared***	**Navigating shared experiences through knowledge and practice**
TRANSFORMATIVE VALUES CONTRIBUTING TO SIMULATION-BASED NURSING		
5	***Exploration of options for new actions, roles, and relationships:***	Exploring the relationships
6	***Planning of a course of action***	Simulation-based resource management
7	***Acquisition of knowledge and skills for implementing one's plan***	Simulation staff capacitation
8	***Provisional trying of new roles:***	Development of simulation-based policies and procedure
9	***Building of competence and self-confidence in a new role***	Adjustment of simulation-based roles of clinical facilitators' roles
10	***Reintegration into one's life based on conditions dictated by one's new perspectives***	[Suggested transformative values still to be put into action]

5.5 CONCLUSION

Chapter five addressed the presentation and interpretation of findings. The interpretation was divided into Sections A, B, and C. Section A interpreted the findings of Phase 2, which concerned building relationships with participants; Section B worked on the findings of Phase 3, which related to the challenges regarding simulation-based nursing; and Section C addressed the objective of Phase 4, which was to develop simulation-based guidelines. The next chapter discusses the interpretation of findings and literature control.

CHAPTER 6: DISCUSSION, INTERPRETATION OF FINDINGS AND LITERATURE CONTROL

6.1 INTRODUCTION

Chapter Five presented the findings of Phases 3 and 4, whereby the themes and subthemes were analysed to obtain a deeper understanding of the study objectives. This chapter focused on the discussion of findings and literature control. Participatory Action Research made it possible to get both the challenges and transformative values related to simulation-based nursing. This chapter discusses the challenges regarding simulation-based nursing and expounds on how each challenge could be transformed into a positive outcome.

The chapter's discussion on the challenges regarding simulation-based nursing and the transformative values thereof align with nine of the ten steps of transformative learning theory, as described in Chapter 3. The fundamental concepts of transformative learning used in this study include frame of reference, discourse, critical reflection, and critical self-reflection. Both instrumental and communicative learning were used in the study. The CIG participated in discourse because they used simulation-based nursing as a teaching and learning strategy, understood the frame of reference, were able to assess arguments and were open to alternative viewpoints. The chapter will discuss the findings of Phases 3 and 4, independent of each phase.

6.2 OBJECTIVE OF THE STUDY

This chapter discusses the findings on simulation-based nursing education obtained in Phases 3 and 4 of data collection, including the literature control.

6.3 DISCUSSION OF FINDINGS AND LITERATURE CONTROL OF PHASE 3

The findings discussed in this chapter are the results of data obtained from the CIG and analysed in Chapter 5. With literature control, the researcher ensured that other evidence-based studies supported the findings. Nine main themes emerged from the analysed data. The first four themes were developed from data obtained from the objective of Phase 3, which was to explore the challenges related to simulation-based nursing. Five themes emanated from the transformative value that contributed to simulation-based learning, an objective of Phase 4.

6.3.1 Theme 1: Barriers in simulation-based nursing

Theme 1 constitutes the first step of the transformative journey, a "*disorienting dilemma*" when simulation-based challenges are identified, as explained in Chapter 3, Phase 3. The simulation-based situation presents a dilemma that necessitates transformation. The findings of this study are relevant for discourse since the CIG engaged in a debate and critical reflection to address the issues of simulation-based nursing that resulted in a change of experience. Astbury et al. (2021:630) identified numerous barriers to simulation-based education in a study conducted in Manchester, United Kingdom, which are similar to the findings in this study. The same research findings include a lack of financial support, a lack of simulation teaching staff, Insufficient time associated with simulation workload, and poorly maintained resources, mainly high-fidelity simulators. The sub-themes mentioned are barriers that can significantly impact the effectiveness of instrumental or environmental learning.

Sub-theme 1: Limited space in the simulation laboratory

The participants perceived a limited space as not being productive or effective. Some of the simulation laboratories, as reported by the participants, were without a debriefing room. Meanwhile, other participants from different South African universities indicated that their simulation laboratory does not have a control room that can allow them to observe the demonstration from various rooms. In support of these findings, Sørensen et al. (2017:6) assert that cooperation between different departments within the simulation laboratory can allow for reasonable sharing and better use of rooms and equipment. For instance, an ideal simulation laboratory consists of several rooms designed to replicate the hospital set up. Such rooms include, for example, several demonstration rooms, a debriefing room, a control room, a storeroom, a sluice room, a kitchen, and bathrooms.

Sub-theme 2: Limited equipment, material, consumables/ simulators barriers

The findings further prove that participants experience different equipment challenges, including limited equipment; the participants indicated that they sometimes opt for oral presentation over practical demonstration due to inadequate equipment for that specific skill performance. Consequently, obtaining student feedback becomes impossible without a practical demonstration of skill. One example mentioned was the birth simulator and the wound dressing simulators, where multiple students could not practice simultaneously. Findings further revealed that a shortage of equipment was reported whereby, in some instances, they would resort to demonstrating the skill at the clinical facility only to realise that the problem of shortage also exists there. In support of these findings, the study conducted by Kibwana et al. (2017:8) confirmed that a shortage of essential simulation-based equipment

and supplies was seen as a common problem among simulation training institutions. In addition, Munangatire and Naidoo (2017:46), in their study findings, a shortage of equipment in the simulation laboratory, including the simulators and cameras, were identified.

Sub-theme 3: Inadequate functional equipment

The findings also suggest that some of the equipment was available but inoperable due to a lack of regular servicing, while others were battery-operated and were not charged. According to Moabi and Mtshali (2021:12), some equipment, especially high-fidelity simulators, is costly to maintain because of budget constraints. The participants further mentioned that some high-fidelity simulators, such as birth simulators, are non-functional due to lack of maintenance. Such equipment negatively impacts the clinical facilitator and the student by hindering teaching and learning opportunities.

Sub-theme 4: Under-utilised high-fidelity simulators

The findings revealed that the high-fidelity simulators were underutilised in some universities under study. For example, Van Vuuren et al. (2018:3) affirms that clinical facilitators across all centers under their study used medium and low-fidelity simulators during their clinical teaching more than they used high-fidelity simulators, and some did not use high-fidelity at all. Similarly, Munangatire and Naidoo (2017:44), in their study findings, reported underutilisation of HFS, which resulted from a lack of management support and insufficient simulation time with mixed perceptions among clinical facilitators regarding the impact on training. Levine et al. (2014:283) mentioned fear of embarrassment and negative evaluation as barriers in simulation-based nursing. This statement confirms that the failure of the clinical facilitator to use high-fidelity simulators leads to the inability of the students to learn and practice from them, which then impacts the students negatively.

On the other hand, Sørensen et al. (2017:6) suggest that coordination between local simulations in hospital settings and simulation centres can assist in avoiding the purchase of equipment that will be underutilised. Therefore, underutilisation of HFS deprives the students of the advantages of the use, which includes a lifelike emergency experience with no harm inflicted, as it, at times, occurs to the actual live patient (Kim and Shin 2016:60). Another advantage is that HFSs are designed to replicate the physiological observation of sounds and some movement of actual human patients. Shinnick, Woo, Horwich and Steadmann (2011:106) state that a high-fidelity simulation is a time and cost-intensive teaching modality consisting of hands-on experiences with a lifetime mannequin and a debriefing session used in the simulation laboratory.

Sub-theme 3: Shortage of human resource

The participant indicated that their roles and responsibilities were not clearly defined. They found themselves teaching all undergraduate levels from one to four in the simulation laboratory because of a shortage of human resources. Similarly, the study conducted by van Vuuren et al. (2018:19) indicated that clinical facilitators carry more workload when they conduct simulation-based teaching to more than one level group of students simultaneously. In addition, the clinical facilitators frequently experience significant challenges. Before demonstrating clinical skills to the students, they must start their clinical sessions with theories that could have been learned in the classroom. Participants indicated that, as part-time employees, they are responsible for a practical module where they must conduct the simulation-based teaching and clinical accompaniment of students without any support from the facilitators in a permanent position. In addition, lack of support and increased workload can negatively impact the clinical facilitators' performance and decrease their instruction quality, negatively impacting students' learning.

6.3.2 Theme 2: Feeling of inadequacy

Transformation is a process that involves emotional shifts in thoughts, feelings, actions, and imagination of how things should be done and is central to the initiation of the process (Mezirow 2008:96). The theme addresses the second step of transformative learning theory, which is self-examination with a feeling of guilt and shame. The concept is part of the broader aspect of communicative learning, which involves critical self-reflection. The clinical facilitators were emotionally disturbed as a result of the challenges they experienced regarding simulation-based nursing. Four sub-themes that emerged from Theme 2 were the effects of feeling inadequacy: lack of simulation-based knowledge and skill, resistance to change, lack of support from the managers and manufacturers, and lack of interdisciplinary collaboration.

Sub-theme 2.1: Lack of orientation

It is evident from the findings that newly appointed simulation-based clinical facilitators constantly experience some challenges in teamwork and unfamiliar sophisticated technology. The CIG indicated that they do not receive any orientation on appointments, which made them feel left out. The findings from the data obtained show that clinical facilitators get emotionally challenged and often face several personal difficulties during the period of transition, such as feelings of uncertainty, fear and even self-doubt. They mentioned that in some instances, they perform the procedure at the clinical facility only to realise later that the specific simulator for that procedure is available in the simulation laboratory.

Sub-theme 2.2: Lack of simulation-based training and in-service education

The participants were concerned that they lacked simulation-based skills, especially those for operating high-fidelity simulators, as they never got empowered to do so. The results of a study by Akhter et al. (2021:6) confirmed a lack of knowledge and skill among clinical facilitators regarding using technology during high-fidelity simulation, including scenario preparation. As Ferguson et al. (2019:920) stated, a lack of knowledge and skill in delivering and implementing simulation-based nursing could harm nursing students' learning. Therefore, without formal simulation-based training, it may be difficult for the clinical facilitators to impart knowledge to the students systematically and effectively. The study conducted by Thurling (2017:59) identified lack of training as the most significant barrier in simulation-based nursing compared to other, less significant ones. The findings from the participants provide evidence that clinical facilitators lack knowledge regarding the simulation methodology during facilitation. It is evident from the data collected those clinical facilitators do not receive continuous education in the form of in-service education, also called in-service training. In-service training is a type of training that is often used to the existing knowledge of staff and is usually offered regularly post-initial training.

Sub-Theme 2.3: Lack of support from the managers and manufactures

It is evident from the data that the participants lacked support from the managers, such that their concerns and challenges were frequently disregarded when reported. Additionally, the participants indicated a lack of follow-up support from the suppliers regarding operating the high-fidelity simulators. According to Seethamjaru et al. (2022:e119), simulation laboratory management support for clinical facilitators is a critical enabler of simulation-based education and offers motivation. The findings identified a gap in managerial assistance, as shown, among others, by a lack of orientation, unresolved difficulties, and a staff shortage. To support the findings, Ferguson et al. (2020:922), in their study, reported a lack of managerial leadership and support towards simulation-based education.

Sub-Theme 2.4: Resistance to change.

The participants alluded to frustration that other clinical facilitators, specifically those in the service for an extended period, are resistant to change, especially with the complexity of simulation technology. The study conducted by Warrick (2023:434) identified several factors to recognise resistance to change that including emotions that manifest due to too many complaints, anxieties, and fear, as well as lack of involvement and poor performance. In this study, the CIG and the researcher could not elaborate on the cause of resistance to change as they could not make assumptions about those who did not participate in the study.

According to Schnitzler (2020:839), change develops with a transformed sense of identity and a change of belief in a cheerful demeanor.

Sub-Theme 2.5: Lack of interdisciplinary collaboration

It is evident from the findings that the nursing department experiences unfair treatment from the simulation managers of different universities where the simulation laboratory is shared amongst the nursing, medical teams, and other disciplines. The participants expressed their frustrations about being denied an opportunity to use the simulation laboratory even if they had booked the venue. Schnitzler (2020:840) state that collaboration is essential when dealing with various challenges that should be sustainable in a learning environment. The participants' language made it evident that how they were denied access to the venue was unprofessional. Furthermore, criticism expressed was that nursing students do not get enough practice time because they do not have space.

6.3.3 Theme 3: Questioning one's assumption and perspective

Questioning one's assumptions and perspective is one key component of transformation. This constitutes the third step of transformative learning theory, a critical assessment of assumptions. It is critical to explore the assumptions and beliefs about how the challenges experienced by clinical facilitators regarding simulation-based nursing impact students. Three sub-themes emerged from theme 3: lack of confidence, the theory-practice gap, and ineffective communication.

Sub-Theme 3.1: Lack of confidence

The challenges experienced by the clinical facilitator affect the students negatively. The CIG indicated that students lack the confidence to perform the skill, resulting in absenteeism from clinical services. The students could not reach the key aspect of simulation-based nursing: practising repeatedly in a safe environment to develop competency and gain confidence. According to Hill and William (2017:404), nursing institutions use simulation-based nursing to build students' confidence and facilitate learning. Becoming confident includes how best the student can perform the skill independently or with little supervision. Furthermore, the CIG confirmed that students do not show confidence when required to perform the skills on a real-life patient.

Although the results show a lack of confidence in using high-fidelity simulation, the study conducted by Crowe et al. (2018:73) reported increased confidence in various disciplines, including clinical facilitators and nursing students.

Sub-Theme 3.2: Theory-Practice gap

Evidence from the data shows a gap between theory and practice as time allocated for clinical practice is too limited. According to Koukourikos et al. (2021:15), integrating theory and practice among students is one of the significant problems in nursing education. One of the CIG members stated that the students were observed as unable to transfer learned theory to a practical situation. In the study conducted by Saifan et al. (2021:1876), limited support from the clinical facilitators, lack of preparation of students for simulation, and lack of trained clinical facilitators were perceived as contributing to the theory-practice gap as felt by the students in the clinical learning environment. Supporting the above statement, the latter stated that some clinical facilitators with relevant qualifications did not translate efficiently into student support and clinical guidance.

The quality of interaction between the clinical facilitator and the student can hinder or facilitate the integration of theory and practice. The findings show that a clinical facilitator not skilled at using simulation equipment cannot produce a competent student who can combine theory with practical skills. Saifan et al. (2021:1870) state that a limited theory offered in a classroom can also contribute to a wide gap between theory and practice.

Sub-Theme 3.3: Ineffective communication

Participants indicated that they become frustrated as they communicate the simulation-based challenges they face to management with no response. Similarly, the study conducted by Moabi and Mtshali (2021:12) reported a lack of communication by the managers regarding well-defined objectives of simulation-based education. In addition, the participants raised concerns that communication between them as clinical facilitators and students and between the students and the patients is ineffective because of the language barrier. Similarly, the study conducted by Dodson et al. (2023:483) reported ineffective interprofessional communication in the simulation centre from data that was obtained from the students. Therefore, it is difficult for the student to understand what was explained during simulation sessions and communicate effectively with the patient. Hence, ineffective communication can lead to miscommunication between the clinical facilitator and the student and a poor relationship between the student and the patient, with the possibility of mistakes and errors. Lee et al. (2021:8) suggest that ineffective communication between nursing staff is a fundamental factor contributing to delay in-patient treatment and medical incidents, thus threatening patients' safety.

Participants reported that ineffective communication between the students and the high-fidelity simulators was observed. This was because simulators are programmed to follow specific requirements rather than being flexible and adaptable to the needs of the students. In their study finding, Saifan et al. (2021:1866) reported that students find it challenging to communicate with real-life patients because they were not afforded enough time to practice communication skills during their simulation-based sessions. Conversely, in the study conducted by Labrague (2021:349), students reported increased communication skills with the patients compared to other competencies due to simulation-based activities.

6.3.4 Theme 4: Navigating shared experiences through knowledge and practice

Navigating shared experiences (discontent) requires knowledge and practice. This theme is aligned with step 4 of transformative learning theory. The CIG identified limited time and lack of financial support as the most common experiences shared by all members.

Sub-theme 4.1: Limited simulation time

Another common challenge indicated by the participants from all the universities under study was limited simulation time, especially when they had to start preparing a high-fidelity simulator before demonstrating the skill. Clinical facilitators felt that it would be appropriate if all the students could be given time to give feedback after receiving the initial demonstration. Consequently, obtaining student input is impossible because of the limited time required to use it in the simulation laboratory. This is supported by Levine et al. (2014:283), who states that scheduled simulation time can be challenging as it requires uninterrupted attention so the team cannot come late or break away from calls. One clinical facilitator thinks diverse responsibilities also contribute to limited time for simulation-based nursing. The study conducted by Seethamjaru (2022:e117) confirmed that clinical facilitators are swamped with added roles and responsibilities far beyond their job description and find it challenging to get their simulation-based nursing well organised in terms of time.

The study discovered that limited time prevents students from giving feedback, debriefing sessions, and practising the skills they demonstrated. Therefore, the clinical facilitator must appropriately plan their simulation time to allow for individual student coaching. According to Koukourikos (2021:18), simulation fails to evaluate some important communication and healthcare conditions due to time constraints.

Sub-theme 4.2: Lack of financial support

It is evident from the findings that lack of financial support contributed to most of the challenges explored and described in Phase 3, such as shortage of material and human resources, which had financial implications. Furthermore, the study conducted by Persico and Lalor (2019:277)

indicated a lack of funding to train clinical facilitators and increase the use of simulation-based nursing education. Similarly, the participants in the current study, blamed their lack of training and equipment on lack of financial support. Therefore, lack of financial support leads to underutilisation of simulation modalities because of lack of training. Van Vuuren et al. (2018:18) state that financial requirements do not only include the purchase of simulators, instead, it represents the paradigm shift in simulation-based nursing education.

6.4. DISCUSSION OF FINDINGS AND LITERATURE CONTROL OF PHASE 4

Transformation represents suggestions the clinical facilitators explore on change processes and literature control to modify simulation-based nursing. Transformation addresses step five of transformative learning theory, where the clinical facilitator explores the possibilities of options for new actions, roles, and relationships that could be considered for the creation of conducive simulation-based nursing. According to the study conducted by Moabi and Mtshali (2021:11), the use of simulation-based nursing education in institutions has shown a dire need for transformation.

6.4.1 Theme:1: Exploring the relationships

Exploring relationships aligns with step 5 of TLT, which commences with the transformation process. The CIG outlines transformative values that can address building relationships, including creating effective communication skills, establishing interdisciplinary collaboration, and benchmarking.

- ***Sub-theme 4.1: Creating an effective communication skill***

The findings revealed the need to create practical communication skills to enhance interprofessional relationships. For example, the participants reported that all clinical facilitators and the simulation managers should sit down and discuss simulation-based issues so that they can reach a consensus. Learning about communication patterns will make it possible to communicate effectively with patients and families, including multidisciplinary healthcare team members. Communication is generating ideas and exchanging information between two or more people. Sezgin and Bektas (2023:7) and Labrague et al. (2019:107) identified strengthening communication as one of the effective strategies that can be used as a roadmap for developing healthcare services.

The findings suggest that simulation has become an effective pedagogical tool for students to learn and practice various communication patterns.

- ***Sub-theme 4.2: Establishment of Interdisciplinary Collaboration***

The participants thought of maintaining continuous collaboration to provide an opportunity to learn from one another and to participate in more simulation-based inquiries. Furthermore, findings revealed that clinical facilitators at different universities should share their experiences, discuss strengths and weaknesses, and understand that this is expected of all responsible for simulation-based nursing. According to Saifan et al. (2021:9), timely and ongoing collaboration with other industries and clinical partners, understanding of the simulation laboratory setting, and participation in curriculum review to incorporate evidence-based clinical teaching can prepare a student to function in a real-world environment. Collaboration between the nursing instructor and the clinical preceptor is also emphasised by Saifan et al. (2021:490) to facilitate student clinical learning positively. Consequently, the participants believe the simulation centers can undergo significant transformative excellence through collaborative efforts with other universities. According to Sørensen et al. (2017:6), it would be beneficial to encourage collaboration between practical organisers of simulations and medical education researchers through research projects. The idea of networking and collaborating with like-minded teams is supported by Seethamraju and Shepherd (2022:e120).

The participants recognised the importance of collaboration as simulation centers share simulation-best practices. Interdisciplinary participation in a collaborative manner is one of the success factors of transformation with a focus on creative problem-solving. In their study, Griswold et al. (2018:173) indicated that institutions should enhance interdisciplinary collaborative efforts to share insight across boundaries and drive more effective simulation-based practice that will lead to quality patient care. Collaboration is also needed among multidisciplinary team members to provide protected time and space during simulation-based practice (Seethamraju 2022:e119). On the contrary, Cranton (2016:7) argues that transformation can also happen without collaboration and expands on the idea that collaboration cannot be described as a characteristic of transformative learning.

- ***Sub-theme 4.3: Benchmarking***

The findings indicated that benchmarking could be helpful in that universities can benefit from one another since some of them are more advanced than others. As stated by Sunderland (2017:28), benchmarking in an advanced university may assist the less advanced one by adopting and applying their practice to support and enhance the delivery of simulation-based nursing, allowing for a more consistent, rigorous standard of practice. The same author further states that benchmarking can assist in achieving and maintaining quality and exclusiveness. Moriarty (2011:603) states that effective benchmarking reflects transformation and welfare

improvement. The central purpose of benchmarking is to improve the quality of simulation-based nursing and enhance patient care. The participants opine that they can adopt the best simulation-based practices through benchmarking, thus enhancing their performance.

6.4.2 Theme 2: Simulation-based resource management

Resource management was considered a critical aspect of simulation-based education that could enhance the teaching and learning experience. Moreover, as suggested by CIG, resource management could be achieved through equipment maintenance and supplier control, time allocation and management, financial support for simulation-based nursing, and human resource management.

- ***Sub-theme 5.1: Equipment maintenance and control of suppliers***

The participants identified maintenance and control of resources as one of the aspects that can improve the use of equipment and simulators. In addition, the maintenance of simulation-based equipment plays a vital role in enhancing and sustaining such available assets in the simulation laboratory. The findings further revealed that increased technology and complexity of high-fidelity simulators, including some of the simulation equipment, function under strict compliance to maintenance and the need to be operated by trained personnel. In support of the findings, Alrabghi and Tiwari (2014:167), assert that the maintenance of simulation-based equipment aims to combat its deterioration, keeping it in good working condition over its operational lifetime. The benefit thereof is the reduction of equipment replacement, thus saving costs.

The participants shared their experience with evaluating simulation laboratory equipment using an evaluation tool as one of the control measures to determine their state of function and identify those in need of repair or service. To support the finding, Lenneusson and Aslem (2018:407) identified two types of equipment maintenance, namely, proactive maintenance and reactive maintenance, whereby proactive maintenance is about scheduled repair to restore the equipment to a functional condition, and reactive maintenance is unscheduled done to fix broken equipment to their functional condition. Alrabghi and Tiwari (2015:173) suggested five points that could be considered to simplify the maintenance system. First, a *perfect inspection* will instantly reveal the actual deterioration of the equipment. Second - *perfect maintenance,* whereby the maintenance job is done perfectly for the first time with no chance of misdiagnoses. After maintenance, the equipment seems to be as good as it is now. Third - *The duration of maintenance action* – should always be constant. Fourth – *The costs of maintenance action* should be continuous. Fifth - Maintenance resources such as extra equipment parts should be readily available should the replacement be required. Human

resources should also be readily available. Lastly – *Failures* should be detected immediately. Such suggested points could also be appropriate with simulation-based equipment.

- ***Sub-theme 5.2: Time Allocation and Management***

It is evident from the findings that the participants suggested managing time as a solution to achieve the entire simulation process, which includes a demonstration of skill and feedback from the students during pre-briefing and debriefing sessions. The participants recommended that self-directed learning should be incorporated into the simulation schedule. However, the time given to simulation-based nursing by the SANC for a four-year undergraduate programme is not specified as it forms part of the 3000 hours for clinical experience. Furthermore, the participants advocated for comprehensive orientation of clinical facilitators, which will save time for support needs during the simulation schedule. The study conducted by Tremblay et al. (2019:385) indicates that unfamiliar resources contribute to increased time spent on the performance of simulation-based tasks. Ideally, simulation-based nursing should include a period of demonstration by the clinical facilitator, feedback, reflection, debriefing, and an opportunity to practice repeatedly and independently in an ideal and safe environment.

- ***Sub-theme 5.3: Financial support for simulation-based nursing***

The findings identified financial support as a key problem solver to most simulation-based challenges in this study. Examples of such identified problems or challenges that will need a sure-fire solution that includes cost consideration are improving infrastructure, buying and maintaining equipment, employing new staff, and offering them training. Therefore, the participants recommended that simulation managers explore funding opportunities from external stakeholders and private entities to meet the simulation-based education needs. Senvisky et al. *(*2023:109) classified simulation-based costs into direct, indirect, and opportunity. An example of the direct cost, according to Senvisky et al. (2023:109), is the construction of the simulation laboratory, the equipment thereof, consumables and salaries, the indirect wage being the insurance or hiring the space elsewhere for extra activities such as simulation-base events and the opportunity costs being for example when the resource time is spent elsewhere. The above information is necessary when requesting financial support from different companies and developing an annual cost cycle. In addition, the participants suggested that the universities finance department should consider allocating an additional budget for the simulation center to ensure resource optimisation. Levine et al. (2014: 633), in their book chapter titled Securing Funds for simulation centers, suggested the development of multidimensional programs to overcome costs related barriers. The above authors indicated that funding can be requested from various sources for such programs, and

suitable revenue streams will be explored. An example of such programs, among others, includes using simulation for best practice.

- ***Sub-theme 5.4: Staff recruitment and retention***

The findings suggested that staff recruitment and retention can be a solution to overcome the challenge related to the shortage of human resources. Consequently, as simulation-based nursing strives for excellence through transformation, its success must begin with staff recruitment and strategic staff retention to achieve long-term goals and competitiveness. To achieve this, simulation management should excel in two interconnected processes: staff recruitment and retention. The participants thought that there is a vital necessity for the recruitment of more staff members to overcome the shortage. Additionally, Tikhonov (2019:522), in their study, classified recruitment under recommendation recruitment and referral recruitment. The same author explained the recommendation of recruitment as employing a specialist for an already existing position based on the recommendation of a person already working in a company. In a simulation-based nursing recommendation, recruitment may be used to employ a clinical facilitator who has been on part-time employment based on their experience and qualifications.

The participants were further suggested that recruiting a simulation laboratory assistant who can assist in preparing procedures will make a difference. Correspondently, the suggestion could be beneficial not only in the challenge of staff shortage but also in terms of time management. Henningsson and Geschwind (2021:55) state that the fundamental ideals throughout the recruitment process, according to state logic, are transparency and justice. Consequently, with transparency, the responsibilities or job description should be clear at the recruitment level to avoid the situation where the clinical facilitator ends up teaching all levels as they mentioned. According to Tikhonov (2019:522), referral recruitment is more effective when focusing on the specific category of the required employee (Tikhonov 2019:522). In addition, this type of recruitment will benefit simulation-based nursing in their recruitment to select a clinical facilitator who will fit easily into the team. A clinical facilitator who can fit in a simulation-based team will be one previously observed to have strong teamwork skills, be flexible and be able to collaborate and communicate effectively. Subsequently, recruiting staff without retaining it is an effortless means of dealing with a staff shortage. In their review, Oates et al. (2020:2904) stated several ways of retaining staff, including improving staff engagement and their well-being, wages and working conditions. The authors further mentioned other staff retention strategies, including consistent education and staff training and investment in continuous support, supervision, and mentoring. Mouton and Bussin (2018:6) indicate that

staff retention can be achieved through employer branding to reduce employee turnover, enhance healthy relationships among employees and improve job satisfaction.

6.4.3 Theme 3: Staff capacitation

Building staff capacity emerges as a pivotal concern in addressing challenges such as inadequate knowledge, underutilisation of equipment, and fear related to the use of HFS. The CIG suggested strategies to capacitate the clinical facilitators, including developing a simulation-based orientation program, simulation-based training, regular simulation-based in-service education, and managing resistance to change.

- ***Sub-theme 1: Development of a simulation-based orientation program***

The participants identified the need to develop an orientation program for new staff members in the simulation laboratory. Roncallo et al. (2021:8) state that simulation-based orientation programs have allowed educators to improve their simulation quality. Pezzimenti et al. (2022:1531) and Traynor et al. (2021:38) alluded that a comprehensive orientation program is required for newly hired employees to acquire clinical and critical thinking skills. One clinical facilitator advised using a manual guide and the suppliers' videos showing how the high-fidelity simulators can be operated.

The findings suggest that orientation activities could reduce frustrations and anxieties experienced by the clinical facilitator joining the simulation team for the first time, thus building their confidence. First-hand simulation-based orientation is key to the development of a positive attitude. Koukourikos et al. (2021:18) state that it is also necessary for the clinical facilitators to orientate themselves with technology in general for appropriate clinical teaching of students and smooth running of simulation-based nursing. Using simulation-based assessment to segment tools during the orientation of the newly appointed clinical facilitator could be beneficial. Traynor et al. (2012:37) used a simulation-based assessment tool to assess the progress in learning towards competence and identify areas of difficulty.

- ***Sub-theme2: Introducing simulation-based training and in-service education***

The participants indicated concern for a need for simulation-based training to enable them to conduct effective facilitation with the students. Ferguson et al. (2019:920) suggest that training of clinical facilitators should be a key element in the delivery and implementation of simulation-based nursing. According to Astbury et al. (2021:628), an effective clinical facilitator must have the necessary skills, including the ability to operate simulation equipment, demonstrate relevance and retrieve the discontinued session due to malfunctioning or failed equipment.

Simulation-based training involves learning activities that will mimic fundamental clinical skills or tasks to improve the competencies of healthcare professionals (Peterson et al. 2022:3). Therefore, formal and intensive simulation-based training will also address challenges such as under-utilisation of high-fidelity simulators where some of the participants confess lack of training and resistance to change as responsible to that effect. The benefits of simulation training also include the ability to work with interdisciplinary teams collaboratively, manage sophisticated situations, strengthen communication skills, and enhance confidence and understanding (Moslehi and Masoumi 2022:17). Simulation-based training reduces operation time, decreases the need for supervision and clinical facilitator discomfort and embarrassment especially during the operation of high-fidelity simulators. Training clinical facilitators on operating high-fidelity simulators will also solve the underutilisation of such simulators.

Pietersen et al. (2022:3) highlight the need for assessment tools for simulation-based training that is supported by valid evidence to ensure that the trainees reach the required level of competency. The above authors suggest using a learning curve for guidance and monitoring simulation-based training. According to Akhter et al. (2021:7), knowledge and skill can be reinforced through the engagement of clinical facilitators and awareness of different international simulation-based societies, associations, and networks. Acquiring knowledge and skills in high-fidelity simulators promotes the clinical facilitators' confidence and allows them to work independently and comfortably. Simulation-based nursing needs to be managed by resourceful clinical facilitators who are well-trained in using all three modalities. In their study, Purva and Nicklin (2018:107) suggested that there is a need for transformation in the use of simulation as an enabling tool to ensure that personnel are trained, educated, and sustained as safe practitioners in a clinical environment. Therefore, successful simulation depends entirely on the proper implementation to provide quality student training. Kibwane et al. (2017:8) reported a marked improvement in knowledge and clinical skills among clinical facilitators who underwent simulation-based training.

Because of their uncertainty regarding that aspect, the participants expressed the need for guidance and clarification of simulation methodologies as part of their training to enhance their clinical teaching skills. Aebersold (2018:78) identified strategies for simulation-based nursing, including operating computerised manikins, standardised patient, role play and virtual simulation. Therefore, such strategies can be used as simulation methodologies. Standardised or simulated patient is a type of simulation where a healthy person is trained to provoke their physiological responses and act in the role of an actual patient on skills such as physical examination (Aebersold 2018:78). Standardised patients can also be trained on communication skills such as counselling, health education and history taking.

The participants mentioned role-play as one of the methodologies used during simulation-based teaching. Aebersold (2018:79) explains role play as an effective experiential learning simulation that focuses on the behaviour of personal interaction by creating an actual situation model by learning through acting. According to Khan and Sheikh (2021:49), role play can help the students retain knowledge and assist them in managing different aspects of complex communications that can affect the patient negatively in a real-life situation (Elshama, 2020:83). Ke and Xu (2020:5246) identified virtual reality simulation-based learning as an alternative methodology to face-to-face. According to the authors, virtual reality (VR) simulation permits a hybrid learning environment that blends the physical environment with virtual simulated space. VR is a computer-generated virtual space designed to integrate 3D, imitating graphics of real-world scenarios. This methodology can simulate skills such as wound care, medication administration and other minor procedures.

The participants highlighted the necessity of in-service education to develop their competency in simulation-based nursing education. The effectiveness and efficiency of simulation-based training need to be strengthened through continuous in-service education. Inservice education is sometimes called continuous professional education (CPE) (Bluestone et al. 2013:2). The researcher thinks combining the two strategies can make a remarkable acquisition of knowledge and skill. Furthermore, in-service training offered to the clinical facilitators will benefit the students so that they will receive quality education. Patients will also benefit as they will receive quality care from the students.

- ***Sub-theme 3 Managing resistance to change***

As indicated by the participants, transformation requires the clinical facilitators to embrace change and foster a culture of innovation as we move to the 5th industrial revolution. In addition, the participants advocated for using Generative Pre-trained, a type of artificial intelligence, to stay current with emerging technological trends. Warrick (2023:439) outlined the strategies for managing resistance to change. The above author further states that some strategies include involving the affected staff members in a change process, providing training to prepare for change, and maintaining clear communication and support. Managers must foster a culture of openness by creating opportunities for dialogue and feedback and act in a manner that builds and shows support.

6.4.4 Theme 4: Development of policies and procedure

The CIG identified another transformative value that qualifies one to contribute to simulation-based nursing, including the development of standard operating procedures (SOPs), the standardisation of procedures, and policy development.

- ***Sub-theme 1: Development of standard operating procedures (SOP's)***

The participants advocated the development of SOPs to guide them in performing their skills, especially in operating high-fidelity simulators. SOPs are documents that regulate the activities performed by the clinical facilitators and carry specific results of action necessary to finish a particular task. The advantages of SOPs, as outlined by Shestopalova (2018:131), are that they provide compliance and similarity with standard requirements and minimise the likelihood of personnel not clearly understanding their responsibilities. When assessing the quality of simulation-based SOPs, attention is paid to how the clinical facilitator intervention turns out and how safe it will be for patient outcomes. Therefore, it is the responsibility of the clinical facilitator to understand the different SOPs related to simulation-based nursing and to record any deviation from the written procedure.

- ***Sub-theme 2: Standardisation of procedures***

The CIG reveal that Standardisation is necessary and applicable to all and should be linked to the module. It is, therefore, appropriate that the standardisation of the procedures be done in collaboration between the clinical facilitators and the clinical service personnel where the students are placed in a way that is understandable to them. Claudio et al. (2021:702) explain the standardisation of procedures as developing a sequence of tasks that represent the best way to complete such tasks within the work assignment. The authors state that the benefits of standardising the procedure include documentation of current processes, reduction of variabilities, baseline for improvements, and training of operators. Standardisation of procedures serves to maintain order in the performance of a given task.

6.4.5 Theme 5: Adjustment of simulation-based roles for clinical facilitators

Data obtained show that clinical facilitators' roles significantly impact student performance. They observed a lack of confidence in their students and a theory-practice gap. Therefore, clinical facilitators are responsible for building students' confidence and competence and bridging the gap between theory and practice.

- ***Sub-theme 1: Building students' confidence and competence***

Participants identified a lack of confidence on the side of the students. Confidence for students is perceived by Kim (2018:258) as a key factor whereby those with high levels of confidence are more likely to use their clinical skills effectively and succeed in their performance. Competence refers to the ability of the student to integrate the skills, knowledge, and attitudes during clinical practice (Mohamed 2019:856). Notably, the findings from the CIG indicated that lack of time makes it difficult for the clinical facilitators to conduct debriefing sessions that can

help the students identify their mistakes and correct them. In addition, clinical facilitators self-identified their knowledge gap; ultimately, that can compromise students' competence and confidence. The study conducted by Priambodo et al. (2022:8) alluded that student performs their skills better if debriefing is done shortly after each scenario than after completing all scenarios. Therefore, having gone through a debriefing session was explained by Priambodo et al. (2022:8) as a teaching strategy that increases the learning opportunity and allows students to learn from their mistakes. The debriefing session includes feedback and a video review of student performance, allowing students to self-reflect. In their study, Bø et al. *(*2021:1374) indicated that simulation-based debriefing sessions allow students to reflect on and interpret their own performance. Reflection in simulation-based nursing is intended to enhance students' critical thinking skills and change in behaviour and clinical practice, thus building their confidence.

Furthermore, although the CIG identified the need to conduct debriefing after simulation, the researcher believes the initial pre-briefing stage should be performed before simulation. Pre-briefing is the strategy for establishing the foundation of building confidence and the facilitation of critical reflection during the debriefing phase. During the pre-briefing stage, the student will be given an opportunity for orientation to simulation facets, including environmental facts, equipment, timing, and tasks (Astbury et al. 2021:627).

Another strategy identified by the CIG that could not be achieved due to lack of time was providing simulation-based feedback to the students. Ritchie et al. (2023:3) explain feedback as information communicated to the students to modify their reasoning skills and behaviour and improve their learning. According to Bø et al. (2021:1374), giving feedback encouragingly and constructively provides an opportunity for guidance, thus taking knowledge to a higher level where competence and confidence will be achieved for the student. Aebersold (2018:) states that another effective way of providing feedback to the student is using a pause and discuss strategy where repetition of skill with feedback in between is afforded to the student.

Furthermore, data from the CIG show that clinical facilitators are good student role models. They observe the professional manner in which the skill is performed and the student interacts with the simulator as a real-life patient. Thus, the student will imitate the confidence of the clinical facilitator. According to Salah et al. *(*2018:881), working closely with the clinical facilitator can improve student confidence and help them find meaning in their simulation-based learning.

- ***Sub-theme 2: Bridging the gap between theory and practice***

The clinical participators indicated that students could contribute to closing the gap between theory and practice through self-directed learning. However, the study conducted by Salah et al. (2018:4) identified several aspects that will contribute to bridging the theory-practice gap, which includes the clinical facilitator's communication skills with the student, guidance of students to improve their simulation and continuous follow-up of students.

Koukourikos et al. (2021:15) suggest that this problem can be solved through knowledge and understanding of nursing-related science, which combines theory and practical skills. Students can best understand the connection between theory and practice if the practical skills are demonstrated shortly after the related theories are presented. Therefore, the schedules for theoretical modules should align with those of the practical modules to enable the students to connect.

Bridging the gap between theory and practice can also be achieved through sharing responsibilities among clinical facilitators (Saifan et al. 2021:9). By sharing the responsibilities, clinical facilitators could divide the work more evenly among themselves and collaborate to create a more comprehensive, well-rounded, supportive, and flexible learning environment for students. Persico and Larlo (2019:275) state that simulation-based nursing can bridge the gap between theory learned in the classroom and clinical skills performed with the patients in a real-life environment. Bridging the theory-practice gap through simulation is about preparing the students to deal with the challenges and complexity of real-world situations. A simulation laboratory is a safe environment that allows students to practice skills until they attain competency.

6.5 CONCLUSION

Chapter Six independently discussed the findings of Phases 3 and 4, which were supported by relevant literature. Nine themes were addressed in alignment with the transformative learning theory, directed by the quotes in Chapter Five. The discussion, as directed by the transformative learning theory, was change-related. The idea of change was brought about by the challenges experienced by the clinical facilitators responsible for simulation-based education. Chapter Seven focuses on refining the provisional statements and eventually developing the simulation-based guidelines that the clinical facilitators may use.

CHAPTER 7: DEVELOPMENT OF GUIDELINES AS EVIDENCE-BASED SUPPORT MEASURE FOR SIMULATION-BASED NURSING

7.1 INTRODUCTION

Chapter Six discussed the findings and literature control, which laid the foundation for developing guidelines to enhance simulation-based nursing. This chapter focused on developing guidelines to improve simulation-based nursing as agreed with the Cooperative Inquiry Group (CIG) as co-researchers of participatory action research. Guidelines were developed from data obtained in Phases 1, 3, and 4. Phase 2 did not form part of the development of guidelines since it focused on building the relationship with participants. Phase 1 conducted an integrative literature review, Phase 3 explored and described the challenges regarding simulation-based nursing, and Phase 4 addressed the transformative value based on the identified challenges.

As outlined in Chapter Three, the guidelines were guided by nine of the ten steps of the transformative learning model. Steps one to four of the model were applied in Phase 3 and literature in Phase 1 of the integrative literature review. They were not included as part of the guidelines as they were challenges that led to transformation. Steps five through nine addressed the transformation in Phase 4, including the literature in Phase 1. Step ten was excluded from this study because the suggested changes have not yet been implemented. The guidelines were developed based on the transformation of the challenges identified in Phases 1 and 3, including the related literature. The participants included in this guideline are simulation center managers, clinical facilitators, students and information technology personnel.

7.2 AIM AND OBJECTIVE

Aim: The overall aim of this study was to develop guidelines as evidence-based support measure for simulation- based nursing.

7.3 GUIDELINES IN HEALTH CARE

Guidelines in healthcare are defined by Murad (2017:423) as statements that are developed systematically to help patients and clinical practitioners make appropriate healthcare decisions in specific situations. Panteli et al. (2017:238) explain guidelines in healthcare as statements

that involve intended recommendations to optimise patient care. Such statements are informed by a review of evidence and an assessment of benefits. Guidelines in this study are formulated to bring about positive change and consistency in simulation-based practice, ultimately benefiting the patients, students, and clinical facilitators. Furthermore, in this study, the guidelines were informed by an integrative literature review and data obtained from CIG members, including assessing benefits and alternative care options. The guidelines should be simple, practical, precise, and exact. Adherence to guidelines in healthcare lowers the risk of patient hospitalisation (Murad 2017:429). Guidelines were developed within the coordinated and structured simulation-based nursing with support from experts in nursing simulation.

Kredo et al. (2016:123) state that guidelines in healthcare have several purposes: to improve quality patient care, prevent adverse occurrences and costly mistakes, and provide auditable standards. Adherence to simulation-based guidelines can provide benchmarks and build students' and staff's confidence, thus cultivating safe clinical skills. Kredo et al. *(*2016:123) argue that guidelines in healthcare can include best practice statements for healthcare providers or concerns regarding screening, diagnoses, management, and monitoring. This study's guidelines are based on how the challenges regarding simulation-based nursing were handled and how data was synthesised.

Clinical safety requires well-developed guidelines for creditable practice. Such guidelines are developed by professionals in the relevant field of study to be comprehensive enough to acquire high-quality clinical practice based on evidence and expert opinion (Garbi 2021:949). In this study, the guidelines were developed by professional nurses with simulation-based experience who participated in the study and validated by simulation-based nursing experts. Panteli et al. (2019:238) assert that it is crucial to ensure that healthcare guidelines are well developed and informed by scientific evidence to have an intended impact on the processes and outcomes of care. Well-developed guidelines have the potential to decrease unwarranted healthcare variation and improve patient safety and quality of healthcare if they are effectively implemented. AGGREE 11 is an international checklist used in healthcare to highlight and assess the importance of clinical practice guidelines. Lamloum et al. (2023:3) outlined that the AGGREE 11 tool is designed to assist the researcher as the developer, including the users, in evaluating the methodological quality of the guidelines. The relevance of AGGREE 11 domain considered the factors that impact the implementation of simulation-based nursing, which included the space, resources, and training needs. The latter represent the attributes of health care. The developer considers the clinical setting where the guidelines will be implemented. When the limitations in guideline development are reported, further improvements are necessary towards such limitations (Wang et al. 2020:8). Wang et al. (2020:7) state that the

WHO guidelines are an example of healthcare guidelines which possess a distinct process, specifications, and requirements such as executive summaries, institutional authorship, and acknowledgement of contributors.

The following five provisional statements were sent to the experts for validation through the e-Delphi process:

Provisional Statement # 1: Simulation managers and clinical facilitators should explore new relationships by establishing communication skills, interdisciplinary collaboration, and benchmarking.

Provisional Statement # 2: Managing simulation-based resources, including equipment and consumables, the shortage of human resources, time, and financial management.

Provisional Statement # 3: Clinical facilitators should acquire the knowledge and skills to implement simulation-based nursing.

Provisional Statement # 4: Simulation laboratory managers and clinical facilitators should develop simulation-based policies and procedures.

Provisional Statement # 5: Simulation-based roles should be adjusted to meet students' learning needs so that they can develop competence and confidence.

7.4. E-DELPHI PROCESS

e-Delphi is a method used to access a geographically scattered group of experts online to validate simulation-based guidelines. McPherson (2018:404) defines an e-Delphi method as a qualitative research approach used through experts' opinions to gain consensus on real-world problems. The panel in this study consisted of 13 expert participants. The technique aims to structure the information on the topic under investigation (McPherson 2018:404). Msibi et al. (2018:2) explain e-Delphi as a technique to structure group communication to address multiple challenges. In this study, e-Delphi promoted the online management of a Likert scale and facilitated communication with experts from different South African universities. The e-Delphi survey was managed using a Qualtrics platform in one of the survey collection software at the University of Pretoria. E-Delphi depends exclusively on an Internet-based platform for communication between the researcher and the expert panel.

7.4.1 Training to use a platform for e-Delphi

The researcher's promoter collaborated with the instructional designer to organise training for the researcher on the University's Learning Management System (LMS). A Learning Management System is an online learning approach that involves managing and organising learning activities within the system (Aljojo et al. 2020:355). The LMS access requirements did not align with the experts' interests, thus leading to their desire to withdraw from

participation. Therefore, the withdrawal from using LMS was substituted with the Qualtrics platform for e-Delphi.

7.4.2 Designing an online platform through Qualtrics

Qualtrics is an electronic survey software used in this study to facilitate an e-Delphi process. It is a popular online survey used by most academic institutions under license (Cui 2021:1). It offers a comprehensive platform for survey research, allowing the researcher to share information about the research title, name of researcher, contact details, institution of study and invitation message. It also allows the researcher to distribute the online survey and administer statements and the Likert scale. Miller (2020:731) argues that using an online survey such as Qualtrics takes less time to complete and readily provides access to participants. The researcher, as the platform administrator, chose the level of anonymity whereby the experts were entirely anonymous to each other and revealed their email addresses only to her, which allowed her to send reminders to those who did not participate within an expected timeframe. The other advantage was that the researcher could log in to the system at any given time to monitor the activities of the expert participants. The participants could access the platform at their most convenient time whenever internet access was available. During the survey, participants could log out and continue where they left off later. In this study, no participants reported a limitation of internet accessibility.

7.5 RECRUITMENT AND RETENTION OF THE PARTICIPANTS AS EXPERTS

- **Recruitment of e-Delphi panel**

  Recruitment of experts is an essential part of the e-Delphi process. It provides the contribution that becomes the key to the research study. The expert in this study is a nurse practitioner with experiential knowledge of simulation-based nursing. Eighteen experts were invited to participate in this study. The panel recruitment was facilitated through emails containing invitation letters that clarified the purpose of the study, the e-Delphi process, the estimated period of participating in all rounds process, and the participant consent document. Follow-up phone calls were made to provide an opportunity for clarification and questions related to the study. WhatsApp messages were also used to clarify some things. Experts from different universities in SA were known to researchers through emails and phone calls with non-physical communication that might influence the responses. The expert panel remained anonymous to each other.

- **Retention of e-Delphi panel**

  Hall et al. (2018:7) state that maintaining participants' full engagement once recruited is an issue. Various methods were used to retain the panel members throughout the process,

including email updates, WhatsApp messages, and phone call reminders. After each round throughout the study, the participants were thanked via email to encourage them to remain involved. Due to their tight schedules, deadlines were extended to accommodate the participants who could not complete the survey within the requested period.

- **Sampling**

  The panel selected for e-Delphi validation in this study consisted of experts with knowledge in simulation-based nursing who were willing to discuss its issues. The experts were sampled from various universities and were potential users of the developed simulation-based guidelines. Purposive sampling was used to obtain expert participants. Thirteen reviewers independently appraised each of the five guidelines, using the AGREE II tool to evaluate the transparency and methodological rigour.

7.6 BIOGRAPHY OF EXPERTS

Table 7.1: The biographical data of the panel of experts

No.	Name of Department/ Organisation	Simulation experience (Years)	Position	Role	Gender	Age		Highest Qualification	Ethnic group
						Below 35	Above 35		
1	University A	7 years	Clinical Simulation Manager	Teaching, learning, and assessment in Simulation	Male		X	PhD in Nursing	African
2	University A	8years	Clinical Simulation Manager	Supporting Teaching, learning, and assessment in Simulation	Female		X	PhD in Nursing	African
3	University B	12years	Associate Professor	Simulation of mental health skills	Female		X	PhD in Nursing	African
4	University C	7years	Nursing Program admin	Co-Ordinator clinical teaching	Female		X	M Cur	White
5	University D	10years	Simulation lab manager	Coordinate all simulation activities in the skills lab	Male		X	PhD in Nursing	African
6	University B	6years	Simulation lab manager	Coordinate all simulation activities in the skills lab	Female		X	M Cur	White
7	University C	7years	Simulation lab manager	Coordinate all clinical at the skills lab & facilities	Female		X	PhD in Nursing	African
8	University C	5years	Deputy Director	Oversees all simulation activities	Female		X	PhD in Nursing	African
9	University D	11years	Director Simulation laboratory	Oversees all simulation activities	Female		X	PhD in Nursing	African
10	University A	6years	Lecturer	Simulation of general nursing skills	Female		X	M Cur	African
11	University D	5years	Lecturer	Teaching, Learning & Assessments: ICU Simulation	Female		X	Awaiting PhD results Thokozile	African
12	University A	8years	Lecturer	Simulation Teaching, Learning & Assessments: PGDips Education	Male		X	PhD in Nursing	African
13	University B	9years	Lecturer	Teaching, Learning & Assessments: ICU Simulation	Male		x	PhD in Nursing	African

Thirteen experts from various universities in South Africa who participated in e-Delphi included four males and nine females with years of experience ranging between five and twelve. Most experts hold a PhD qualification, while few are still pursuing their doctoral degrees.

7.7 GUIDELINES DEVELOPMENT AS EVIDENCE-BASED SUPPORT MEASURE FOR SIMULATION-BASED NURSING

The guidelines in this study are systematic statements developed to facilitate appropriate simulation-based nursing. They were developed in four phases: the preparatory phase, the exploratory phase, the consensus phase, and the refinement phase.

7.7.1 Phase 1: Preparatory phase

The promoter appointed the instructional designer to assist the researcher in creating an e-Delphi platform. The university's Learning Management System (LMS) created the platform. An ID copy for the LMS users was mandatory, but most expert participants hesitated to provide it. Based on the expert participants' unwillingness to share their identity copies, Qualtrics was used as an alternative system to survey as it did not require an identity copy of the participants. The expert participants were requested to provide their demographic data, as in Table 7.1. The instructional designer shared a platform link with the researcher after training her on utilising the Qualtrics features. The researcher developed two types of Likert scales, the 2-point Likert scale and the 7-point Likert scale, in preparation for the subsequent phases. Furthermore, the researcher drafted the information to guide the experts in participating in the survey.

The electronic platform was developed using the university's Learning Management System (LMS) to facilitate expert engagement and discussions to reach a consensus based on the study's guidelines. However, an ID copy was mandatory for LMS users to be added to the system. This caused hesitancy among many expert participants due to concerns over protecting their personal information and identity. As a result of this reluctance, Qualtrics was adopted as an alternative platform for conducting the survey, as it did not require participants to provide an ID copy

7.7.2 Phase 2: Exploratory phase

Using a 2-point Likert scale, two rounds were conducted as an electronic survey. Round one aimed to refine the original provincial statements to improve their clarity with qualitative knowledge regarding simulation-based nursing. The aim of Round 2 was to confirm the accuracy of statements inferred from Round 1. The Qualtrics survey was loaded with five provincial statements designed to assist with developing guidelines related to simulation-based nursing. The researcher posted the link to the individual expert participants via email to provide them with clear instructions on how to participate in the validation process within the Qualtrics platform. The statements were incorporated with the two-point Likert scale, rated either agree or disagree. The expert panel was expected to provide their responses regarding agreeing or disagreeing with each provincial statement, providing a comment if there was any, or rephrasing the statement. Expert panel members were given one week to complete and submit the online survey through the Qualtrics platform. The researcher amended the provincial statements based on the experts' comments from Rounds 1 and 2 after each round. The comments were later made available to the Qualtrics platform as an attachment, allowing expert participants to view how they share similar thought processes while maintaining anonymity. See Figure 7.1 for the 2-point Likert scale.

7.7.3 Phase 3: Consensus phase.

The aim of Round 3 was to validate the refined provincial statements based on the experts' comments during Rounds 1 and 2. Furthermore, a 7-point Likert scale using the AGREE 11 tool was used via the Qualtrics platform, where the refined statements were redistributed to the expert panel. Moreover, the researcher added the Likert scale with provincial statements. An interactive communication will remain active until consensus is attained. The survey consisting of five refined provincial statements was loaded to the Qualtrics platform, where the link thereof was shared with the individual expert participants to their emails. Experts who committed to participate in the study were subsequently given one week to give feedback on the statements provided. Different levels of agreement can be used to evaluate consensus among e-Delphi panellists (Von der Gracht 2012:1529). The (ibid) further states that consensus can be reached based on agreement and disagreement on provided statements, and the majority opinion depends on percentages higher than average. This study reached consensus measurement through Average Percentage of Majority Opinions. Below is the

formula (Von der Gracht 2012:1530). The three where a percentage above 50% is defined as the majority. The consensus measurement in all rounds was above 50%.

$$\text{APMO} = \frac{\text{Majority Agreements + Majority Disagreements}}{\text{Total Opinions expressed}} \times 100$$

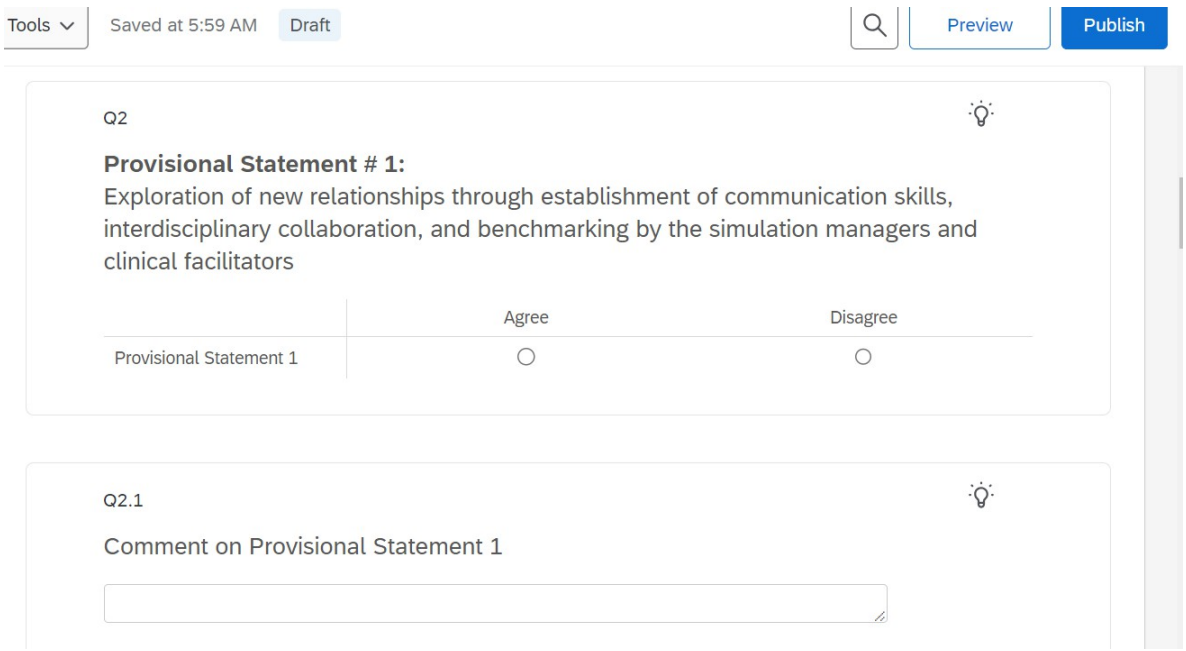
7.7.4 Phase 4: Refinement of data

The researcher evaluated the ratings and comments made by expert participants in the three rounds. Some comments included constructing some statements and adding words to give them more meaning.

7.7.5 Data analyses

Thirteen experts participated in the 2-point Likert scale of agree and disagree in round one and the 7-point Likert scale using the AGREE 11 tool. The 2-point Likert scale, with either agree or disagree, was used in Rounds 1 and 2, ranging from 1 (strongly disagree) to 7 (strongly agree) to measure consensus.

Table 7.2: Qualtrics survey Round 1



Provisional Statement # 2:
Managing simulation-based resources including equipment and consumables, shortage of human resource, time, and financial management.

	Agree	Disagree
Provisional Statement 2	○	○

Q3.1

Comment on Provisional Statement 2

Using the validated tool, a consensus was reached through the experts' comments, inputs and suggestions. See Figure 7.1

Disagree

D	E	F	G	H
Q3.1 Comment on Provisional Statement 2	Q4_1 Provisional Statement # 3: Acquisition of knowledge and skill necessary for implementation of simulation-based nursing by the clinical facilitators - Provisional Statement 2	Q 4.1 Comment on Provisional Statement 3	Q5_1 Provisional Statement # 4: Development of simulation-based policies and procedures by the simulation laboratory managers and clinical facilitators - Provisional Statement 2	Q5.1 Comment on Provisional Statement 4
This will sound better of phrased like this: "Managing simulation resourced including equipment, consumables, human resources, timetable, facility, and financial resources".	Agree	This will sound more precise if it is phrased like this: "Acquisition of knowledge and skill necessary for implementation of simulation-based education for students by the nurse educators and the clinical facilitators".	Agree	Rephrase: "Development of simulation policies, guidelines and procedures by the multidisciplinary team comprising simulation laboratory technicians, simulation laboratory manager, nurse educator, and educators from other health sciences departments, and clinical facilitators."
	Agree	We can add also add/ restructure: Implementation of Simulation-based Education for Nursing students by	Disagree	Development of simulation policies, guidelines and procedures by multidisciplinary team involved in
	Agree	We can add also add/ restructure: Implementation of Simulation-based Education for Nursing students by Clinical facilitators and Nurse Educators	Disagree	Development of simulation policies, guidelines and procedures by multidisciplinary team involved in simulation: simulation manager, simulation champions from various departments, simulation educators, simulation technicians, simulation facilitators.
	Agree		Agree	Please include nurse educators as well
	Agree	Clinical facilitators would benefit by a course in Simulation-based learning.	Agree	Policies and procedures are the roadmap to day-by-day management of a simulation laboratory and simulation- based learning
It will read better as "Managing simulation-based human and non-human resources including time and simulation lab related finances."	Agree	Please add "and simulation lab managers". Its very important to capacitate managers as well because they do supervision during SDL	Agree	None

Sheet0

Table 7.3 Summary of e-Delphi rating in Round 3

CRITERIA	Credibility							Dependability							Confirmability							Authenticity							Transferability						
Rating scale 7= Strongly Agree 6= Agree 5= Agree somewhat 4= Undecided 3=Disagree somewhat 2= Disagree 1= Strongly disagree	The guidelines are simple, understandable, and supported by clear rationale							The guidelines are reliable and can be adapted to fit the specific context.							The guidelines are objective and not influenced by researcher's own bias													The guidelines can be generalised to other settings						
	A P P L I C A B I L I T Y																																		
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Guideline1: Exploring relationships through communication and collaboration and benchmarking:	0	0	0	0	0	**3**	**8**	0	0	0	0	0	**2**	**9**	0	0	0	0	**2**	**4**	**5**	0	0	0	**1**	0	**1**	**9**	0	0	0	0	**1**	**2**	**8**
Guideline 2: Management of simulation-based human and non-human resources	0	0	0	0	0	**2**	**9**	0	0	0	0	0	**2**	**9**	0	0	0	0	**1**	**3**	**7**	0	0	0	**1**	0	**2**	**8**	0	0	0	0	0	**2**	**9**
Guideline 3: Acquiring of knowledge and skill for implementation of simulation-based nursing.	0	0	0	0	0	**3**	**8**	0	0	0	0	0	**5**	**6**	0	0	0	0	0	**3**	**8**	0	0	0	**1**	0	**3**	**7**	0	0	0	0	0	**2**	**9**
Guideline 4: Developing a new plan of action on policies and procedures	0	0	0	0	1	**3**	**6**	0	0	0	0	0	**5**	**6**	0	0	0	0	0	**4**	**7**	0	0	0	**1**	0	**3**	**7**	0	0	0	0	0	**2**	**9**
Guideline 5: Adjust simulation-based roles to meet the learning needs of the students	0	0	0	0	**1**	**4**	**6**	0	0	0	0	0	**3**	**8**	0	0	0	0	0	**2**	**9**	0	0	0	**1**	0	**1**	**9**	0	0	0	0	**1**	**1**	**9**

Pelegamotse Tabea Motsilanuane

7.8 Monitoring online responses from Qualtrics platform

Below are the comments from expert participants and the researcher.

7.8.1 Round 1

Provisional Statement # 1: Round 1

- *Communication skills are the most important skills needed in simulation learning.*
- *However, please clarify what relationships. Also, I think communication skills does not really talk much about new relationships. I would suggest that this statement be shaped to read as "Enhancing collegial relationships through interdisciplinary collaboration, benchmarking and establishing communications channels by simulation managers and clinical facilitators".*
- *Exploration of new relationships through establishment of communication, interdisciplinary collaboration, and benchmarking by the simulation managers and clinical facilitators*
- *The statement captures an ideal scenario. although it is bombarded with big unrelated concepts.*
- *I hope communication and interdisciplinary collaboration will include the dean, HODs, educators, university preceptors, students from different disciplines and hospital clinical facilitators to ensure ownership of decisions.*

Comments by the researcher on Statement 1, Round 1

Enhancement of effective communication can contribute to building new relationships through interdisciplinary collaboration and benchmarking. This guideline aims to enhance multidisciplinary collaboration between nurses, doctors, simulation technicians and other healthcare professionals engaged in simulation-based education.

Provisional Statement # 2

- *This will sound better if phrased like this: "Managing simulation resource including equipment, consumables, human resources, timetable, facility, and financial resources".*
- *It will read better as "Managing simulation-based human and non-human resources including time and simulation lab related finances".*
- *High fidelity equipment is critical as students learn better unlike old, outdated equipment.*
- *The phrase shortage must be removed.*

- *Proper allocation or placement of students (To avoid congestion and ownership of the facility by one department).*

Comments by the researcher on Statement two, round 1

A simulation laboratory manager is responsible for creating a conducive simulation-based environment for teaching and learning. Proper resource management, such as ensuring that there are no shortages and that all equipment is in good working order, can achieve this. Resource management will also benefit the patients who receive quality care from well-trained students.

Provisional Statement # Round 1

- *This will sound more precise: "Acquisition of knowledge and skill necessary for the implementation of simulation-based education for students by the nurse educators and the clinical facilitators".*
- *We can also add/restructure the implementation of Simulation-based Education for Nursing students by Clinical facilitators and Nurse Educators.*
- *Clinical facilitators would benefit from a course in Simulation-based learning.*
- *Please add "and simulation lab managers". It is important to capacitate managers as well because they do supervision during SD.L*
- *Clinical facilitators to be trained more often to improve their skills too as they transfer to students.*
- *Skill for implementation and or utilisation.*
- *Evidence-based knowledge is required from clinical facilitators and nursing educators.*

Comments by the researcher on Statement 3, Round 1

Ideal simulation-based nursing education involves acquiring knowledge and skills from the simulation laboratory manager and the clinical facilitator. Therefore, simulation-based education and training opportunities for simulation managers and clinical facilitators are vital to enhance students' clinical learning.

Provisional Statement # 4

- *Rephrase: "Development of simulation policies, guidelines and procedures by the multidisciplinary team comprising simulation laboratory technicians, simulation laboratory manager, nurse educator, and educators from other health sciences departments, and clinical facilitators."*

- *Development of simulation policies, guidelines and procedures by multidisciplinary team involved in simulation: simulation manager, simulation champions from various departments, simulation educators, simulation technicians, simulation facilitators.*
- *Please include nurse educators as well.*
- *Policies and procedures are the roadmap to day-by-day management of a simulation laboratory and simulation- based learning.*
- *None.*
- *So critical and they should be revised regularly.*
- *In line with their statutory body's prescripts.*

Comments by the researcher on Statement 4, Round 1

It is essential that policies developed are accessible to all staff members and revised whenever necessary and during the transformation process.

Provisional Statement # 5

- *It is not clear whose roles should be adjusted*
- *Extra time needs to be provided to spend time in the simulation laboratory for practice in procedures to gain competence*
- *Simulation based also include standard patients, I don't see a statement for them. This is because, your study is about simulation-based nursing. It needs to employ a holistic approach*
- *Agree, this includes continuous exploration of new technologies as they develop and incorporating it into current curriculums*
- *Adjustment of simulation-based roles to meet the learning needs of the students to enhance competence and confidence*
- *Whose roles?*

Comments by the researcher on Statement 5, Round 1

The roles of the clinical facilitators should be written and explained. Simulation managers should ensure that clinical facilitators adhere to their designated roles to deliver quality simulation education to students, thus building their confidence and competence.

Table 7.4 Summary of e-Delphi rating in Round 1

Statement	Agree	Disagree	Did not respond	Comments	
1	13	0	0		
2	12	0	1		
3	12	0	1		
4	12	1	0		
5	11	1	1		

7.8.2 : Round 2

Provisional Statement # 1 Round 2

- Communication between laboratory mangers and clinical facilitators is essential to enhance the experiential learning opportunities of the student. The laboratory manager keeps up to date with the latest technology that can be used in simulation learning. Whereas the facilitators experience the latest procedures that are used in the clinical facilities. This collaboration is in the best interest of the student.
- Communication is key in facilitating collaboration therefore clear communication guidelines and platform are to be established.

Provisional Statement # 2 Round 2

- Communication is also important to arrange time slots for the use of the simulation laboratory to provide optimum learning opportunities for the nursing student. The manager is responsible for the upkeep of all equipment used in the simulation laboratory as well as managing the supplies of the models, equipment and other materials.
- Managing Simulation-based learning requires human and non-human resources such as trained personnel on simulation teaching, support from stakeholders involved, equipment, infrastructure, finance and equipment. effective sessions of conducting simulation requires enough resources to simulate a real live experience so that all students from various health professionals must learn clinical skills in a safe environment.
- effective sessions of conducting simulation requires enough resources to simulate a real live experience so that all students from various health professionals must learn clinical skills in a safe environment the resources include space, high and low fidelity mannikins trained technical staff, support staff to order, stores , manage all equipment, the facilitators are to be trained on how to use all the resources safely so as not to lead to damages, unused items and poorly utilised space which may result in fruitless expenditure. training of staff on simulation skills and advancing

technology remains critical so as to benefit the students and maximum use of resources

Provisional Statement # 3 Round 2

- Acquisition of knowledge and skills necessary for implementation of simulation-based education of students by clinical facilitators and simulation laboratory managers.
- Clinical facilitators and simulation laboratory managers should be given the opportunity to visit other Universities and Colleges to learn from those colleagues. They should also attend courses in simulation training.
- Simulation-based education requires knowledge, skills and training of educators, simulation support personnel, simulation facilitators on how to facilitate simulation for students.

Provisional Statement # 4 Round 2

- In order to properly secure and maintain the equipment and facility, access to the Simulation Centre must be closely coordinated by the abovementioned team who use the facilities. the policy provides structure and guidance and stability between all the role players responsible to develop, provide maintain facilitate simulation processes.
- The policy provides structure and guidance and stability between all the role players responsible to develop, provide maintain facilitate simulation processes. I fully support developed standard operating procedures (SOPs) on how to use of mannikins and linked to curriculum of various health professionals so that there is information sharing, continuity, and succession plan.
- Simulation laboratories best-practice standards warrants the involvement of relevant stakeholders (users) to be involved in the development of above-mentioned structure standards. Remember we are doing all these to meet their needs and make their life easy.

Provisional Statement # 5 Round 2

- The clinical facilitator role is to engage the student in a clinical education experience that is safe, realistic and in an effective environment. In the simulated environment learners can practice in a risk free and realistic environment that enables students to build self-confidence through skills mastery. The Simulation Laboratory provides an environment where clinical practice is promoted in a professional setting.

environment has to adapt, thus the simulators and the clinical facilitators serving needs of students are to keep up and continuously through training and updating themselves built their confidence and not be a shame in front of students. Health environment is dynamics, health protocols, procedures are not static as research informs safe practices and technology improves how things are done.

- Facilitation of simulation-based learning requires clear roles and responsibilities outlined in order to meet the simulation learning objectives.
- The health environment has to adapt, thus the simulators and the clinical facilitators serving needs of students are to keep up and continuously through training and updating themselves built their confidence and not be a shame in front of students.

Table 7.5 Summary of e-Delphi rating in Round 2

Statement	Agree	Disagree	Did not respond	Number of Comments	Total number of expert panel
1	9	1	0		10
2	10	0	0		10
3	10	0	0		10
4	10	0	0		10
5	9	1	0		10

Rationale

Acquisition of knowledge and skills necessary for implementing simulation-based education of students by clinical facilitators and simulation laboratory managers. Clinical facilitators and simulation laboratory managers should be allowed to visit other Universities and Colleges to learn from those colleagues. They should also attend courses in simulation training.

7.8.3: Round 3

The quality of the guidelines was evaluated using an Appraisal of Guidelines for Evaluation and Research (AGREE) tool, which uses a 7-point Likert scale. The experts were allocated one week to refine and rate the drafted provincial statements.

Amendment of Provincial Statements after the last round

The researcher reviewed the provincial statement from all the two rounds and refined them in line with the comments made by the experts' participants.

Refined guidelines	TLT as aligns with guidelines
Guideline # 1: Establishment of effective communications channels by simulation laboratory managers and clinical facilitators to facilitate collegial relationships through interdisciplinary collaboration and benchmarking	***Step 5:*** Exploration of option for new actions, role, relationships
Guideline # 2: Managing simulation-based human and non-human resources including space, simulators equipment and consumables, time, and finance.	***Step 6:*** Planning of a course of action
Guideline #3: Acquisition of knowledge and skill necessary for implementation of simulation-based education for students by the clinical facilitators and simulation laboratory managers.	***Step 7:*** Acquisition of knowledge and skill for implementing one's plan
Guideline# 4: Development of simulation-based policies and procedures by the simulation laboratory managers and clinical facilitators.	***Step 8:*** Provisional trying of new roles
Guideline # 5: Adjustment of simulation-based clinical facilitators' roles to meet the learning needs of the students and build their competence and confidence	***Step 9:*** Building of competence and self-confidence in a new role

Guideline # 1: Establishment of effective communications channels by simulation laboratory managers and clinical facilitators to facilitate collegial relationships through interdisciplinary collaboration and benchmarking

This statement aligns with Step 5 of the transformative learning model, which focuses on exploring options for new relationships. Step 5 represents the first transformation step within the transformative learning model Heron (1996) after the four steps related to the challenges. The participants explored ways of strengthening relationships with students and multidisciplinary team members and building relationships with other like-minded professionals. Establishing effective communication channels was identified as a means of networking with others through collaboration and benchmarking.

Rationale

Enhancing collaborative and communication efforts with hospital and clinics where students are placed improve student clinical learning whereby benchmarking allow the simulation centres to share knowledge about simulation-based activities with other amongst each other. According to SANC Regulation No. R. 683 Clinical facilitator as a professional nurse is expected to have developed professionally to be able to collaborate effectively with multidisciplinary team members in terms of cooperation in achieving common goal. The effective collaboration and communication should be applicable not only to the clinical facilitators but to the entire multidisciplinary team.

Operationalisation of effective measures for the transformation of simulation-based nursing

Effective communication skills

- Ensure that students understand different communication patterns to establish effective communication with patients, families, and multi-disciplinary healthcare team.
- Verbal communication in a form of report giving on activities performed should be simulated to develop student readiness for real-world situation.
- Written communication skills on activities performed should be demonstrated to the students for them to became competent in writing patient reports.
- Non-verbal communication skill should be simulated to the students so that they can be able to observe the same behaviour in a real-life situation
- Ensure effective communication with the students by avoiding lack of response and lack of confirmation to prevent of confusion and misunderstanding.
- Ensure that students are having access to online

Interdisciplinary collaboration

- Simulation centres from different universities to collaborate with each other to create an opportunity of exchanging ideas.
- Collaborative approaches should be enhanced among interdisciplinary team members using simulation centre.
- Collaboration between clinical facilitators and those facilitation theoretical module should be created to enhance student clinical leaning
- Simulation staff should collaborate with manufacturing industries for sophisticated high technology equipment in order to meet industrial competence needs.

Benchmarking

- Simulation managers should engage in a collaborative benchmarking to allow them to share knowledge about simulation-based activities with other universities

- Clinical facilitators should compete with others from different simulation centres to evaluate their performance against other competitors.
- Comparative with other simulation centres output to identify the gaps.
- Identify factors and practices that lead to the success of simulation- bases nursing.

Guideline # 2: Managing simulation-based human and non-human resources, including space, simulator equipment and consumables, time, and finance.

Rationale

Simulation managers should ensure that there are sufficient resources including material and human resource and all equipment are functional for provision of quality simulation teaching and learning. This statement aligns with *the second step of transformation that is Step 6 which focuses on planning of a course of action: The study findings indicated various challenges related to resources which included limited resources, underutilization, and non-functional equipment. Based on the findings, simulation-based resource management was suggested as transformative value including trying new roles in managing equipment, human, time and financial resources.*

Operationalisation

Managing equipment and consumable

- Simulation management should motivate for extension of simulation centre to allow enough space for students to practice and to give feedback.
- Clinical facilitator should monitor the availability of equipment and material and report any shortage to the simulation laboratory managers.
- Ensuring that equipment is not just bought without being used to avoid issues related to underutilization.
- Conduct periodic inventory to keep track of what is available in stock and what need to be replaced.
- Calibration of equipment should be done regularly to ensure that its functionality is still within the specification of the manufacturer.
- Adhere to scheduled maintenance of equipment and advocate for unscheduled one should it be required to avoid premature deterioration.
- Use the evaluation tool to determine the equipment's state of function and identify those that need repair or service.

Managing shortage of human resource

- Simulation managers should compile simulation laboratory staffing need analysis by assessing the type and number of staff members needed.
- Develop recruitment and retention strategies for simulation-based nursing
- Recruitment of staff and employment of more staff members should be done to overcome the shortage and to ensure quality simulation-based nursing
- Simulation managers should promote the well-being of staff by creating a supportive environment and ensuring that staff is reasonably compensated to achieve staff retention.

Time Allocation and management

- Allocate simulation time to accommodate different sessions including pre-briefing, demonstration, debriefing, and reflection.
- Clinical facilitators should be familiar with the resources to be used to avoid spending simulation time on familiarisation.
- Ensure that bookings of simulation times are completed promptly to prevent consequent delays and disruptions that may arise from clashes in terms of time.

Financial support for simulation-based nursing

- Simulation managers should develop multidisciplinary simulation-based programs to overcome cost constraints
- Explore suitable income streams towards developed programs.
- Request for financial support from a variety of sources when developing an annual budget cycle

Guideline #3: Acquisition of knowledge and skills necessary for implementation of simulation-based education for students by the clinical facilitators and simulation laboratory managers.

Simulation-based training of the clinical facilitators is key to providing quality clinical teaching and optimal patient care.

Rationale

Simulation managers should capacitate all staff members so that they can feel empowered and free from feelings of inadequacy. There must be a plan to develop new strategies for the implementation of new perspectives.

Operationalisation

Ensure simulation-based training to all clinical facilitators

- Simulation-laboratory manager should have a proper staff development programme in place
- Ensure simulation-based training of all staff members who use simulation as a teaching and learning strategy.
- Training should be compulsory for both permanent and part-time clinical facilitators

Develop a continuous in-service education program

- Develop continuous simulation-based in-service education program for clinical facilitators on methodologies for simulation-based nursing.
- Ensure that all clinical facilitators attend scheduled in-service education programs so that they can develop the necessary knowledge and skills to impart to the students and to handle challenging simulation-based situations.

Clarifying simulation methodologies

- Computerised simulators are used as a method for simulation therefore, clinical facilitators should master how they are operated to act like real human beings.
- Encourage training of and using standardised patient in the simulation of communication skills such as history taking, health education, and counselling.
- Train the standardised patients to provoke their physiological response so that they can thereafter be as a method to simulate skills such as physical examination.
- Use role-play as a way of creating a real situation model through acting.

Develop proper simulation-based orientation programs for newly appointed staff

- Conduct a comprehensive orientation to newly appointed clinical facilitators for a period specified in a program to assess the learning progress of the orienteers towards competence
- Simulation-based assessment tool for orientation should be developed
- Use of manuals and videos for the specific simulator or equipment that is purchased with such.

Actions to overcome resistance to change.

- Managers should measure the attitudes of clinical facilitators towards simulation-based nursing through self-report.
- Clinical facilitators' behaviours during simulation should be observed to determine whether they match the self-reported attitude.
- Simulation managers should clarify the reasons for change to the clinical facilitators who have been long in a field and how it will benefit the students.

- Managers should educate clinical facilitators on change, and train them on how to manage change effectively and how to adapt to simulation-based change.
- Simulation managers should address the concerns of fears and create open, two-way communication between them and the clinical facilitators where the aspects of change could be considered.
- Managers should offer support for change and participate in a change process that the clinical facilitators experience
- Managers should lift the clinical facilitators up rather than tearing them down be transparent, keep them informed and invite feedback

Guideline# 4 Development of simulation-based policies and procedures by the simulation laboratory managers and clinical facilitators

Clinical facilitators face challenges in simulation centres where policies and procedures are not standardised. Simulation-based nursing may present risks to patient safety and student learning if activities are performed without guidance from relevant policies and procedures. However, developing and adhering to simulation-based procedures may improve patient safety and enhance student success.

Rationale

The situation that may compromise the health of the patients and the learning needs of students is when the simulation-based policies and procedures are divergent from those in a real-life setting.

Operationalisation

Development of standard operating procedures (SOP)`

- Ensure that patient safety is considered when designing standard operation procedures.
- Assess the quality of standard operating procedures by observing how effective the recommended interventions are.
- All clinical facilitators should be familiar with the standard operating procedures that are related to simulation-based nursing

Standardisation of procedures

- Clinical facilitators, together with clinical service personnel where students are placed, should jointly participate in the standardisation of procedures, which is done to maintain order in skill performance.

Simulation-based polices

- Both managers and clinical facilitators should review old simulation-based policies and develop new ones if the need arises.
- Personnel should work according to the developed policies.
- Policies should be developed in a way that they will benefit both the students and the patients

Guideline # 5: Adjustment of simulation-based clinical facilitators' roles to meet the learning needs of the students and build their competence and confidence

This is about embracing the power of one's assumptions and perspective questioning. Clinical facilitators must take ownership of their viewpoints and honour their values and beliefs, allowing them to increase their self-awareness and improve their critical thinking and decision-making skills.

Rationale

Simulation managers should work with the clinical facilitators to modify the simulation-based activities and adjust their roles to better suit the needs of the students. Being competent in an activity can certainly create confidence in that act. However, as stated by Gottlieb *et al* 2021:39), confidence, as termed self-efficacy in educational literature, can shape people's sense of competence. The clinical facilitators to be capable of instilling competence and confidence in the students, they themselves must be competent and possess confidence. Bridging the gap between theory and practice can improve student competence and confidence.

Operationalisation

Building students' confidence and competence

- Pre-briefing should be conducted for students before simulation to establish a groundwork for building confidence
- The clinical facilitator should perform an initial demonstration of skills to the students and ensure that their understanding is guaranteed.
- Create simulation-based scenarios that will mimic real-world patient-related activities.
- Clinical facilitators should conduct debriefing sessions with the students after every simulation to allow students to self-reflect.
- Clinical facilitators should always provide constructive feedback to students to create an opportunity for guidance.

- Clinical facilitators should portray a good role model so that the student can imitate the observed confidence

Bridging the gap between theory and practice

- Clinical facilitators should ensure that theory and practice are in synchrony to prevent the gap in between.
- Clinical facilitators should create a supportive environment for students' self-directed learning by providing the resources while leaving ultimate practice in the hands of the students.

7.9 CONCLUSION

This chapter addressed the objective of Phase 5, which is to develop simulation-based guidelines. It presented a comprehensive process for developing guidelines. Three rounds of the Qualtrics platform survey for e-Delphi were conducted with 13 expert panel members. Five guidelines were developed in alignment with the five steps of transformative learning theory. The guidelines will benefit simulation managers, clinical facilitators, and students by enhancing quality simulation-based education.

CHAPTER 8: SUMMARY OF THE STUDY FINDINGS, IMPLICATIONS, RECOMMENDATIONS, LIMITATIONS, AND CONCLUSION

8.1 INTRODUCTION

The previous chapter focused on the development of simulation-based guidelines. In this chapter, the researcher summarises the five phases of the study and the recommendations for future research and implementation of simulation-based nursing education. The significance of the study and the limitations are also included in this chapter.

8.2 OVERVIEW OF THE STUDY AND SUMMARY OF FINDINGS

8.2.1 PHASE 1

The objective of phase 1 was *"To critically evaluate the evidence regarding simulation-based nursing using an integrative literature review."*

This integrative literature review evaluated the current state of knowledge on simulation-based nursing by exploring, describing, and analysing related published articles. The integrative literature review was collected from 21 published articles on simulation-based nursing education. The literature was analysed using the Donabedian quality of care model, which includes structure, process, and Outcome. The structure included human and non-human simulation-based resources, the process featured simulation teaching and learning, and the outcome included the competencies and the effect of simulation-based teaching on student training. Therefore, the following three themes were developed: structure, process, and outcome.

Theme 1: Structure

This review included the simulation laboratory, equipment, simulators (High, medium, and low-fidelity simulators), cameras, simulation centre staff, and simulated patients. The findings in theme one revealed a shortage of human and non-human resources, which is more common in South African nurse training institutions, including other African countries. The literature also revealed a lack of simulation-based training for clinical facilitators, management support, and financial support for implementing simulation-based education at the simulation centres.

Theme 2: Process

The process reflected simulation-based teaching and learning using low-, medium-, and high-fidelity simulators, including simulation pre-briefing and debriefing. Pre-briefing is the initial

phase of simulation-based teaching, followed by a demonstration of skills and a simulation of clinical activities. Debriefing is conducted after all the activities with a focus on positive aspects and things that the student needs to improve on. The complete process allows the student an opportunity to integrate theory and practice, to learn from feedback and to develop problem-solving, decision-making, and psychomotor skills.

Theme 3: Outcome

Three identified categories of outcome included competencies, collaboration, and desired outcome. Competent clinical facilitators are expected to produce qualified students with psychomotor, critical, problem-solving, decision-making, and communication skills. The targeted outcomes were student satisfaction, patient satisfaction, system outcome, and teamwork-based collaboration.

8.2.2 Phase 2

In Phase 2, the objective was *"to establish a working relationship with clinical facilitators participating in the study"* as co-researchers in participatory action research. During this phase, the nursing managers appointed mediators as gatekeepers from 5 selected universities. These mediators worked as the simulation managers and assisted with recruiting participants. Participants were recruited via email and telephone. The researcher planned and conducted a workshop on the orientation of the study to the potential participants who responded positively to the invitation.

8.2.3 Phase 3

The objective of phase 3 was *"To explore and describe challenges perceived by clinical facilitators regarding simulation-based nursing."*

A total of 29 CIG members participated in various focus group interviews within the cooperative inquiry group meetings. In Phase 3, the CIG members from the selected universities with experience in simulation as a teaching and learning strategy shared their challenges regarding simulation-based nursing, which were explored and described in relation to the ten steps of transformative learning theory. Four themes that emerged from data collected in phase three are discussed in chapter five and are summarised below.

Theme 1: Barriers to simulation-based resources

The findings revealed resource-based challenges that compromised the students' simulation-based education and further anticipated compromised patient care. Examples of these resource-based barriers included limited space in the simulation centre, a shortage of human

and non-human resources, non-functional resources, and underutilisation of high-fidelity simulators.

Theme 2: Feeling of inadequacy

During this phase, the participants became aware of their self-reflective feelings of inadequacy, which was evident in their knowledge deficit regarding the use of simulation-based nursing. The participants self-reported their knowledge gap emanating from lack of simulation-based training, lack of in-service training and lack of orientation. In addition, the participants self-reported their knowledge gap emanating from a lack of orientation, lack of simulation-based training, and lack of in-service training, support, and manufacturers. They indicated that resistance to change has been observed by some of their colleagues conducting simulation-based nursing education for a long time. Subsequently, the clinical facilitators had a problem collaborating with the interprofessional team as they felt their simulation needs were disregarded over those of the doctors.

Theme 3: Questioning one's assumption and perspective

The CIG began to explore the assumptions of how the challenges they experience could impact the students. The identified impact included a lack of student confidence and competence, a theory-practice gap and ineffective communication

Theme 4: Navigating shared experiences through knowledge and practice

The results revealed that limited simulation time, which involved time to demonstrate the skill, obtain feedback and conduct pre-briefing and debriefing sessions, was one of the challenges that all the participants shared. In addition, all the participants indicated a lack of financial support in their respective simulation centres.

8.2.4 Phase 4

The same CIG members in Phase 3 continued participating in Phase 4, which aimed *"to identify the transformative values that contribute to simulation-based nursing."*

Clinical facilitators participating in CIG meetings acknowledge the need for transformation in simulation-based nursing education. The data collected from the clinical facilitators as CIG members revealed five themes related to the five steps of transformative learning theory. The five themes that emerged are exploring the relationships, simulation-based resource management, staff capacitation, development of policies and procedures and adjustment of simulation-based roles for clinical facilitators, are discussed as follows:

Theme 1: Exploring the relationships

The CIG mentioned that new relationships could benefit them, as they would have an opportunity to learn from one another and compete with other simulation centres. Consequently, the CIG identified strategies for achieving these beneficial relationships. Such strategies included developing effective interprofessional communication skills, establishing interdisciplinary collaboration, and benchmarking from advanced simulation centres.

Theme 2: Simulation-based resource management

The results suggest resource management is most important in ensuring quality simulation-based teaching and learning. The CIG identified different resource management optimisation strategies, including equipment maintenance and supplier control, simulation staff recruitment and retention, and efficient time allocation and management. In addition, financial support for simulation-based nursing was identified as one of the most important components that could contribute to and transform most simulation-based challenges.

Theme 3: Staff capacitation

The results suggest that clinical facilitators are eager to be empowered with the knowledge and skills necessary to offer students a quality simulation-based education. Therefore, as recommended by the CIG, the approaches to their empowerment included simulation-based training with clarification of relevant methodologies, development of a simulation-based orientation program, and regular receipt of simulation-based in-service training.

Theme 4: Development of policies and procedure

As indicated by the CIG development SOP, standardisation of simulated procedures and the development of simulation-based policies would ensure compliance with required standards while also providing orientation on how things operate and the proper approach to performing the skills.

Theme 5: Adjustment of simulation-based roles for clinical facilitators

The study demonstrated the benefits of personalising the responsibilities of clinical facilitators, which include increasing students' confidence and competence and bridging the theory-practice gap.

8.2.5 Phase 5

The objective of phase five was *"To develop guidelines as evidence-based support measure for simulation-based nursing".*

Thirteen experts in simulation-based nursing participated in three rounds of the e-Delphi Qualtrics survey platform. Only 10 of the 13 expert participants participated in rounds two and three.

Most experts had PhDs, while the minority were still pursuing the same qualification, and only two participants had their master's degrees as the highest qualification. The first two rounds of the e-Delphi involved the 2 -2-point Likert scale and the third round was a 7-point Likert scale. The experts reached a consensus, and none disagreed with the refined simulation-based guidelines.

Development of guidelines as evidence-based support measure for simulation-based nursing

The guidelines were developed in relation to the five themes that aligned with the five steps of transformative learning theory.

- **Theme 1: Exploring the relationships**

Guideline#1: Establishment of effective communications channels by simulation laboratory managers and clinical facilitators to facilitate collegial relationships through interdisciplinary collaboration and benchmarking

- **Theme 2: Simulation-based resource management**

Guideline # 2: Managing simulation-based human and non-human resources, including space, simulators, equipment, consumables, time, and finances.

- **Theme 3: Staff capacitation**

Guideline #3: Acquisition of knowledge and skills necessary for implementation of simulation-based education for students by the clinical facilitators and simulation laboratory managers.

- **Theme 4: Development of policies and procedure**

Guideline# 4 Development of simulation-based policies and procedures by the simulation laboratory managers and clinical facilitators.

- **Theme 5: Adjustment of simulation-based roles for clinical facilitators**

Guideline # 5: Adjustment of simulation-based clinical facilitators' roles to meet the learning needs of the students and build their competence and confidence

8.3 CONTRIBUTION OF THE STUDY

The study significantly contributed to the existing body of knowledge by developing an extensive set of simulation-based guidelines to empower the clinical facilitators with knowledge and skills for clinical teaching. The guidelines developed have the great potential to enhance simulation-based nursing, ultimately leading to student clinical competence and quality patient care.

8.4 RECOMMENDATIONS

The study contributes to the discussion about the effective ongoing implementation of simulation-based nursing education. As a result, the recommendations were divided into two categories—recommendations for future simulation-related research and Simulation-based education.

8.4.1 Recommendations for future research

The CIG was involved in PAR cycles of action and reflection and had an opportunity to get emersed data and develop a deep understanding of simulation-based nursing education, including the challenges and related transformative values. The findings guided the developed guidelines. Based on developed guidelines as evidence-based support measure, recommendations for future research are made as follows:

- The nursing curriculum has to emphasise simulation-based teaching and learning to improve students' clinical competence.
- Interprofessional collaboration among nursing and medical staff sharing simulation facility for education and training.
- Develop strategies to manage resistance to change in a high-fidelity simulation centre, as experienced clinical facilitators may struggle to adapt.
- The study population should consider clinical facilitators as information providers and students as information recipients.
- Time management strategies should be developed to accommodate all the required skills for a particular session
- Develop strategies to manage resistance to change within a high-fidelity simulation centre for experienced clinical facilitators who may struggle to adapt. The use of high-fidelity simulation is still new to other SA institutions; therefore, experienced clinical facilitators may sometimes find it difficult to adapt.
- Well-managed time will assist the clinical facilitator and student in completing all of the skills required for the simulation session,

8.4.2 Recommendation for implementation of simulation-based education

- There is a need for simulation-based training of the clinical facilitators to provide quality clinical teaching and learning.
- Provide a scheduled in-service training program for clinical facilitators to enhance simulation skills and update knowledge.
- Employing sufficient staff is significant in increasing productivity and preventing employee turnover and burnout.
- Provide precise booking schedules for medical and nursing students to prevent clashes and misunderstandings when they share the same simulation centre.
- Universities with simulation laboratories are to employ enough staff to ensure that they adhere to their expected roles.
- Provide support staff to assist the clinical facilitators with stock management, which involves preventing overstocking and understocking, checking expiration dates, and ensuring the functionality of the equipment.
- Simulation laboratories are to be staffed with IT personnel in permanent positions to prepare and maintain sophisticated equipment and high-fidelity simulators.

8.5 IMPLICATIONS OF THE STUDY

The following implications of the study are discussed according to nursing education, nursing practice, and research

8.5.1 Nursing Education

The guidelines developed as evidence-based support measure for simulation-based nursing aim to equip clinical facilitators with knowledge and skills regarding using different modalities during simulation education, such as low, medium, and high fidelity, to improve students' teaching and learning. The study may contribute to the theoretical understanding of simulation-based nursing by addressing the barriers and implementing transformative values.

The developed guidelines as evidence-based support measure for simulation-based nursing might improve undergraduate nursing students' clinical performance. Students may be able to integrate theory and practice and strengthen their problem-solving, critical thinking, and psychomotor skills, and add to the body of knowledge of nursing, including the curriculum

8.5.2 Nursing practice

The implications for nursing practice are that the developed guidelines as evidence-based support measure for simulation-based nursing might improve patient satisfaction, as students rendering care may gain experience when implemented accordingly. Furthermore,

patient care may be enhanced since students who have undergone training using the simulation-based programme may demonstrate competence and confidence during care.

8.5.3 Research

The implication for research is that the study may add to the body of knowledge regarding the research methodology and findings. The knowledge generated may encourage the need for further research by other researchers.

8.6 LIMITATIONS OF THE STUDY

Not all universities offering a four-year degree in simulation-based nursing responded to the invitation to participate in a study. The researcher believes such universities could have provided data that might have added value to the one obtained from clinical facilitators. The limitation of the suggested data collection method, the World Café, is that it requires more than 15-20 people, whereas participants for the study were less than 10. The study focused only on clinical facilitators involved in simulation-based nursing education as a population and did not include lectures demonstrating skills to students in the simulation laboratory. It could have carried more weight if the students, as the recipients of simulation-based nursing, formed part of the study population. Only 5 universities took part in the study, and therefore, the findings cannot be generalised to all the universities in South Africa.

8.7 CONCLUSION

The study aimed to develop and validate simulation-based guidelines for the clinical facilitators responsible for conducting clinical education in a simulation centre at South African universities. The study employed a qualitative approach and thematic data analysis. The objectives were achieved through a participatory action research design. Participants were committed to transformation. Two sets of themes were developed to address objective three, which identified the challenges regarding simulation-based nursing education, and objective four, which focused on the transformative values essential to tackle such challenges. Provisional statements were drafted and shared with the experts via an online survey for validation. Three rounds of the Qualtrics survey were conducted with experts. Limitations were identified, and recommendations were made based on the study's findings.

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ANNEXURE A

PARTICIPANTS' INFORMATION AND INFORMED CONSENT

Pelegamotse Tabea Motsilanyane

ANNEXURE A: PARTICIPANTS' INFORMATION AND INFORMED CONSENT

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

PARTICIPANTS' INFORMATION AND INFORMED CONSENT DOCUMENT

TITLE OF THE STUDY: Evidence-based support measures for simulation-based nursing: Participatory action research from universities in South Africa

……

Sponsor: … (To be specified at a later stage)……

Principal Investigator: *Pelegamotse Tabea Motsilanyane*

Institution: University of Pretoria

DAYTIME AND AFTER HOURS TELEPHONE NUMBER(S):

Daytime number/s: 082 943 4590……

Afterhours number: 082 943 4590……

DATE AND TIME OF FIRST INFORMED CONSENT DISCUSSION

Date	**month**	**year**		**Time**

Dear Prof/ Dr/ Mr / Mrs .....

1) INTRODUCTION

You are invited to participate in this research study titled, "*Evidence-based support measures for simulation-based nursing: Participatory action research from universities in South Africa*. I am a doctoral candidate in the Department of Nursing Science, School of Health Care Sciences, Faculty of Health Sciences, University of Pretoria. The information in this document will assist you to decide if you would like to participate in the study or not. Before you agree to take part in this study, you should fully understand what is involved. If you have any questions, which are not fully explained in this document, do not hesitate to ask the researcher. You should not agree to take part unless you are completely happy about all the procedures involved.

2) THE NATURE AND PURPOSE OF THE STUDY

The aim of this study is to apply the findings to inform evidence-based support measures for simulation-based nursing education in these institutions.

3) EXPLANATION OF PROCEDURES AND WHAT WILL BE EXPECTED FROM PARTICIPANTS

Your decision to participate in a study will make you part of the Cooperative Inquiry Group (CIG), consisting of 10 -15 members. All participants in the CIG, will be co-researchers, while the above-mentioned author will be the principal researcher. CIG will be responsible for ***developing the research questions, objectives of the study and research methods that will guide us throughout the study until the final stage of applying the findings to inform evidence-based support measures.*** As a member of CIG, you are required to attend meetings that will be schedules by all group members. The purpose of CIG is to share your experience regarding simulation-based nursing. The meetings will be held online by all members within your institution. The principal researcher will compile the report after data analysis by the group. At the end of the study, the findings will be presented to your university.

4) POSSIBLE RISKS AND DISCOMFORTS INVOLVED

There are no medical risks associated in the study. The only possible discomfort involved might be ***if there are participants who dominate discussions in the group during discussion sessions.*** The principal researcher will emphasise the principle of ***liberating*** thus, providing freedom of participants from oppressive debilitating conditions.

5) POSSIBLE BENEFITS OF THE STUDY

Although you may not benefit directly, the study findings of the study will assist you ***to improve your teaching skills through support mearsures.***
Your participation in this study may develop your research, communication, critical thinking and problem-solving skills.

6) COMPENSATION

You will not be paid to participate in this study. However, any cost incurs due to your participation in the study, for example, ***data used*** will be reimbursed.

7) YOUR RIGHTS AS A RESEARCH PARTICIPANT

Your participation in this study is voluntary and you have the right to withdraw at any time without stating any reason. Your withdrawal will not affect any of your working conditions.

8) ETHICAL APPROVAL

An application for ethical protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, telephone numbers 012 356 3084 / 012 356 3085 and written approval has been granted by the Committee. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with recommendations guiding doctors in biomedical research, involving human/subjects. A copy of the Declaration may be obtained from the investigator, should you wish to review it.

9) INFORMATION

If you have any questions concerning this study, please contact:

Mrs Motsilanyane on 018 389 2534 or 082 943 4590.

10) CONFIDENTIALITY

All information obtained during the course of this study will be regarded as confidential. Each participant will be addressed with their initials. This will ensure confidentiality of information collected. Only the researcher will be able to identify participants. Results will be published or presented to ensure participants remain anonymous. Hard copies of all records if available, will be kept in a locked

facility at a storeroom of the University of Pretoria and soft copies of transcripts will be protected with password and saved in separate folder.

11) CONSENT TO PARTICIPATE IN THE STUDY

- I confirm that the person requesting my consent to take part in this study has inform me about the nature and process, any risks or discomforts and the benefits of the study.
- I have also received, read and understood the above written information about the study.
- I have had adequate time to ask questions and I have no objections to participate in this study.
- I am aware that the information obtained in the study, including personal details, will be anonymously processed and presented in the reporting of results.
- I understand that I will not be penalised in any way should I wish to discontinue with the study and that withdrawal will not affect my further treatment.
- I am participating willingly.
- I have received a signed copy of this informed consent agreement.

_____

Participant's name (Please print)

_____

Participant's signature Date

PT MOTSILANYANE

Researcher's name (Please print)

06/ December/ 2023

Researcher's signature Date

ANNEXURE B

EXPERT PARTICIPANTS' INFORMATION AND INFORMED CONSENT DOCUMENT

Pelegamotse Tabea Motsilanyane

ANNEXURE B: EXPERT PARTICIPANTS' INFORMATION AND INFORMED CONSENT DOCUMENT

Faculty of Health Sciences
Department of Nursing Science

EXPERT PARTICIPANTS' INFORMATION AND INFORMED CONSENT DOCUMENT

TITLE OF THE STUDY: Evidence-based support measures for simulation-based nursing: Participatory action research from universities in South Africa

……

Principal Investigator: ***Pelegamotse Tabea Motsilanyane***

Institution: University of Pretoria

DAYTIME AND AFTER HOURS TELEPHONE NUMBER(S):

Daytime number/s: 082 943 4590……

Afterhours number: 082 943 4590……

Dear prospective expert participant
Dear Ms/Dr Thokozile Kgongwana

1) INTRODUCTION

You are invited to participate in this research study titled, "Evidence-based support measures for simulation-based nursing: Participatory action research from universities in South Africa. I am a **doctoral** candidate in the Department of Nursing Science, School of Health Care Sciences, Faculty of Health Sciences, University of Pretoria. The information in this document will assist you to decide if you would like to participate in the study or not. Before you agree to take part in this study, you should fully understand what is involved. If you have any questions, which are not fully explained in this document, do not hesitate to ask the researcher. You should not agree to take part unless you are completely happy about all the procedures involved.

2) THE NATURE AND PURPOSE OF THE STUDY

The aim of this study was to apply the findings to inform evidence-based support measures for simulation-based nursing. By so doing, you will be able to develop the guidelines regarding simulation-based nursing that will guide the facilitation of nursing students in clinical teaching and learning environment at selected Universities in South Africa.

3) EXPLANATION OF PROCEDURES AND WHAT IS EXPECTED FROM PARTICIPANTS

Your decision to participate in a study will make you part of the experts consisting of 10 -15 members. For the period of six (6) we will use the online platform through the University of Pretoria LMS to engage with you continuously to reach consensus about the statements for the process of development of the envisage guidelines. Every week the researcher will post two statements to deliberate on. Additionally, a rationale and anticipated outcomes for the statement will also be added for the online engagement. You will be expected to share your expert knowledge related to the posed statements and rationale as well as the anticipated outcome. You will also be allowed to comment or add to the comments from other experts participating in the same platform. Additionally, use literature to support your inputs in this regard.

4) POSSIBLE RISKS AND DISCOMFORTS INVOLVED

There are no medical risks associated in the study.

5) POSSIBLE BENEFITS OF THE STUDY

Although you may not benefit directly, the study findings of the study will assist you ***to improve your validation skill.*** Your participation in this study may develop your research, communication, critical thinking and problem-solving skills.

6) COMPENSATION

You will not be paid to participate in this study. However, any cost incurs due to your participation in the study, for example, ***use of data bundle*** will be reimbursed.

7) YOUR RIGHTS AS A RESEARCH PARTICIPANT

Your participation in this study is voluntary and you have the right to withdraw at any time without stating any reason. Your withdrawal will not affect your access to other research activities.

8) ETHICAL APPROVAL

An application for ethical protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, telephone numbers 012 356 3084 / 012 356 3085 and written approval has been granted by the Committee. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with recommendations guiding doctors in biomedical research, involving human/subjects. A copy of the Declaration may be obtained from the investigator, should you wish to review it.

9) INFORMATION

If you have any questions concerning this study, please contact:

Mrs Motsilanyane on 018 389 2534 or 082 943 4590.

10) CONSENT TO PARTICIPATE IN THE STUDY

- I confirm that the person requesting my consent to take part in this study has inform me about the nature and process, any risks or discomforts and the benefits of the study.
- I have also received, read and understood the above written information about the study.
- I have had adequate time to ask questions and I have no objections to participate in this study.
- I understand that I will not be penalised in any way should I wish to discontinue with the study and that withdrawal will not affect my further treatment.
- I am participating willingly.

	29 May 2024
Participant's name (Please print)	Date
	29 May 2024
Participant's signature	Date
_____	_____
Investigator's name (Please print)	Date
_____	_____
Investigator's signature	Date

Pelegamotse Tabea Motsilanyane

ANNEXURE C

INVITATION LETTER TO EXPERT PARTICIPANTS OUTLINING THE INSTRUCTIONS, SUMMARY STUDY OBJECTIVES AND SUMMARY OF THE FINDINGS

Pelegamotse Tabea Motsilanyane

ANNEXURE C: INVITATION LETTER TO EXPERT PARTICIPANTS OUTLINING THE INSTRUCTIONS, SUMMARY STUDY OBJECTIVES AND SUMMARY OF THE FINDINGS

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

INVITATION LETTER TO EXPERT PARTICIPANTS OUTLINING THE INSTRUCTIONS, SUMMARY STUDY OBJECTIVES AND SUMMARY OF THE FINDINGS

TITLE OF THE STUDY: Evidence-based support measures for simulation-based nursing: Participatory action research from universities in South Africa.

……

Principal Investigator: ***Pelegamotse Tabea Motsilanyane***

Institution: University of Pretoria

Contact number: 082 943 4590……

Dear Mr / Mrs / Dr / Prof .....

1) INTRODUCTION

You are invited to participate as an expert in this research study titled, Evidence-based support measures for simulation-based nursing: Participatory action research from universities in South Africa. I am a **doctoral** candidate in the Department of Nursing Science, School of Health Care Sciences, Faculty of Health Sciences, University of Pretoria. I am conducting a study under the supervision of Professor R Mogale, Professor SS Moloko-Phiri and Dr M Jiyane. The information in this document will assist you to decide if you would like to participate in the study or not. Before you agree to take part in this study, you should fully understand what is involved. If you have any questions, which are not fully explained in this document, do not hesitate to ask the researcher. You should not agree to take part unless you are completely happy about all the procedures involved.

2) THE NATURE AND PURPOSE OF THE STUDY

The aim of this study is to apply the findings to inform evidence-based support measures for simulation-based nursing education in these institutions.

The objectives that will form the basis of this study will be according to the four phases of the study which are to:

Phase 1 - To establish a working relationship with clinical facilitators participating in the study.

Phase 2 – To explore and describe challenges perceived by clinical facilitators regarding simulation-based education.

Phase 3 - Ito identify the transformative values that contribute to the study.

Phase 4 - Apply the findings from the three phases to inform evidence-based support measures for simulation-based nursing education in the all the universities in SA.

Phase 1:The phase will represent the first CIG meeting where the researcher will present the statement of inquiry. The researcher and participants will decide on how the statement can be framed to become fruitful for the research process (Heron 1096:75). During this phase, the researcher will be able to establish a working relationship with participants. The world café method will be used to achieve the objective in phase 1. World café is a method of facilitating productive dialogue between a group or groups of people around an issue that matters to the group as a whole. The CIG will have its first meeting during which the decision will be taken on the research questions, objectives and methodologies to use to conduct the study as a whole (Mash 2014:3). The CIG will formulate questions together on the challenges related to simulation-based education during the online meeting The decision on the subsequent session will be made by members of the group as co-researchers, together with the principal researcher. Same members of CIG will participate in phase 1to phase 3.
Researcher together with the CIG member will take part in data analysis. Six phases of thematic data analysis, will be used to analyse data*:*

Phase 2: This stage involves application of greed action and recording of own and other's reflections The CIG will explore challenges regarding simulation-based education which includes teaching and learning as well as what need to be improved when conducting simulation-based education in their second CIG meeting. The CIG meetings will be online using Microsoft teams and google drive jam board. Group member will be able to share their

experience by also writing the sticky notes. The CIG may reflect on what has been happening in the simulation laboratory regarding clinical simulation-based education in order to develop a better understanding of their experiences and try out new forms of action. 3 CIG meetings will be conducted to enable the deepening of experiences and allow the development and elaboration of superficial understanding. Focus group discussions will be used to collect data.. CIG members will have an opportunity to brainstorm on challenges related to simulation-based education. A typical 2-hour group session should include a series of about 12 semi-structured questions.

Phase 3: Transformative values that will contribute to simulation-based education will then derive from the challenges explored in phase 2 regarding simulation-based education. CIG will be used to identify the transformative values that will contribute to the study. Exploration of such challenges will be done through focus group discussions to identify transformative values, using words from the discussions and grouping them into categories. Members of the Cooperative Inquiry Group will in their fifth meeting be fully immersed on issues that might address challenges regarding simulation-based education thus, bringing transformation towards effective simulation-based education. The full immersion phase may lead to new actions, questions and create insights. Members of the Cooperative Inquiry Group will be led by new ideas from the original ideas and make proposals into a new field, unpredicted action and creative insights. Focus group interviews will be used to identify values that will generate change to simulation-based education. Same members of CIG who participated in phase 1 and 2 will participate in focus group interview. Six phases of thematic data analysis, as outlined by Braun and Clarke (2017:52), will be used to analyse data, as explained in 11.1.4.

Phase 4: In this phase the researcher will be assisted to create one e-Delphi platform by the instructional designer and the system administrator of University's Learning Management System. Access will also be provided to the experts in simulation-based education who does not affiliate with the university that will create the e-Delphi platform. The researcher will post outcomes of the evidence-based support measures from all the three phases of the study for the brainstorming with expert. Using the validated tool, a consensus will be reached through the comments, inputs and suggestions made by the experts. This phase might be done depending on the measures that the experts and the researcher will agree upon.

For any clarification that may be required please contact me or my supervisors on the following:

8) ETHICAL APPROVAL

An application for ethical protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, telephone numbers 012 356 3084 / 012 356 3085 and written approval has been granted by the Committee. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with recommendations guiding doctors in biomedical research, involving human/subjects. A copy of the Declaration may be obtained from the investigator, should you wish to review it.

- I have received a signed copy of the letter.

MRS X Expert's name (Please print	2 July 2021 Date
Signed Participant's signature	2 July 2021 Date
PT MOTSILANYANE Researcher's name (Please print)	2 July 2020 Date
 Researcher's signature	2 July 2021 DATE

ANNEXURE D

REQUEST FOR PERMISSION TO CONDUCT THE STUDY

Pelegamotse Tabea Motsilanyane

ANNEXURE D: REQUEST FOR PERMISSION TO CONDUCT THE STUDY

REQUEST FOR PERMISSION TO CONDUCT THE STUDY

Northwest University
Private Bag x2046
Mmabatho
2735
24 May 2023

The Head of Nursing Department
Sefako Makgatho Health Science University
Molotlegi Street
Pretoria

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I am a PhD candidate enrolled with the University of Pretoria. I request permission to conduct research at your institution. The title of the study is: **Evidence-based support measures for simulation-based nursing: Participatory action research from universities in South Africa.**

NB: Aim and objectives are preliminary as the group will decide on the final ones. The overall aim of this study is to apply the findings to inform evidence-based support measures for simulation-based nursing education in these institutions. Data will be collected online through cooperative inquiry group meetings and analysed through thematic data analysis.

The findings of the study will contribute to the body of nursing knowledge, particularly teaching and learning.
It is hoped that a simulation-based programme will equip clinical facilitators with knowledge and skills regarding the use of different modalities such as low, medium and high fidelity. Clinical performance of undergraduate nursing students could be improved. Students will be able to integrate theory and practice and strengthen their problem-solving and critical thinking skills.

Furthermore, the findings of the study will be used to improve patient satisfaction whereby, students will have gained experience in clinical practice. Patient care may be improved since students who have undergone training using the simulation-based programme may demonstrate competence and confidence during caring. In this research it is hoped that the study will add to the body of knowledge in

terms of the methodology and findings. The knowledge generated will encourage the need for further research by other researchers.

The right of privacy and confidentiality of participant's information will be adhered to. This means that the identity of the participants will be protected. Participation in the study is voluntary therefore participants are free to withdraw from the study at any stage if they so desire.

The highest standards of research planning, implementation and reporting will be adhered to throughout the study. The researcher is also committed to honest and unbiased research.

Results of the study will be made available to you on request. Should you have any questions regarding the research project, I will be pleased to answer them.

I will conduct the research under the supervision of Prof. R.S. Mogale, Prof S.S. Moloko-Phiri and Dr Jiyane. To protect the rights of the university and that of the participants, I followed the protocol whereby ethical clearance certificate from University of Pretoria is obtained already.

Sincerely
Mrs Pelegamotse Tabea Motsilanyane
Student number: 21312517

Tel: 018 389 2534
Cell: 082 943 4590

Email: 22063447@nwu.ac.za

ANNEXURE E

PERMISSION TO CONDUCT RESEARCH

ANNEXURE E: PERMISSION TO CONDUCT RESEARCH

UNIVERSITY OF THE WESTERN CAPE
PERMISSION TO CONDUCT RESEARCH

DEAR **Pelegamotse Tabea Motsilanyane**

This serves as acknowledgement that you have obtained and presented the necessary ethical clearance and your institutional permission required to proceed with the project referenced below:

RESEARCH TOPIC

EVIDENCE-BASED SUPPORT MEASURES FOR SIMULATION-BASED NURSING: PARTICIPATORY ACTION RESEARCH FROM UNIVERSITIES IN SOUTH AFRICA

Name of researcher	:	Pelegamotse Tabea Motsilanyane
Permission valid till	:	18 May 2024
Institution	:	University of Pretoria
Ethics reference	:	354/2021
Permission reference	:	UWCRP857609

You are required to engage this office (researchperm@uwc.ac.za) in advance if there is a need to continue with research outside of the stipulated period. The manner in which you conduct your research must be guided by the conditions set out in the annexed agreement: Conditions to guide research conducted at the University of the Western Cape.

Please be at liberty to contact this office should you require any assistance to conduct your research or require access to either staff or student contact information.

Regards
Dr Ahmed Shaikjee
Deputy Registrar Academic Administration

Approval status: **APPROVED** 7 November 2023

To verify or confirm the authenticity of this document please contact the University at researchperm@uwc.ac.za.

Pelegamotse Tabea Motsilanyane

ANNEXURE F

APPROVAL CERTIFICATE

Pelegamotse Tabea Motsilanyane

ANNEXURE F: APPROVAL CERTIFICATE

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

Institution: The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.
- FWA 00002567, Approved dd 18 March 2022 and Expires 18 March 2027.
- IORG #: IORG0001762 OMB No. 0990-0279 Approved for use through June 30, 2025 and Expires 07/28/2026.

Faculty of Health Sciences **Research Ethics Committee**

16 May 2024

Approval Certificate
Annual Renewal

Dear Mrs PT Motsilanyane,

Ethics Reference No.: 354/2021 – Line 5
Title: Evidence-based support measures for simulation-based nursing: participatory action research from universities in South Africa

The **Annual Renewal** as supported by documents received between 2024-04-11 and 2024-05-15 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on 2024-05-15 as resolved by its quorate meeting.

Please note the following about your ethics approval:

- Renewal of ethics approval is valid for 1 year, subsequent annual renewal will become due on 2025-05-16.
- The Research Ethics Committee (REC) must monitor your research continuously. To this end, you must submit as may be applicable for your kind of research:
  a) annual reports;
  b) reports requested *ad hoc* by the REC;
  c) all visitation and audit reports by a regulatory body (e.g. the HPCSA, FDA, SAHPRA) within 10 days of receiving one;
  d) all routine monitoring reports compiled by the Clinical Research Associate or Site Manager within 10 days of receiving one.
- The REC may select your research study for an audit or a site visitation by the REC.
- The REC may require that you make amendments and take corrective actions.
- The REC may suspend or withdraw approval.
- Please remember to use your protocol number (354/2021) on any documents or correspondence with the Research Ethics Committee regarding your research.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

On behalf of the FHS REC, Dr R Sommers
MBChB, MMed (Int), MPharmMed, PhD
Deputy Chairperson *of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria*

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health).

Research Ethics Committee
Room 4-60, Level 4, Tswelopele Building
University of Pretoria, Private Bag X323
Gezina 0031, South Africa
Tel +27 (0)12 356 3084
Email: deepeka.behari@up.ac.za
www.up.ac.za

Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tša Maphelo

Pelegamotse Tabea Motsilanyane

ANNEXURE G

WORKSHOP PRESENTATION

Pelegamotse Tabea Motsilanyane

ANNEXURE G: WORKSHOP PRESENTATION

Department of Nursing Science

Mrs PT Motsilanyane

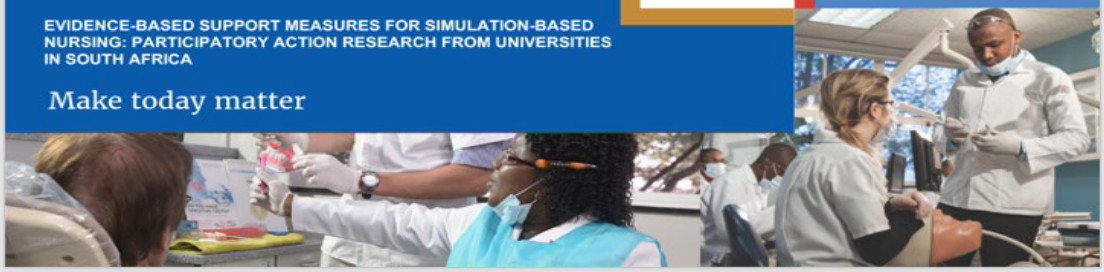
CGMeeting:Orientation to the Study

04 APRIL 2022

EVIDENCE-BASED SUPPORT MEASURES FOR SIMULATION-BASED NURSING: PARTICIPATORY ACTION RESEARCH FROM UNIVERSITIES IN SOUTH AFRICA

Make today matter

Faculty of Health Sciences
Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tša Maphelo



Introduction

- Clinical time in nursing education has been augmented with simulation to accommodate a large number of nursing students in need of clinical experience.
- Students are exposed to the simulation laboratory in order to enhance their preparedness for patient care.
- There are a number of simulators, ranging from low, medium to high fidelity simulators, depending on the degree that they match reality.
- There is underutilisation of both medium and high fidelity simulators whereby lack of support for clinical facilitators is viewed as a as the key aspect to this problem

Problem Statement

- There is a noteworthy concern about underutilisation of the simulation laboratory, despite the ongoing training
- Mostly use low and medium simulators leaving out high fidelity simulators.

- A study conducted by Munangatire and Naidoo (2017:44), point lack of support for clinical facilitators as the key aspect.
- Lack of such support cascades into negative perceptions for the use of HFS, eventually leading to underutilisation thereof.
- May deprive students of experience and confidence
- Thus, the researcher deemed it necessary to conduct PAR with clinical facilitators from other universities that are using low, medium and high fidelity simulators in order to -- explore and describe challenges involved in SBE and
- Will apply the findings to inform evidence-based support measures for simulation-based nursing education.

Research Aim and Objectives

Research Aim

The overall aim of this study will be to apply the findings to inform evidence-based support measures for simulation-based nursing education in these institutions.

NB: Questions and objectives are preliminary as the group will decide on the final ones).

Phase 1:

- ***Research question***: How can a working relationship be established among clinical facilitators as co-researchers?
- ***Research objective***: To establish a working relationship with clinical facilitators participating in the study.

Phase 2:

- ***Research question***: What do you perceive as challenges regarding simulation-based education for students
- ***Research objective***: To explore and describe challenges perceived by clinical facilitators regarding simulation-based **education**.

Phase 3:

- ***Research question***: What are the transformative values that can contribute to the facilitation of clinical simulation-based education?
- ***Research objective***: To identify transformative values that contribute to simulation-based education.

Phase 4:

- ***Research question***: What support measures for simulation-based nursing education can be applied in the selected universities?
- ***Research objective :*** To apply the findings from the three phases to inform evidence-based support measures for simulation-based nursing education.

Theoretical Framework

Transformative learning theory (TLT)

- The study will be guided by TLT
- TLT was chosen because it allows CF an opportunity to critically reflect on challenges in simulation laboratory in order to bring about transformative solutions to SBE.
- Transformation focuses on clinical facilitators engaged in a dialogue on their experiences about the use of SBE.

Paradigmatic Perspective

Transformative paradigm

- Transformative paradigm is participatory and change-oriented.
- Highly dependent on the individual's ability to interpret events, the way of doing, interacting with others
- Transformative methodological assumptions suggest that researchers start with qualitative data collection moments to learn about issue under discussion.

Research Design

Participatory Action Research (PAR)

- The researcher will use PAR research design
- The study of social situations with a view to improving quality of the action within it.
- It Involves Systematic collection and analysis of data for the purpose of taking action and making change" by generating practical knowledge
- The advantage of using PAR is that it emphasises on problem-solving.
- The researcher considered PAR design will be since it is expected that the design can be used to improve simulation-based education.
- CIG as a field in PAR, will be used to direct the study

Research design cont.

Cooperative Inquiry Group

- Co-operative inquiry is a way of working with other people who share similar interests and concerns

- in order to understand the world and learn how to act to change things and how to do things better
- CIG refers to a group of clinical facilitators experienced in clinical simulation as co-researchers and the principal researcher, who will be participating the study.
- 'clinical facilitator' is a nurse educator, a preceptor who facilitates clinical teaching through simulation.

Research Methods

A qualitative approach will be used with emphasis on PAR design.

- ***Phase 1***: World café Thematic data analysis
- ***Phase 2***: Focus group discussion Thematic data analysis
- ***Phase 3***: Focus group discussion Thematic data analysis
- ***Phase 4***: e-Delphi technique Thematic data analysis

Data collection

^ Stages of data

- ***PHASE 1***
- **Stage 1: First reflection phase**;
- Researcher will present the statement of inquiry.
- The researcher and participants will decide on how the statement can be framed to become fruitful for the research process
- The decision on the subsequent session will be made by CIG members.
- ***PHASE 2***
- **Stage 2: First action phase;**
- The CIG will explore challenges regarding simulation-based education which includes teaching and learning as well as what need to be improved when conducting simulation-based education in their second CIG meeting
- **Stage 3: Full immersion in stage two**; deepening of experiences

- ***PHASE 3***
- **Stage 2: First action phase;**
- CIG will be used to identify the transformative values that will contribute to the study.
- **Stage 3: Full immersion in stage two**
- **Stage 4:** Second reflection phase; and
- **Stage 5**: The cyclical inquiry will continue, depending on for special interventions in the action phase .
- **Stage 6:** Final reflection – conclusion of the CI.

Thank You

Pelegamotse Tabea Motsilanyane

ANNEXURE H

QUESTIONS TO PARTICIPANTS POST PRESENTATION

Pelegamotse Tabea Motsilanyane

ANNEXURE H: QUESTIONS TO PARTICIPANTS POST PRESENTATION

Faculty of Health Sciences
Department of Nursing Science

QUESTIONS TO PARTICIPANTS POST PRESENTATION

Thank you so much for listening.

Now…. going back to the presentation

1. How do you feel about the following?
   - research questions
   - research objectives

(Remember like I said these are only preliminary)

1.1 Do you feel comfortable with them? (Please feel free and let's create a sense of ownership to the study)

1.2 OR do you feel we should rephrase them?

NB: Should you want to write down your comment, you are free to do so

Ok Let's tackle them phase by phase…. I can repeat them as we go

2. Now again based on the presentation what do you think could be the solution? Remember this can change based on explored challenged or based on how we want to transform the Simulation-based nursing education

ANNEXURE I

ONLINE CHATS – COOPERATIVE INQUIRY GROUP MEETING

Pelegamotse Tabea Motsilanyane

ANNEXURE I: ONLINE CHATS – COOPERATIVE INQUIRY GROUP MEETING

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences
Department of Nursing Science

Chats during online Cooperative Inquiry Group Meeting

LM There is no pre and post simulation preparation, as preceptors we do everything on our own and is tiring.

As stated that its tiring, It affects my performance as i will be expected to perform at my best abilities.

LM It is time consuming it affects my performance negatively because it limits time I spend with the students.

Some students will show less interest in what I will be demonstrating to them.


we need to collaborate as institutions to continuously learn from each other on how to maneuver around the common challenges we are having in terms of transformative learning


Standardization of policies and procedure across the institutions is vital in that it will facilitate easier transformation

MM Challenge: Manikins in clinical simulation old fashioned ,not upgraded in line with new emerging teaching and learning techniques

Human resource: There is shortage of personnel in the workplace, and that inconvenience students and that lead them to be at the simulation lab longer.

MM Simulation clinical teaching is not correlating with real life/clinical situation as some of new clinical learning techniques are not available in simulation lab

I cannot provide new and updated clinical teaching to students as new clinical information is continous and emerging everyday.


we need to collaborate as institutions to continuously learn from each other on how to maneuver around the common challenges we are having in terms of transformative learning

MM Impact to students: simulation clinical teaching is not correlating with real life/clinical situation as some of new clinical learning techniques are not available in simulation lab

ANNEXURE J

EDITING CERTIFICATE

Pelegamotse Tabea Motsilanyane

ANNEXURE J: EDITING CERTIFICATE

Caption COMMUNICATIONS

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407 West Avenue-
Randburg
2194

28. Nonmber 202.4

TO **WHOM** JT **MAY GONI!:ERN**

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by

Pelegamotse Tabea Motsilanyane

Sincerely

J Musi
Editor

Tel: +27 84 513 3707• Fax: 086 532 6404• e-mail: caption@webmail.co.za • P O Box 1550 • Honeydew • 2040

ANNEXURE K

TRANSCRIPT FOR FOCUS GROUP INTERVIEW

Pelegamotse Tabea Motsilanyane

ANNEXURE K: TRANSCRIPT FOR FOCUS GROUP INTERVIEW

RESEARCH TITLE: "*EVIDENCE-BASED SUPPORT MEASURES FOR SIMULATION-BASED NURSING: PARTICIPATORY ACTION RESEARCH FROM UNIVERSITIES IN SOUTH AFRICA"*

Cooperative Inquiry Meeting

Date: 26/06 Time 17h30

Number of Cooperative group members: Three

Number of Universities: One

Main Research question: *What do you perceive as challenges regarding simulation-based education for students?*

Research Objective: *To explore and describe challenges perceived by clinical facilitators regarding simulation-based nursing.*

Data Analyses:

Researcher together with the CIG member will take part in data analysis. Six phases of thematic data analysis, as outlined by Braun and Clarke (2017:52), will be used to analyse data as follows:

- *Familiarising with data***:**
- *Generating initial codes*
- *Searching for themes:*
- *Reviewing themes*
- *Defining and naming themes*
- *Producing a report:*

Facilitator: OK. Thank you very much for allowing me to record the meeting. And then now that I have already explained everything, at this stage you are requested to describe the challenges that you are faced with, regarding simulation-based nursing
ASM: Myself
ASM: Yeah. Maybe we can start with the challenges that we face as facilitators. Time versus the number of students that we have that they do not have time to practise the skill after it has been demonstrated to them for me that is my first. Oh ok. Concern yah, time to practice the skill, yes, versus the number of students we had, we had, we have many students and the time that is allocated to us in the simulation at times does not just make sense. You demonstrate and then is time to, go so as we practice it becomes a concern

Facilitator: Meaning that they don't even, get a chance to give feedback. **ASM:** One or two would give feedback but in that instance, you will always have the students that are forthcoming and then the ones that are at the back, you are not sure that they understood or they can do the skill or, yah, then they don't ask questions and it is time to go and then in to practice you find that they are not as competent that you could have loved them to be. Ok. Maybe someone can interject yah.
Facilitator: Ok, ok then I understood you.
ASM: My challenge, to continue on what Mas was saying, for example, we have like 60 students in one level, and in the simulation, they don't allow them to be in one room ,
Facilitator: Yes
ASM: For some reason, so when we separate them, it will be different lecturers talking to them, so they don't get the same message at the same time. Ok. That is my challenge because when we start practising, when we get the chance of practicing and then they will say Mam Ma said this way and Mam AM said this way.
Facilitator Ok.
ASM: Another challenge that I have is, in the simulation I will expect us to demonstrate to the student, but we start by still giving the theory. Ok. So the time that is limited is not even enough for demonstration. Because now the time is taken by theory as you say. Yes. Ok. I will get back to that when we summarise.
Facilitator: Ok. Any other one with a different problem or challenge?
ASM: Another challenge is time allocated, for example, with our first years, if they are in the simulation block, where they come to simulation skills, they have one hour 50 minutes, one day. In a week they have only four hours and they are 60. That four hours is supposed to be demonstration and them practicing. Time allocated is not enough. Ok. **ASM:** And the last one from me is, the equipment's, or the consumables, the consumables most of the time they are not what we want them it be, for example, if we do a demonstration for maintaining sterility, with dressing tray, they order different ones from different companies, this year we have the one that doesn't have a towel that makes sterile area, last year we had

one so its not consistent, I don't know if its because of cost or what. Does it make sense what I'm saying?
Facilitator: Okay it does. It does make a lot of sense what you are saying is that like for example you give an example of using a dressing pack when now this year you order from this company that next year you order from a different company of which they don't.
ASM: We have already a tool that says do this, do this, do this and a worst challenge is when they go to the hospital, they don't find those packs. They find something completely different.
Facilitator: So your challenge specifically is based on consumables, because firstly you said equipment or maybe you said equipment by mistake you wanted to talk about the consumables only? Or is there anything you want to say regarding equipment? What can I say with equipment?
ASM: What? What can I say with equipment? The equipment is not that.
MAS: I was saying even the mannequins as we proceed, if you want maybe a pregnant mannequin, they are not enough, the wounds that are not enough, even with the mannequins itself that we use we have to assume a lot which is a concern to the students because I think in simulation we should be as close as we can as to what they are supposed to be seeing in nursing in actual clinical settings and I agree with consumables we have to make sterile unsterile and unsterile sterile in the process where we can find them practicing, we do not get enough and like what AM have said, when you go to the hospitals that we allocate our students, they have never seen , they will not see and I think it's a struggle that will has to be dealt with maybe from the institutions and the university that we are under
Facilitator: Ok. I understand so what you say, you only have one pregnant simulator?
MAS: Not necessarily one but you will find if you want a pregnant you do not get so when we come to formatives and all that, you find you take long or you don't get the same in the rooms because now you have to makeshift of what should be in the scenario for the formative.
Facilitator: Ok if I may ask? What kind of simulators are you using? Is it the high-fidelity simulator, the medium or the low fidelity simulators or you've got all those?

MAS: A little bit of all, but they are not enough for the number of students.
Facilitator: MAB do you have anything to say?
MAB: I can just add just few things, but I haven't been exposed a lot in the simulation of SMU but what I have seen is that time is not enough for the students to practice. I think the simulation is also used by both the doctors and nurses so that's why time is so limited
Facilitator: You are sharing the same structure meaning that there is no area for doctors no special area for nurses?
MAB: Yah it's a booking system where people have to book. If you have booked earlier then it means that you are going to get rooms. And another thing that I haven't seen it where AM was talking about the telemetric technology you see where you present something here some other people can see. I haven't seen it at SMU at simulation lab I haven't seen it yet but I don't know whether its there you know because the students are in large numbers and when they are in large numbers you can even just break the numbers in different rooms and the presenter can also present somewhere alone the students would be able to see this telemedicine whatever but I haven't seen it, I don't know whether its there I don't have to tell the wrong things about the simulation area of the SMU
Facilitator: So do you have a control room because usually it's in the control room where a technician stay there for all the time, she is hired to work in the control room where they will be operating that connection for somebody who is in a specific room and then others are maybe in the gallery they can see actually what is being demonstrated to everybody. I don't know how your rooms are structured
MAB Yah that's why I said I haven't seen it because if that's the case because students numbers, you know they have a lot of students, the numbers are so high so that method can really work, it can work for you, yes for that number of students because we don't have to call them to come to one place and you know they gather there in one area and doing that procedure its also time consuming.
Facilitator: Now if I may ask, how many rooms do you have in your simulation lab?
ASM: Can I come in there

Facilitator: Yes Mam
ASM: hat Mme is saying is we just started it. There, we, I demonstrate through interlink of the rooms and the other students but its still at the teething stages, we started this month like I will be in this room with thirty students and the other students will be in another room watching on the TV, Ok, and even the voice we just started it now
Facilitator: Oh its something new with you?
ASM: Yes
Facilitator: But you people are not new in the simulation lab right?
ASM: No, that system it just started now.
Facilitator: Ok. So you are still familiarising yourself with that?
ASM: Yes and like for example, we did it with only the first years the second years and the third year and the forth level we haven't done. We haven't used it. Oryt. Yes we used it on the first year GNS.
Facilitator: Ok so do you have the control room for that?
ASM: There is no control room, the technician come and setup which it has some challenges because it's a new thing. The technician come and set it up and the volume and the, I think….. We just started that system, its in operation but its at the, like a teething stage.
Facilitator: And the technician is he full time placed in the simulation lab or they just come and go?
ASM: No he is not with us in the room but he is in simulation department.
Facilitator: What I'm saying is, is he employed to work in the simulation lab?
ASM: Yes he is employed loke for example they employed him I think last year if I'm not mistaken, and they bought these mannequins that can make sounds and connected with a simulator to the screen and he is helping with that.
Facilitator: Ok, no I understand that, other simulation laboratory has got that kind of technology we also have that kind of technology even if we still experience some challenges ofcause, yah. Any other challenges?
MAB: I think those are the most critical challenges for us in simulation. The time, the consumables, the equipment and the lack of practice for the students because of the number that they are and that it is a centre that is used by all nurses, physiotherapists, doctors and its per booking and there is a time limit if it could go on and on and on you cannot because at a certain time it has to be closed, it becomes those concerns
Facilitator: Ok, I have got few follow-up questions to you if you don't mind, you spoke about equipment, you said you have got medium, low and high-fidelity simulators so are they all in a working order? Are they all functional? Are they serviced? The way they are supposed to be serviced?

MAB: I can say for example, the defibrillator, not all of them are serviced.
Facilitator: And what about the very simulators the high-fidelity simulators?
ASM: No, they are, some are new and some are working with the battery so if you find you want to use it, and the battery was not charged, it will be a challenge and I think most of us in SMU, the people who are working at the skill lab, the accompanists, we are fairly new like less than five years there. So some of our colleagues, they don't know what is in the simulation so but the director of the simulation department is planning to have a orientation to all of us because some of us they don't know what is therefore they can use.
Facilitator: And then you say you have been there for less than five years?
ASM: Yes
Facilitator: Say for example you have been there for four years, you mean you haven't received that orientation for the period of four years?
ASM: Simulation department and nursing department is too different so that is why Mm was telling you that its used by all the health professionals. So we are in nursing department but we use the simulation department also, the doctors they use it, the physiotherapists they use it, so we have been there but there was an open day where they were introducing new equipment and not everybody attended. Ok. so I can be wrong, but that's my observation
Facilitator: Ok, but those equipment that has been there for long, did you receive an orientation to that?
ASM: Not a formal one because when you come and book for the rooms, you tell the people at skills to say I am going to do abdominal palpation, then they will take out whatever you have asked them to take out, then you only see the mannequin, and the babies and the pregnant at that time. We have not, we don't have open access if I may put it that way, open access that you can go there yourself and take, all these things that you require. So you book and then you state the procedure that you are going to do. Weather its dressing or abdominal palpations or examination of the placenta, then they take out the consumables and the mannequins that can be used, suturing they will take mannequins that requires suturing.
Facilitator: So does that mean that makes your life very difficult when you don't have access to the equipment and you only depending on somebody to bring you what you are asking for? Was it going to be easier if you had access to the stuff that you going to need? Was it going to be a bit easier?
MAS: For me I think it would be easy because you would have the skill, you would have the how to do and then you would prepare according to what is in your procedure manual
Facilitator: Hmmm
MAS So in the midst of somebody preparing for you as much as you go and check you would find that they do not have the dressing that you have asked or now it's a different dressing

pack compared to what is in your procedure manual then you have to, as much as you say you have to be creative and all that and its different rooms, different facilitators, what I'm saying to my group, AM is not saying because we also explaining differently experienced. I might be good in dressing and she's good on management or high care or incubation but then we are found with this skill that must be the same for all the students.
Facilitator: Ok. A follow up question, I had three questions, You answered that one of equipment and then the training, are you receiving any specific training regarding the use of simulators or whatever the training that is required for simulation laboratory before you can get in front of the students and become so competent to say I know everything that I'm supposed to be knowing. Do you receive the proper training?
MAS: From who?
Facilitator: I don't know, from whoever maybe somebody a more qualified in a simulation lab, come to train you or even the manufacturer. My last question. You said you have got less than five years, and which levels are you teaching?
ASM: You mean the student level? Yes. Me teach from first year to fourth level. You teach all the levels in the simulation lab? Yes, because I'm the accompanist. Oh, you are the accompanist? yes, I'm, so we accompany them to the clinical area. So, before we accompany them, we must demonstrate to them in the simulation skill lab.
Facilitator: Ok
ASM: So first years, second year, third and forth are GNS I do
Facilitator: Are you all accompanists, the three of you?
ASM: Yes
Facilitator: Ok. So if you are accompanists, basically most of your time you are in the simulation lab?
ASM: Yes and clinical
Facilitator: You don't do theory?
ASM: No. we should be not doing theory but at the end sometimes it starts with, like she is saying the time will be taken by trying to find a base and trying to find, you know you cannot just start without asking the questions in terms of the objectives that you are going to do and the knowledge that they have, specific to the procedure that you are going to demonstrate.
Facilitator: All right.
MAS: Maybe, yah we are accompanists, there are facilitators that are fully employed for the levels that we are talking. One is doing level 1, level 2,level 3, level 4 and the disciplines but I see that they are not in this meeting I don't know weather do you separate meetings with them or thina we are at the bottom to the action as we…
Facilitator: So the facilitators, they do both the sim and theory? Theory and practical?

ASM: They are suppose to. There is theory lecturers, there is facilitators clinical and then there is us.
Facilitator: Ok. But the information that I got from you will also help me a lot. So is that all before I summarise what you said so that we can agree that I really heard you? Yes. Anything that you want to say before I summarise?
ASM: What I wanted to say is we use facilitators and coordinators interchangeably, there is a level coordinator,
MAS: Hmmm like level 1 coordinator who will talk to the person who is doing theory so that we must follow with the skill so those are the ones that are not in this meeting which I think they would have been of help to you also, yah, so sometimes they say coordinators, facilitators, accompanists.
Facilitator So if I may ask for clarity, coordinators make sure that theory and practica are integrated?
Those are the ones, we are the part-timers, those are the ones who are employed full time so we are the part timers.
Facilitator: Let me summarise quickly what we were talking about. You said you are having huge number of students of which it was not stated, the specific number but somebody in the middle spoke about 60 so I don't know if all the levels are 60 students.
MAS: No, they start at level 1 being 60 but as you know that they drop. Ok, so the 60 is the large but sometimes they go more than 60 because, let me say in second year only 58 passed and then there are those who were remaining so its around 60 65 around there. Ok they don't get enough chance to practice the skill because they are allocated just a limited amount of time. Then they demonstrate, few will manage to give you a feedback, maybe 1 or 2 students will manage to make a feedback but others they don't only to find that when you accompany them to the services then you realise that they, it looks like they haven't learned a lot,
Facilitator: So, you also mentioned that you have got 60 students in level 1 and then they are not all allowed in one room sometimes you separate them into two halves, 30 30 with different lecturers, this is very much interesting to me because when you say you separate them with different lectures does it mean the different lecturers perform one skill at the same time?
MAS: Yes. Ok if it's about wound dressing, I do wound dressing in one room, and then you also do dressing in another room? Yes. Of which the students don't learn from one person?
Facilitator: And you will find that you are the strongest link, I'm the weakest link and then your students are going to benefit more because I'm the weakest link.
Something like that yes because we cannot be the same.

And then you said you start with theory which is taking a lot of your demonstration time so when you said theory, does it mean…….And then you said for first year you allocate 1 hour 50 minutes?
Yes.
Facilitator: But its not possible that 1 hour 50 minutes can be 4 hours in a week.
She has to answer that she does most of the first years but I know they have 1 Friday afternoon and then Wednesday in the morning. They do theory and then they do practice In the skills centre. Ok. I have to verify the times, they do on different days. Ok.
Facilitator: And then, one other thing that you mentioned, you spoke about the consumables, the challenges, I'm not going to get much into that because I understood well when she was giving an example of pack ordering packs from different companies of which you don't get same stuff. And then you are running short of mannequins, you don't have enough to cater for all disciplines, doctors, physiotherapists and nurses. You should be having more than
MAS I think the clinical facilitators agree we have a scheduled and then we know that your students will be in skills on this particular day in that month after they do blocks. And yes, in that block you have to book your sessions, the procedures that you are going to do and align them to their skill centre. They will tell you we are open here, we are not open there, so it has to be coordinated for all people that use the Skills Lab. Even if you book in advance at sometimes and then you find that there's a doctor's exams or what do they call it? H PS A is coming, then they will move you or then they can take those slots as much as you have booked in advance
Facilitator: It but sometimes the challenge they take your slot.
MAS: Yes
Facilitator: Because of exams or because they need to demonstrate for other disciplines. Who did not book?
Mas: I don't know. I agree. Then they will say no. We had a booking, but this health professional cancel. A bo di-exams or whatever they call it. Then you are all now moved. To I don't know whether the after us or they booked before us or there's double booking. I would not know
Facilitator: Alright, then the last thing that I am going to reflect on is this one of orientation which you have never received a formal orientation.
Masentle: The skills that.
Facilitator: To say you know everything that is happening, even though you did not receive a formal orientation, everybody knows that it is an ongoing process. But there is no orientation process taking place right?

MAS: No, I'm maybe they are looking at it now. We are not. We are just like this is the Skills lab and you book and then you tell the procedure and then you will take out what you require based on what we have.
Facilitator: OK: Ohh right. Yeah, I think that is that. And then you are lacking access to the equipment such that you have to depend on someone and you cannot be creative.
MAS: Hmm. You can be creative. You just have to ask for things that are on the list.
Facilitator: But if they are not there, you cannot just decide now that I see this, let me improvise because I can unlike when you can't see what is in stock.
MAS: Yes, that's where the assumptions arise. Assume that this is for example Normal saline .
Facilitator: Yeah, I think we have covered all.
MAS: Hmm.
Facilitator: Yeah Thank you very much for attending this meeting. I mentioned that this is voluntarily, but I appreciate your attendance so very much. I appreciate and I'm still going to invite you with the next meeting which probably will be the last meeting if I have another meeting of this kind. At your university. Yeah. And I'm happy that I got different challenges from other universities.
MAS: The pledge, OK.
Facilitator: Thank you so much. Thank you so much. My sister, if you don't mind, can you take my number, please? And then send me a WhatsApp and send me. The numbers for the two ladies who were with us, please.
MAS: OK, just hold for me.
MAS: Okay I will do that, and I will include the two that were with us
Facilitator: Yes and thank you so much. Then if you have got a challenge, maybe you are you join outside the university, you can just tell me. Then I can send you a data.
MAS: Yeah, but we it's OK with me. Do not worry about it. But I will tell the others. Ohh.
Facilitator: I can as well tell them in the on WhatsApp if you. On WhatsApp, yeah.
MAS: Yeah, you can tell them in the WhatsApp. I think I will create and then you take it from there with other. Hey, let me saying.
Facilitator: Thank you so much. I'll wait for you for your WhatsApp.
MAS: OK, I'll do so. Thank you. Good luck.

ANNEXURE L

TURNITIN REPORT

Pelegamotse Tabea Motsilanyane

ANNEXURE L: Turnitin Report

PhD Thesis Submission

by PT (Pelegamotse) Motsilanyane

Submission date: 06-Dec-2024 12:38PM (UTC+0200)
Submission ID: 2542832138
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Character count: 359251

PhD Thesis Submission

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