

# **EXPERIENCES OF OPERATING ROOM STAFF ABOUT THE ROLE OF THEATRE TECHNICIANS IN PERI-OPERATIVE NURSING**

**LORAIN VISZOLAI**

Thesis presented in partial fulfilment of the requirements  
for the degree of Master of Nursing Science  
in the Faculty of Medicine and Health Sciences  
at Stellenbosch University



**Supervisor: Professor E.L. Stellenberg**

**March 2016**

## DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Signature: .....

Date:

# ABSTRACT

## Background

Unregulated theatre technicians allocated in scrub, circulating or anaesthetic assistant roles challenge traditional nursing roles in the operating room. No evidence could be found on the role of theatre technicians within the South African context, whilst such changes have an unknown effect on peri-operative patient care.

## Research question

The study was guided by the question: “What are the experiences of operating room staff about the role of theatre technicians within peri-operative nursing?”

## Aim

The aim of this study was to explore the experiences of operating room staff about the role of theatre technicians in peri-operative nursing.

## Objectives

The objectives of this study were to gain an understanding of the experiences of operating room staff about the role of theatre technicians in peri-operative nursing with specific reference to:

1. Pre-operative nursing
2. Intra-operative nursing
3. Post-operative nursing
4. The supervision by professional nursing practitioners when theatre technicians are allocated to peri-operative nursing roles.

## Research process

A descriptive qualitative research design was applied in this study. Ethics approval was obtained from the Health Research Ethics Committee of Stellenbosch University and three private healthcare organisations in the Cape Metropolitan area prior to the study.

A pilot interview was conducted after which data was collected during semi-structured, audio recorded interviews with fourteen purposefully selected participants to whom pseudonyms were allocated to ensure anonymity. The interviews were transcribed, themes were induced and data was coded and elaborated upon whilst applying Lincoln and Guba’s criteria of credibility, transferability, dependability and conformability to enhance the trustworthiness of the study.

## **Results**

The study found that theatre staff experienced overlapping roles between the roles of theatre technicians and that of operating room (OR) qualified professional nurses (PNs), as well as diverse views on comprehensive peri-operative care. Vague role boundaries were demonstrated through similar role expectations of staff in the scrub, circulator and anaesthetic assistant roles: “I don’t think there is a scope of practice for us... that says...this is what you do, this is what you don’t do” (Participant 12). However, within these roles, theatre technicians’ technical focus opposed the holistic patient care approach by OR qualified PNs. Holistic care, which necessitates an understanding of existing patient conditions, was associated with the anticipation and prevention of peri-operative risks.

Surgical team composition seems undirected by standards and unguided by a required level of supervision. In the high risk OR environment, staff shortages and vague role expectations are linked to unclear responsibility. Coupled with limited information about team members’ credentials and their role boundaries, OR staff report conflict and leadership uncertainty, highlighted by theatre technicians’ educational backgrounds: “I (surgeon) think their training must be done differently to give them insight into what they do” (Participant 5).

## **Conclusion**

The study emphasised unclear supervision requirements and questionable accountability of theatre technicians, although theatre staff experienced theatre technicians’ role as similar to that of OR qualified PNs.

As voiced by participant 7: “If there is a real emergency...I (theatre technician) will be worried”. Thus, theatre technicians’ ambiguous role expectations require clarification as peri-operative risk prevention is fundamental to safe surgical care.

# OPSOMMING

## Agtergrond

Die ongereguleerde aanwys van teatertergnici om te skrop, te sirkuleer of as narkose-assistent rolle te vervul, is 'n uitdaging vir tradisionele verpleegrolle in die operasie-saal. Geen bewys kon gevind word oor die rol van teatertergnici binne die Suid-Afrikaanse konteks nie, terwyl sulke benaderinge 'n ongekende effek op operatiewe pasiëntsorg het.

## Navorsingsvraag

Hierdie studie is gelei deur die vraag: "Wat is die ervaringe van personeel in die operasie-saal oor die rol van teatertergnici binne peri-operatiewe verpleging?"

## Doel

Die doel van hierdie studie is om die ervaringe van personeel in die operasie-saal oor die rol van teatertergnici in peri-operatiewe verpleging te ondersoek.

## Doelwitte

Die doelwitte van hierdie studie is om 'n begrip te verkry van die ervaringe van die personeel in die operasie-saal oor die rol van teatertergnici in peri-operatiewe verpleging met spesifieke verwysing na:

1. Pre-operatiewe verpleging
2. Intra-operatiewe verpleging
3. Post-operatiewe verpleging
4. Die toesighouding deur professionele verpleegkundiges wanneer peri-operatiewe verpleegrolle aan teatertergnici toegeken word.

## Navorsingsproses

'n Beskrywende kwalitatiewe navorsingsontwerp is in hierdie studie toegepas. Etiese goedkeuring is van die Gesondheidsnavorsingsetiekkomitee aan die Universiteit van Stellenbosch en drie private gesondheidsinstellings in die Kaapse Metropolitaanse area, voor die studie verkry.

'n Loodsprojek was na die insameling van data gedurende semi-gestruktureerde, oudio-opnames met veertien doelbewus geselekteerde deelnemers aan wie skuilname toegeken is om anonimiteit te verseker, gedoen. Die onderhoude is getranskribeer, temas bepaal, data gekodeer en uitgebrei, terwyl Lincoln en Guba se kriteria van geloofwaardigheid,

oordraagbaarheid, afhanklikheid en ooreenstemmigheid om die betroubaarheid van die studie te versterk, toegepas is.

### **Resultate**

Die studie het getoon dat teaterpersoneel oorkoepelende rolle het wat die rol van teatertegnici, asook die van operasie-saal gekwalifiseerde professionele verpleegsters behels, met uiteenlopende sieninge oor komprehensiewe peri-operatiewesorg. Vae rolgrense is gedemonstreer deurdat personeel wat skrop, sirkuleer en narkose-assistent is, dieselfde rolverwagtinge het: “Ek dink nie dat daar ‘n bestek van praktyk vir ons in die praktyk is nie.. ...wat sê dis wat jy doen, dis wat jy nie doen nie” (Deelnemer 12). Nietemin, binne hierdie rolle is die teatertegnici met hul tegniese fokus in teenstelling met die holistiese benadering vir pasiëntsorg van operasie-saal professionele verpleegsters. Holistiesesorg waarvoor daar ‘n begrip van bestaande pasiënttoestande moet wees, word geassosieer met die antisipering en voorkoming van peri-operatiewe risiko’s.

Die samestelling van chirurgiese spanne kom voor asof dit nie deur standarde of ‘n vereiste vlak van toesighouding bepaal word nie. In die hoë risiko operasie-saal omgewing, word personeeltekorte en vae rolverwagtinge gekoppel aan onduidelike verantwoordelikhede. Gekoppel aan beperkte inligting oor spanwerkers se gekwalifiseerdhede en hulle rolgrense, rapporteer operasie-saal personeel konflik en leierskap onsekerhede, wat deur teatertegnici se opvoekundige agtergronde aan die lig gebring word: “Ek (chirurg) dink hulle opleiding moet verskillend wees om hulle die insig te gee oor wat hulle doen.” (Deelnemer 5)

### **Gevolgtrekking**

Die studie beklemtoon onduidelike toesigvereistes en bevraagteken aanspreeklikheid van teatertegnici, alhoewel teaterpersoneel die rol van teatertegnici dieselfde as die van operasie-saal professionele verpleegkundiges ervaar.

Soos aangehoor deur deelnemer 7: “As daar ‘n werklike noodgeval.... sal ek (teaterteknikus) bekommerd wees”. Dus, teatertegnici se onduidelike rolverwagtings noodsaak duidelikheid, omdat peri-operatiewe risiko-voorkoming fundamenteel vir veilige chirurgiese sorg is.

## ACKNOWLEDGEMENTS

I would like to express my sincere thanks to:

- My study supervisor, Professor E.L. Stellenberg, who guided, corrected and supported me throughout the study.
- The three healthcare organisations for granting me permission to conduct the study in their clinical facilities.
- The theatre managers who welcomed me behind that notorious red line, and the participants who shared their valuable experiences without hesitation.
- The Harry Crossley Foundation, for partially funding this study.
- The research team and my colleagues at the Division of Nursing, for their advice and support.
- Zea, Liam, Karel, my family and friends: without your support, this journey would have been much more arduous, and without the Grace of God, impossible.

## TABLE OF CONTENTS

<b>Declaration</b> .....	<b>ii</b>
<b>Abstract</b> .....	<b>iii</b>
<b>Opsomming</b> .....	<b>v</b>
<b>Acknowledgements</b> .....	<b>vii</b>
<b>List of tables</b> .....	<b>xiii</b>
<b>List of figures</b> .....	<b>xiv</b>
<b>Appendices</b> .....	<b>xv</b>
<b>Abbreviations</b> .....	<b>xvi</b>
<b>Chapter 1: Foundation of the study</b> .....	<b>1</b>
1.1 Introduction.....	1
1.2 Significance of the problem .....	2
1.3 Rationale .....	2
1.4 Research problem .....	5
1.5 Research question .....	6
1.6 Research aim .....	6
1.7 Research objectives .....	6
1.8 Conceptual framework .....	6
1.9 Research methodology .....	8
1.9.1 Research design .....	8
1.9.2 Study setting.....	8
1.9.3 Population and sampling .....	8
1.9.4 Data collection instrument.....	9
1.9.5 Pilot interview .....	9
1.9.6 Trustworthiness .....	9
1.9.7 Data collection.....	9
1.9.8 Data analysis.....	9
1.10 Ethical considerations .....	10
1.10.1 Right to self-determination .....	10
1.10.2 Right to confidentiality and anonymity.....	10
1.10.3 Right to protection from discomfort and harm .....	10
1.11 Operational definitions.....	10
1.12 Duration of the study .....	11

1.13	Chapter outline .....	12
1.14	Significance of the study .....	12
1.15	Summary .....	13
1.16	Conclusion.....	13
<b>Chapter 2:</b>	<b>Literature review.....</b>	<b>14</b>
2.1	Introduction.....	14
2.2	Selecting and reviewing the literature .....	14
2.3	Peri-operative patient care .....	15
2.4	Operating room teamwork.....	15
2.5	Peri-operative role expectations.....	16
2.5.1	Role clarification.....	17
2.5.2	Operating room leadership.....	17
2.6	Operating room roles.....	17
2.6.1	Role of operating room professional nurses.....	18
2.6.1.1	<i>Peri-operative nursing competence</i> .....	18
2.6.1.2	<i>Coordination of care</i> .....	18
2.6.1.3	<i>Operating room professional nurse clinical roles</i> .....	19
2.6.2	Role of theatre technicians.....	19
2.6.3	Legislation and qualifications .....	20
2.6.3.1	<i>Legislation</i> .....	20
2.6.3.2	<i>Qualifications</i> .....	21
2.6.4	Peri-operative scrub, circulator and anaesthetic assistant roles .....	22
2.6.4.1	<i>Peri-operative role of the circulator</i> .....	22
2.6.4.2	<i>The scrub role</i> .....	22
2.6.4.3	<i>The anaesthetic assistant role</i> .....	22
2.7	Peri-operative phases .....	22
2.7.1	Pre-operative phase.....	23
2.7.2	Intra-operative phase .....	24
2.7.3	Post-operative phase .....	25
2.7.3.1	<i>Post-anaesthetic care role</i> .....	25
2.7.3.2	<i>Post-operative nursing tasks</i> .....	25

2.8	Operating room competencies .....	26
2.8.1	Technical competencies.....	26
2.8.2	Non-technical competencies .....	27
2.9	Operating room staffing.....	27
2.10	Staffing ratios .....	28
2.11	Nursing shortages .....	29
2.12	Risk prevention.....	29
2.13	Conceptual framework .....	31
2.14	Summary .....	32
2.15	Conclusion.....	33
<b>Chapter 3:</b>	<b>Research methodology.....</b>	<b>34</b>
3.1	Introduction.....	34
3.2	Aim and objectives .....	34
3.3	Study setting.....	34
3.4	Research design .....	35
3.5	Population and sampling .....	36
3.5.1	Inclusion criteria .....	38
3.5.2	Exclusion criteria .....	38
3.6	Instrumentation.....	38
3.7	Pilot interview .....	38
3.8	Trustworthiness .....	39
3.8.1	Credibility.....	39
3.8.2	Transferability.....	40
3.8.3	Dependability.....	40
3.8.4	Confirmability.....	41
3.9	Data collection.....	41
3.10	Data analysis.....	43
3.10.1	Familiarisation and immersion: Step 1 .....	43
3.10.2	Inducting themes: Step 2.....	43
3.10.3	Coding: Step 3.....	43
3.10.4	Elaboration: Step 4.....	43
3.10.5	Interpretation and checking: Step 5.....	44
3.11	Summary .....	44

<b>Chapter 4: Findings</b> .....	<b>45</b>
4.1 Introduction.....	45
4.2 Section A: Biographical data .....	45
4.3 Section B: Themes emerging from the interviews.....	46
4.3.1 Theme 1: Overlapping roles .....	47
4.3.1.1 <i>Sub-theme 1: Procedural competence</i> .....	47
4.3.1.2 <i>Sub-theme 2: Theoretical knowledge</i> .....	49
4.3.1.3 <i>Sub-theme 3: Role expectations</i> .....	50
4.3.1.4 <i>Sub-theme 4: Role boundaries</i> .....	52
4.3.2 Theme 2: Team composition.....	53
4.3.2.1 <i>Sub-theme 1: Staff credentials</i> .....	53
4.3.2.2 <i>Sub-theme 2: Conflict</i> .....	54
4.3.2.3 <i>Sub-theme 3: Supervision</i> .....	54
4.3.2.4 <i>Sub-theme 4: Leadership</i> .....	55
4.3.3 Theme 3: Comprehensive patient care .....	55
4.3.3.1 <i>Sub-theme 1: Patient interaction</i> .....	56
4.3.3.2 <i>Sub-theme 2: Prevention of risks and patient safety</i> .....	56
4.3.4 Theme 4: The healthcare environment .....	57
4.3.4.1 <i>Sub-theme 1: Career development and training</i> .....	57
4.3.4.2 <i>Sub-theme 2: Staff shortages</i> .....	58
4.3.4.3 <i>Sub-theme 2: Insufficient information</i> .....	58
4.4 Summary .....	59
<b>Chapter 5: Discussion, conclusions and recommendations</b> .....	<b>60</b>
5.1 Introduction.....	60
5.2 Discussion .....	60
5.2.1 Objective 1: The role of theatre technicians in pre-operative nursing .....	61
5.2.2.1 <i>Theme 2: The composition of the surgical team</i> .....	61
5.2.2.2 <i>Theme 1: Overlapping roles</i> .....	61
5.2.2 Objective 2: The role of theatre technicians in intra-operative nursing .....	65
5.2.2.1 <i>Theme: Overlapping roles</i> .....	65
5.2.3 Objective 3: The role of theatre technicians in post-operative nursing.....	69

5.2.3.1	<i>Theme: Comprehensive post-operative patient care</i> .....	69
5.2.4	Objective 4: Supervision of theatre technicians by professional nurses .....	71
5.2.4.1	<i>Theme: Team composition</i> .....	71
5.2.4.2	<i>Theme: The healthcare environment</i> .....	73
5.3	Conceptual framework of the study .....	76
5.4	Limitations of the study.....	77
5.5	Conclusions.....	77
5.6	Recommendations .....	78
5.6.1	Recommendation 1: Establish role boundaries and role content for theatre technicians .....	78
5.6.2	Recommendation 2: Establish and implement the required level of training and supervision for theatre technicians.....	78
5.6.3	Recommendation 3: Establish and implement guidelines regarding the composition of the surgical team.....	79
5.6.4	Recommendation 4: Identification of peri-operative staff and their related competencies .....	79
5.6.5	Recommendation 5: Prioritize peri-operative patient safety.....	79
5.6.6	Future research .....	80
5.7	Dissemination.....	80
5.8	Conclusion.....	80
	<b>References</b> .....	<b>81</b>
	<b>Appendices</b> .....	<b>88</b>

## LIST OF TABLES

Table 1.1: Approval from private healthcare organisations.....	12
Table 4.1: Biographical Data.....	46
Table 4.2: Themes and sub-themes .....	47

# LIST OF FIGURES

Figure 1.1: Conceptual map: Comprehensive peri-operative patient care..... 8

## APPENDICES

Appendix 1: Ethical approval from Stellenbosch University .....	88
Appendix 2: Permission from the healthcare organisations .....	91
Appendix 3: Participant information leaflet and declaration of consent by participant and investigator .....	95
Appendix 4: Interview guide .....	99
Appendix 5: Confidentiality agreement with data transcription verifier .....	100
Appendix 6: Extract of transcribed interview .....	101
Appendix 7: Declarations by language and technical editors .....	104
Appendix 8: Financial support from the Harry Crossley foundation .....	106

## **ABBREVIATIONS**

OR	Operating room
PN	Professional nurse
ENA	Enrolled nursing Auxiliary
AORN	Association for Peri-Operative Registered Nurses
SANC	South African Nursing Council
EN	Enrolled nurse

# CHAPTER 1: FOUNDATION OF THE STUDY

## 1.1 INTRODUCTION

The study sought to gain insight into the current role of theatre technicians in the private hospital sector of the Western Cape operating rooms as experienced by peri-operative staff. Chapter one presents the foundation for the study, including the rationale, significance, conceptual framework, research question, aim and objectives and a brief of the research methodology. Furthermore, a conceptual framework is used to align nurses' contribution to the care of the surgical patient to the Dreyfus Model of Skill Acquisition as described in Benner's philosophy (Benner, 1982:407).

Peri-operative nursing refers to the delivery of care within the framework of the nursing process during the pre- intra- and post-operative phases (Rothrock, 2011:1). This is distinctly different from conventional bedside nursing (Gillespie, Polit, Hamlin & Chaboyer, 2012:91). Peri-operative nurses apply specialised skills to analyse the condition of the patient whilst coordinating care provided by other healthcare practitioners (Meretoja & Koponen, 2011:420). Duvall and Andrews (2013:310) also emphasises the necessity for specialised nurses to promote patient safety. In addition to competent practitioners, effective teamwork is dependent on clear role expectations (Hull, Arora, Kassab, Kneebone & Sevdalis, 2011:25).

The operating room (OR) specialised professional nurse (PN) traditionally functioned as a scrub practitioner. With the change of this trend internationally, the PN functions as a circulating nurse in the United Kingdom and United States of America. The Association for Peri-Operative Registered Nurses (AORN) associates the role of the circulator with the ability to focus less on the technical aspect of OR nursing, thus shifting more focus to the coordination of patient care whilst supervising a trained subordinate practitioner (Association for Peri-Operative Practice, 2013:208).

Peri-operative care is rendered simultaneously by various healthcare professionals with regard to patient tasks, equipment and provision tasks as well as communication tasks (Russ, Arora, Wharton, Wheelock, Hull, Sharma, Darzi, Vincent & Sevdalis, 2013:478). Thus, in addition to supervision of subordinate practitioners, the expert OR nurse must also analyse the condition of the patients and ensure their well-being from various perspectives, whilst coordinating care provided by other healthcare practitioners (Meretoja & Koponen, 2011:420).

Competent patient care is dependent on adequate staffing with consideration of non-technical and technical skills (Gillespie et al., 2012:91). However patient safety, leadership and training

of new staff are affected by an international shortage of specialised nurses (Duvall & Andrews, 2010:312).

Additional optimal competencies for peri-operative care, based on Benner's philosophy, were identified by Meretoja and Koponen (2011:419). They state that accountability for the surgical patient is underpinned by the nurse's ability to make ethically appropriate decisions in life-threatening situations.

The allocation of roles to team members should therefore facilitate comprehensive peri-operative patient care by incorporating team members with technical competence, non-technical skills and expert knowledge to coordinate care.

## **1.2 SIGNIFICANCE OF THE PROBLEM**

In South Africa, no research evidence could be found about the role application and staffing ratios of OR staff since the inclusion of theatre technicians in OR teams. The findings of this study will thus inform policy makers in health, nursing education and various stakeholders about the roles of theatre technicians in OR, as experienced by OR staff. Appropriate interventions based on scientific evidence may then be introduced to ensure patient safety and quality of care.

## **1.3 RATIONALE**

The OR is a high-risk, high stress environment necessitating comprehensive patient care, delivered by expert healthcare providers (Russ et al., 2013:478). The safety of the surgical patient is dependent on effective peri-operative inter-professional teamwork (Cohoon, 2011:557) and healthcare practitioners who function within clearly defined roles (Hull et al., 2011:25).

As regulated by the Health Professionals Council, medical practitioners include surgeons, surgical assistants and anaesthetists in South Africa (SA), whilst nursing practitioners are regulated by the South African Nursing Council. As experienced by the researcher in the OR, nursing practitioners typically function as members of the sterile team, namely as a "scrub" practitioner, or as unsterile team member in the circulator role or assistant to the anaesthetist.

Peri-operative nursing diagnosis is grounded in the prevention of harm (Rothrock, 2011:3). The anticipation, prevention and early detection and management of complications may prevent serious harm to patients in the OR (Hoyland & Thomassen, 2014:77).

However, there is a shortage of specialised OR nursing practitioners (Zinn, Guglielmi, Davis & Moses, 2012:653). In response to this shortage of OR nurses, operating department assistants were trained in the United Kingdom (Timmons, 2010:338). Similarly, in South Africa, theatre technicians are employed in the OR (Mediclinic, 2014; Life Healthcare, 2014; Netcare, 2014). The researcher experienced that the inclusion of non-professional, unregistered theatre technicians, culminated into significant changes to task allocation within the OR workforce, thereby challenging traditional nursing roles. In addition, no evidence could be found of national OR workforce standards, thus, task delegation might be at the discretion of OR managers in South Africa.

The negotiation of task division and authorising groups to undertake certain task-bundles within a certain context, can be seen as role content (Maxwell, Baillie, Rickard & McLaren, 2013:623). Dependent on clear role expectations, effective teamwork will emphasise patient care by promoting communication and minimizing risks (Hull et al., 2011:25). Role confusion, conflict and poor relationships may result from unclear role definitions when new roles are introduced (Maxwell et al., 2013:623). Grando, Peleg, Cuggia and Glasspool (2011:140) state that task delegation should be in accordance with workplace policy and at the appropriate level of supervision. They further state that a supervision system should be in place to ensure patient safety (2011:141).

The researcher observed that a professional nurse (PN) is not always included in the surgical team in Western Cape operating rooms, and that the role of theatre technicians as scrub, circulator or anaesthetic assistants, correspond with that of nursing.

Internationally, references to theatre technicians as part of the OR team vary with regard to educational qualifications, role descriptions, titles and professional registration. In the United States, theatre technicians may obtain a degree, diploma or certificate to qualify as a surgical technician and obtain certification (EduSearch Network, 2015). The United Kingdom employs registered operating department practitioners and other support workers and healthcare assistants in the OR (Association for Peri-operative Practice, 2014). In South Africa different titles and educational levels also apply to theatre technicians in the OR. However, OR theatre technicians in SA are not registered as health professionals, nor are they regulated by legislation (Allied Health Professions Council of South Africa, 2013).

According to training brochures, theatre technicians function as operating department assistants or operating department practitioners, and are trained to provide peri-operative care in the OR (Mediclinic, 2014; Life Healthcare, 2014; Netcare, 2014). Training brochures further

describe their tasks which include pre-operative theatre preparation, assist with anaesthesia during surgical procedures, be a sterile team member and provide post-operative patient care.

However, as observed by the researcher, in South Africa, the OR qualified PN generally acts as the scrub practitioner, while the non-professional nurses are usually allocated in the role of circulating and anaesthetic nurses. These roles, historically uncontested, shifted since the inclusion of theatre technicians as scrub, circulating and anaesthetic assistants. Subsequently, inconsistent peri-operative roles and team compositions have been observed.

Evidently, patient safety in the OR is reliant on specialised care. Position statements by the AORN declare that a qualified registered nurse should be allocated to each surgical patient (Association for Peri-Operative Practice, 2013:208), and only care for one patient at a time (Rothrock, 2011:15). Validating this requirement, Californian state law mandates a minimum nurse to patient ratio in the OR as 1:1 (Agency for Healthcare Research and Quality, 2014:1). Benner also emphasises individualised patient care according to the needs of each patient to avoid risks (George, 2011:593). Substantiated further, Rauta, Salanterä, Nivalainen and Junttila (2012:1395) identify the PN to provide safety aspects essential to peri-operative patient care.

According to Gillespie et al. (2012:97), technical skills in the OR include the maintenance of sterility, handling and assembly of surgical instruments and participation during surgical procedures. The competent practitioner who provides these technical skills in the OR requires foundational knowledge of anatomy, physiology, surgical procedures, and intra-operative risk factors to ensure that safe nursing interventions are initiated, anticipated and associated risks prevented (Rothrock, 2011:1,15).

A non-technical nursing skill, such as critical thinking in the OR is based upon experience, knowledge and expertise (Gillespie et al., 2012:91). These researchers identified leadership, collaboration, empathy and professional development as non-technical skills of the OR nurse.

Patient safety may also be influenced by organizational structures if reported events do not lead to changing practices. As reported in a South African study, half of the participating professional nurses were doubtful whether hospital management addressed reported patient care issues (Blignaut, Coetzee & Klopper, 2014:229). Considering that the OR is often the highest revenue-incurring department, under-utilization translates into financial losses (Hoyland & Thomassen, 2014:76). They further state that the demand for productivity may outweigh the time spent on risk prevention and that health facilities may be pressurised to either increase staff-workloads, or managers may opt to utilize less qualified staff.

The absence of practice standards regarding task allocation and staffing norms leave nursing managers ill-equipped to negotiate recruitment, placement and additional training of staff. Consequently, financial aspects regarding staffing may become a deciding factor with the current inability to quantify the contribution of nurses in healthcare (Lin & Liang, 2007:27). Wyatt (2013:270) urges an understanding of the effect of workforce changes and to increase recognition for the contribution that nurses make towards successful patient outcomes.

Nurses should work to the full extent of their training, take part in the planning of patient care and participate in policy formulation to provide comprehensive peri-operative care (Wyatt, 2013:270). However, Cohoon (2011:561) states that inconsistent information and incorrect patient monitoring are the predominant team factors that most frequently cause near miss adverse events in the OR.

The prevention of harm to surgical patients is illustrated in SA case law. As stipulated in Isaacs vs Pandie (Western Cape High Court, 2012: JDR 0866), a court will regard the diligence and level of skill expected from a practitioner related to the branch of the profession to which such practitioner belongs. In the stated case, surgery was performed without the required consent; reference is made to the responsibility of nursing practitioners and the surgeon with regard to obtaining and verification of consent to surgical procedures.

The absence of staffing norms and team factors, together with role confusion may increase safety risks to the patient in the OR, compounded by inexperienced practitioners performing tasks with questionable accountability.

Changes in OR staffing have an unknown effect on patient safety and the quality of the care rendered to the surgical patient (Wyatt, 2013:269). No evidence could be found on how healthcare professional experience the role of theatre technicians in the OR, necessitating an exploration into these roles.

#### **1.4 RESEARCH PROBLEM**

Based on the rationale, no South African research evidence could be found on how the roles of theatre technicians in the OR are currently incorporated into professional healthcare teams to facilitate the delivery of safe peri-operative patient care. Furthermore, no evidence could be found on practice standards to prevent unregulated practitioners from providing unsupervised care to surgical patients. The qualified professional nurse OR practitioner may be excluded from the peri-operative healthcare team, and substituted by unregulated practitioners. Thus, an exploration of the experiences of operating room staff with regard to the role of theatre technicians in the OR is compelling.

## **1.5 RESEARCH QUESTION**

The study was guided by the research question, “What are the experiences of operating room staff about the role of theatre technicians within peri-operative nursing?”

## **1.6 RESEARCH AIM**

The aim of this study was to explore the experiences of operating room staff about the role of theatre technicians in peri-operative nursing.

## **1.7 RESEARCH OBJECTIVES**

The objectives of this study were to gain an understanding of the experiences of operating room staff about the role of theatre technicians in peri-operative nursing with specific reference to:

1. Pre-operative nursing (Pre-operative patient visits and nursing care planning, theatre preparation for the surgical procedure and anaesthesia, involvement and communication within the healthcare team with regard to the planning for intended procedure)
2. Intra-operative nursing (scrubbing for surgical cases, circulating during procedures, swab, sharp and instrument control, specimen control, assisting with anaesthetics and transfer and handover to recovery room)
3. Post-operative nursing (recovery room nursing: involvement in the post-operative nursing assessment, management, discharge and handover of the surgical patient)
4. The supervision by professional nursing practitioners when theatre technicians are allocated to peri-operative nursing roles.

## **1.8 CONCEPTUAL FRAMEWORK**

Competence, staffing and teamwork have an influence on comprehensive peri-operative (pre-operative, intra-operative and post-operative) patient care. Gillespie et. al. (2012:91), state that competent patient care in the OR is dependent on behaviour, technical and non-technical skills. Duvall and Andrews (2010:310) further indicate the necessity for specialised nurses to promote patient safety. In addition, teamwork, with an emphasis on patient care, is dependent on clear role expectations (Hull et al., 2011:25).

The concepts of competence, staffing and teamwork can further be related to Benner’s levels of proficiency, based on the Dreyfus model of skill acquisition (Benner, 1982:402).

As described by Vos et al., (2011:37), models can be used in social science to emphasise certain obvious concepts, whilst acknowledging that it is a partial representation of a

phenomenon. Similarly, this study was partially guided by a conceptual framework correlating with Benner's levels of proficiency, which was used to depict associated concepts.

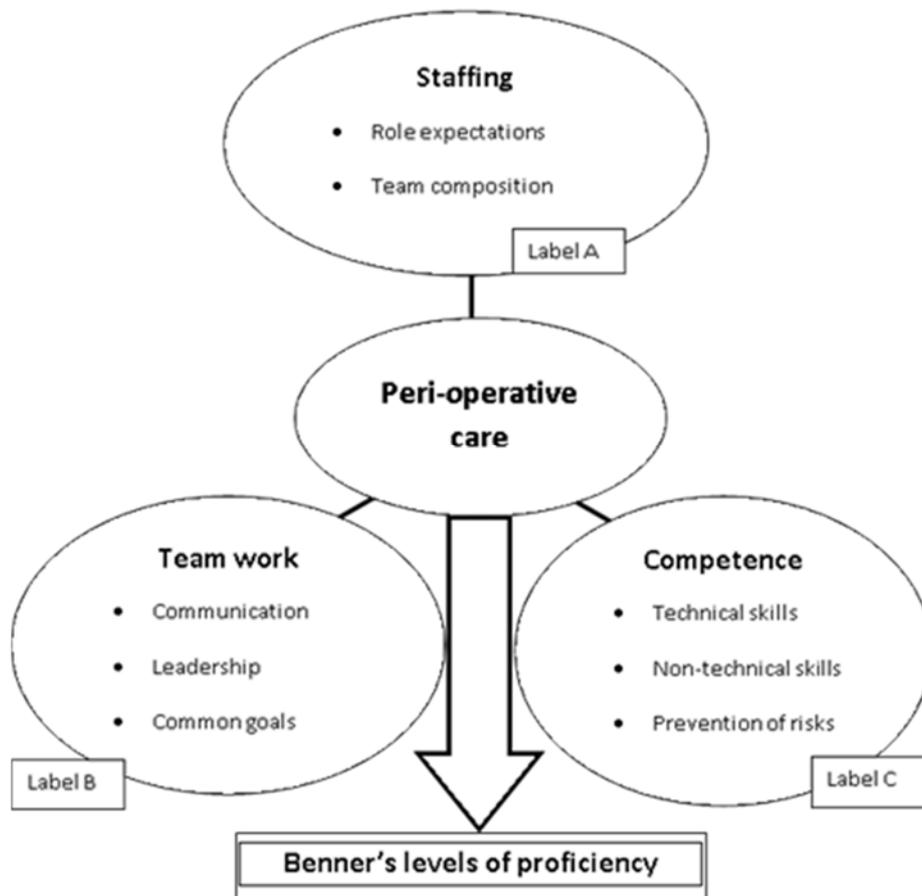
Benner states that expert nurses are vigilant in monitoring the condition of the patient, and is able to remain composed in rapidly changing situations as described in George (2011:585). Expert nurses are guided by professional standards, equipped to advocate for a patient and to collaborate with other professionals (George, 2011:585), which is an important skill when caring for unconscious patients (Meretoja & Koponen, 2011:420; Rothrock, 2011:9).

The three labels on the following conceptual map are explained as shown in figure 1.1.

**Label A:** Competent patient care is dependent on adequate staffing (Gillespie et al., 2012:91) as peri-operative care is rendered simultaneously by various healthcare professionals (Russ et al., 2013:478). Each surgical procedure involves at least a surgeon, anaesthetist, scrub person and circulator (Cohoon, 2011:562), and ambiguous role expectations within the team may contribute to human errors in the OR (Ricci, Panos, Lincoln, Salerno & Warshauer, 2012:799).

**Label B:** Communication and teamwork in a complex inter-professional environment like the OR is essential to prevent reportable events (Fowler, 2013:12), and to direct teams toward shared goals in the OR (Finn, Learmonth & Reedy, 2010:1152). The coordination of role-related tasks require strong leadership in the OR (Kurmann, Tschan, Semmer, Seelandt, Candinas & Beldi, 2012:224).

**Label C:** Peri-operative risk prevention is essential to patient safety because half of the adverse events in hospitals are associated with surgical procedures (Fowler, 2013:11). Thus, specific OR competencies are crucial for peri-operative patient care, to integrate advanced knowledge and procedural skills with holistic patient care (Gillespie et al., 2012:98).



**Figure 1.1: Conceptual map: Comprehensive peri-operative patient care**

*(Figure by researcher)*

## **1.9 RESEARCH METHODOLOGY**

A brief account of the research methodology will be described, followed by a detailed methodology discussion in chapter three.

### **1.9.1 Research design**

For the purpose of this study a descriptive qualitative research design was applied to explore the experiences of theatre technicians professional nurses, surgeons and anaesthetists about the role of theatre technicians in peri-operative nursing.

### **1.9.2 Study setting**

This study was conducted in private healthcare facilities within the Cape Metropolitan area.

### **1.9.3 Population and sampling**

The target population to reach the objectives of this study included participants from private hospitals within the Cape Metropolitan area:

1. Professional nurses that form part of the surgical team
2. Theatre technicians that form part of the surgical team
3. Surgeons
4. Anaesthetists

After gaining institutional support, the objectives and nature of the study were communicated with potential participants. Guidance was sought from the unit manager to identify individuals who work as theatre technicians, or with theatre technicians in their capacity as PN, surgeon or anaesthetists as potential participants. Thereafter, potential participants were approached directly. The purposive sample consisted of 14 participants with whom audio recorded interviews were conducted.

#### **1.9.4 Data collection instrument**

Pre-determined, open-ended questions based on the objectives of the study were used as a guide to engage participants in discussion during semi-structured interviews (Appendix 4).

#### **1.9.5 Pilot interview**

The appropriateness of the methodology, interview guide, the interview time and interview skills of the researcher were evaluated and tested through one pilot interview, prior to the main study. The data collected during the pilot study was excluded from the main study.

#### **1.9.6 Trustworthiness**

Lincoln and Guba's criteria for trustworthiness in qualitative studies were applied in this study. Through adherence to the constructs of credibility, transferability, dependability and conformability, the trustworthiness of the study was increased.

#### **1.9.7 Data collection**

Data was collected by the researcher using an interview guide. Recorded interviews were conducted in a pre-arranged interview room at each identified clinical facility. Pseudonyms were allocated to participants to retain anonymity and access to all data was restricted to the researcher and supervisor.

#### **1.9.8 Data analysis**

The data analyses steps as identified by Terre Blanche, Durrheim and Painter (2006:322) was followed in this study. Familiarisation and immersion began during data collection and was followed by inducing general themes. Simultaneous with theme development, data was related to the research question and coded. Themes were refined during the elaboration phase and put into context through interpretation and related to Benner's theory on expert nursing.

## **1.10 ETHICAL CONSIDERATIONS**

Ethical approval was sought from the Health Research Ethics Committee (Stellenbosch University), and from the private healthcare institutions prior to the study. Data collection was commenced after Ethical approval was granted (Appendix 1).

In adherence to the Helsinki declaration (World Medical Association Declaration of Helsinki 2008:3), the following ethical principles were adhered to:

### **1.10.1 Right to self-determination**

To protect the participant's right to self-determination, participation in the study was voluntary. Participants were informed of the study objectives, expectations from participants and the foreseen risks. A signed informed consent form was obtained from each participant prior to data collection (Appendix 3). Participants were also informed that they could withdraw from the study upon request.

### **1.10.2 Right to confidentiality and anonymity**

To support the participant's right to privacy of information, the recorded data was handled anonymously and confidentially. Pseudonyms were allocated to participants to retain anonymity, whilst the names of the specific clinical facilities were also kept anonymous and confidential. A confidentiality agreement was signed by the transcription verifier (Appendix 5), and access to all data was further restricted to the researcher and supervisor.

### **1.10.3 Right to protection from discomfort and harm**

In adherence to the ethical principles of beneficence and non-maleficence, participants were not harmed during this study. Slight discomfort, related to the interview process was the only foreseen risk to participants. No direct benefit to participants was identified. However, indirect benefit to OR healthcare providers may result from the study by building on the scientific body of knowledge.

## **1.11 OPERATIONAL DEFINITIONS**

**Comprehensive peri-operative patient care:** The delivery of scientifically based care through an understanding of the rationale and knowledge of surgical interventions. By using the nursing process, skills and knowledge are applied through independent and interdependent functions of the registered nurse (Rothrock, 2011:2-5).

**Peri-operative patient care:** The delivery of care to the surgical patient within the framework of the nursing process, during the pre-operative, intra-operative and post-operative periods (Rothrock, 2011:1).

For the purpose of this study:

**The pre-operative phase** commences when a patient is scheduled for surgery, ending upon transfer onto the OR table (Russ et al., 2013:476).

**The intra-operative phase** commences when a patient is transferred onto the theatre table, and ends upon completion of the surgical procedure (Kilvered, Öhlén & Åkesdotter Gustafsson, 2012:449).

**The post-operative phase** commences upon completion of the surgical procedure and ends with discharge and handover from the post-anaesthetic care unit (Russ et al., 2013:476).

**Role** refers to the actual role content or work division, as established by negotiation or custom (Maxwell et al., 2013:623). In this study, role specifically relates to the role of the scrub or circulator practitioner and anaesthetic assistant.

**The scrub practitioner** is a member of the sterile team, who may be a PN or theatre technician, responsible for creating and maintaining the sterile field. The assembly, disassembly and preparation of surgical instruments are included in this role. Counting of surgical items and prevention of retained items are done together with the circulator (Phillips, 2013:56).

**The circulating nurse** is a member of the non-sterile team who is responsible for assisting the sterile team, communication with other healthcare providers and handling of non-sterile equipment and supplies (Phillips, 2013:62).

**The anaesthetic assistant** is a member of the non-sterile team who assists the anaesthetist during anaesthesia (Goodman & Spray, 2014:8).

**Theatre technicians:** For this study, this term will refer to those practitioners who provide peri-operative patient care, overlapping with nursing roles. Theatre technicians function as sterile or non-sterile team members in the OR, and are not registered or governed by a professional body, as relevant within the South African context.

## **1.12 DURATION OF THE STUDY**

Ethical approval from Stellenbosch University was obtained on 13 April 2015. Thereafter, ethical approval was sought from each private healthcare organisation, and data was collected according to the table below.

**Table 1.1: Approval from private healthcare organisations**

<b>Healthcare organisation</b>	<b>Ethical approval obtained</b>	<b>Hospital approval obtained</b>	<b>Predata collection contact</b>	<b>Data collection</b>
<b>1</b>	7 July 2015	30 June 2015	13 July 2015	14 and 23 July 2015
<b>2</b>	4 August 2015	7 July 2015	25 August 2015	1 September 2015
<b>3</b>	21 August 2015	3 September 2015	9 September 2015	10 September 2015

The transcription of interviews and data analysis commenced during data collection. The final thesis was submitted for examination on 30 November 2015.

### **1.13 CHAPTER OUTLINE**

#### **Chapter 1: Foundation of the study**

The foundation of this study is described which include the rationale for the study, research question, objectives and a brief overview of the research methodology. It is presented within the context of the ethical and operational parameters that guided the study.

#### **Chapter 2: Literature review**

Chapter two presents the literature review process and depict published literature relevant to the aims and objectives of the study.

#### **Chapter 3: Research methodology**

Chapter three presents the research methodology that was followed throughout the study along with a description of the methods used to safeguard methodological congruence.

#### **Chapter 4: Results**

The findings of this study are discussed in chapter four.

#### **Chapter 5: Discussion, conclusions and recommendations**

The discussion of the study findings is presented in chapter five, followed by the study conclusion and recommendations based on the study findings.

### **1.14 SIGNIFICANCE OF THE STUDY**

The study describes how theatre staff in private healthcare organisations in the Cape Metropolitan area experience the role of theatre technicians.

### **1.15 SUMMARY**

Chapter one provides a methodological and contextual overview of the study which is elaborated upon in chapter three. Whilst chapter one provides operational definitions and a more detailed focus on the underpinning ethical considerations, chapter two depicts the literature review, particularly as it relates to the aim and objectives of the study.

### **1.16 CONCLUSION**

In conclusion, the study was conducted consistent with the stated descriptive qualitative methodological approach, to describe the experiences of theatre staff about the role of theatre technicians in peri-operative nursing.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 INTRODUCTION**

In this chapter, the literature explored sought to provide background information and discourse awareness within the field of operating room nursing and theatre technicians.

Literature was evaluated and categorised according to its relevance to the research problem. This chapter thus presents a literature review on peri-operative patient care, peri-operative roles, OR competencies and OR teamwork. In addition, literature relevant to OR staffing and risk prevention in the OR were utilised to gain an understanding of current peri-operative practices. Furthermore, literature was used to provide a theoretical framework and methodological congruence that guided the researcher to grasp previous research related to the research questions.

### **2.2 SELECTING AND REVIEWING THE LITERATURE**

When commencing the study, the literature provided the researcher with existing information which led to the formulation of the research problem. Electronic databases, internet sources and textbooks were accessed throughout the study to conduct the literature review described in this chapter.

Electronic databases were searched for general keywords including:

- “Peri-operative patient care”
- “Operating room staff”
- “Operating room patient safety”
- “Operating room competencies”

To refine literature searches, databases including Science Direct, Cinahl and Pubmed were searched, limiting searches to publications in peer reviewed journals within the last ten years.

Publications within the last ten years, relevant to the current study were saved electronically for further perusal.

However, to obtain literature on the philosophical methodological underpinning and the theoretical framework, the literature search extended beyond ten years and was obtained from:

- Lippincott Williams & Wilkins (The American Journal of Nursing)

- Journal of the British Society for Phenomenology – obtained from Medicine and Health Sciences Library (Stellenbosch University)
- Blackwell Publishing (International Journal of Nursing Practice)

Textbooks were also included in the literature search. References were made to operating room, research and nursing theories textbooks to supplement literature from electronic databases.

After the preliminary evaluation of literature sources, the material was electronically filed according to its relevance to the current study. The cited literature was then printed and filed by using index cards to facilitate a logical representation in this chapter. This wide-ranging engagement with academic research escalated the researcher's insight in the field of peri-operative patient care.

### **2.3 PERI-OPERATIVE PATIENT CARE**

Peri-operative patient care is the delivery of care to the surgical patient within the framework of the nursing process, during the pre-operative, intra-operative and post-operative phases (Rothrock, 2011:1).

Operating room nursing as a caring science was presented by Lindwall and Von Post (2008:680). Their study found that OR nurses often see their work as self-evident and never spoken of, leaving the OR culture vague. However, OR nursing is a continuation of caring within the nursing profession throughout the peri-operative phase, with a specific focus on patient safety (Rauta et al., 2012:1392).

Nevertheless, OR nursing may be regarded as obvious and instinctive, thus understating the caring science of nursing to relieve suffering and promote health and dignity throughout the peri-operative patient journey (Lindwall & Von Post, 2008:680).

Yet, care is rendered simultaneously by various healthcare professionals (Russ et al., 2013:478). Consequently, the PN applies skills and knowledge through independent and interdependent functions, to deliver comprehensive patient care (Rothrock, 2011:2-5).

### **2.4 OPERATING ROOM TEAMWORK**

Through a multi-dimensional team approach, expert healthcare practitioners deliver peri-operative patient care in a high-risk, high stress environment (Russ et al., 2013:478). Each surgical procedure involves at least four people: a surgeon, anaesthetist, scrub person and circulator (Cohoon, 2011:562).

Thus, to prevent reportable events, communication and teamwork in a complex inter-professional environment like the OR is essential (Fowler, 2013:12). In addition, communication and teamwork direct teams toward shared goals in the OR (Finn et al., 2010:1152).

Cohoon (2011:553) found that team factors were the most frequent cause of near-misses, in a mixed method study to determine the type, frequency and causes of near-misses in the OR. These findings correspond with studies, conducted by Lindwall and Von Post (2008:677). They found that a hidden power structure with informal “bosses” directing the tone in the OR, may create conflict and influence teamwork.

Similarly, Pupkiewics, Kitson and Perry (2015:5) describe that the social culture of rigid hierarchal structures, lack of support, and the pressurised OR environment may not be conducive to competency development and unhindered adaptation in the OR. Their interpretive phenomenological study focus on the lived experiences of novice scrub- nurses. A limitation to this study may be that only nursing staff were interviewed, thus input regarding team competence may be limited. Since interpretive phenomenology relies on experience and existence in a specific context (McConnell-Henry, Chapman & Francis, 2009:11), the methodology chosen may also limit generalizability (Pupkiewicz et al., 2015:1). However, the methodological congruence to Heidegger’s phenomenology could be supportive (Kisiel, 1973:217), as the researchers clearly represented the participants’ viewpoints, thereby increasing credibility as described by McConnell-Henry et al. (2009:13).

Conversely, when different professional skills are acknowledged, co-operation between team members will improve (Lindwall & Van Post, 2008:675). The lack of role clarification and information about the competence of team members hinders teamwork in healthcare (Grando et al., 2011:157), whereas inter-professional role learning will assist with collaboration between healthcare providers (Khalili, Orchard, Laschinger & Fara, 2013:451).

Therefore, clear role expectations is essential for teamwork and patient safety to minimize risks (Hull et al., 2011:25), as ambiguous roles and role misconceptions may lead to human errors in healthcare (Ricci et al., 2012:799).

## **2.5 PERI-OPERATIVE ROLE EXPECTATIONS**

Specific competencies identify the unique role of healthcare providers in the OR where members have diverse educational backgrounds, and team members may have overlapping capabilities (Ricci et al., 2012:798). However, the lack of information on the roles of various

team members and their competencies may hinder teamwork in healthcare (Grando et al., 2011:157).

### **2.5.1 Role clarification**

The clarification of roles played by team members should be precise with regard to responsibilities and accountability (Grando et al., 2011:158), since vague expectations may lead to role ambiguity or an uncertainty of one's responsibility (Udlis & Mancuso, 2015:275). Unclear role definitions may further lead to role confusion, conflict and poor relationships (Maxwell et al., 2013:623).

The role related to a certain position, may be defined as the expectations and behaviour (Udlis & Mancuso, 2015:275), whereas the authorisation of groups to perform bundles of tasks within a certain context may be seen as role content (Maxwell et al., 2013:623).

Human errors due to leadership misperceptions and role ambiguity (Ricci, et al., 2012:799) necessitate the coordination of role related tasks through strong leadership in the OR (Kurmann et al., 2012:224).

### **2.5.2 Operating room leadership**

The skills and competencies required to coordinate a surgical team is dependent on an identified leader, who is able to coordinate a multi-disciplinary team without becoming distracted from the surgical procedure (Kurmann et al., 2012:226).

However, clinical leadership problems within OR teams may be problematic as reported in the findings of a quantitative survey in South Carolina by Singer, Jiang, Huang, Gibbons, Kiang, Edmondson, Gawande and Berry (2015:306). They found that, within the dimensions of teamwork, leadership had a 38% neutral or negative score.

Consensus about leadership could also not be reached in qualitative studies by Mitchell, et al. (2011:826) who reported that scrub-nurses were unclear about who the team leader is.

## **2.6 OPERATING ROOM ROLES**

As practitioners may be held responsible for the outcomes within their roles (Grote, 2014:3), task division should be according to workplace policy with supervision at the appropriate level (Grando et al., 2011:140).

To demonstrate the role expectations of OR professional nurses and that of theatre technicians, these roles are described in the following section.

### **2.6.1 Role of operating room professional nurses**

Qualified operating room professional nurses should be clearly distinguished from other healthcare providers by defining roles and abilities (Lin & Liang, 2007:20). The role of the PN in the OR is challenging to define within the traditional character of nursing (Gillespie, Wallace & Chaboyer, 2008:259), as patient care in the OR appears indirect (Shewchuk, 2007:38).

#### **2.6.1.1 Peri-operative nursing competence**

The role description of peri-operative nurses require them to assess, monitor, teach and support the patient (Goodman & Spray, 2014:265). Simultaneously, operating room professional nurses implement advanced OR competencies to ensure patient safety during the peri-operative period (Shewchuk, 2007:38). This obliges the expert OR nurse to analyse the condition of the patient, and ensure their well-being through early recognition and management of emergencies (Meretoja & Koponen, 2011:420).

Although these specific OR competencies are crucial for peri-operative patient care, advanced knowledge and procedural skills must be integrated with patient centred caring behaviours (Gillespie et al., 2012:98).

Gillespie et al. (2012:98) developed a model of competence in the OR through a national survey with 1138 peri-operative nurse respondents. Their findings reaffirm that holistic patient care, and equally important, the coordination of activities are fundamental to peri-operative practice.

#### **2.6.1.2 Coordination of care**

To coordinate peri-operative activities, professional nurses in the OR must collaborate with the healthcare team, as Kelvered et al. (2012:453) also reported. Their study found that the motivation behind nursing care procedures in the OR, is based on nurses' need to create a secure peri-operative environment, whilst keeping a watchful eye and evaluating patient care to create a safe OR environment.

Studies corroborate the findings of Meretoja and Koponen (2011:420), who reported that qualified OR professional nurses implement safe nursing care, whilst coordinating care provided by other healthcare practitioners.

The coordination of care according to Allen (2014:133) includes

1. inter-departmental transfers,
2. resource allocation,
3. the anticipation of how care would unfold, and
4. the planning for such care

Allen's (2014:137) findings through an ethnographic study support the notion that graduate training is necessary to undertake the sophisticated organisational, social and technical skills expected from nurses.

### **2.6.1.3 Operating room professional nurse clinical roles**

The role of nurses in the OR evolved since the first nursing role in the OR was documented in 1889 (Hardesty, 1978). The role of the PN in the OR was that of scrub-nurse but evolved from 1976 to that of circulator in the OR in several countries (Shewchuk, 2007:38).

Currently, professional nurses in the OR may provide peri-operative care in roles that may vary between that of a scrub-nurse, circulator, anaesthetic nurse or recovery room (post-anaesthetic care unit) nurse (Russ et al., 2013:479).

Maxwell et al. (2013:627) report that the evolvments of roles with a focus on professional principles, a niche role, contrast roles driven by organisational needs and fixer roles. Fixer roles focus on tasks and techniques, and may leave the impression that fixer roles are exclusively determined by managers (Maxwell et al., 2013:627). Their study did not demonstrate how role identities are influenced over time, when workplace jurisdiction becomes stabilised, which is considered a limitation of this interpretive case study design. Additionally, the integration of new nursing roles was the focus of the study. Yet, these role descriptions may correspond to the role development of theatre technicians.

### **2.6.2 Role of theatre technicians**

Theatre technicians' role in the United Kingdom evolved since 1970 in response to long surgical waiting lists and a shortage of OR nurses, and overlaps the roles of OR nurses (Timmons, 2010:338). Training brochures verify that theatre preparation, assistance with anaesthetics and surgery, and post-operative care are included in the training for theatre technicians (Mediclinic, 2014).

These similar roles challenged the historical OR nursing roles, causing rivalry around boundary lines between nursing and theatre practitioners (Timmons, 2010:341).

A case study by Timmons (2010:348), focussed on the professionalization process of theatre technicians in the United Kingdom. The findings of this study suggest that rather than autonomy, professionalization may be equated to regulation. Thus, control and regulation of theatre technicians in the United Kingdom addressed the question of accountability. Legal regulatory accountability and adherence to standards and codes by theatre technicians are reiterated by Abbott and Booth (2014:162). They also draw attention to the disparities between

theatre technicians and nurses, even after the professionalization of theatre technicians in the United Kingdom.

The jurisdictional disputes between theatre technicians and OR, are amplified through overlapping role boundaries and diverse legislative and educational regulation (Timmons, 2010:345).

### **2.6.3 Legislation and qualifications**

#### **2.6.3.1 Legislation**

Legislation in Pennsylvania necessitates the presence of a registered nurse with experience and a qualification in OR nursing as circulator for all surgical procedures requiring anaesthesia or sedation (PA law calls for circulating nurse, 2010). Also in California, the legislated registered nurse to patient ratio in the OR is 1:1 (Agency for Healthcare Research and Quality, 2014).

In South Africa, the White Paper (Republic of South Africa, 2015:39), on norms and standards for healthcare establishments, require healthcare facilities to document the role and responsibilities of healthcare personnel. Their roles and responsibilities must also be aligned to their scope of practice, and a formal supervision programme. However, the scope of practice refers to actions permitted by professional regulatory bodies (Republic of South Africa, 2015:8).

Legal jurisdiction to undertake certain tasks has been given to nurses through the Nursing Act 33 of 2005 (Republic of South Africa, 2005). Nursing practitioners are authorised and regulated by the South African Nursing Council to function within a standardised legislative and ethical framework (South African Nursing Council, 2014).

As an illustration, only registered healthcare practitioners can be held accountable for anaesthesia related deaths in the OR (Madiba, Naidoo & Naidoo, 2011:235). In the same way, Grote (2014:3) argued that accountability cannot be conferred without having control over outcomes.

Subsequently, as theatre technicians in SA are not licensed, nor registered as health professionals (Allied Health Professions Council of South Africa, 2013), and qualifications may vary, the diffusion of accountability may be contended.

Evidently, a failure to recognise, develop and optimally apply specialised nursing knowledge may exasperate the current role confusion in the OR (Gillespie et al., 2008:259).

### **2.6.3.2 Qualifications**

New strategies for nursing education in South Africa place the focus on the realignment of nursing qualifications with the National Qualifications Framework (South African Nursing Council, 2011). According to this strategy, initiated at the first national nursing summit in 2011, a postgraduate diploma in nursing will exit on a NQF level 8, as aligned to the National Qualifications Framework Act 67 of 2008 (Republic of South Africa, 2008). Thus, a PN with an additional postgraduate diploma in OR nursing, will exit on an NQF level 8, as a nurse specialist. Professional nurses with a post-graduate qualification can register as a nurse specialist (South African Nursing Council, 2012).

Nevertheless, the educational qualifications and professional regulation vary amongst theatre technicians. In the United States, theatre technicians may obtain a degree, diploma or certificate to qualify as a surgical technician and obtain certification (EduSearch Network, 2015). The United Kingdom employs registered operating department practitioners and other support workers and healthcare assistants in the OR (Association for Peri-operative Practice).

However, different titles and educational levels apply to theatre technicians in South Africa. Theatre technicians in the SA OR practice either as operating department assistants in Mediclinic and Life Healthcare, where theatre technicians qualify after a three year diploma, as accredited by the Council of Higher Education (Mediclinic, 2014; Life Healthcare, 2014). Other theatre practitioners may exit on a NQF level 5 as operating department practitioners (Netcare, 2014).

Whilst the training and employment of theatre technicians may be regarded as workplace jurisdiction for the role of theatre technicians in South Africa, legal jurisdiction within healthcare has not been established, nor has professional regulation (Allied Health Professions Council of South Africa, 2013).

The negotiation of task division through legal, public and workplace jurisdiction, is required to legitimise the right to undertake tasks (Maxwell et al., 2013:623), since the power to transfer uncertainty to people who have no control leaves the diffusion of accountability questionable (Grote, 2014:3).

Nevertheless, training brochures describe the role of theatre technicians in South Africa as that of scrub, circulator or anaesthetic technician (Mediclinic, 2014; Life Healthcare, 2014; Netcare, 2014) within the three peri-operative phases.

## **2.6.4 Peri-operative scrub, circulator and anaesthetic assistant roles**

### **2.6.4.1 Peri-operative role of the circulator**

The PN as circulator should manage, direct and supervise peri-operative patient care (Rothrock, 2011:15). This role enables the PN, as an unsterile team member, to focus on coordinating patient care whilst supervising a trained subordinate practitioner with less emphasis on the technical aspect of OR nursing (Association for Peri-Operative Practice, 2013:208). Allied health providers, like surgical technologists often perform the role of the sterile scrub practitioner (Phillips, 2013:56-63; Rothrock, 2011:1-18).

Inadequate supervision is considered a contributor to near-misses in the OR (Cphoon, 2011:2011), thus the PN with an additional OR qualification is placed in either circulator or managerial roles to provide supervision (Shewchuk, 2007:38).

Accordingly, the position statement by the South African theatre association (SATS, 2015), endorse that a PN is essential to peri-operative patient care. However, they state that the supervision and accountability requirement of the PN in the OR do not include that of unlicensed practitioners.

### **2.6.4.2 The scrub role**

The scrub role can be filled by a PN or surgical technologist as a member of the sterile team (Association for Peri-Operative Practice, 2014:210). A scrub practitioner is responsible for the preparation and maintenance of the sterile field, and the assembly, disassembly and control of surgical items.

To ensure a smooth surgical procedure, the timely anticipation and reactive assistance to the surgeon is a crucial task in the scrub role (Koh, Park & Wickens, 2014:1236). Whilst the counting of surgical instruments and the prevention of retained surgical items are done together with the circulator (Phillips, 2013:62).

### **2.6.4.3 The anaesthetic assistant role**

The role of the anaesthetic assistant as an unsterile team member in the OR works under direct supervision of the anaesthetist who is responsible for the administration of anaesthesia throughout the peri-operative phase (Goodman & Spray, 2014:8).

## **2.7 PERI-OPERATIVE PHASES**

The continuity of care and knowledge of the patient's condition is critical to formulate care plans in healthcare (Ricci et al., 2012:800).

The behavioural responses of the patient and family to surgery, the physiological responses to surgery and the safety of the surgical patient are core elements of peri-operative nursing (Rauta et al., 2012:1396). Monitoring of the anaesthetised patient is performed for the early detection of physiological changes in response to surgery or anaesthesia, thus, the PN must be competent in recognising normal and abnormal responses (Goodman & Spray, 2014:272).

Throughout the peri-operative period, communication tasks include the condition of the patient, patient needs, handover between phases, procedural briefs and patient notes (Russ et al., 2013:477).

Given that communication deficits in the OR is considered a high contributor to near-misses (Cohoon, 2011:562), the expert PN in OR must coordinate patient care provided by other healthcare practitioners throughout the peri-operative period (Meretoja & Koponen, 2011:420).

The “Metric for Evaluation Task Execution in the Operating Room“ (METEOR) is an extensive, yet not exhaustive list of tasks that may be used to present the specific tasks related to peri-operative teamwork (Russ et al., 2013:478).

As has been noted, peri-operative care is divided into three distinct phases, the pre-operative, intra-operative and post-operative phases. Moreover, these phases are characterised by specific functions, as described by Russ et al. (2013:479).

### **2.7.1 Pre-operative phase**

The pre-operative phase refers to the period starting when a patient is scheduled for surgery up to transfer onto the OR table (Russ et al., 2013:476).

During this phase, nursing assessment data is gathered from various sources. The incorporation of data from healthcare documentation, patient interview and communication with other healthcare providers, is used to prepare for individual needs and to enable patient advocacy (Goodman & Spry, 2014:15).

The verification of patient records, including surgical consent, surgical site and patient history, are included in this phase to identify and prevent surgical risks (Zahiri, Stromberg, Skupsky, Knepp, Folstein, Silverman & Singh, 2011:59).

Specific pre-operative tasks, as identified in METEOR by Russ et al. (2013:478), include tasks related to the patient, equipment, provisions and communication. According to them, patient tasks include the confirmation that the right patient is sent for and that all notes, x-rays and relevant patient documentation are present. Other patient tasks include the monitoring of the

patient's condition, safe transfer to the OR table and protection of pressure points. In addition, the confirmation of the correct surgical team, correct patient identification and patient consent confirmation are also included in pre-operative patient tasks.

The pre-operative equipment and provision tasks refer to what is needed for the preparation for anaesthesia and the surgical procedure. Anaesthetic related equipment, such as monitoring and positioning devices, and provisions such as drugs are prepared pre-operatively. Surgical equipment and instruments, specific to the intended surgical procedure, are also prepared pre-operatively. Equipment and provision tasks include the preparation for, and application of, amongst others, the diathermy, warming devices, deep venous thrombosis prophylaxis systems and urinary catheters.

Throughout this phase, METEOR describe various communication tasks. These tasks include non-verbal communication in the form of displayed theatre lists and team communication. Team communication includes the double confirmation of the patient's consent, correct patient, correct surgical site and surgical side. Communication tasks related to delays or changes in the list are also included, as is communication with external team members, such as radiographers. Abbott and Booth (2014:7), state that deficits in both the technical and non-technical skills like communication, situation awareness and decision making can lead to poor patient outcomes in the OR.

Although some nursing diagnosis may apply to many patients, care is individualised through patient assessment, and interventions are planned accordingly (Goodman & Spry, 2014:24).

### **2.7.2 Intra-operative phase**

The intra-operative phase is the period from when a patient is transferred onto the theatre table, until completion of the surgical procedure (Kilvered et al., 2012:449).

During this phase, the patient is at risk for injury related to surgical site infections, retained surgical items, transfer and positioning (Goodman & Spry, 2014:24). Thus, the OR nurse ensures patient safety through maintenance of the sterile field, surgical instrumentation, fluid loss and position monitoring (Kilvered et al., 2012:449).

Specific patient, equipment, provisions and communication tasks are identified in METEOR, and related to the intra-operative phase (Russ et al., 2013:478).

Russ et al. (2013:478) describe patient tasks that include the performance of the correct surgical procedure, the continuous monitoring of the patient, such as blood loss monitoring throughout the intra-operative phase. They also describe equipment and provision tasks like

the adjustment of operative lights, leads and suction devices. Other provisions like swabs, sharps and drains should be available whilst swab, sharp and instrument control is performed.

METEOR lists communication relating to wound closure and swab, sharp and instrument control as another aspect of intra-operative communication. Retained surgical items were the most frequently reported sentinel events in 2010, often leading to litigation (Goodman & Spry, 2014:174). Intra-operative communication deficits were listed as one of the challenges to correct surgical counts (Goodman & Spry, 2014:174).

METEOR further describes communication tasks throughout the intra-operative phase. Communication tasks associated to anaesthesiology, such as patient instability and surgery related communication, such as blood loss and unexpected findings are shared.

The intra-operative phase concludes when the surgical procedure has been completed (Kilvered et al., 2012:449).

### **2.7.3 Post-operative phase**

The post-operative phase commences upon completion of the surgical procedure up to discharge and handover from the post-anaesthetic care unit (Russ et al., 2013:476).

#### **2.7.3.1 Post-anaesthetic care role**

Surveillance of the anaesthetised patient includes cardiac, circulatory, ventilation, temperature and level of consciousness by using invasive and non-invasive monitoring devices (Goodman & Spray, 2014:272).

The post-anaesthetic care role in nursing, postulates that nursing surveillance assess and manage post-operative complications in the surgical patient (Voepel-Lewis, Pechlavanidis, Burke & Talsma, 2013:905). They describe nursing surveillance as an ongoing process, whereby physiological data is gathered and analysed to ensure timely reactions to complications and to prevent rescue interventions (Voepel-Lewes et al., 2013:906).

#### **2.7.3.2 Post-operative nursing tasks**

Specific post-operative tasks, as identified in METEOR (Russ et al., 2013:479) include the patient, equipment, provisions and communication tasks. Specific patient tasks they have identified involve post-operative checks for patient injury, such as diathermy burns and pressure areas. The patient is cleaned and transferred off the OR table, whilst maintaining an open airway. The documentation, notes and x-rays accompany the patient. Post-operative patient instructions, analgesia and fluid prescriptions are provided during this phase.

Russ et al. (2013:479) describe post-operative equipment and provision tasks as specimen labelling, application of dressings and securing drains and catheters. These tasks also incorporate the cleaning of the theatre, disposal of sharps and dismantling of instrumentation. They further include anaesthetic related equipment tasks, such as suctioning during extubation and the provision of oxygen. In the recovery room, monitors are attached for the full monitoring of the patient.

During the post-operative phase, nurses monitor the physiological condition to prevent and manage anaesthesia and surgery related complications (Voepel-Lewis et al., 2013:905).

Throughout the post-operative phase, METEOR identifies communication tasks that incorporate the handover of the patient, with consideration of drugs given, the condition of the patient and post-operative instructions.

Thus, peri-operative communication tasks included verbal and non-verbal communication between the anaesthetic provider, surgeon, scrub-nurse, circulating nurse and external team members (Russ et al., 2013:480).

## **2.8 OPERATING ROOM COMPETENCIES**

The competence of OR team members influence comprehensive peri-operative patient care (Cohoon, 2011:561). Equally important, behavioural, technical and non-technical skills further influence competent care of the surgical patient (Gillespie et al., 2012:91).

### **2.8.1 Technical competencies**

Clinical skills of the PN in the OR include patient assessment and the planning and execution of nursing interventions (Rothrock, 2011:3).

According to Gillespie, et al. (2012:97) technical skills in the OR include the maintenance of sterility, handling and assembly of surgical instruments and participation in surgical procedures. Included in nursing interventions are the prevention of retained items, physiological monitoring of the patient and supervision of specimens during surgical procedures (Retzlaff & Hamlin, 2012:267).

Therefore the PN in OR should display a sound knowledge of anatomy, physiology and surgical procedures to initiate safe peri-operative nursing interventions (Rothrock, 2011:15) and apply specialised knowledge, skills and experience to manage stressful situations (Mitchell et al., 2011:818).

To improve quality peri-operative care through the measurement of team efficiency and task completion, the “Metric for Evaluating Task Execution in the Operating Room” (METEOR) was developed by Russ et al. (2013:480). METEOR allows the quantifiable measurement of OR efficacy, adjunct to assessment of non-technical competencies.

Likewise, competence and experience are required to ensure safe patient outcomes through cost effective care (Mitchell et al., 2011:818-828). In this qualitative study it was found that effective skills regarding procedural preparation significantly affected the intra-operative phase.

### **2.8.2 Non-technical competencies**

Non-technical skills in the OR refer to the cognitive and social skills required to deliver safe peri-operative patient care (Mitchell, Flin, Yule, Mitchell, Coutts & Youngson, 2012:201). These skills are influenced by the ability to manage stress and procedural fatigue and are explicitly developed through experience (Mitchell et al., 2011:828).

Mitchell et al. (2012:201) identified essential non-technical competencies in the OR through a behavioural rating system, “Scrub Practitioners’ List of Intraoperative Non-Technical Skills” (SPLINTS). SPLINTS include teamwork, situational awareness and task management (Mitchell et al., 2012:201). By using SPLINTS in an observational study, Koh et al., (2014:1238) found that experienced scrub-nurses displayed significantly better non-technical skills than novice nurses, substantiating earlier studies by Mitchell et al. (2011:828).

Gillespie et al. (2012:91) concur that safe peri-operative care is based on experience, knowledge and expertise. They included leadership, collaboration, empathy and professional development as non-technical skills of the OR nurse through quantitative survey analysis.

## **2.9 OPERATING ROOM STAFFING**

With consideration of technical and non-technical skills, competent patient care is further dependent on adequate staffing (Gillespie et al., 2012:91).

The Nursing Standard’s Care campaign identified good staffing as one of ten action priorities (Moore, 2012:18), although the contributions that nurses make to holistic patient care is complex to describe (Allan, 2014:136).

Staffing standards in South Africa should receive urgent attention (Rispel, 2015:12). No evidence regarding staffing standards in the South African context could be found during the literature review. The proposed norms and standards for healthcare staff in South Africa

(Republic of South Africa, 2015:39) do not include the documentation of the roles and responsibilities for theatre technicians, as they are not regulated.

## **2.10 STAFFING RATIOS**

In peri-operative nursing, patient safety is a primary focus (AORN, 2014:209). Patient outcomes can be improved with more PNs, as found in a study combining longitudinal retrospective and concurrent cross-sectional methods (Duffield, Diers, O'Brien-Pallas, Aisbett, Roche, King & Aisbett, 2011:246). Supporting this statement, Voepel-Lewis et al. (2013:905) reported in a retrospective case control study, that surveillance, relevant to nurse-staff levels moderated adverse events.

Although static formulas to determine nursing ratios cannot evaluate the nursing input and clinical outcomes related to caseloads or task complexity in a local context (Duffield et al., 2011:253), AORN recommends one registered nurse per patient, with unlicensed assistive personnel to help with delegated patient care (Association for Peri-Operative Practice, 2014).

In South Africa, SATS (2015) in their position statement on staffing support one PN allocated to each peri-operative patient. However, Rispel (2015:12), reported on the shortage of specialised nurses within SA, coupled with an aging nursing workforce and emphasised the need for national staffing standards.

The importance to match nursing competencies to their work environment is crucial to optimally utilise scarce nursing resources (Meretoja & Koponen, 2011:420). Furthermore Duffield et al. (2011:253) also suggest that the quality of the working environment, workload and high patient turnovers should be considered when determining staffing systems and ratios.

According to Wyatt (2013:267) effective workforce planning and policy making in nursing will require more data collection and information infrastructure. In addition to inadequate workforce planning, Wyatt argues that the OR workforce is particularly vulnerable to nursing shortages. Similarly, in South Africa there is a need for workforce planning in healthcare, as there is currently no electronic database on health professions (Matsoso & Strachan, 2011:51).

Workforce planning in South Africa is further challenged by the wide spectrum of disease and high injury burden in South Africa. Simultaneously, the training of mid-level workers had not been planned whilst the numbers of specialist nurses notably decreased (Matsoso & Strachan, 2011:52). The employment of mid-level healthcare workers to perform tasks previously only

undertaken by professional healthcare practitioners are increasingly used to supplement the shortage of healthcare staff (Lassi, Cometto, Huicho & Bhutta, 2013:824).

## **2.11 NURSING SHORTAGES**

Specialised nurses in the OR will promote the safety of the surgical patient (Duvall & Andrews, 2013:310). However, world-wide, there is a shortage of qualified OR nurses (Pupkiewicz et al., 2015:1).

The shortage of professional healthcare staff may be supplemented by mid-level healthcare workers to meet the healthcare demands, especially in developing countries such as in Africa (Lassi et al., 2013:829). However, Gillespie et al. (2008:259) reported that the presence of the RN in OR is essential although threatened by the declining number of OR qualified RNs. Due to the extended training time for new nurses in the OR, these shortages are compounded by the difficulty in recruiting and retaining OR qualified nurses (Zinn et al., 2012:652).

The shortage of nursing experts in OR may further influence the training of new staff, leadership and patient safety (Duvall & Andrews, 2010:312). International shortages of OR qualified PNs challenge the realisms of a PN in the OR allocated to each surgical patient (Gillespie et al., 2008:276), whilst fewer qualified nurses result in increased adverse patient events (Duffield et al., 2011:244) and higher safety risks for patients (Lin & Liang, 2007:2029).

## **2.12 RISK PREVENTION**

The anticipation, prevention and early detection of adverse events and expedited management of surgical or anaesthetic complications may prevent serious harm to patients in the OR (Hoyland & Thomassen, 2014:77). The prevention of risks is thus the departure point for OR nursing diagnosis, contradictory to other nursing diagnosis, based on clinical manifestations (Rothrock, 2011:3).

Peri-operative risk prevention is essential to patient safety because half of the adverse events in hospitals are associated with surgical procedures, rendering the peri-operative phase a hazardous period (Fowler, 2013:11).

Zahiri et al. (2011:55) reported that retained surgical items, fires in the OR and wrong site surgery were the most reported preventable “never events” in the OR. They assert that up to 1 500 cases related to retained surgical items and 4 000 wrong site surgeries occur in United States operating rooms annually.

At the same time, the Medical Chronicle (Medical litigation: A National Health Crisis, 2011) called medical litigation in South Africa a “National health crisis requiring urgent solutions”. According to them, there was a 132% spike in claim costs in 2011, while there was a 550% increase in claims above R1 million, compared to ten years ago (Malherbe, 2013:83).

SA case law illustrates the preparation for patient specific needs and the associated risk prevention. In the case of Isaacs vs Pandie (Western Cape High Court, 2012: JDR 0866), surgery was performed without the required consent. Reference is made to the responsibility of nursing practitioners and the surgeon to obtain and verify consent to surgical procedures. A court will regard the diligence and level of skill expected from a practitioner related to the branch of the profession to which such a practitioner belongs (Western Cape High Court, 2012: JDR 0866).

Numerous law suits due to peri-operative safety violations demonstrate that the accumulation of minor safety violations by various individuals result in major patient complications (Zahiri et al., 2011:59). The literature review by Zahiri et al. (2011:59), reiterates the necessity for teamwork, patience, communication and enough time to prevent OR risks. They also questioned the efficacy of penalty for safety violations against an incentive-based programme to promote patient safety in the OR.

Fowler’s recent review (2013:13) on advances in peri-operative patient safety, specified the importance of incident reporting to obtain information that can be used to prevent further incidents. Though, in healthcare incident reporting is sporadic due to punitive systems, lack of confidentiality and an institutional culture (Ricci et al., 2012:800). Harrison, Birks, Hall, Bosanquet, Harden and Iedema (2014:342) conducted a narrative review, and affirmed that conflicting duties to the patient, self, the healthcare team and organisations are barriers to incident disclosure by nurses.

Therefore, a cross sectional survey of 1 117 professional nurses in SA verifies that they believe their mistakes are held against them (Blignaut et al., 2014:227). They also found that PNs believe event reports are not addressed by institutional managers; hence it does not elicit the necessary changes (Blignaut et al., 2014:229).

Furthermore, other managerial aspects, including financial aspects surrounding staffing may influence the safety of the surgical patient (Lin & Liang, 2007:27), as the OR is the highest revenue incurring department and underutilisation translates into financial losses (Hoyland & Thomassen, 2014:76). The OR budget may account for 40% of a particular hospital, compelling maximum utilisation and minimum operating costs (Xiang, Yin & Lim, 2015:336).

Thus, managers may be pressurised into increasing staff workload, or opt to use less qualified staff (Hoyland & Thomassen, 2014:76).

The pressure to achieve more in less time has been described as a tone setting habit in the OR due to the increased demands for productivity. Nevertheless, production pressure prevents professional development, increases stress and may violate the ethical code of a caring profession (Lindwall & Van Post, 2008:678).

In the same way, Singer et al. (2015:313) found that production pressure may hinder patient safety in the OR. This quantitative survey study was conducted in 38 South Carolina hospitals and their findings indicate that 56% of respondents perceived the pressure to quickly move from one patient to another, as a concern for patient safety. Singer et al. indicated that they excluded staffing levels and team composition, which may be a limitation to their study.

Similarly, Wyatt (2013:269), also indicated that changes in OR staffing have an unknown effect on the quality of care rendered to the surgical patient (Wyatt, 2013:269). Evidently, work in organisations has to continue whether there is enough professional staff to do it, or not (Maxwell et al., 2013:622).

## **2.13 CONCEPTUAL FRAMEWORK**

Underpinning nurses' likely focus on the ethical values of patients (Jansky, Marx, Nauck & Alt-Epping, 2013:281), is the particular vulnerability of peri-operative patients (Retzlaff & Hamlin, 2012:272). Pertinent to the OR, nurses are vigilant in monitoring the condition of the patient, and is able to remain composed in rapidly changing situations (George, 2011:585).

Benner's philosophy describe expert nurses as being able to understand a situation and exercise control in situations unfamiliar to patients (Benner, 1982:406) with an emphasis on individualised patient care (George, 2011:593).

The concepts of expert nurses described by Benner's philosophy (Benner, 1982:406), correlate with comprehensive peri-operative patient care concepts in this study. Vos et al. (2011:36) describe the use of a model within a conceptual framework as one that serves to demonstrate explanations or understanding.

Although controversial, a conceptual guided qualitative study may provide contextual density and alert researchers to processes that they may otherwise by unidentified (MacFarlane & O'Reilly-de Brún, 2012:607). Similarly, the use of a conceptual framework in this study sought to provide conceptual context of related concepts.

Meretoja and Koponen (2011:420) identified optimal competencies derived from Benner's framework. Through a mixed method approach, they report future challenges and actual competencies in peri-operative care. This study emphasises the requirement of knowledge and skills, accountability and collaboration. Although they report limited generalisability, the study allows replication, as recommended by the authors (Meretoja & Koponen, 2011:419).

Non-technical competencies, including situational awareness, communication, advocacy, stress management, teamwork and leadership, are exclusively developed through experience (Mitchell et al., 2011:828).

The novice OR nurse must be mentored through simulation, team training and experience to reach competency and situational awareness (Pupkiewicz et al., 2015:7). Similarly, experienced nurses perform better in all task performance areas in the OR in a task management study conducted during caesarean sections (Koh et al. 2014:1230). Gillespie et al. (2012:91) state that critical thinking in the OR is based upon experience, knowledge and expertise.

Knowledge, expertise and experience within a holistic nursing approach are also described by Kelvered et al. (2012:454). This qualitative interpretive approach drew on the specific practice knowledge of peri-operative nurses to describe patient related intra-operative care. The authors harmonise the findings with the skills described by Gillespie et al. (2009:1019) and Benner's philosophy, from novice to expert (1982:407).

Thus, nurses' contribution to the care of the surgical patient can be aligned to the Dreyfus Model of Skill Acquisition as described in Benner's philosophy (Benner, 1982:407).

## **2.14 SUMMARY**

Throughout this chapter, qualitative and quantitative studies were utilised and supplemented with online data and text books to portray the researcher's review of published literature significant to the objectives of this study.

The knowledge gap, pertinent within the South African context, regarding the role of theatre technicians within peri-operative nursing was explored through the presented literature.

Appropriate to the research question, and supported by the literature presented in chapter two, chapter three depicts the research methodology of this study. The literature and the applied research methodology will be elaborated upon in the discussion of the study findings, with specific emphasis on the overlapping roles, the composition of the surgical team and the delivery of comprehensive patient care within the healthcare environment.

## **2.15 CONCLUSION**

The aim of the presented literature review was to become familiar with the academic discourse about the field of peri-operative patient care. Consequently, the literature review enabled the researcher to analyse the methodology and findings of existing literature.

Through engagement with existing literature, the critical value of peri-operative nursing and various factors that may influence safe patient care in the OR were displayed.

## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.1 INTRODUCTION**

The literature review, as described in chapter two, confirmed the lack of evidence relevant to the study topic, and provided guidance for the development of the research methodology.

This chapter describes the methodology that was followed to reach the study objectives through the information that theatre staff provided during semi-structured interviews.

Thus, to explore the role of theatre technicians, as experienced by OR staff in the Cape metropolitan area, a descriptive qualitative design was applied, congruent to the aim, objectives and research question.

### **3.2 AIM AND OBJECTIVES**

The aim of this study was to explore the experiences of operating room staff about the role of theatre technicians in peri-operative nursing.

The objectives of this study were to gain an understanding of the experiences of operating room staff about the role of theatre technicians in peri-operative nursing with specific reference to:

1. Pre-operative nursing (Pre-operative patient visits and nursing care planning, theatre preparation for the surgical procedure and anaesthesia involvement and communication within the healthcare team with regard to the planning of the intended procedure)
2. Intra-operative nursing (Scrubbing for surgical cases, circulating during procedures, swab, sharp and instrument control, specimen control, assisting with anaesthesia and transfer and handover to recovery room)
3. Post-operative nursing (recovery room nursing: involvement in the post-operative nursing assessment, management, discharge and handover of the surgical patient)
4. The supervision by professional nursing practitioners when theatre technicians are allocated to peri-operative nursing roles.

### **3.3 STUDY SETTING**

Qualitative studies are conducted in real world settings (Polit & Beck, 2006:213). This study was conducted in three clinical facilities in the Cape Metropolitan area, South Africa. Each clinical facility is connected to a separate private healthcare organisation.

### 3.4 RESEARCH DESIGN

According to Grove, Burns and Gray (2013:202), the design of a study should provide the researcher with the ability to reach the study objectives, obtain accurate responses to questions and increase the study validity.

A qualitative research design is the most appropriate to gain an understanding of a phenomena through the perceptions and experiences of people (De Vos, Strydom, Fouché & Delport, 2011:304).

A descriptive qualitative design aims to describe phenomena in depth and holistically, not specifically linked to a research tradition (Polit & Beck, 2006:229). The descriptive qualitative approach in this study provided the opportunity to explore the role of theatre technicians in peri-operative nursing within the context that it occurred, thereby providing an insider view which may have been lost during a quantitative approach (Guba & Lincoln, 1994:106).

However, as qualitative studies may involve an emerging design as the study unfolds (Polit & Beck, 2006:229), this study evolved by harmonising with descriptive phenomenology to some extent. Similar to Husserl's descriptive phenomenology (McConnell-Henry et al., 2009:8), this study sought to raise awareness by describing the role of theatre technicians in the Cape Metropolitan area.

Within the dimensions of an interpretive paradigm an inductive approach was followed that relied on a subjective relationship between the researcher and participants during interviews (Terre Blanche, Durrheim & Painter, 2006:7). An emic view, referring to an approach to understand a phenomenon within a system, follows an inductive approach, whilst focussing on meaning within the described experiences of phenomena (Terre Blanche, Durrheim & Painter, 200:353). To remain open to the meanings of participants and to describe the lived experience of participants, bracketing was used (McConnell-Henry et al., 2009:8).

To discover meaning, the researcher's ability to explore and describe the phenomena was dependent on prior knowledge and experience in OR patient care. Tufford and Newman (2010:89) state that researchers should be aware of preconceptions during the conceptualisation phase of a research project. The researcher has 15 years OR nursing experience in both private and provincial hospitals, eight years of which as an OR lecturer. This may have shaped a bias view of the importance of the role of PN in the OR. In view of that, Grove et al. (2013:269), state that the researcher must be aware of potential biases due to past personal experiences. Thus personal experience was bracketed during the conceptualisation, data collection and data analysis phases of the study. In addition, the

researcher conducted clinical training in healthcare facilities as an OR lecturer. Tufford and Newman (2010:93) state that bracketing may assist researchers to understand power issues between themselves and participants. Hence, to prevent power issues, this study was conducted in clinical facilities where the researcher had no current direct student involvement. In addition, future students were excluded from the sample, as only qualified OR staff were interviewed according to the inclusion criteria of the study, whilst no previous OR nursing students with whom the researcher was directly involved, were recruited for participation in the study.

The research question should be congruent with the conceptual framework when a guiding theory is selected in qualitative studies (Grove et al., 2013:267). Unguided by a single theoretical framework, this study asked how OR staff experienced the role of theatre technicians within peri-operative nursing. As literature confirmed the need for proficient, comprehensive patient care (Gillespie et al., 2012:91), expert nursing care was contextualised and related to Benner's levels of proficiency (Benner, 1982:402) with specific reference to competence, teamwork and staffing.

### **3.5 POPULATION AND SAMPLING**

Grove et al. (2013:315) defines the population as the group of people that is the focus of the study. The target population is described as the entire group of people that meet the sampling criteria.

The sample is identified as a specific group within the target population and included in the study. Vos et al. (2011:391) state that in qualitative research non-probability sampling is applied, the researcher does not know the total population size, or the members of the population, therefore, each member of the population does not have an equal chance of selection. Purposive sampling, as a method of non-probability sampling, refers to the recruitment of participants that can provide and expand upon rich information pertaining to a certain topic (Grove et al., 2013:269). Purposive sampling was applied to select participants who were able to provide in-depth information about the purpose of the study as described.

A wider range of participants are needed to describe a relatively new phenomenon (Terre Blanche, Durrheim & Painter, 2006:289). Accordingly, this study included a range of theatre staff, as theatre technicians are relatively new within the South African context. Terre Blanche, Durrheim and Painter (2006:289) further state that between 10 and 20 interviews are required for maximum variation samples. Hence, relevant to the research aim of this study, a wide range of perspectives were sought.

The target population to reach the objectives of this study included 14 participants from private hospitals within the Cape Metropolitan area:

1. Six professional nursing practitioners that form part of the surgical team in private healthcare institutions.
2. Five theatre technicians that form part of the surgical team in private healthcare institutions.
3. Three medical practitioners, of which two surgeons and one anaesthesiologist within the identified private healthcare institutions.

Grove et al. (2013:361) state that a list of the organisations and institutions should be made where the identified population could be drawn from.

Thus, for the purpose of this study the organizations in the Cape Metropolitan area that met the inclusion criteria were:

1. Private Healthcare Organization 1
2. Private Healthcare Organization 2
3. Private Healthcare Organization 3

A large clinical facility from each organisation was selected, due to a high turnover of various surgical procedures, thus exposing the technicians to various clinical activities in the OR. Participants from each facility were purposefully selected to provide information in order to reach the set objectives:

1. theatre technicians
2. professional nurses with a postgraduate qualification in OR nursing
3. medical practitioners (surgeon and/or anaesthetist)

The purposive sample consisted of 14 participants with whom interviews were conducted. This maximum variation sample allowed the identification and documentation of patterns across group variations as stated by Polit and Beck (2006:272).

After gaining institutional support, the objectives and nature of the study was communicated with potential participants during a predata collection meeting at each clinical facility. Guidance was sought from the unit manager to identify individuals who worked as theatre technicians, or with theatre technicians in the role of PN, surgeon or anaesthetists as potential participants. Thereafter, potential participants were approached directly, as supported by Grove et al. (2013:376).

### **3.5.1 Inclusion criteria**

Participants who provided peri-operative care in private operating room facilities in the Cape Metropolitan area, performing the following roles were included in the study:

1. Sterile team member as scrub practitioner (PN or theatre technician)
2. Non-sterile team member as circulating practitioner (PN or theatre technician)
3. Non-sterile team member as anaesthetic assistant (PN or theatre technician)
4. Surgeon
5. Anaesthetist

To ensure that the data reflected current practices in a setting where all staffing categories were available, only healthcare facilities that employed both nursing and theatre technicians in the OR were included.

### **3.5.2 Exclusion criteria**

1. Clinical facilities that do not employ theatre technicians were excluded.
2. Healthcare providers in the OR with less than one year experience after obtaining their relevant qualifications were excluded to ensure data was collected from participants who were able to provide rich data, congruent with the study methodology.
3. Other staff members in the peri-operative environment, e.g. laboratory staff, cleaning staff or radiology staff were excluded as participants to ensure only essential data, relevant to this study were obtained.
4. Clinical facilities that met the inclusion criteria, but where the researcher had current operating room nursing students to prevent power issues.

## **3.6 INSTRUMENTATION**

A semi-structured interview guide was utilised during data collection, as Polit and Beck (2006:291) describe that it would ensure that all the research objectives were discussed (Annexure 4).

## **3.7 PILOT INTERVIEW**

A pilot interview was conducted with an OR qualified PN with 10 years' experience prior to the main study. The pilot interview was used to evaluate the interview guide, interview time, interview skills of the researcher, and the appropriateness of the methodology. The data collected during the pilot interview was excluded from the main findings, although data analysis revealed themes harmonious to that of the main study.

The researcher recruited one PN who met the inclusion criteria of the study. This participant was not employed at one of the pre-selected clinical institutions, thus, although the interview

was conducted after obtaining Health Research Ethics Committee and institutional approval, the interview was excluded from the main study.

The pilot interview was conducted and audio recorded by the researcher after explaining the procedure and written consent was given by the participant. During the interview, the researcher used the pre-determined, semi-structured interview guide to engage the participant in the discussion, and also utilised further probing questions to clarify and understand information made by the participant.

The interview was transcribed by the researcher, thereafter data analysis of the pilot interview was done, consistent to the main study, according to the steps identified by Terre Blanche, Durrheim and Painter (2006:322).

The transcribed interview and analysed data was submitted to the study supervisor, and after feedback was obtained, the data analysis was reviewed and the researcher proceeded with data collection and analysis, without making changes to the interview guide.

### **3.8 TRUSTWORTHINESS**

To enhance the trustworthiness of the study, the researcher aimed to develop an early understanding of the culture of each organisation as suggested by Shenton (2004:65) through a preliminary meeting with each clinical facility's nursing manager and OR manager. After the preliminary meeting, and subsequent participant information meeting, data collection visits to each site was limited to two per facility, thus preventing too many demands on staff.

Shenton (2004:73) describes Lincoln and Guba's criteria for trustworthiness in qualitative studies namely credibility, transferability, dependability and conformability which were applied in the study. De Vos et al. (2011:420), state that the trustworthiness of the study will be increased by applying the constructs as identified by Lincoln and Guba.

#### **3.8.1 Credibility**

Credibility is enhanced when the research setting, population and theoretical framework is clearly stated (De Vos et al., 2011:421). This study was conducted in three private healthcare facilities in the Cape Metropolitan area, through interviews with 14 purposefully selected participants. Although unguided by a single theoretical framework, the study was contextualised and related to Benner's theory on expert nurses.

Thus, to enhance the authenticity of the study, the researcher documented the steps of the research process and data analysis, and included member-checking after the transcription of interviews as described by De Vos et al. (2011:420). Shenton (2004:68) also emphasises

member checking to increase the study's credibility as indicated by Lincoln and Guba. Member checking was done with four participants after initial thematic analysis.

The credibility of the study was enhanced whilst the research was undertaken by searching for discrepant information, as described by Terre Blanche, Durrheim and Painter (2006:91).

Transcription reliability is confirmed by the researcher by listening to the recording and reading the transcription (Terre Blanche, Durrheim & Painter, 2006:302). Hence, the researcher listened to the transcriptions and, in addition, the interview transcriptions were verified by an external verifier after reaching a confidentiality agreement to protect the confidentiality of the participants.

McConnell-Henry et al. (2009:13) state that the decisions made during data analysis should be identified and documented by the researcher. Thus, the researcher documented these decisions, and submitted it to the study supervisor throughout data collection and analysis, thereby safeguarding the transparency and audibility of the participants' viewpoints.

### **3.8.2 Transferability**

Transferability of the study findings was increased through data collection from professional nurses, theatre technicians and medical practitioners in three clinical settings within three private healthcare institutions. According to De Vos et al. (2011:240) a more heterogeneous sample could corroborate or describe data. Thus, participant diversity in this study provided data from multiple perspectives, thereby elevating the study validity (Terre Blanche et al., 2006:380).

Transferability was increased through providing background information through a literature review ensuring that the described phenomena were understood within the intended context.

### **3.8.3 Dependability**

In adherence to the construct of dependability, the methodology of the study was described to allow a repeat of the study (Shenton, 2004:79).

De Vos et al. (2011:420) further state that the dependability of the study findings will be promoted by following a logical process and thorough documentation thereof. Therefore, audio recordings, transcriptions and data analysis were documented, and evidenced through the use of a checklist throughout the research process. The raw and analysed data were verified with the study supervisor for corroboration throughout data collection, analysis and reporting.

### **3.8.4 Confirmability**

McConnell-Henry et al. (2009:13) describe rigour as the ability to instil confidence in research findings. Conformability, a criterion for trustworthiness in qualitative studies, refers to the neutrality of the data (Polit & Beck, 2006:336).

Conformability was improved through an audit trail. By providing evidence of an audit trail, the study allows an independent auditor to corroborate the research findings, as described by De Vos et al. (2011:421). Hence, in this study, conformability was enhanced by a systematic collection and documentation of data, including the raw data interviews, interview transcripts, analysis documents, personal notes and report drafts. The researcher also documented all decisions and actions during the study to provide a decision trail to enhance the audit ability of the study.

Conformability is further increased through bracketing of the researcher's personal beliefs and through identification of shortcomings in the study (Shenton, 2004:79). Through identification of pre-conceived ideas that was shaped through prior OR experience as a PN, bracketing was applied to exclude potential bias.

## **3.9 DATA COLLECTION**

After obtaining permission from the Stellenbosch University Health Research Ethics Committee, and the private healthcare organisational ethical committees, the researcher requested information meetings at each clinical facility.

During the information meetings the researcher visited the OR to explain the purpose of the study and to recruit potential participants who fitted the inclusion criteria. However, the researcher approached medical practitioners individually to recruit them as participants, as they did not attend the information meetings. Terre Blanche, Durrheim and Painter (2006:322), state that maximum variation sampling entails seeking for participants with different views on the topic to gain the broadest range of information. Thus, during participant recruitment in the second and third clinical facility, one surgeon, three PNs and three theatre technicians were purposefully included as participants from different organisations and clinical facilities who could present differing experiences. According to Shenton (2004:66), a wide variety of participants in multiple sites may increase the credibility of the study through the reduction of local factors, peculiar to a single organisation. Similarly, in this study, participants' experiences about the role of theatre technicians did not seem unique to one organisation, and no new themes emerged from the interviews at the third clinical facility.

The researcher explained the purpose of the study, the responsibilities of participants and the study process to the potential participants. Inclusion and exclusion criteria for participation was explained during the meeting. Anonymity, privacy and confidentiality were assured, and potential participants were assured of voluntary participation without any form of reciprocation, should they choose to withhold participation or withdraw at any stage.

The researcher conducted semi-structured interviews with participants that met the inclusion criteria and who voluntary approached the interview room. A vacant, furnished office within each facilities' OR complex was used to conduct the interviews in a private, non-threatening environment as was prior arranged with the theatre manager.

Audio recorded interviews, with the duration of between 30 minutes and 45 minutes each, were conducted after obtaining written consent from participants.

When data collection commenced at the third clinical facility after a predata collection meeting, the preliminary thematic analysis of the first two facilities were completed and submitted to the study supervisor.

At all three clinical facilities, the researcher documented the name, pseudonym, the clinical facility and healthcare organisation of each participant on the descriptive notes. To provide audit ability of the research process, the qualifications of each participant, and their years of experience in the OR were also documented on the descriptive notes. through the course of the interview.

The researcher asked participants to relay their experiences of the role of theatre technicians by asking questions like, "How do you experience the pre-operative role of theatre technicians in your facility?" or: "How do you experience the role of theatre technicians as a circulator in the OR?".

Participants were encouraged to freely share information, and were prompted by open-ended questions like: "Can you tell me about the role of theatre technicians in teamwork?". Follow-up questions were utilised to clarify vague information that emerged during the interview.

During the audio recorded interviews all ethical principles were maintained. The researcher made handwritten notes which contained demographic data of the interview date, time and place, and also reflective notes of impressions and problems that arose during each interview.

### **3.10 DATA ANALYSIS**

Data analysis commenced simultaneous to data collection to organise, provide structure and elicit meaning from the transcribed semi-structured interviews. The duration of an interview was an average of 35 minutes and consisted of approximately 15 transcribed pages each.

The data analyses steps as described by Terre Blanche, Durrheim and Painter (2006:322) were followed in this study:

#### **3.10.1 Familiarisation and immersion: Step 1**

Data analyses started during data collection during which ideas were developed about how OR staff viewed the role of theatre technicians in peri-operative nursing.

Interviews were transcribed by the researcher and the audio transcriptions were verified by an external verifier after the transcription. The researcher listened to the recorded interviews again whilst reading the transcriptions. The handwritten notes made during the interviews, were viewed in conjunction with the recordings and transcripts. Consequently, the researcher began to understand the data as provided by the various OR staff, and began to understand what preliminary findings may be supported by the data.

#### **3.10.2 Inducting themes: Step 2**

During the induction of themes, the underlying themes or characteristics from the data were identified through immersion into the data recordings and transcripts by studying common characteristics and processes.

General themes were labelled by using the language of the participants, and then organized into chronological themes. Pre-operative, intra-operative and post-operative themes, congruent with the research objectives were used to place data into context. The preliminary thematic analyses were reviewed by the study supervisor.

#### **3.10.3 Coding: Step 3**

Coding of data was done simultaneously with theme development after each transcribed interview. Phrases and texts were highlighted, related to the research question and then coded. Data was highlighted as being relevant to the themes, and then organised by using the cut and paste option on a Microsoft word document.

#### **3.10.4 Elaboration: Step 4**

During the elaboration phase, the themes were examined and compared to data in the transcripts that appear linked. This was accomplished by avoiding the chronological order of

the interviews, but viewing the data as connected ideas following the identification of themes and coding.

The aim of a qualitative study is to gain an understanding of a phenomenon, therefore researchers do not typically make group comparisons, however, during data analysis, data patterns may emerge that illuminate certain group comparisons (Polit & Beck, 2006:212). As found in this study, patterns that emerged from interviews prompted comparisons between PNs, medical practitioners and theatre technicians.

During this phase, themes were refined. Subthemes emerged and data that was not captured previously were identified during this stage.

Coding was continued and elaborated upon until no new information or insight was gained from the collected data.

### **3.10.5 Interpretation and checking: Step 5**

During the interpretation and checking phase, interpretation of data was placed into context and further related to the research question and objectives. Themes and subthemes were given through a written account, but over-interpretation and mere summaries were avoided. The researcher identified any bias, and whether preconceived ideas were bracketed. In addition, the researcher reflected on data collection and data interpretation.

Content analyses, although unguided by a single theoretical framework, was related to Benner's theory on expert nursing.

As stated by Grove et al. (2013:285), participant validation was done after transcription of data. For this study four participants were approached for validation of transcripts and thematic analysis. These participants read the typed transcripts of their individual interviews and also verified the initial thematic analysis thereof, congruent with Shenton (2004:68), who emphasised the importance of member checks to increase the credibility of a study.

## **3.11 SUMMARY**

The qualitative descriptive research approach that was followed to reach the objectives of the study was described in this chapter. A description of participant recruitment, data collection and data analysis were provided in the light of the measures taken to enhance the trustworthiness of the study. Chapter four will present the findings of the study, which will be elaborated upon in chapter five, with consideration of the foregoing literature review.

## **CHAPTER 4: FINDINGS**

### **4.1 INTRODUCTION**

The data collected through interviews in this descriptive qualitative study is presented in chapter four.

The findings of the study indicate that participants generally agree that theatre technicians are a good practical help in theatre. However, the findings will also present the different experiences of professional nurses, medical practitioners and theatre technicians with regard to the role of theatre practitioners in the scrub, circulator and anaesthetic assistant roles.

Participants found it difficult to explain the role of theatre technicians within the boundaries of the pre-operative, intra-operative and post-operative phases, as stipulated by the research objectives of this study. Throughout data collection and analysis, the researcher noted that participants inevitably ended up comparing the efficacy and competence of professional nurses with that of theatre technicians.

The themes that emerged through participants' comparisons between the overlapping roles of scrub, circulator and anaesthetic assistant roles of theatre technicians and that of nurses were retained to ensure audibility of participants' voices.

These themes will be elaborated in section B, following the tabulated biographical data presentation in section A.

### **4.2 SECTION A: BIOGRAPHICAL DATA**

Interviews were conducted with fourteen participants who met the inclusion criteria for this study. Of these fourteen participants, two were surgeons, one anaesthetist, five theatre technicians and six registered professional nurses.

The participants have obtained their various educational qualifications, and currently work with or as theatre technicians in the OR within their field of study. The years of experience indicate participants' years of practice within their speciality as OR professional nurse, surgeon, anaesthetist or theatre technician.

Biographical data is presented in table 4.1:

**Table 4.1: Biographical Data**

<b>Participant 1</b>	Professional nurse	10 years experience
<b>Participant 2</b>	Professional nurse	15 years experience
<b>Participant 3</b>	Professional nurse	20 years experience
<b>Participant 4</b>	Theatre technician	5 years experience
<b>Participant 5</b>	Surgeon	20 years experience
<b>Participant 6</b>	Anaesthetist	15 years experience
<b>Participant 7</b>	Theatre technician	5 years experience
<b>Participant 8</b>	Professional nurse	15 years experience
<b>Participant 9</b>	Professional nurse	20 years experience
<b>Participant 10</b>	Theatre technician	5 years experience
<b>Participant 11</b>	Surgeon	20 years experience
<b>Participant 12</b>	Theatre technician	5 years experience
<b>Participant 13</b>	Theatre technician	6 years experience
<b>Participant 14</b>	Professional nurse	15 years experience

#### **4.3 SECTION B: THEMES EMERGING FROM THE INTERVIEWS**

Participants described the role of theatre technicians relating to the scrub, circulating and anaesthetic assistant role throughout peri-operative nursing. In fact, when participants were asked to describe their experiences with regard to the role of theatre technicians within the overlapping roles of peri-operative nursing, they stated that the roles of theatre technicians are similar to that of nursing roles.

Consequently, participants emphasised the composition of the surgical team and the delivery of peri-operative care within the healthcare environment in which they function, thereby establishing the overarching themes of this study.

In the same way, participants provided insight into the factors that might influence the composition of the surgical team. Participants offered various experiences in these factors, and their perceptions about the staff credentials, leadership and supervision, and the conflict created by overlapping roles were identified as sub-themes, related to the composition of the surgical team.

The following theme, “comprehensive peri-operative care” surfaced boldly during the interviews with PNs and medical practitioners. However, this theme, coupled with the sub-theme of patient interaction, and the prevention of risks to ensure the safety of the surgical

patient, set the tone for most participants in their comparisons between the roles of nurses and theatre technicians.

The experiences of theatre staff regarding the role of theatre technicians in peri-operative nursing seemed to have been shaped by various factors. The healthcare environment, with specific reference to the training and career prospects of theatre technicians, the shortages of theatre staff, and unclear information was reiterated by participants, emerging as sub-themes.

These themes and subthemes are presented in table 4.2, followed by a more in-depth discussion.

**Table 4.2: Themes and sub-themes**

<b>Themes</b>	<b>Sub-themes</b>
<b>Overlapping roles</b>	Procedural competence Theoretical knowledge Role expectations Role boundaries
<b>Team composition</b>	Staff credentials Conflict Supervision Leadership
<b>Comprehensive peri-operative care</b>	Patient interaction Prevention of risks and patient safety
<b>The healthcare environment</b>	Career development and Training Staff shortages Insufficient Information

#### **4.3.1 Theme 1: Overlapping roles**

Participants expressed that the roles, or the associated bundles of tasks within the roles of scrub, circulating and anaesthetic assistants, overlap with that of nurses. Participants rarely referred to the specific role requirements when theatre technicians are allocated into these roles. Instead, participants often compared their perception of competence between theatre technicians and that of professional nurses.

Thus, throughout data collection interviews, when participants referred to the overlapping role of theatre technicians in the OR, they made reference to procedural competence, theoretical knowledge, role expectations and role boundaries. These concepts re-emerged as themes throughout data analysis.

##### **4.3.1.1 Sub-theme 1: Procedural competence**

In general, participants experience technician's procedural competence as good. They stated that they are well-trained to prepare equipment and supplies (*"There are technicians that are excellent... I will take them to war with me..."* (Participant 2)).

However, another participant contested that they (theatre technicians) lack certain skills and have less insight in sterility: *“Their sterile technique often not up to standard...whereas scrub sisters are more aware of sterility”* (Participant 5).

Participants also disagreed on the level of participation required from scrub, circulating and anaesthetic assistants during surgical procedures. One surgeon described theatre technicians' inability to anticipate the surgical process as a distraction in theatre, linking distractions in the OR to increased risks for the surgical patient: *“They are trained to count swabs...and turn away from the surgeon to count and loose the surgical steps”* (Participant 5).

Similarly, PNs also expected anticipation and inter-professional involvement from these role players, and indicated that procedural competence require comprehensive knowledge: *“How do they learn? Monkey see, monkey do...but you must look at everything in totality, and people without that training, without that knowledge, work step by step, 1,2,3,4...like saying a recitation”* (Participant 9). These participants stated that technicians do not participate and focus as much as PNs, resulting in poor anticipation during the procedure and more distractions to the surgeon.

In contrast, theatre technicians and one surgeon expected a focus on task competency, and are frustrated with “highly qualified” nurses telling them what to do: *“If you have a highly qualified person, coming in from elsewhere, telling me right from the beginning, what to do”* (Participant 11).

In the same way, one surgeon and one theatre technician agree when they related to the qualifications required to perform certain roles, believing that nursing qualifications are unsuitable for OR roles: *“A lot of overqualified people are doing a lot of things and I am sure, being a theatre sister is one of them”* (Participant 11).

Whereas other participants believe that the background of nursing is essential for peri-operative practice: *“I (anaesthetist) think they (theatre technicians) must be better prepared – it is probably about training, and perhaps also selection. Before they actually get exposed to a practical situation that is highly specialised”* (Participant 6).

Opposing this statement, one theatre technician declared that nurses are less competent in the OR, because they are not taught the correct procedures. *“A sister... is placed in theatre, and they have to learn. So they don't do according to a book. I, as a surgical technician must do according to a book... basic stuff, count swabs, instruments, of which the sisters don't do, because they have not been taught”* (Participant 10). This drew attention to theatre

technicians' ignorance about the procedural and theoretical competence expected from OR qualified PNs.

#### **4.3.1.2 Sub-theme 2: Theoretical knowledge**

PN and medical practitioners experience that theatre technicians lack comprehensive knowledge of patient conditions. Therefore, they are unable to link pre-operative and post-operative patient care to intra-operative skills. They perceive that this lack of continuity may result in an inability to link patient conditions to intra-operative risk management: *"They don't have an idea of what is done in the wards...people must first work outside theatre ...then one understands the complications... basic complications like infections in an older person..."* (Participant 2).

Although participants referred to theatre technician's theoretical anatomy and physiology knowledge, they varied greatly on their views concerning the theoretical competence of theatre technicians.

Even as some PNs and theatre technicians thought that theatre technicians had sound anatomy and physiology knowledge, others experienced that theatre technicians were ill-equipped with regard to anatomical structures, and linked it to poor procedural competence and anticipation during the surgical procedure.

On the contrary, some theatre technicians referred to their own anatomy knowledge as superior to that of the PN, whilst others stated that their training involved very little anatomy and physiology: *"Sometimes that doctors will ask about things, like the blood pressures, then I don't really know...we did very little anatomy as technicians...I did not know about blood flow through the body...so basically, what I have learnt, I learnt in in practice"* (Participant 12).

The researcher viewed these comments as an indication of various levels of training provided to theatre technicians, as some theatre technicians specified that they completed an accredited three year diploma course, whereas others completed in-house training courses, not nationally accredited. Similarly, two theatre technicians completed additional in-service training courses to assist with anaesthetics, whereas others have never been exposed to anaesthetics.

Regardless of the various levels of training, and different educational qualifications, role expectations of staff in the scrub, circulator and anaesthetic assistant role seemed to remain the same.

#### 4.3.1.3 Sub-theme 3: Role expectations

The overlapping roles of PN and technicians in the OR, does result in confusion surrounding the expectations that theatre staff have about the role of a scrub practitioner, circulator or anaesthetic assistant: *“They (theatre technicians) do exactly what we (PN) do”* (Participant 2).

In the scrub role, similar to the circulator and anaesthetic assistant roles, they expect certain outputs. It seemed that PNs, theatre technicians and medical practitioners alike, expect the same output of staff in these roles, regardless of their designation: *“It is more the same with the scrub sister. We do more or less the same thing.”* (Participant 10)

By and large, PNs and theatre technicians seemed uncertain about the reasons why technicians may do certain tasks, like scrubbing for major surgery unsupervised, but other tasks, like inserting a suppository, they may not perform.

PNs and theatre technicians experience some tasks as high risk tasks, like scrubbing for an aorta aneurism, and this may be performed unsupervised by a technician. Whereas other tasks, like inserting a suppository, they perceive as a lower risk task, but technicians may not perform that, even under direct supervision. *“They can scrub for an aortic aneurism, or knee replacement... or a deadly laparotomy.... Sick patients.....But, they can’t draw up medication, put in catheters... they can’t put in a suppository...”* (Participant 2).

Reiterated by theatre technicians: *“The catheter, and the drugs and the suppository ...that is the only things that they can do, and we can’t. It’s not difficult stuff... it does not look difficult to me.”* (Participant 4).

Conversely, not all participants agreed on the role content of theatre technicians, as inserting urinary catheters, applying tourniquets and handling medication are performed by some technicians: *“He (technician) is an assistant better to the table, positioning the patient, he can do a catheterisation, male or female, better than what I have noticed in certain ENA’s... (Technician).....will apply the tourniquet, he will position the patient”* (Participant 8).

Whilst PNs, medical practitioners and theatre technicians agree on the necessity of procedural competence of technicians, PNs feel that the ultimate responsibility for patient care in the OR remains with them: *“I see them as a help for me, but it feels like I take most of the responsibility for what happens”* (Participant 1). This is however contradicted by some theatre technicians: *“Because if the technician is the scrub person, you take responsibility for everyone in there, including the patient. And the rest of the staff. But you take responsibility for the team, because it’s your patient.”* (Participant 4).

PNs and theatre technicians seem equally uncertain about the delegation of tasks, traditionally associated with the role of scrub practitioner, circulator or anaesthetic assistant: *“If there is no RN in theatre, I take responsibility. Because although, as a surgical tech, you should have a Registered Nurse with you in theatre, who should take the blame, because you are not registered with SANC. Yes. But if I am alone, ultimately, I am the one”*. (Participant 10).

When participants described their experiences of the role of theatre technicians, these uncertainties seemed indicative of a vague understanding, not only of professional responsibility, but also of the legal framework, such as when handling medication: *“We were sent to do this anaesthetic course...it’s just the drugs that make everybody upset... We can’t work with scheduled drugs. We can’t handle the key of the cupboard, and we can’t be involved in the counting, or the register or anything like that.”* (Participant 4).

By referring to the inability of technicians to “draw up medication” and managing schedule five and six drugs, PNs and theatre technicians conclude that assisting with anaesthetics is not the ideal role for theatre technicians, although some theatre technicians are trained to assist with anaesthetics. An anaesthetist also experienced that theatre technicians’ limited knowledge increased peri-operative risks, especially in emergency surgical procedures: *“An emergency Caesar, I walk into theatre and expect that someone will be able to help me... And there I sat with a technician that had no clue”* (Participant 6).

Uncertain role expectations with regard to the post-operative phase also seemed prevalent. Participants seemed to disagree on the role of theatre technicians with regard to post-operative care. PNs generally agreed that the role of technicians in the post-operative period should be limited to that of cleaning the theatre and equipment.

However, they expected the technician in the scrub role to be able to hand a patient over to the recovery PN. *“You (technician) hand over to recovery room most of the time, never to the ward. Sometimes to ICU, if you go directly – if you are the scrub person”* (Participant 4). However, they agreed that it often happened that a PN was not immediately available to receive the patient in the recovery room. Consequently, theatre technicians apply monitors and commence monitoring without a PN in attendance: *“Look, they expect us to at least put on the BP cuff and SATS monitor in recovery room. If they are not there quick enough, we learnt how to connect the oxygen”* (Participant 7).

As stated by an anaesthetist: *“They get pushed into a situation for which they are perhaps not adequately prepared”* (Participant 6), and agreed upon by theatre technicians, their training did not include the care and monitoring of the post-operative patient. Nevertheless, some

theatre technicians commence the immediate post-operative monitoring when a PN is not available to take over the patient: *“We connect the monitors, and if they (PN) take too long, we write down the first measurements. They have taught us nicely in here. I feel good that I can do that, because I did not study in that line”* (Participant 7).

Hence, some participants felt that theatre technicians should be trained to include this aspect of peri-operative care.

#### **4.3.1.4 Sub-theme 4: Role boundaries**

Uncertainties surrounding role boundaries may be grounded in the lack of clear legal jurisdiction and the lack of professional awareness.

Technicians stated that they provide post-operative care, even if their scope of practice did not authorise this: *“...not allowed to wake the patients... it is not in my scope...but I used to do it”* (Participant 10).

Whilst PNs and theatre technicians, agreed that ENAs are better equipped for the role as anaesthetic assistant. They motivated this by referring to technician’s prohibition to draw up medication and manage schedule five and six drugs. These statements appeared uninformed to the researcher, as these tasks are excluded from the scope of practice of ENAs. Similarly, the references to theatre technicians who perform urinary catheterisation better than ENAs, and apply tourniquets, reiterated blurred standards about the role boundaries of theatre technicians.

Although theatre staff referred to the scope of practice of theatre technicians, some theatre technicians were unaware of a formal document authorising certain tasks: *“I don’t think there is a scope of practice for us... that says...this is what you do, this is what you don’t do”* (Participant 12).

Within the OR environment, theatre technicians recounted various tasks that they refer to as unauthorised. Apart from providing care and monitoring in the recovery room, another is performing the task of surgical assistant, with or without a PN in attendance: *“I (theatre technician) personally know that it is not allowed, but sometimes I assist the surgeon...sometimes there will be a scrub sister, then I am the assistant, sometimes there is not (a scrub sister), then I must just jump in”* (Participant 12).

The tasks performed by theatre technicians thus do not only overlap with that of PN, but also with that of medical practitioners if theatre technicians perform the role of surgical assistant in the OR.

The researcher understood that a lack of standards regarding team composition may be a contributor to the lack of role boundaries.

#### **4.3.2 Theme 2: Team composition**

During the interviews, participants did not refer to any institutional policy or standard regarding team composition in the OR. *“We are used to having a PN in each theatre, but nowhere, that is on paper...there are no standard rules or guidelines that say how it (team composition) should be”* (Participant 9).

*“The team is a technician and two ENAs - They can’t put in a catheter. So you must go and find a PN or staff nurse”* (Participant 2).

The overall impression was that individual competence of the scrub person, circulator and anaesthetic assistant equates a good team.

##### **4.3.2.1 Sub-theme 1: Staff credentials**

The inability to distinguish between various staff categories perpetuates the overlapping roles and unclear role boundaries.

All the participants in this study concurred that they mostly did not know, and could not identify the rank or designation of theatre staff who are assigned to the team: *“I don’t know who is scrubbing for me, whether it is a PN or technician, and I think I should know that”* (Participant 5).

Hence, role expectations seem not based on educational level, or scope of practice. It rather appears connected to supposed competence: *“If you are the kitchen girl, and you have willingness and you have eagerness, I train you* (Participant 8)”.*”*

The perceptions that theatre technicians and PNs in the OR perform the same roles are echoed in the quote below:

*“The surgeon ... most of the time they don’t even know that you are a technician. They think if you scrub, and do everything... according to them you are a sister”* (Participant 4).

These obvious role comparisons seemed to have convinced some participants that educational background is unrelated to peri-operative role delegation.

Thus, team composition, and the lack of continuity in OR teams may elevate ambiguity surrounding responsibility.

#### **4.3.2.2 Sub-theme 2: Conflict**

The variance in team composition seems to encourage conflict within the OR team.

PNs expect respect for seniority, whereas technicians expect equal recognition for roles equal to that of a PN. *“I think the nursing staff don’t think we are equal. I think it’s because of the catheter, and the drugs and the suppository, they think they have more responsibility... That is the only things that they can do, and we can’t”* (Participant 4).

Although theatre technicians themselves report that they do not focus on comprehensive patient care, the perception that theatre technicians perform the same tasks as PNs in the OR, echoed through all interviews with theatre technicians. This was underlined by their frustration as they perceive unequal financial and role recognition: *“We do more or less the same thing...I would not see it is fair. Because we do not get (shows money-rub between fingers) a lot. And we do mostly the same work...they see a surgical tech as, as this person who thinks they know everything, but is nothing. Because we have not done nursing.”* (Participant 10).

Equal financial recognition which included the absence of theatre allowances for theatre technicians, were also contended by technicians as unfair recognition for equal task performance *“I’m doing exactly what they do – why can’t I get my theatre allowance?”* (Participant 4).

The seemingly unfair financial and role recognition that theatre technicians describe do not only portray conflict with the nursing team but also with medical practitioners. They state that surgeons also question the validity of their role which emerged during the interviews: *“Sometimes, the doctor will say that we were taken off the road just to learn about tools”* (Participant 7).

In addition, nursing subcategories do not always accept delegated tasks from theatre technicians, as they possibly would accept task delegation from PN.

#### **4.3.2.3 Sub-theme 3: Supervision**

Specialised healthcare in the OR occurs in a high stress environment, and a surgeon, anaesthetist and PNs questioned the suitability of theatre technicians to be left unsupervised in the OR.

The exclusion of PNs from the theatre team may leave the delegation of responsibility questionable as stated by a theatre technician: *“As a surgical tech, you should have a*

*Registered Nurse with you in theatre, who should take the blame, because you are not registered with SANC” (Participant 10).*

However, even though most participants were of the view that a PN in theatre is needed, be it only for certain tasks, this view does not seem to be mirrored in practice: *“... It is usually a technician and two nurses” (Participant 1).*

Most participants also asserted that more often than not, the teams in which they function do not include PNs: *“For the last three or four years I mostly work on my own, and if I don’t know something, I will tell the doctor, or the sisters that have been working there for a long time. I will ask them to teach me, but mostly I am on my own” (Participant 12).*

#### **4.3.2.4 Sub-theme 4: Leadership**

Teams that exclude a PN, is made up of technicians and non-professional nurses: *“Sometimes in the team, I (theatre technician) am the only scrub person there, so everyone expects I must be in charge - the team leader...” (Participant 4).*

Theatre technicians viewed leadership in the OR as dependent on who was allocated to the surgical team, and who knew the surgeon the best. Again, leadership, for some theatre technicians was not defined within the framework of comprehensive peri-operative care, but rather within step-by-step procedural experience.

#### **4.3.3 Theme 3: Comprehensive patient care**

All of the participants experienced that technicians focus only on the technical aspects regarding peri-operative care, although they had varying accounts regarding the suitability of such a technical focus. Theatre technicians and one surgeon advocated for skill-specific task allocation, whilst another surgeon and PNs reiterated that specialised knowledge and skills should be applied through holistic, caring behaviour: *“I am a nurse...caring comes easy for me...so being a scrub sister is just the practical side of the job, but still it’s about the patient, caring for the patient” (Participant 1).*

PNs ascribed the lack of non-technical competence to the fact that most theatre technicians are still young. Contesting this, a surgeon ascribed it to inadequate training where technicians, unlike medical practitioners and nurses do not learn coping skills in a pressured healthcare system before being exposed to specialised healthcare like the OR: *“Through four years of training, nurses were trained to handle the pressure in the system, before they went for further training” (Participant 5).*

On the other hand, one surgeon indicated that PNs are too qualified to function in the OR, and stated that OR roles are aligned toward a more specifically skilled workforce, requiring generalised, rather than specialised nurses. Though, arguing the same point, one PN stated that some surgeons do not want staff in theatre who can think for themselves *“there are doctors who are willing to work with people that they can train from scratch...as long as they do as they are told it is perfect, because they don’t like it when people can think for themselves”* (Participant 9).

#### **4.3.3.1 Sub-theme 1: Patient interaction**

An emphasis on the technical aspects was evident also from interviews with theatre technicians: *“As a theatre technician, you don’t interact that much with a patient, so I think that is a nice thing. I don’t have to interact with patients that much”* (Participant 4).

Whereas PNs agree that, although working with anaesthetised patients, patients still require nursing care, including privacy, patient advocacy and comfort: *“Without nursing care...the blanket will stay creased”* (Participant 2), technicians focus on the skill, rather than patient care: *“I am not a people’s person. I like the people when they are asleep”* (Participant 4).

Notwithstanding, a PN identified the need for peri-operative nursing care, continuity of care and risk management: *“I understand and that is mostly practical... but there is still a patient on the table that must be looked after, that must be... you know, cared for... it’s a person.”*(Participant 1). Whereas theatre technicians did not identify with this view of peri-operative care. *“That is just the whole barrier. A blockage. ...Because that is the nursing part of this whole story. You know – I don’t have this nursing background.... I did not work in the wards... did not give medications, did not do full body washes, and nappy changes”* (Participant 4).

Then again, surgeons and anaesthetists in general reiterated comprehensive patient care and peri-operative team participation. They believe that PNs are better equipped in non-technical aspects like communication, anticipation and team management. One surgeon unmistakably linked PN participation to fewer distractions to the surgeon and subsequent peri-operative risk reduction.

#### **4.3.3.2 Sub-theme 2: Prevention of risks and patient safety**

*“Distractions in theatre... that is the problem with people that are less trained, you (surgeon) must look around much more in theatre as things that can potentially go wrong...technicians definitely do not have insight into surgical risks”* (Participant 5).

Whereas another surgeon gave preference to skills above qualifications, *“Appropriate skills in the right place, is a model that should be followed, rather than um, you know, telling everybody, they need so many qualifications”* (Participant 11). Other participants believe such an approach may jeopardise patient safety: *“It is not personal, it is about patient safety. The basis of my practice is about patient safety”* (Participant 5).

#### **4.3.4 Theme 4: The healthcare environment**

Participants described the OR environment as a high risk environment, whilst various factors like heavy workloads and conflict may affect the care of the surgical patient, though not all participants agreed about the role of theatre technicians or their required level of supervision within the healthcare team.

*“...high work load, high stress levels, high risk...you must take that stress, look after your patient, keep the doctor happy, and he shouts at you, the staff are unhappy, you are tired, and it is long cases.”* (Participant 9).

References by PN and theatre technicians about institutional sanctions or punishment for not being in control of their team seemed to be a cause of confusion to PNs, because it left the question unanswered: *“What if there is no PN in the theatre?”* (Participant 9).

While both PN and technicians were aware that there is no professional registration for technicians, medical practitioners assumed that technicians were professionally registered, and that their acts and omissions were thus governed both on organisational and national level.

When participants referred to on-call practices or after hours work: *“Some of them feel uncomfortable to do weekend calls with technicians because there is nobody – no other people in the complex to help if anything should happen”* (Participant 4).

In the same manner, participants questioned theatre technicians' ability to anticipate, prevent and manage emergency situations in the OR, albeit not alone, but as an effective peri-operative team member: *“But if there is a real emergency...I (theatre technician) will be worried, because we are not involved in it (anaesthesia) much”* (Participant 7).

##### **4.3.4.1 Sub-theme 1: Career development and training**

The limited career development opportunities and OR specific training of theatre technicians emerged throughout the interviews with them: *“I feel that I can't go any further, this is what I am, and this is what I'll stay...the only thing that I can do, is work in theatre”* (Participant 4).

Whilst this task orientated training frustrated theatre technicians, surgeons presented opposing views on the effect that skill-specific training had on peri-operative care, although the researcher deduced that the variances in the training and education of theatre technicians may have influenced these perceptions.

Surgeons voiced unrelated expectations of scrub practitioners' roles as illustrated by the following opposing opinions: *"I think their training must be done differently. They must get a background of nursing to give them insight into what they do"* (Participant 5). Contesting this, another surgeon said: *"I am very in favour of actually training people for a specific task. And I don't think it really matters where they come from"* (Participant 11).

In the same way, theatre technicians regarded their own training in different ways. Whilst three theatre technicians considered their training as equal, or superior to that of nurses in the peri-operative environment, one theatre technician contradicted this: *"I (theatre technician) think our scope of training must...include more anatomy, more about medication and the environment – what you have to look for"* (Participant 12).

These statements confirmed the different training backgrounds of theatre technicians. Some theatre technicians had two years' in-house training, with no formal recognised qualifications, others obtained a national diploma from an accredited higher education institution, though still not accredited or regulated through a healthcare regulatory council.

Evidently, from the data that has been collected, theatre technicians function within the roles of scrub, circulator or anaesthetic assistants, in spite of different educational qualifications. In this manner, theatre technicians fill the gap left by nursing shortages in the OR.

#### **4.3.4.2 Sub-theme 2: Staff shortages**

Participants agreed that there are not enough PNs in theatre, which necessitates the inclusion of theatre technicians in the surgical team: *"We are short of scrub people, we need sisters, or even nurses, and then we got technicians, and I think it is a good thing"* (Participant 12).

#### **4.3.4.3 Sub-theme 2: Insufficient information**

None of the participants distinguished between the roles of theatre technicians with cognisance of the various educational backgrounds amongst theatre technicians. The researcher attributed this to a lack of information available to participants.

PNs referred to accepting the overall responsibility to patient care in the OR within the roles of scrub practitioner, circulator and anaesthetic assistant.

Medical practitioners assumed that theatre technicians were regulated and bound by an ethical and clinical code of conduct similar to their own and that of the nursing profession. In this way, the lack of inter-professional role insight became apparent.

Also theatre technicians experienced a lack of information about their role, although they referred to their scope of practice throughout interviews: *"I don't think at the moment there is anything, black on white, that says, this is what a tech can do...it will help, because then you can standardise...this is what you do, this is what you don't do"* (Participant 12).

#### **4.4 SUMMARY**

The overlapping roles of professional nurses and theatre technicians, the composition of the surgical team, various views on comprehensive patient care and the healthcare environment emerged as themes in this study.

These themes and sub-themes, as presented in chapter four, centred on what participants perceived as barriers or enablers within the roles that theatre technicians are currently allocated to.

In chapter five, these findings will be disseminated to the study objectives, and presented in its association to existing literature.

## **CHAPTER 5: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 INTRODUCTION**

The findings of this study are discussed in chapter five, and critically debated within the context of existing literature in the field of peri-operative nursing.

### **5.2 DISCUSSION**

The aim of this study was to explore the experiences of OR staff about the role of theatre technicians in peri-operative nursing.

Throughout the peri-operative phases, the caring science of nursing is continued (Rauta et al., 2012:1392). Comprehensive patient care necessitates a holistic, individualised approach and the coordination of multi-professional peri-operative activities (Gillespie et al., 2012:98).

Whilst comprehensive patient care developed as a theme throughout this study, participants concurred that theatre technicians lack a holistic patient approach. OR qualified PNs in this study underlined the caring nature of nursing: *“I understand and that is mostly practical... but there is still a patient on the table that must be looked after, that must be cared for... it’s a person”* (Participant 1). This may be explained by verifying literature, as the particular vulnerability of peri-operative patients (Retzlaff & Hamlin, 2012:272) underpins nurses’ likely focus on the ethical values of patients (Jansky et al., 2013:281).

As participants reiterated the similar role expectations attached to nurses and theatre technicians, they also focussed on comparisons between these two staff categories in the roles of scrub, circulator and anaesthetic assistants.

These themes and subthemes, although relevant to the entire peri-operative period, will be presented within the context of the specific study objectives, and thereafter it will be connected to the guiding conceptual and theoretical framework of this study.

As peri-operative patient care is divided into three distinct phases, characterised by specific functions (Russ et al., 2013:479), the role of theatre technicians and the level of supervision as experienced by theatre staff are described within the pre-operative, intra-operative and post-operative periods.

### **5.2.1 Objective 1: The role of theatre technicians in pre-operative nursing**

The pre-operative phase refers to the period starting when a patient is scheduled for surgery up to transfer onto the OR table (Russ et al., 2013:476). During this phase, competent staff are allocated in the roles of scrub, circulator and anaesthetic assistant (Mitchell et al., 2011:818).

Professional nurses are allocated to secure a safe environment whilst evaluating peri-operative patient care (Meretoja & Koponen, 2011:420). However, as described by the participants of this study, professional nurses are often not included in the team for each surgical patient. Instead, it was found that theatre technicians often function in the scrub role, whilst non-professional nurses are allocated in the role of circulator and anaesthetic assistant.

#### **5.2.2.1 Theme 2: The composition of the surgical team**

The composition of the surgical team emerged as a theme in this study as participants agreed that standards regarding staffing in the OR are absent. The findings of this study may support Rispel (2015:12), who state that staffing standards in South African healthcare should receive urgent attention. Particularly so in view of Cohoon (2011:561), who state that team factors like inconsistent information and incorrect patient monitoring, are frequent causes of near miss adverse events in the OR.

It was evident that participants were unaware of legislative, operational or educational requirements regarding the composition of the surgical team: *"We are used to having a PN in each theatre, but nowhere on paper...there are no standard rules or guidelines that say how it (team composition) should be"* (Participant 9).

However, there is a shortage of qualified OR nurses (Pupkiewicz et al., 2015:1), and participants agreed that theatre technicians fill the gap left by nursing shortages. *"I think there is just not enough registered people...and the ones we have is close to retirement"* (Participant 9).

Despite the fact that task division should be according to workplace policy with appropriate supervision (Grando et al., 2011:140), the findings of this study suggest that task division and supervision regarding the role of theatre technicians are vague: *"I don't think there is a scope of practice for us...I don't think at the moment there is anything, black on white, that says, this is what a tech can do... this is what you don't do"* (Participant 12).

#### **5.2.2.2 Theme 1: Overlapping roles**

Despite the fact that literature describes that specialised knowledge, skills and experience are required peri-operatively (Mitchell et al., 2011:818), the findings of this study suggest that

theatre staff have opposing views of the knowledge, skills and experience required in peri-operative patient care.

#### 5.2.2.2.1 Subthemes: Pre-operative role expectations and patient interaction

In the pre-operative phase, theatre technicians described similar role expectations to that of OR qualified PNs, although their educational backgrounds vary considerably: *"We fall in with the scrub sisters...they count us as a sister"* (Participant 4). Whilst one participant supported task-orientated training within healthcare: *"I am very in favour of actually training people for a specific task"* (Participant 11). Allen (2014:137) reiterated that graduate training is necessary to undertake the sophisticated organisational and technical skills that are expected from nurses.

Organisational tasks during the pre-operative phase incorporate team communication about delays or changes to theatre lists, and communication with external team members such as radiographers (Russ et al., 2013:478). Likewise, individualised patient care is planned through patient assessment to enable patient advocacy (Goodman & Spry, 2014:24). Contrasting to this, this study found that theatre technicians had a limited focus on patient interaction: *"As a theatre technician, you don't interact that much with a patient, so I think that is a nice thing. I don't have to interact with patients that much"* (Participant 4).

The patient is handed over from a pre-operative unit which requires communication about the patient's specific needs and the condition of the patient (Russ et al., 2013:477). Though, during the interviews with theatre technicians they focussed on the technical theatre preparation: *"Pre-operative role - check what procedure you're doing and just prepare the theatre"* (Participant 4). However, OR qualified PN and medical practitioners reported that theatre technicians lack insight into comprehensive patient care: *"I think their training must be done differently. They must get a background of nursing to give them insight into what they do"* (Participant 5). Contesting this view, one surgeon advocated for skill specific training: *"Appropriate skills in the right place, is a model that should be followed, rather than telling everybody, they need so many qualifications"* (Participant 11).

Although, on the one hand participants encouraged the need for comprehensive knowledge and holistic care, whilst others supported skill specific training, these different perceptions may affect the safety of the surgical patient. Literature supports comprehensive nursing care as OR nursing continues throughout the peri-operative phases, with a specific focus on patient safety (Rauta et al., 2012:1392). Furthermore, Tibbs and Moss (2014:486) state that communication and teamwork perceptions are crucial for peri-operative patient safety.

#### 5.2.2.2.2 *Subthemes: Prevention of pre-operative risks and patient safety*

Peri-operatively, the safety of the surgical patient is of prime concern (Rauta et al., 2012:1396), and participants all support the safety of the surgical patient amidst these different views.

During the pre-operative period, the patient records, surgical consent, surgical site and patient history are verified to identify and prevent surgical risks (Zahiri et al., 2011:59). These aspects of pre-operative patient safety were reiterated by theatre technicians and PNs: “*Check the side of type of, the procedure being done, for which doctor, any allergies*” (Participant 10).

However, the verification of surgical consent, the surgical site and patient records, are viewed within the background of an individual patient’s history (Zahiri et al., 2011:59). In contrast, participants in this study experienced that the training of theatre technicians’ left them ill-equipped to link existing patient conditions to intra-operative risk management, although one theatre technician reported doing admissions and providing health education to patients: “*You (theatre technician) must also admit the patient...you ask the patient a whole lot of questions...you explain the procedure....you tell the patient sign here, sign there...then the patient says the doctor did not explain the procedure...then you explain to the patient...you give a fair amount of health education... but I also bring bed pans sometimes, so there is also nursing involved*” (Participant 13).

Despite the fact that the prevention of peri-operative risks requires constant analysis of the patient’s condition, participants gave different accounts of their experiences about theatre technicians in this role, as theatre technicians are regardless of the risks still allocated as an assistant to the anaesthetist.

##### *(i) The pre-operative role of the anaesthetic assistant*

The pre-operative role of an anaesthetic assistant include the preparation of anaesthetic related equipment such as warming devices, monitoring equipment and drugs (Russ et al., 2013:478). Two theatre technicians reported competence in the role of anaesthetic assistant; another theatre technician reported some exposure, whilst another theatre technician reported no anaesthesiology related training or knowledge.

Whilst all participants indicated that theatre technicians are prohibited to manage medication, they questioned the reason behind this prohibition. Although the control, storing and dispensing of medication is regulated by the Medicines and Related Substances, Act 101 of 1965 (McQuoid-Mason & Dada, 2011:107), neither PNs, nor theatre technicians referred to this legislative framework underpinning the management of medication.

Even though theatre technicians work under direct supervision of an anaesthesiologist in the role of anaesthetic assistant, peri-operative risks may escalate due to theatre technicians' inability to anticipate and manage risks during emergency surgical procedures as iterated: "*An emergency Caesar, I (anaesthesiologist) walk into theatre and expect that someone will be able to help me... And there I sat with a technician that had no clue*" (Participant 6). Thereby, this response emphasises that the anticipation, early recognition and management of emergency situations within the OR team is crucial to promote patient safety (Meretoja & Koponen, 2011:420).

Thus, participants concurred that theatre technicians are less effective, if not unsafe in the role of anaesthetic assistant.

(ii) *The pre-operative role of the scrub and circulator practitioner*

In the role of scrub or circulator practitioner, this study found that theatre staff experience theatre technicians as efficient in the task of theatre preparation. Pre-operatively, the equipment and instruments, as well as supplies are prepared for the surgical procedure (Russ et al., 2013:478).

Despite the fact that technical, step-by-step procedural competence is required within the peri-operative field, the care must be delivered through collaboration by various healthcare professionals in the OR (Kilvered et al., 2012:453).

Although participants in this study agree that theatre technicians' role include that of preparation for the procedure, they do not experience that role to include patient care: "*Caring for the instruments...pre-operative, post-operative...not caring for the patient*" (Participant 1).

Thus, as competence incorporate the planning of care, transfers of patients, resource allocation and anticipation of how care would unfold (Allen, 2014:133), theatre staff do not experience theatre technicians as competent in these role expectations.

Jointly, pre-operative competence and experience are expected to ensure safe patient outcomes and cost-effective care, as procedural preparation significantly affects the intra-operative phase (Mitchell et al., 2011:818-828).

In conclusion, the objective to explore the experiences of theatre staff with regard to the pre-operative role of theatre technicians was thoroughly explored and reached. The study found that theatre staff experience theatre technicians' focus on the technical preparations in the pre-operative phase, but that they lack a holistic and collaborative patient care approach. As described by the stated literature, such a limited technical focus of theatre technicians' affect

their ability to anticipate and prevent peri-operative patient risks, especially so in the absence of an OR qualified PN.

### **5.2.2 Objective 2: The role of theatre technicians in intra-operative nursing**

The intra-operative phase is the period from when a patient is transferred onto the theatre table, until completion of the surgical procedure (Kilvered et al., 2012:449).

Internationally, the PN, as a circulator coordinates patient care whilst supervising a trained subordinate practitioner, with less emphasis on the technical aspect of OR nursing (AORN, 2013:208).

Theatre technicians' tendency to focus on the technical aspect of peri-operative care, support the findings by Maxwell et al. (2013:627) who found that niche roles focus on professional principles as opposed to the fixer roles, where the focus is on tasks and techniques. Likewise, the approach of PNs in this study centred around the caring principles of nursing, whereas theatre technicians, similar to the fixer roles described by Maxwell et al. (2013:627), focussed on tasks and techniques, often upon direction from the surgeon: *"The doctor will tell you, this is the best way of doing this, so you need to do it...the doctors help you a lot"* (Participant 13)

Internationally, allied health providers, like surgical technologists often perform the role of the sterile scrub practitioner (Phillips, 2013:56). In contrast, such clear role expectations were not found in this study as the roles of qualified PNs and theatre technicians overlapped entirely.

#### **5.2.2.1 Theme: Overlapping roles**

Whilst PNs and theatre technicians alike, were allocated to the roles of scrub practitioner and circulator, these overlapping roles emerged as a primary theme in the study, underlined by uncertainty regarding responsibility: *"They (theatre technicians) do exactly what we (PN) do, but they still don't take the responsibility"* (Participant 2).

##### *5.2.2.1.1 Sub themes: Role expectations and role boundaries*

Ambiguous roles and the bundles of tasks within each role surfaced throughout interviews. Participants reported various tasks undertaken by theatre technicians, regardless of their training: *"He (technician) is an assistant to the table, positioning the patient, he can do a catheterisation, male or female, will apply the tourniquet"* (Participant 8). Other theatre technicians reported that they sometimes perform the role of surgical assistant, which is normally performed by a medical practitioner, and still others performed post-operative patient monitoring, despite not being trained in the field.

These findings support that role ambiguity and leadership misconception may underpin human errors (Ricci et al., 2012:799).

#### 5.2.2.1.2 Sub themes: Leadership and intra-operative risk prevention

To prevent adverse events in the OR, the training and proficiency of staff must be considered (Cohoon, 2011:563), as risks related to the intra-operative phase include injuries related to transfer and positioning, surgical site infections and retained surgical items (Goodman & Spry, 2014:24).

However, as it was stated by a theatre technician, surgical counts were often neglected due to production pressure: *“Sometimes it gets too hectic, and there is no time to actually look at your instruments, because it is a whole checklist...actually, most of the cases, there is not time...but you as the scrub technician is responsible for this whole thing... if the doctor suspect that there is a raytex swab in the patient, then the only thing to do is to take an x-ray, then so basically you will call the sister on the floor...then they will come in”* (Participant 13).

This statement underlines the crucial importance of clear standards regarding task delegation, with consideration of proficiency and training, to decrease peri-operative risks. Nevertheless, the delegation and coordination of role related tasks require strong leadership in the OR (Kurmann et al., 2012:224).

Theatre technicians in this study experienced that intra-operative leadership was dependent on who was more familiar with the surgeon’s preferences, thereby emphasising a procedural approach: *“It (team leaderships) depend on who knows the doctor better - who works with the doctor the most”* (Participant 4). Whilst PNs relayed leadership to various factors, including work load, patient care and staff management *“...high work load, high stress levels, high risk...you must take that stress, look after your patient, keep the doctor happy, and he shouts at you, the staff are unhappy, you are tired, and it is long cases.”* (Participant 9). Similarly, literature refers to the ability to manage stress and procedural fatigue, and linked safe peri-operative care to these cognitive and social skills (Mitchell et al., 2011:828).

Nevertheless, an identified leader should coordinate the team without becoming distracted from the surgical procedure (Kurmann et al., 2012:226). As, stated by participant 5: *“Distractions in theatre... that is the problem with people that are less trained, you (surgeon) must look around much more in theatre as things that can potentially go wrong”*.

The high risks of intra-operative care necessitates nursing interventions to prevent the risks associated with surgical procedures.

As stated by a theatre technician: *“Sometimes it gets too hectic, and there is no time to actually look at your instruments, because it is a whole checklist, and your floor nurse is not always there to stand by you to count the instruments...actually, most of the cases, there is not time...but you as the scrub technician is responsible for this whole thing... if the doctor suspect that there is a raytex swab in the patient, then the only thing to do is to take an x-ray”* (Participant 13)

Thus, nursing interventions should include the prevention of retained items, physiological monitoring of the patient and supervision of specimens during surgical procedures (Retzlaff & Hamlin, 2012:267).

#### 5.2.2.1.3 Sub themes: Intra-operative procedural competence and theoretical knowledge

The OR nurse further ensures patient safety through maintenance of the sterile field, surgical instrumentation, fluid loss and position monitoring (Kervered et al., 2012:449). Thus, technical skills in the OR include the maintenance of sterility, handling and assembly of surgical instruments (Gillespie et al., 2012:97).

To participate in surgical procedures, the PN in OR should display a sound knowledge of anatomy, physiology and surgical procedures (Rothrock, 2011:15), as the timely anticipation and reactive assistance to the surgeon is crucial to ensure a smooth surgical procedure (Koh et al., 2014:1236).

One surgeon in this study experienced that theatre technicians functioned very well in the scrub role: *“I have scrubbing for me...not a sister, and I don’t think it makes any difference whatsoever”* (Participant 11). Whilst another surgeon experienced intra-operative incompetence from theatre technicians, linking it to distractions that increase intra-operative risks: *“They don’t give attention to detail... and don’t keep up with the surgery, they are not involved in the procedure, whereas scrub sisters can anticipate the surgical steps, and hand correct instruments without the surgeon having to ask”* (Participant 5).

Literature emphasise these essential non-technical skills, and teamwork, situational awareness and task management are vital peri-operative non-technical skills (Mitchell et al., 2012:201).

However, in this study, diverse views on the training and competence of theatre technicians were provided by theatre technicians, professional nurses and medical practitioners. This notably correspond with Matsoso and Strachan (2011:52). They identified the lack of planning and integration of mid-level healthcare workers between the healthcare and higher education sector in the 2012/2013 – 2016/2017 human resource strategy for South Africa.

Whilst three theatre technicians perceived their training as equal or superior to that of nurses, one identified deficits in their training with regard to anatomy, physiology and comprehensive care. The latter view echoed the view of professional nurses and medical practitioners, although one surgeon viewed PNs as being overqualified. In contrast, professional development, leadership, collaboration and empathy were identified by Gillespie et al. (2012:91) as non-technical skills upon which safe peri-operative practice is based.

These diverse intra-operative experiences highlighted the different training backgrounds of theatre technicians in this study.

Adverse events must be anticipated or detected early to prevent serious harm to the surgical patient (Hoyland & Thomassen, 2014:77).

To detect physiological changes in response to surgery or anaesthesia, the surgical patient is monitored continuously. Thus, the PN in the OR must be competent in recognising normal and abnormal responses (Goodman & Spray, 2014:272). However, as found in this study, a PN is often not included in the surgical team, whilst participants experience that theatre technicians are not competent in recognising normal and abnormal responses.

The role of the anaesthetic assistant as an unsterile team member in the OR works under direct supervision of the anaesthetist and is responsible for the administration of anaesthesia throughout the peri-operative phase (Goodman & Spray, 2014:8). However, this study found that the anaesthetic assistant in the South African context does not administer anaesthesia, but instead provides assistance to the anaesthesiologist.

Three theatre technicians in this role reported that they were prohibited from drawing up drugs, or administering medication or counting and recording schedule five and six drugs in the register: *"When it comes to medication, we are not taught to work with medication, we can't sign for medication"* (Participant 12). Another theatre technician reported that they did not receive any training in the field of anaesthesiology.

Such variant reports again underlined the theme of overlapping roles and role expectations, underpinned by the lack of guidelines regarding the composition of the team. As literature concur that the PN must monitor the surgical patient, monitor blood loss and patient instability (Kelvered et al., 2012:449). The vague training of theatre technicians in this field is amplified by the exclusion of the PN from the direct patient care team. In support of these findings, Duvall and Andrews (2013:310) also state that specialised nurses in the OR will promote the safety of the surgical patient. Participants in this study experienced that the person in the scrub role, whether it may be a PN or theatre technician, accompanies and hands the patient over

to the recovery room. Thus, as stated in literature, upon completion of the surgical procedure, the patient is transferred off the OR table whilst maintaining an open airway and transferred to the recovery room together with prescriptions and documentation (Russ et al., 2013:479). These communication tasks related to the condition of the patient, patient needs, handover between phases, procedural briefs and patient notes (Russ et al., 2013:477), are of particular significance, as communication deficits in the OR is a high contributor to near-misses, (Cohoon, 2011:562). Thus, theatre technicians in the scrub role are involved in patient handovers, even in the light of their narrow insight into patients' health conditions.

To conclude, theatre technicians that function unsupervised may contribute to near-misses due to their inability to identify, communicate and prevent potential harm to the surgical patient. Thus, the objective to explore theatre staff's experiences about the role of theatre technicians in the intra-operative phase, have been reached after thorough exploration.

### **5.2.3 Objective 3: The role of theatre technicians in post-operative nursing**

The post-operative phase commences upon completion of the surgical procedure up to discharge and includes the handover from the post-anaesthetic care unit (Russ et al., 2013:476). During this post-operative phase, nurses monitor the physiological condition to prevent and manage anaesthesia and surgery related complications (Voepel-Lewis et al., 2013:905).

This study found that theatre technicians in the scrub role accompany the patient to the recovery room where they hand the patient over to professional nurses, with consideration of drugs given, the condition of the patient and post-operative instructions.

#### **5.2.3.1 Theme: Comprehensive post-operative patient care**

Nursing surveillance is as an ongoing process during which physiological data is gathered and analysed to ensure timely reactions to complications and to prevent rescue interventions (Voepel-Lewis et al., 2013:906).

The post-operative monitoring of the anaesthetised patient includes cardiac, circulatory, ventilation, temperature and level of consciousness by using invasive and non-invasive monitoring devices (Goodman & Spray, 2014:272).

Even though participants in the study agreed that theatre technicians' training does not equip them to perform these tasks, four of the five theatre technicians nevertheless reported the contrary: *"Recovery room, are not, according to the scope of practice, I am not allowed to wake the patients....but I used to do it"* (Participant 10).

Knowledge of the patient's condition is critical to provide continuity of care and to formulate care plans (Ricci et al., 2012:800). Whilst these reports by theatre technicians regarding the monitoring of the anaesthetised post-operative patient seemingly disregard their educational background, it also emphasises the vague role expectations and unclear role boundaries.

#### 5.2.3.1.1 *Sub-themes: Role boundaries and role expectations*

Theatre technicians in the scrub role are expected to accompany the anaesthesiologist and the patient to the recovery room, and hand the patient over to a PN. Three theatre technicians reported that they also commence monitoring of the patient if there is no PN available to take over from them immediately: *"We connect the monitors, and if they take too long, we write down the first measurements. They have taught us nicely in here. I feel good that I can do that, because I did not study in that line"* (Participant 7). Though, such statements do not portray an understanding of patient conditions, or the integration of physiological patient monitoring and peri-operative risk prevention.

Thus, the study supports the importance to match nursing competencies to their work environment and to optimally utilise scarce nursing resources as supported by Meretoja and Koponen (2011:420). Failure to recognise, develop and apply specialised nursing knowledge may exasperate the current role confusion in the OR (Gillespie et al., 2008:259).

Correspondingly, this study found that specialised OR nursing knowledge is not acknowledged by theatre technicians, thereby underlining role confusion regarding overlapping roles. This ignorance of theatre technicians about comprehensive patient care may be ascribed to their focus on technical skills, and their limited insight into nursing competence: *"That is just the whole barrier. A blockage. ...Because that is the nursing part of this whole story. You know – I don't have this nursing background.... I did not work in the wards... did not give medications, did not do full body washes, and nappy changes"* (Participant 4).

Thus, clear role expectations may prevent ambiguous perceptions about responsibility and accountability (Grando et al., 2011:158) and reduce human errors (Ricci et al., 2012:799).

#### 5.2.3.1.2 *Sub-themes: Staff shortages and patient safety*

The shortages of OR qualified nurses are associated with increased adverse events (Duffield et al., 2011:244) and higher safety risks for peri-operative patients (Lin & Liang, 2007:2029). In the same way, as theatre technicians report that they commence monitoring of an anaesthetised patient as a PN is not always available to take over from them; the increased risks to the surgical patient are hereby accentuated.

In conclusion, the study found that theatre technicians' commence specialised patient monitoring and handover tasks in the post-operative phase for which they did not receive formal education. In view of the technical, skill-oriented focus of theatre technicians and the emphasis that literature place on comprehensive patient assessment and advocacy, such practices pose a threat to the safety of the surgical patient. Thus, the objective to describe the experiences of OR staff about the post-operative role of theatre technicians, have been achieved through thorough exploration.

#### **5.2.4 Objective 4: Supervision of theatre technicians by professional nurses**

In a high-risk, high stress environment like the OR (Russ et al., 2013:478), practitioners are held accountable for the outcomes within their roles (Grote, 2014:3). Task delegation should thus be done with supervision at the appropriate level (Grando et al., 2011:140).

In this study, participants voiced different experiences about the supervision requirements of theatre technicians. Yet, near-misses in the OR have escalated through inadequate supervision (Cohoon, 2011:2011).

On the one hand, theatre staff was of the view that theatre technicians may work unsupervised, or under indirect supervision: *"I (theatre technician) don't think we always need a sister in theatre. If I don't feel confident, I will call a sister"* (Participant 7), whereas other participants required direct supervision by a PN: *"you can't give that person to a surgeon alone without a sister"* (Participant 6).

Abbott and Booth (2014:161) state that it may be problematic if it is expected that less experienced staff request supervision or assistance when they are unable to manage a situation, as in itself, this requires experience and specific expertise. However, theatre technicians agreed that they will call a PN if they need assistance: *"...then so basically you will call the sister on the floor...then they will come in"* (Participant 13).

##### **5.2.4.1 Theme: Team composition**

According to literature it is required that a PN manages, directs and supervises peri-operative patient care (Rothrock, 2011:15). The study found that theatre staff experience unclear guidelines regarding the supervision of theatre technicians when they are allocated within the role of scrub, circulating or anaesthetic assistant. Even though, internationally, as in South Africa, OR organisations advocate for an OR qualified PN to be allocated to each surgical patient.

The AORN recommends one registered nurse per patient, with unlicensed assistance personnel to help with delegated patient care (Association for Peri-Operative Practice, 2014),

and in South Africa, SATS (2015) support one PN allocated to each peri-operative patient in their position statement on staffing.

Conversely, the participants in the study experienced that theatre technicians within peri-operative nursing are allocated as scrub, circulator and anaesthetic assistants without direct supervision of a PN. In addition, a lack of standards regarding supervision of theatre technicians within these roles may leave supervision requirements of theatre technicians to the discretion of the manager.

#### 4.2.4.1.1 *Sub-Themes: Staff Credentials and insufficient information*

The unpredictable composition of the surgical team was further highlighted by theatre staff's inability to distinguish between the various staff categories in the scrub, circulator and anaesthetic assistant roles.

In the OR, team members may have overlapping capabilities and diverse educational backgrounds, but the unique role of healthcare providers should be identified by specific competencies (Ricci et al., 2012:798). Though, in this study, PNs, theatre technicians and medical practitioners experienced that equal role expectations are attached to these roles, regardless of the qualifications that such a team member has: *"The surgeon ... most of the time they don't even know that you are a technician. They think if you scrub, and do everything... according to them you are a sister"* (Participant 4).

Whilst they experienced equal role expectations, PNs believed that they accept the overall responsibility to patient care in the OR even if theatre technicians were allocated in the roles of scrub practitioner, circulator and anaesthetic assistant. This seemed to be a cause of confusion to PNs, because it left the question unanswered: *"what if there is no PN in the theatre?"* (Participant 9).

To deliver comprehensive patient care, PNs apply skills and knowledge through independent and interdependent functions (Rothrock, 2011:2-5). While PNs assume the responsibility for comprehensive peri-operative patient care, they did not refer to their own dependent, interdependent and independent functions. Neither did they acknowledge legal accountability for their acts and omissions, although the application thereof is a professional expectation.

PNs in the study did not refer to the application of professional accountability for their acts and omissions in the OR. However, it could not be inferred that the PN participants are unaware of their professional regulatory framework as it may echo the findings of Lindwall and Von Post (2008:680), who found that OR nurses see their work as self-evident and never spoken of.

#### **5.2.4.2 Theme: The healthcare environment**

Internationally, there are states as in Pennsylvania (PA law calls for circulating nurse, 2010:5) and in California (Agency for Healthcare Research and Quality, 2014), where legislation necessitates the presence of a registered nurse. A PN with experience and a qualification in OR nursing are allocated as circulator for all surgical procedures requiring anaesthesia or sedation.

Such legislative directives are not stated in South Africa, although healthcare facilities are required to document the role and responsibilities of healthcare personnel (Republic of South Africa, 2015:39). Such roles and responsibilities must be aligned to practitioners' scope of practice and a formal supervision programme. However, the scope of practice only refers to actions permitted by professional regulatory bodies (Republic of South Africa, 2015:8) and thus excludes theatre technicians from this directive.

The OR is the highest revenue incurring department and underutilisation translates into financial losses (Hoyland & Thomassen, 2014:76). Theatre technicians recounted various tasks that they refer to as unauthorised, highlighting that production pressure may hinder patient safety in the OR (Singer et al., 2015:313). Apart from providing care and monitoring in the recovery room, another is performing the task of surgical assistant, with or without a PN in attendance: *"I (theatre technician) personally know that it is not allowed, but sometimes I assist the surgeon...sometimes there will be a scrub sister, then I am the assistant, sometimes there is not (a scrub sister), then I must just jump in"* (Participant 12).

Whilst it is known that managerial aspects, and aspects around staffing may influence the safety of the surgical patient (Lin & Liang, 2007:27), the roles, responsibilities and supervision of theatre technicians in this study depended on the manager's discretion and workplace jurisdiction. Overlapping role boundaries and diverse legislative and educational backgrounds of theatre technicians amplify the jurisdictional disputes between theatre technicians and OR qualified professional nurses. (Timmons, 2010:345).

Lassi et al. (2013:828) reiterated that mid-level health care workers, such as theatre technicians may provide valuable support in the light of staff shortages. However, they further state that inadequately trained or poorly supervised mid-level healthcare workers may have a negative effect on both quality of care and staff retention.

In this study, overlapping roles, with consequent vague role boundaries, surfaced boldly throughout the interviews. Similar to the findings related to fixer roles (Maxwell et al.,

2013:627), it left the impression that the role of theatre technicians were exclusively determined by managers.

Within the healthcare environment, career development and training of theatre technicians emerged as another sub-theme in that it may affect the experience of theatre staff regarding the role of theatre technicians.

#### *5.2.4.2.1 Sub-theme: Career development and training*

Internationally, the training and career development of theatre technicians vary. The training and career development of theatre technicians internationally and in South Africa were described in chapter two, paragraph 2.6.

Congruently, theatre technicians in this study described various educational backgrounds and qualifications, although they reported similar supervision perceptions, role expectations and role boundaries in the scrub and circulator role.

Thus, workplace jurisdiction for the role of theatre technicians in South Africa may be inferred by the training and employment of theatre technicians, although legal jurisdiction and professional regulation within healthcare has not been established (Allied Health Professions Council of South Africa, 2013). The omission of policies, health systems support and workforce strategies is considered an obstacle to the contribution that mid-level healthcare workers may make (Lassi, et al., 2013:829).

The findings of this study confirmed the variant training backgrounds of theatre technicians whilst they Practise unregulated and often unsupervised in the high risk OR environment.

#### *5.2.4.2.2 Sub-theme: Peri-operative patient safety and the prevention of risks*

A strong emphasis is placed on safe practices in the OR. Fowler (2013:11) reported that half of the adverse events in hospitals are associated with surgical procedures.

Numerous law suits demonstrate the violations of peri-operative safety practices. This is demonstrated by the Medical Chronicle (Medical Litigation: a National Health Crisis Requiring Urgent Solutions, 2011), who reported that medical litigation in South Africa saw a 132% spike in claim costs in 2011.

Whilst the professionalization of theatre technicians in the United Kingdom, and the resulting regulation of theatre technicians addressed the question of accountability (Timmons, 2010:348), the question of accountability in the South African context is left unanswered by this study.

As yet, theatre technicians are not registered, and despite this, they are allocated unsupervised in the OR. PNs are excluded from the direct patient care team. A surgeon in this study described that he experienced that this places more responsibility on him.

Matsoso and Strachan (2011:56) recommended that all healthcare professionals in South Africa should be licenced to practice. In South Africa, only registered healthcare practitioners can be held accountable for anaesthesia-related deaths in the OR (Madiba et al., 2011:235). Similarly, accountability cannot be conferred without having control over outcomes (Grote, 2014:3).

PNs are held accountable for their dependent, independent and inter-dependant functions. Even as intra-operatively surgeons and anaesthetists are present throughout the case, PNs are dependent on legal jurisdiction, and accountable for their independent acts and omissions. The exclusion of PNs from the theatre team could be detrimental to patient safety, especially when it is viewed in the light of adverse events in the OR, as retained surgical items, fires in the OR and wrong site surgery are the most reported “never events” in the OR (Zahiri et al., 2011:55).

Yet, the distribution of accountability in the OR seems vague when theatre technicians are left unsupervised or on OR call. When participants referred to on-call practices or after hours work: “some of them feel uncomfortable to do weekend calls with technicians because there is nobody – no other people in the complex to help if anything should happen” (Participant 4).

Evidently, the safety of the surgical patient is dependent on teamwork of various healthcare professionals. Through the acknowledgement of different professional skills, the co-operation between team members will improve (Lindwall & Van Post, 2008:675).

#### 5.2.4.2.2 *Sub-theme: Conflict*

The lack of role clarification and information about the competence of team members hinders teamwork in healthcare (Grando et al., 2011:157). Timmons (2015:345), specifically illustrate the boundary disputes as a source of conflict between theatre technicians and PNs in the OR.

In this study, together with boundary disputes, theatre technicians describe conflict with the nursing team and medical practitioners about the validity of their role: “*Sometimes, the doctor will say that we were taken off the road just to learn about tools*” (Participant 7). Theatre technicians further argued that they should receive equal financial recognition for equal task performance: “*I’m doing exactly what they do – why can’t I get my theatre allowance?*” (Participant 4). Though, such statements may be anticipated when viewed in the context of

unclear role definitions, it may lead to role confusion, conflict and poor relationships (Maxwell et al., 2013:623).

In conclusion, when the safety of the surgical patient is violated, an accumulation of minor safety violations by various individuals may result in major patient complications (Zahiri et al., 2011:59). This study found vague experiences surrounding the required level of supervision of theatre technicians, coupled with unclear role boundaries which may violate the safety of the surgical patient.

Thus, the fourth objective of the study was reached by exploring and describing the experiences of theatre staff about the level of supervision by PNs when theatre technicians are allocated in the roles of scrub, circulator and anaesthetic assistants.

### **5.3 CONCEPTUAL FRAMEWORK OF THE STUDY**

Teamwork in the OR is focussed on patient care, and dependent on clear role expectations (Hull et al., 2011:25). Whilst peri-operative care incorporates technical, non-technical and behavioural skills (Gillespie et al., 2012:91), knowledge, skills, accountability and collaboration are vital competencies for OR staff (Meretoja & Koponen, 2011:420).

The conceptual framework that guided the study includes these concepts, as comprehensive peri-operative care relies on competence, staffing and teamwork.

In this study, the overlapping roles of PNs and theatre technicians addressed the vital competencies of theoretical knowledge and procedural skills, the composition of the surgical team and comprehensive peri-operative care within the healthcare environment.

These themes can be aligned to the Dreyfus Model of Skill Acquisition as described in Benner's philosophy (Benner, 1982:407). Benner's philosophy describe expert nurses as being able to understand a situation and exercise control in situations unfamiliar to patients (Benner, 1982:406). Internationally, an OR qualified PN should be allocated to each surgical patient, and remain present during the entire procedure (Association for Peri-Operative Practice, 2012), thereby underlining the specialised nurses' crucial role and accountability to the surgical patient.

Particularly significant to the OR an emphasis is placed on individualised patient care (George, 2011:593) by expert nurses, and their vigilance in monitoring the condition of the patient, and whether they are able to remain composed in rapidly changing situations (George, 2011:585). Although participants generally disagree on the competence of theatre technicians' in these aspects, they generally viewed PNs as competent in these aspects of peri-operative care.

However, literature supports that critical thinking in the OR is based upon experience, knowledge and expertise (Gillespie et al., 2012:91). This experience develops non-technical competencies, including situational awareness, communication, advocacy, stress management, teamwork and leadership (Mitchell et al., 2011:828).

These roles and abilities should clearly distinguish OR qualified PNs from other healthcare providers (Lin & Liang, 2007:20). However, participants in this study were unable to distinguish between the role expectations of qualified OR nurses and that of theatre technicians. Instead, the themes of this study evolved around overlapping roles and comparisons between the competencies that theatre staff experienced from theatre technicians and PNs when allocated in similar peri-operative roles. Whilst care rendered by mid-level healthcare workers may be of equal standard to that of professional staff, Lassi, et al. (2013:828) reiterate that their roles, skills and level of supervision should be addressed by national policies.

Similarly, the Human resource strategy for health for South Africa (Matsoso & Strachan, 2011:52) identified that the training of mid-level healthcare workers have not been planned, nor has it been integrated between the health and higher education sectors.

#### **5.4 LIMITATIONS OF THE STUDY**

The findings of this study may only be applicable within the specific context and demographical area of the study, due to the inherent limited generalisability of qualitative studies.

#### **5.5 CONCLUSIONS**

The aim of the study was to explore the experiences of theatre staff about the role of theatre technicians in peri-operative nursing, as no research evidence could be found about the role application and staffing within OR teams staff since the inclusion of theatre technicians in OR teams.

Guided by the question: “What are the experiences of operating room staff about the role of theatre technicians within peri-operative nursing?” the study question was answered through the exploration of each objective.

The study found contrasting experiences of theatre staff about the role of theatre technicians in peri-operative nursing. The role comparisons between OR qualified PNs and that of theatre technicians highlight key features in understanding the peri-operative workforce, and the effect that it may have on peri-operative patient safety.

The composition of the surgical team, comprehensive peri-operative patient care and the healthcare environment emerged as themes in this study.

## **5.6 RECOMMENDATIONS**

Based on the scientific evidence obtained in this study, the following recommendations are made:

### **5.6.1 Recommendation 1: Establish role boundaries and role content for theatre technicians**

Role boundaries and role content through the development of standardised training and expected competencies should be established. Regulation of theatre technicians, accompanied by a scope of practice and subsequent competence requirements amongst theatre technicians will prevent vague role descriptions and confusion. In the same way, it is recommended that the role boundaries and competencies of OR qualified PNs are clearly distinguished from that of theatre technicians. The development of all levels of the South African healthcare workforce in the 2012/2013 – 2016/2017 strategy was prioritised by the National Department of Health in order to meet policy and health needs.

A comprehensive integration of patient conditions require specialised knowledge to anticipate and prevent risks associated with peri-operative patient care. To ensure that near-misses and adverse events are prevented in the high-risk peri-operative environment, pre-operative and post-operative patient assessment and handover, and intra-operative continuation of holistic care should be executed by highly skilled and specialized professional staff. Congruent with literature and international trends, one OR qualified PN should be allocated to each patient undergoing surgery, and remain present during the entire intra-operative phase.

### **5.6.2 Recommendation 2: Establish and implement the required level of training and supervision for theatre technicians**

The establishment and implementation of the required level of supervision for theatre technicians in the scrub, circulating and anaesthetic assistant roles must be put in place. Aligned with recommendations in the human resource strategy for the South African health sector (Matsoso & Strachan, 2011), the training of mid-levels healthcare workers should be coordinated between health and education sectors. Thus, various in-house training should be discontinued, and standard training should be developed to clarify role expectations.

Attention to supervision when allocating on-call staff and legislation regarding drug administration is recommended, as peri-operative patient care should be delivered within the legal and ethical framework of healthcare. The coordination of care delivered by various

healthcare professionals requires specialised training, leadership, patient advocacy and supervision to prevent peri-operative risks. Thus, it is recommended that theatre technicians function under direct supervision of an OR qualified PN when executing peri-operative patient care.

### **5.6.3 Recommendation 3: Establish and implement guidelines regarding the composition of the surgical team**

It is recommended that guidelines and standards regarding the composition of the surgical team, by taking cognisance of international guidelines and recommendations in position statements and legislation be established and implemented.

When establishing and implementing these standards, it is recommended that vague perceptions surrounding responsibility and accountability within the multi-professional team is addressed by leadership and management across the health sector. A specific focus is recommended on the PN's role regarding the supervision, responsibility and accountability of non-registered personnel delegated to the multi-professional team.

### **5.6.4 Recommendation 4: Identification of peri-operative staff and their related competencies**

The implementation of effective identification methods of all healthcare practitioners, that will distinguish between various staff categories is recommended. As theatre staff are often in sterile attire, identification strategies like coloured or identifying theatre caps may assist in identification.

The lack of available information on relevant platforms – information about expected staff competencies, role boundaries, professional registration, accountability and responsibility should be addressed.

### **5.6.5 Recommendation 5: Prioritize peri-operative patient safety**

Role ambiguity may lead to human errors, especially in the high-risk peri-operative environment. The competence of each OR team member is vital for the safety of the surgical patient as minor safety violations from various individuals may result in major adverse events.

In-service training programmes and continuous development programmes could be utilised to promote inter-professional education, collaboration and role learning to promote a greater understanding of the vital non-technical competence required to ensure safe peri-operative patient care.

The regulations on the national norms and standards in healthcare will soon to be promulgated. In line with the constitution of South Africa, the National Health Act and the Nursing Act, it underpins the patient's right to safe healthcare and the improvement of healthcare delivery.

#### **5.6.6 Future research**

Observational research regarding the actual team composition and role expectations of theatre staff may provide more information about the current application of the OR workforce.

Comparative research between the actual and perceived competencies of theatre technicians and OR qualified PNs may guide role clarification and policymaking in the OR. Such a quantitative study may contain specific questions about the tasks performed by staff members in the OR environment.

### **5.7 DISSEMINATION**

This study will be published in fulfilment of the requirements of a master's degree thesis of Stellenbosch University.

The research will be disseminated through publication and presentation on academic platforms, including journals, conferences and workshops.

The findings of the study will be distributed to the private healthcare organisations involved in this study.

### **5.8 CONCLUSION**

Theatre staff described different experiences of the role of theatre technicians in peri-operative nursing.

Similar role expectations of scrub, circulator and anaesthetic assistants are attached to theatre technicians and that of OR qualified PNs, despite the various educational backgrounds amongst theatre technicians. These aspects may affect patient safety as comprehensive patient care is dependent on vital technical and non-technical peri-operative competencies.

Literature concur that theatre staff require specialised qualifications in a high risk environment such as the OR, to anticipate and prevent risks to the surgical patient through multi-professional collaboration. Thus, to ensure patient safety, an OR qualified PN should lead and manage safe peri-operative care.

## REFERENCES

- Abbott, H. & Booth, H. 2014. *Foundation for Operating Department Practice*. Berkshire: Open University Press.
- Agency for Healthcare Research and Quality. 2014. *State-mandated Nurse Staffing Levels Alleviate Workloads, Leading to Lower Patient Mortality and Higher Nurse Satisfaction* [Online]. Available: <http://innovations.ahrq.gov/content> [2014, September 2].
- Allan, D. 2014. Re-conceptualising holism in the contemporary nursing mandate: From individual to organisational relationships. *Social Science & Medicine*, 119:131-138.
- Allied Health Professions Council of South Africa. 2013. *Recognition of the allied health professions council of South Africa as a professional body and registration of its professional designations* [Online]. Available: <http://www.saqqa.org.za> [2015, February 2].
- Association for Peri-Operative Practice. 2012. *AORN Position Statement on Allied health Care Providers and Support Personnel in the Perioperative Practice Setting*. [Online]. Available: [www.afpp.org.uk/home](http://www.afpp.org.uk/home) [2015, February 2].
- Association for Peri-Operative Registered Nurses. 2013. "AORN statement on nurse-to-patient ratios" [Online]. Available: <http://www.aorn.org/Recommendedpractices> [2014, February 27].
- Association for Peri-operative Practice. 2014. AORN Position Statement on Perioperative Safe Staffing and On-Call Practices. *AORN Journal*, 99(2):208-218.
- Association for Peri-operative Practice. 2015. *More information on becoming an ODP*. [Online]. Available: [www.afpp.org.uk/home](http://www.afpp.org.uk/home) [2015, February 2].
- Benner, P. 1982. From Novice to Expert. *The American Journal of Nursing*, 82:402-407.
- Blignaut, A.J., Coetzee, S.K. & Klopper, H.C. 2014. Nurse qualifications and perceptions of patient safety and quality of care in South Africa. *Nursing and Health Sciences*, 16:224-231.
- Cphoon, B. 2011. Causes of Near Misses: Perceptions of Perioperative Nurses. *AORN Journal*, 93(5):551-565.
- De Vos, A.S., Strydom, H., Fouché, C.B. & Delport, C.S.L. 2011. *Research at grass roots*. Hatfield: Van Schaik Publishers.
- Duffield, C., Diers, D., O'Brien-Pallas, L., Aisbett, C., Roche, M., King, M. & Aisbett, K. 2011.

- Nursing staffing, nursing workload, the work environment and patient outcomes. *Applied Nursing Research*, 24:244-255.
- Duvall, J. & Andrews, D. 2010. Using a structured review of the literature to identify key factors associated with the current nursing shortage. *Journal of Professional Nursing*, 26(5):309-317.
- EduSearch Network, Inc. 2015. *Surgical Technician Schools, Certification & Careers* [Online]. Available: <http://www.surgicaltech.net> [2015, February 06].
- Finn, R. Learmonth, M. & Reedy, P. 2010. Some unintended effects of teamwork in healthcare. *Social Science & Medicine*, 70:1148–1154.
- Fowler, A.J. 2013. A review of Recent Advances in Perioperative Patient Safety. *Annals of Medicine and surgery*, 2(1):10-14.
- George, J.B. 2011. *Nursing theories*. New Jersey: Pearson Education, Inc.
- Gillespie, B.M., Polit, D.F., Hamlin, L. & Chaboyer, W. 2012. Developing a model of competence in the operating theatre: Psychometric validation of the Perceived Perioperative Competence Scale—revised. *International Journal of Nursing Studies*, 49:90-101.
- Gillespie, B.M., Wallace, M., & Chaboyer, W. 2008. Operating Theater Culture Implications for Nurse Retention. *Western Journal of Nursing Research*, 30(2):259-277.
- Goodman, T. & Spray, C. 2014. *Essentials of Perioperative practice*. Burlington: Jones & Bartlett Learning.
- Grando, M. A., Peleg, M., Cuggia, M. & Glasspool, D. 2011. Patterns for collaborative work in health care teams. *Artificial Intelligence in Medicine*, 53:139-160.
- Grote, G. 2014. Promoting safety by increasing uncertainty – Implications for risk management. *Safety Science* (in press).
- Grove, S.K., Burns, N. & Gray, J.R. 2013. *The practice of nursing research: appraisal, synthesis, and generation of evidence*. St. Louis: Elsevier.
- Guba, E.G. & Lincoln, Y.S. 1994. Competing paradigms in qualitative research, *Handbook of qualitative research*. Thousand Oaks, CA: Sage.
- Hardesty, M.T. 1978. Operating room nursing and other beginnings. *AORN Journal*, 27(5):956.
- Harrison, R., Birks, Y., Hall, J., Bosanquet, K., Harden, M. & Iedema, R. 2014. The contribution of nurses to incident disclosure: A narrative review. *International Journal of*

*Nursing Studies*, 51:334-345.

- Hull, L., Arora, S., Kassab, E., Kneebone, R. & Sevdalis, N. 2011. Assessment of stress and teamwork in the operating room: an exploratory study. *The American Journal of Surgery*, 201(1):24-30.
- Hoyland, S., Haugen, A.S. & Thomassen, O. 2014. Perceptions of time spent on safety tasks in surgical operations: A focus group study. *Safety Science*, 70:70-79.
- Jansky, M., Marx, G., Nauck, F. & Alt-Epping, B. 2013. Physicians' and nurses' expectations and objections toward a clinical ethics committee. *Nursing Ethics*, 20(7):771-783.
- Khalili, H., Orchard, C., Laschinger, H.K.S. & Fara, R. 2013. An interprofessional socialization framework for developing an interprofessional identity among health professions students. *Journal of Interprofessional Care*, 27(6):448-453.
- Kelvered, M., Öhlén, J. & Åkesdotter Gustafsson, B. 2012. Operating theatre nurses' experience of patient-related, intraoperative nursing care. *Scandinavian Journal of Caring Sciences*, 26:449-457.
- Kisiel, A.T. 1973. Dimensions of a Phenomenology of Science in Husserl and Young DR Heidegger. *Journal of the British Society for Phenomenology*, 4(3):217-234.
- Koh, R.Y.I, Park, T. & Wickens, C.D. 2014. An investigation of differing levels of experience and indices of task management in relation to scrub-nurses' performance in the operating theatre: Analysis of video-taped caesarean section surgeries. *International Journal of Nursing Studies*, 51:1230-1240.
- Kurmann, A., Tschan, F., Semmer, N.K., Seelandt, J., Candinas, D. & Beldi, G. 2012. Human factors in the operating room - The surgeon's view. *Trends in Anaesthesia and Critical Care*, 2:224-227.
- Lassi, Z.S., Cometto, G., Huicho, L. & Bhutta, Z. 2013. Quality of care provided by mid-level health workers: systematic review and meta-analysis. *Bulletin World Health Organisation*, 91:824-829.
- Lin, L. & Liang, B.A. 2007. Addressing the Nursing Work Environment to Promote Patient Safety. *Nursing Forum* (42)1:20-30.
- Life Healthcare, 2014. Life College of learning [Online]. Available: <http://www.lifehealthcare.co.za> [2015, February 02].
- Lindwall, L. & von Post, I. 2008. Habits in Perioperative Nursing Culture. *Nursing Ethics*, 15 (5):670-681.
- MacFarlane, A. & O'Reilly-de Brún, M. 2012. Using a Theory-Driven Conceptual Framework

- in Qualitative Health Research. *Qualitative Health Research*, 22(5):607-618.
- Madiba, T.E., Naidoo, P. & Naidoo, S.R. 2011. The amended legislation on procedure-related deaths – an advance in patient care? *South African Medical Journal*, 101(4):234-236.
- Malherbe, J. 2013. Counting the cost: The consequences of increased medical malpractice litigation in South Africa. *South African Medical Journal*, 103(2):83-84.
- Maxwell, E., Baillie, L., Rickard, W. & McLaren, S.M. 2013. Exploring the relationship between social identity and workplace jurisdiction for new nursing roles: A case study approach. *International Journal of Nursing Studies*, 50:622–631.
- McConnell-Henry, T., Chapman, Y. & Francis, K. 2009. Husserl and Heidegger: Exploring the disparity. *International Journal of Nursing Practice*, 15: 7-15.
- McQuoid-Mason. D. & Dada, M. 2011. *A-Z of nursing law*. Cape Town: Juta.
- Medical Litigation: A National Health Crisis Requiring Urgent Solutions. 7 November 2011. *The Medical Chronicle* [online]. Available: <http://www.medicalchronicle/news.co.za> [2015, August, 12].
- Mediclinic, 2014. *Diploma in operating department assistance* [Online]. Available: <http://www.mediclinic.co.za> [2015, February 02].
- Meretoja, R. & Koponen, L. 2011. A systematic model to compare nurses' optimal and actual competencies in the clinical setting. *Journal of advanced nursing*, 68(2):414-422.
- Mitchell, L., Flin, R., Yule, S., Mitchell, J., Coutts, K. & Youngson, G. 2011. Thinking ahead of the surgeon. An interview study to identify scrub-nurses' non-technical skills. *International Journal of Nursing Studies*, 48:818-828.
- Mitchell, L., Flin, R., Yule, S., Mitchell, J., Coutts, K & Youngson, G. 2012. Evaluation of the Scrub Practitioners' List of Intraoperative Non-Technical Skills (SPLINTS) system. *International Journal of Nursing Studies*, 49:201-211.
- Matsoso, M.P. & Strachan, B. 2011. Human Resources for Health for South Africa: HRH strategy for the health sector 2012/13 - 2016/17. *SAHR*, 49-58.
- Moore, A. & Waters, A. 2012. Getting ratios right, for the patients' sake. *Nursing Standard*, 26(31):16-20.
- Netcare, *Nursing Education brochure* [Online]. Available: <http://www.netcare.co.za> [2015, February 02].
- PA law calls for circulating nurse. 2010. *The American Nurse*. July/August:5.

- Phillips, N. 2013. *Berry & Kohn's Operating Room Technique*. St. Louis: ELSEVIER
- Polit, D.F. & Beck, C.T. 2006. *Essentials of Nursing Research, Methods, Appraisal, and Utilization*. 6<sup>th</sup> ed. Philadelphia: Lippincott Williams & Wilkens
- Pupkiewicz, J., Kitson, A. & Perry, J. 2015. What factors within the peri-operative environment influence the training of scrub nurses? *Nurse Education in Practice*, (in press).
- Rauta, S., Salanterä, S., Nivalainen, J. & Junntila, K. 2012. Validation of the core elements of perioperative nursing. *Journal of Clinical Nursing*, 22:1391-1399.
- Republic of South Africa. Department of Health. 2015. *White paper on norms and standards regulations*. Government Gazette no. 3846, 18 February.
- Republic of South Africa. 2005. *Nursing Act 33 of 2005*. Pretoria: Government Printer.
- Republic of South Africa. 2008. *National Qualifications Framework Act 67 of 2008*. Pretoria: Government Printer.
- Retzlaff, K. & Hamlin, L. 2012. Nursing on a Global Scale: Perspectives From Around the World. *AORN Journal*, 95(2):267-273.
- Ricci, M., Panos, A.L., Lincoln, J., Salerno, T.A. & Warshauer, L. 2012. Is aviation a good model to study human errors in health care? *The American Journal of Surgery*, 203(6)798-801.
- Rispel, L. 2015. Nurses who moonlight strain the health system. *Business Day*, 2 July: 12.
- Rothrock, J.C. 2011. *Alexander's care of the patient in surgery*. St. Louis: ELSEVIER.
- Russ, S., Arora, S., Wharton, R., Wheelock, A.; Hull, L., Sharma, E., Darzi, A., Vincent, C. & Sevdalis, N. 2013. Measuring Safety and Efficiency in the Operating Room: Development and Validation of a Metric for Evaluating Task Execution in the Operating Room. *American College of Surgeons*, 216:472-481.
- South African Nursing Council, 2011. *Nursing Compact National nursing summit – April 2011*. [Online]. Available: <http://www.sanc.co.za> [2015, 4 September].
- South African Nursing Council. 2012. *Position statement – advanced practice nursing position statement*. [Online]. Available: <http://www.sanc.co.za/position> [2015, 4 September].
- South African Nursing Council. 2014. *Regulations setting out the acts or omissions in respect of which the council may take disciplinary steps*. [Online]. Available: <http://www.sanc.co.za/regulat/Reg-act-2014.pdf> [2015, 4 September].

- South African Theatre Sister association. 2015. *Position statement – Staffing in the OR* [Online]. Available: <http://www.SATS.co.za>, [2015, 30 June].
- Shewchuk, M. 2007. Why a registered nurse (RN) in the OR? The perioperative registered nurse role--a well-kept secret. *Canadian operating room nursing journal*, 25(4):38-39.
- Shenton, A. K. 2004. *Strategies for ensuring trustworthiness in qualitative research projects*. Education for Information, 22: 63–75
- Singer, S.J., Jiang, W., Huang, L.C., Gibbons, L., Kiang, M.V., Edmondson, L., Gawande, A.A. & Berry, W.R. 2015. Surgical Team Member Assessment of the Safety of Surgery Practice in 38 South Carolina Hospitals. *Medical Care Research and Review*, 72(3): 298–323.
- Terre Blanche, M., Durrheim, K., Painter, D. 2006. *Research in practice: Applied Methods for the Social Sciences*. Cape Town: University of Cape Town Press (Pty) Ltd.
- Tibbs, S.M. & Moss, J. 2014. Promoting Teamwork and Surgical Optimization: Combining TeamSTEPPS with a Specialty Team Protocol. *AORN Journal*, 100:477-488.
- Timmons, S. 2010. Professionalization and its discontents. *SAGE health*, 15(4):337-352.
- Tufford, L. & Newman, P. 2010. Bracketing in Qualitative Research. *Qualitative Social Work*, 11(1):80-96.
- Udlis, A.K. & Mancuso, J.M. 2015. Perceptions of the role of the Doctor of Nursing Practice-Prepared Nurse: Clarity or Confusion. *Journal of Professional Nursing*, 31(4):274–283.
- Voepel-Lewis, T., Pechlavanidis, E., Burke, C. & Talsma, A.N. 2013. Nursing surveillance moderates the relationship between staffing levels and pediatric postoperative serious adverse events: A nested case–control study. *International Journal of Nursing Studies*, 50:905–913.
- Western Cape High Court, 2012. *Isaacs v Pandie, (Western Cape)*. 2012 JDR 0866. Juta & Company (Pty) Ltd, 2014: 1-23.
- World Medical Association Declaration of Helsinki, 1964. *Ethical principles for Medical Research Involving Human Subjects (adopted by the 59<sup>th</sup> WMA General Assembly, Seoul)*, October 2008: 1-5
- Wyatt, D.A. 2013. The future of nursing: Understanding who nurses are. *AORN Journal*, 98(3):267-272.
- Xiang, W., Yin, J. & Lim, G. 2015. An ant colony optimization approach for solving an operating room surgery scheduling problem. *Computers & Industrial Engineering*, 85:335–345.

Zahiri, H.R., Stromberg, J., Skupsky, H., Knepp, E.K., Folstein, M., Silverman, R. & Singh, D. 2011. Prevention of 3 “Never Events” in the Operating Room: Fires, Gossypiboma, and Wrong-Site Surgery. *Surgical Innovation*, 18(1):55–60.

Zinn, J.L., Guglielmi, C.L., Davis, P.P. & Moses, C. 2012. Addressing the Nursing Shortage: The Need for Nurse Residency Programs. *AORN Journal*, 96(6):652-657.

# APPENDICES

## Appendix 1: Ethical approval from Stellenbosch University



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY  
jou kennisvenoot • your knowledge partner

### Approved with Stipulations New Application

14-May-2015  
Viszalai, Loraine L

**Ethics Reference #: S15/03/061**

**Title: Experiences of operating room staff about the role of theatre technicians in peri-operative nursing.**

Dear Ms. Loraine Vizsakai,

The **New Application** received on **26-Mar-2015**, was reviewed by members of **Health Research Ethics Committee 2** via Expedited review procedures on **13-Apr-2015**.

Please note the following information about your approved

research protocol: Protocol Approval Period: **13-Apr-2015 -13-**

**Apr-2016**

The Stipulations of your ethics approval are as follows:

**1. The method of participant selection should be specified and should be scientific.**

**1.1 Please consider whether inclusion of other staff such as surgeons and anaesthetists could add value to the study, or motivate their exclusion.**

**1. The research questions should be made more specific to address very specific components that overlap with nursing care. Components that are outside the scope of the nursing practitioner's field should be excluded.**

**2. Please review the reference and date of publication.**

**The study is subject to HREC approval and consent from the Private Healthcare managers and identified facilities.**

Please remember to use your **protocol number (S15/03/061)** on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

**After Ethical Review:**

Please note a template of the progress report is obtainable on [www.sun.ac.za/rds](http://www.sun.ac.za/rds) and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.

Translation of the consent document to the language applicable to the study participants should be submitted.

Federal Wide Assurance Number:

00001372 Institutional Review

Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 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 2004 (Department of Health).

### **Provincial and City of Cape Town Approval**

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape

Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health ([healthres@pgwc.gov.za](mailto:healthres@pgwc.gov.za) Tel: +27 21 483 9907) and Dr Helene Visser at City Health ([Helene.Visser@capetown.gov.za](mailto:Helene.Visser@capetown.gov.za) Tel:

+27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager.

Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.

For standard HREC forms and documents please visit: [www.sun.ac.za/rds](http://www.sun.ac.za/rds)

If you have any questions or need further assistance, please contact the HREC office at 219389207.

### **Included**

#### **Documents:**

Application

form Protocol

Synopsis

Declaration L

Viszalai

Protocol

Declaration E

Stellenberg CV

E Stellenberg

CV L Vizsolai

Harry Crossley funding

award Checklist

Consent form

Sincerely,

Mertrude

Davids

HREC

Coordinator

Health Research Ethics Committee 2

# Investigator Responsibilities

## Protection of Human Research Participants

Some of the responsibilities investigators have when conducting research involving human participants are listed below:

1. Conducting the Research. You are responsible for making sure that the research is conducted according to the HREC approved research protocol. You are also responsible for the actions of all your co-investigators and research staff involved with this research.
2. Participant Enrolment. You may not recruit or enrol participants prior to the HREC approval date or after the expiration date of HREC approval. All recruitment materials for any form of media must be approved by the HREC prior to their use. If you need to recruit more participants than was noted in your HREC approval letter, you must submit an amendment requesting an increase in the number of participants.
3. Informed Consent. You are responsible for obtaining and documenting effective informed consent using **only** the HREC-approved consent documents, and for ensuring that no human participants are involved in research prior to obtaining their informed consent. Please give all participants copies of the signed informed consent documents. Keep the originals in your secured research files for at least fifteen (15) years.
4. Continuing Review. The HREC must review and approve all HREC-approved research protocols at intervals appropriate to the degree of risk but not less than once per year. There is **no grace period**. Prior to the date on which the HREC approval of the research expires, **it is your responsibility to submit the continuing review report in a timely fashion to ensure a lapse in HREC approval does not occur**. If HREC approval of your research lapses, you must stop new participant enrolment, and contact the HREC office immediately.
5. Amendments and Changes. If you wish to amend or change any aspect of your research (such as research design, interventions or procedures, number of participants, participant population, informed consent document, instruments, surveys or recruiting material), you must submit the amendment to the HREC for review using the current Amendment Form. You **may not initiate** any amendments or changes to your research without first obtaining written HREC review and approval. The **only exception** is when it is necessary to eliminate apparent immediate hazards to participants and the HREC should be immediately informed of this necessity.
6. Adverse or Unanticipated Events. Any serious adverse events, participant complaints, and all unanticipated problems that involve risks to participants or others, as well as any research-related injuries, occurring at this institution or at other performance sites must be reported to the HREC within **five (5) days** of discovery of the incident. You must also report any instances of serious or continuing problems, or non-compliance with the HRECs requirements for protecting human research participants. The only exception to this policy is that the death of a research participant must be reported in accordance with the Stellenbosch University Health Research Ethics Committee Standard Operating Procedures [www.sun025.sun.ac.za/portal/page/portal/Health\\_Sciences/English/Centres%20and%20Institutions/Research\\_Development\\_Support/Ethics/Application\\_package](http://www.sun025.sun.ac.za/portal/page/portal/Health_Sciences/English/Centres%20and%20Institutions/Research_Development_Support/Ethics/Application_package)  
All reportable events should be submitted to the HREC using the Serious Adverse Event Report Form.
7. Research Record Keeping. You must keep the following research-related records, at a minimum, in a secure location for a minimum of fifteen years: the HREC approved research protocol and all amendments; all informed consent documents; recruiting materials; continuing review reports; adverse or unanticipated events; and all correspondence from the HREC
8. Reports to the MCC and Sponsor. When you submit the required annual report to the MCC or you submit required reports to your sponsor, you must provide a copy of that report to the HREC. You may submit the report at the time of continuing HREC review.
9. Provision of Emergency Medical Care. When a physician provides emergency medical care to a participant without prior HREC review and approval, to the extent permitted by law, such activities will not be recognised as research nor will the data obtained by any such activities should it be used in support of research.
10. Final reports. When you have completed (no further participant enrolment, interactions, interventions or data analysis) or stopped work on your research, you must submit a Final Report to the HREC.
11. On-Site Evaluations, MCC Inspections, or Audits. If you are notified that your research will be reviewed or audited by the MCC, the sponsor, any other external agency or any internal group, you must inform the HREC immediately of the impending audit/evaluation.

## Appendix 2: Permission from Private healthcare organisations



21 August 2015

**ATTENTION: Loraine Viszolai**

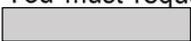
**SUBJECT: APPLICATION TO CONDUCT RESEARCH**

**TITLE: Experiences of operating room staff about the role of theatre technicians in peri-operative nursing.**

Our previous correspondence refers.

The Research and Scientific Committee hereby conditionally approves your request.  
Approval number: 20150821-02. Valid until 2016/08/31.

The approval is conditional to your agreement on the following provisos:

1. You must request permission (in writing) from the Hospital Manager and Nursing Manager of the  (LHC) facility in which you intend conducting your research, accompanied by this letter.
2. LHC will not be liable for any costs incurred during or related to this study.
3. Should patient or institutional confidentiality be compromised, LHC has the right to withdraw the permission and take legal action.
4. The researcher will provide LHC Research and Scientific Committee with an update on the progress of the study every four months.
5. An electronic copy of the final research report is submitted to the Life Healthcare Research and Scientific Committee *prior* to publication.
6. No direct reference is made to LHC or its various facilities in the research report or any publications thereafter.
7. The Company and its facilities are not in any way identifiable in the study.
8. On completion of the degree, an electronic (.pdf) copy of the research report will be provided to LHC. This copy will be uploaded to the institutional repository.
9. Kindly clear copy-right issues with your supervisor and/or Higher Education Institution prior to accepting these terms and conditions.

Please sign this letter as indicated below and return to the sender within 5 working days:

I, Loraine Viszolai, hereby agree to the provisos (points 1-9) as listed above.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

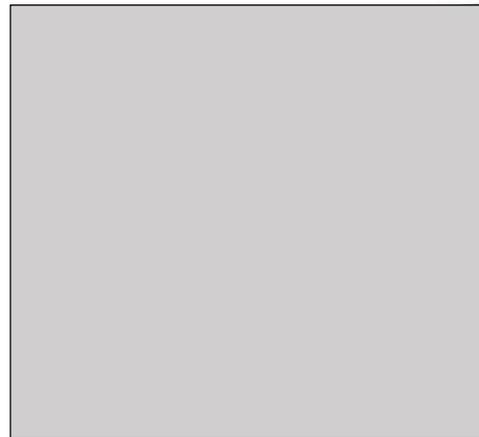
We wish you the best in your studies and look forward to the final results.

Yours sincerely

**Anne Roodt**

on behalf of the Research and Scientific Committee.





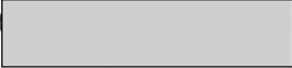
26 June 2015

Ms L Viszalai  
Division of Nursing  
Faculty of Medicine and Health Sciences  
Stellenbosch University  
PO Box 19063  
TYGERBERG  
7505

Dear Loraine

**PERMISSION TO CONDUCT RESEARCH AT** 

Your research proposal entitled "*Experiences of operating room staff about the role of theatre technicians in peri-operative nursing*" refers.

It is in order for you to conduct your research at , and I wish you success with this project.

Yours sincerely

  
ESTELLE COUSTAS  
Nursing Executive



**RESEARCH OPERATIONS COMMITTEE FINAL APPROVAL OF RESEARCH**

Approval number: UNIV-2015-0045

Ms Loraine Viszalai

E mail: lorainev@sun.ac.za

Dear Ms Viszalai

**RE: EXPERIENCES OF OPERATING ROOM STAFF ABOUT THE ROLE OF THEATRE  
TECHNICIANS IN PERI-OPERATIVE NURSING**

The above-mentioned research was reviewed by the [redacted] Research Operations Committee's delegated members and it is with pleasure that we inform you that your application to conduct this research at [redacted], has been approved, subject to the following:

- i) Research may now commence with this FINAL APPROVAL from the [redacted] Research Operations Committee.
- ii) All information regarding [redacted] will be treated as legally privileged and confidential.
- iii) [redacted] name will not be mentioned without written consent from the Netcare Research Operations Committee.
- iv) All legal requirements with regards to participants' rights and confidentiality will be complied with.
- v) [redacted] must be furnished with a STATUS REPORT on the progress of the study at least annually on 30th September irrespective of the date of approval from the [redacted] Research Operations Committee as well as a FINAL REPORT with reference to intention to publish and probable journals for publication, on completion of the study.
- vi) A copy of the research report will be provided to the [redacted] Research Operations Committee once it is finally approved by the relevant primary party or tertiary institution, or once complete or if discontinued for any reason whatsoever prior to the expected completion date.
- vii) [redacted] has the right to implement any recommendations from the research.

---

Directors: J du Plessis, S Chetty, R H Friedland, K N Gibson

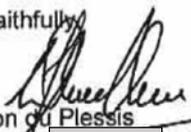
Company Secretary: L Bagwandeen

Reg. No. 1996/006591/07

- viii) [redacted] reserves the right to withdraw the approval for research at any time during the process, should the research prove to be detrimental to the subjects / [redacted] or should the researcher not comply with the conditions of approval.
- ix) APPROVAL IS VALID FOR A PERIOD OF 36 MONTHS FROM DATE OF THIS LETTER OR COMPLETION OR DISCONTINUATION OF THE STUDY, WHICHEVER IS THE FIRST.

We wish you success in your research.

Yours faithfully,

 15/7/2015

Prof Dion du Plessis  
Full member [redacted] Research Operations Committee & Medical Practitioner evaluating research applications as per Management and Governance Policy

  
Shannon Nell  
Chairperson: [redacted] Research Operations Committee  
[redacted] Hospitals (Pty) Ltd

Date: 24/7/2015

---

Directors: J du Plessis, S Chetty, R H Friedland, K N Gibson

Company Secretary: L Bagwandeen

Reg. No. 1996/006591/07

### **Appendix 3: Participant information leaflet and declaration of consent by participant and investigator**

#### **PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM**

##### **TITLE OF THE RESEARCH PROJECT:**

Experiences of operating room staff about the role of theatre technicians in peri-operative nursing.

**REFERENCE NUMBER: #: S15/03/061**

**PRINCIPAL INVESTIGATOR: Mrs. L. Viszalai**

**ADDRESS: Faculty of Medicine and Health Sciences**

**Tygerberg**

**7505**

**CONTACT NUMBER: 021 938 9297**

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Health Research Ethics Committee at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

##### **What is this research study all about?**

- 1. This study will be conducted in three private healthcare facilities in the Cape Metropolitan area.*

2. *From each facility, four participants will be recruited. 12 Participants will be recruited in total of which professional nurses, theatre technicians, surgeons and anaesthetists.*
3. *In this study, we would like to gain an understanding of how operating room staff experience the role of theatre technicians. The reason for this study is to improve our understanding about the role content of the scrub person, circulating staff and anaesthetic assistants in South Africa. This may assist stakeholders in the future to compile policies regarding operating room staffing and role delegation.*
4. *If you agree to participate in the study, you will be asked to sign this consent form. During an interview, you will be asked to share your experience about the role of theatre technicians in the operating room. This interview is expected to take about 45 minutes, and will be in a private room between you and the researcher. The researcher will record and transcribe the recorded interviews, and you may be asked to check this transcription at a later stage to confirm that it is a true reflection of the interview. Your identity and hospital will be handled as confidential.*

#### **Why have you been invited to participate?**

1. *You have been invited to participate in this study because you are either a theatre technician, professional nurse, surgeon or anaesthetist in the operating room. We believe that you could provide us with valuable information about how you experience the role of theatre technicians.*

#### **What will your responsibilities be?**

2. *You will be asked to participate in an interview that is anticipated to take about 45 minutes. You may be asked to check a transcript of the interview at a later stage. This is done to ensure that the transcription is a true reflection of the interview.*

#### **Will you benefit from taking part in this research?**

3. *Although there are no personal benefits to your participation in the study, future stakeholders may benefit from this study if we understand how theatre staff experience the role of theatre technicians.*

#### **Are there in risks involved in your taking part in this research?**

4. *We do not anticipate risks involved in this study, although it is possible that you may feel slightly uncomfortable in sharing your experiences during a recorded interview.*

#### **If you do not agree to take part, what alternatives do you have?**

5. *If you do not agree to participate in this study, or if you decide to withdraw from the study, there will be no negative consequences to you or your hospital.*

#### **Who will have access to your information?**

6. *To protect your anonymity, the researcher will allocate fictitious names (e.g. participant 1) to all participants. The data will be analysed and presented in a research report without disclosing any personal or hospital information. This study forms part of a Master's degree thesis at Stellenbosch University and only the researcher and her supervisor will have access to the data collected.*

**Will you be paid to take part in this study and are there any costs involved?**

No, you will not be paid to take part in the study but there will be no costs involved for you, if you do take part. To prevent transport costs, interviews will be scheduled in a private area at your hospital.

**Is there anything else that you should know or do?**

7. You can contact Prof. E.L. Stellenberg at tel 021 938 9244 if you have any further queries or encounter any problems.
8. You can contact the Health Research Ethics Committee at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by your study doctor.
9. You will receive a copy of this information and consent form for your own records.

**Declaration by participant**

By signing below, I ..... agree to take part in a research study entitled: Experiences of operating room staff about the role of theatre technicians in peri-operative nursing.

I declare that:

1. I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
2. I have had a chance to ask questions and all my questions have been adequately answered.
3. I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
4. I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
5. I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) ..... on (*date*) ..... 2015.

.....  
**Signature of participant**

.....  
**Signature of witness**

**Declaration by investigator**

I (*name*) ..... declare that:

1. I explained the information in this document to .....
2. I encouraged him/her to ask questions and took adequate time to answer them.
3. I am satisfied that he/she adequately understands all aspects of the research, as discussed above
4. I did/did not use an interpreter. (*If an interpreter is used then the interpreter must sign the declaration below.*)

Signed at (*place*) ..... on (*date*) ..... 2015.

.....  
**Signature of investigator**

.....  
**Signature of witness**

**Appendix 4: Interview guide**

<p><u>Study Objectives</u></p> <p>To gain an understanding of the peri-operative role of theatre technicians with specific reference to:</p> <th data-bbox="799 275 1398 517"> <p><u>Open ended questions</u></p> </th>	<p><u>Open ended questions</u></p>
<p>Pre-operative phase (Pre-operative patient assessment and visits to patients, preparing for the surgical procedure, anaesthetic preparation, involvement and communication with healthcare team with regard to the planning for intended procedure)</p>	<p>Tell me how you experience the pre-operative roles of theatre technicians in your facility</p>
<p>Intra-operative (Scrubbing for surgical cases, circulating during procedures, swab, sharp and instrument control, specimen control, assisting with anaesthetics and transfer and handover to recovery room)</p>	<p>Tell me about the intra-operative roles by theatre technicians in your facility</p>
<p>Post-operative (recovery room: involvement in the post-operative assessment, management, discharge and handover of the surgical patient)</p>	<p>Tell me about the post-operative roles by theatre technicians in your facility</p>
<p><u>Probing questions related to conceptual framework</u></p>	<p>Tell me about the competence of theatre technicians</p> <p>Tell me about OR staffing in your facility</p> <p>Tell me about the role of theatre technicians in teamwork</p>

## Appendix 5: Confidentiality agreement with data transcription verifier

### Confidentiality agreement: verification of interview transcriptions

The following agreement was reached in support the participants' right to privacy of information throughout the research process of the following study:

Title: Experiences of operating room staff about the role of theatre technicians in peri-operative nursing.

Ethics Reference #: S15/03/061

I, ROBERT BENJAMIN UYS, agree to keep all information on the audio recorded interviews confidential. Information provided by interviewees will not be disclosed.

The original audio recordings and the transcriptions thereof will not be duplicated or used for any purposes whatsoever.

Signature:



Date: 16 September 2015

**Appendix 6: Extract of transcribed interview**

Participant 10 (Theatre technician)
Transcribed by researcher, and verified independently.
<i>Thank you very much for being willing to talk to me. As I explained to you, this research is about, how theatre staff experience the role of theatre technicians in the OR. Now you are an OT technician... So can you tell me – what do you see as the role as a theatre technician? How do you see that?</i>
Um, it is more the same with the scrub sister. We do more or less the same thing.
<i>Mm mm?</i>
With the surgical tech, we more specialised in theatre. More than the outside, like in ICU or ward. So we only specialise in theatre. But the roles are not the same. In theatre we do the same thing, but the main core thing is about the patient.
<i>Mm mm?</i>
The patient journey to theatre.
<i>So throughout theatre?</i>
Throughout theatre. Pre op in receiving, on the theatre table in the recovery. Even in the ward, we should do pre visits, especially with major cases like, um, hip replacements. Go before – the night before the op, and you go and introduce yourself to the patient, so that you know that tomorrow, they don't become more scared, because they know someone in theatre. It becomes easy for them.
<i>Al right?</i>
And even afterwards, the visits after that. To see how the patient is doing, and you know, the progress of the patient.
<i>So you are, you spoke about the pre op, and seeing the patient pre-operatively. So, tell me a little bit more about that?</i>
Ok, with the pre visits, you check the patients' history, you also ask more about the the, um, patient's health, medication they are on, their family history as well...and...
<i>Mm mm? Ok, so you sort of assess the patient?</i>
Yes, yes, assess the patient.
<i>Ok?</i>
You get to know the patient better.
<i>To understand? It sounds like you try to understand...</i>
Yes, yes.
<i>And the theatre preparation?</i>
It is done according to the procedure itself. Um, also using the doctor's preferences, because they are all different.

<i>Mm mm?</i>
And firstly as a basic, to a nurse, or a scrub tech, you must damp dust your theatre. Check everything that is working. Also the floor...the staff, have a meeting before you start so everybody knows what their duties are. It saves time, it saves the patient's time as well. We all working as the team.
<i>So you are mentioning teamwork, and communication between the team members?</i>
Teamwork very important, yes.
<i>And you spoke about intra –operatively...what would you say is your role there?</i>
Yah, intra operatively, intra, as my role, I introduce myself, well, you do that peri op, also in theatre as well, that is the intra operatively, when you do the operations, um we, we would do the surgical pause.
<i>Mm mm?</i>
Again, um, verbalise with the side of type of, the procedure being done, for which doctor, any allergies, and that the patient that might have that you might not have asked before. And, yah, it's just the patients, we make them feel at ease.
<i>Ok. And, um, post operatively?</i>
When you, when I take the patient to the recovery, the journey from after the operation has been done. To the recovery. Handing over the patient, the procedure been done, if the patient has a catheter, or drains or so on. Any special attention to be given to the patient in the um, ward, um, any screening, x-rays to be done. Those important things.
<i>Mm mm?</i>
Which, sometimes most doctors ask for, anaesthetics doctors do ask for. They can ask the sisters in recovery, and from there on the patient is handed over to the recovery sisters. And later on, if it is a big case, it is mostly um, go to the ward, as will other patients as well.
<i>Mm mm. so you told me a lot about how the role of a theatre technician is similar to that of a RN. Can you tell me more about how you feel about that?</i>
Registered nurse (sigh) um, to be honest, um, it's, I would not say it is fair. Because, in terms of... we do not get (shows money-rub between fingers) a lot. And we do mostly the same work. But we practice more on we have been taught.
<i>Mm mm?</i>
Unlike a sister, who has just been a RN, and is placed in theatre, and they have to learn. So they don't do according to a book. I, as a surgical technician must do according to a book. If I have to count swab,... basic stuff, count swabs, instruments, of which the sisters don't do, because they have not been taught...And I've been through that.
<i>Mm mm?</i>

And I'm thinking that, so I do everything that I have been taught, by the book.
<i>Mm mm?</i>
Not as I see. By the book. So everything that surgical techs do, is according to the book. Not how we have been taught when we get to theatre.
<i>Ok?</i>
That is the main difference. Because most of the RN have not done surgical tech. Some have done, so they quite a bit. But even the draping, the prep, it is all done according to the book. Not by visualising.
<i>Mm... Ok, so if you have to look at what you have just said to me... do I understand you correctly that you say, that sometimes the theatre technicians do the prepping and the draping and the swab counts, perhaps better than the RN?</i>
Better than the registered nurses. True. Because as I say, we do it according to the book. It is always the same prep – whereas the sister might, maybe if she is doing a laparotomy of some sorts.
<i>Mm?</i>
Some sisters, um, they start... deurmekaar. They start from, they start draping from the feet. I don't know. Sometimes they don't do that. Or they place their drapes differently, not according to. Which can also um, implement a lot of infection – contaminated stuff. Which they do not see. Because you have to do accordingly. So that everything is kept sterile. The sterile field.

## Appendix 7: Declarations by language and technical editors



3 Beroma Crescent  
Beroma  
Bellville 7530

### *TO WHOM IT MAY CONCERN*

This letter serves to confirm that the undersigned

**ILLONA ALTHAEA MEYER**

has proof-read and edited the document contained herein for language correctness.

 (Ms IA Meyer)

SIGNED

**FOR: VISZOLAI, LORAINÉ**

**TITLE: EXPERIENCES OF OPERATING ROOM STAFF ABOUT THE ROLE OF  
THEATRE TECHNICIANS IN PERI-OPERATIVE NURSING**

Lize  
Vorster  
Communication

---

To whom it may concern

This letter serves as confirmation that I, Lize Vorster, performed the Technical Formatting of Loraine Vizsolai's thesis. Technical formatting entails complying with the Stellenbosch University's technical requirements for theses.

Yours sincerely

Lize Vorster  
Language Practitioner



---

Vygie street 9, Welgevonden Estate, Stellenbosch, 7600 \* e-mail: [lizevorster@gmail.com](mailto:lizevorster@gmail.com) \* cell: 082 856 8221

## Appendix 8: Financial support from the Harry Crossley foundation



UNIVERSITEIT•STELLENBOSCH•UNIVERSITY  
jou kennisvennoot • your knowledge partner

11 December 2014

Ms L Viszalai  
Division of Nursing Science  
Department of Interdisciplinary Health Sciences

Dear ms Viszalai

### APPLICATION FOR FINANCIAL SUPPORT FROM THE HARRY CROSSLEY FOUNDATION FOR 2015

With reference to your application for financial support by the above-mentioned foundation, on behalf of the Trustees, we make the following award:

**Project:** An investigation on how operating room experts perceive the effect of workforce variants on the safety of the surgical patient during the pre-operative, intraoperative and post-operative phases

**Amount awarded:** R6 650

The funds will be transferred to your Harry Crossley cost centre\* pending the submission of a valid ethics approval letter and/or updated ethics renewal letter to our office (for attention Tashwell de Wet, [tashwell@sun.ac.za](mailto:tashwell@sun.ac.za)). **If you cannot provide proof of ethics approval by 31 July 2015 this award will automatically be cancelled.** (\*Should you not yet have a Harry Crossley cost centre, Finances will create a Harry Crossley cost centre for you.)

#### **PLEASE NOTE:**

1. You may not utilise this award towards any personnel costs, including consultation expenses (except if special permission is obtained from Tania Brodovcky); neither may you claim for any conference-related expenses, tuition fees or thesis editing/printing fees, despite what you may have indicated in your budget.
2. All transactions for funding awarded must be finalised by **30 November 2015** or it will be transferred back to the Harry Crossley Foundation cost centre. Funds may not be transferred to the next funding cycle.

For any enquiries regarding your Harry Crossley Foundation award, kindly contact **Tashwell de Wet** ([tashwell@sun.ac.za](mailto:tashwell@sun.ac.za)).

Yours faithfully

A handwritten signature in black ink, appearing to be 'T Brodovcky', written in a cursive style.

**Dr T Brodovcky**

**Head: Research Funding Opportunities and Capacity Development  
RESEARCH DEVELOPMENT AND SUPPORT (TYGERBERG)**

