KNOWLEDGE OF SURGICAL COUNTING PRACTICES OF OPERATING ROOM NURSES IN PROVINCIAL HOSPITALS IN THE CAPE METROPOLE

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DECLARATION

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ABSTRACT

Background: Retained surgical items are a preventable medical error that leads to patient harm and increased hospital stay. Surgical safety has emerged as a significant global health concern to avoid preventable medical errors and deaths globally. The cost implications for the facility and severe patient complications are significant and safety procedures to prevent this occurring are vital.

Methods: A descriptive, cross-sectional design with a quantitative approach utilising a self-administered questionnaire was used for this study. Four public hospitals were included in this study, which are situated in the Cape Metropole district. The study was conducted in their operating theatres to gain more information about surgical counting practices as it occurs in the natural setting. The population size was N=164 therefore no sampling was required on advice of the statistician. All nurses meeting the inclusion criteria were invited to participate in this study. Permission to conduct the study was obtained from the Health Research Ethics Committee at Stellenbosch University and the National Health Research Board. Data collection occurred at each respondent's place of employment after an information session was held and informed, written consent obtained. Data was analysed by a statistician and presented in frequencies, tables and histographs. The variables were compared using either the Pearson chi-square test for differences in nursing category or the Mann-Whitney U-test for differences in years of experience.

Results: Findings indicate that there is a serious knowledge deficit of the fundamental surgical counting procedures further corroborated by the section of the survey on clinical practice. Overall the respondents identified the major factor impacting surgical counting practice is handover during change of shift. It is suggested that increased awareness and training regarding surgical counting practices needs to be implemented.

Conclusion: Renewed accountability for correct surgical counts needs to be fostered amongst theatre personnel by re-enforcement of counting policy and identifying best-practices. There should be zero tolerance for not adhering to policy and deviation from recommended practice that compromise patient safety. The time spent with perioperative staff to reinforce surgical count policy and ensure application is standardised, is more valuable compared to the financial implications of legal proceedings and disciplinary measures lodged against facility and staff.

Keywords: Unintended retention of surgical items, surgical counts, counting policy, foreign objects.

OPSOMMING

Agtergrond: Behoud van chirugiese items is ’n voorkombare medies fout wat lei tot benadeling van die pasiënt en verlengde verblyf in die hospital. Chirurgiese veiligheid het na vore gekom as ’n belangrike globale gesondheidsvrees om voorkombare medies foute en sterftes wereldwyd te verhoed. Die koste implikasie vir die fasiliteit en ernstige komplikasies vir pasiënte is beduidend en veiligheidsprosedures om te verhoed dat dit voorkom, is noodsaaklik.

Metode: ’n Nie-eksperimentele, beskrywende, deursnee ontwerp met ’n kwantitatiewe benadering wat van n self-geadministreerde vraelys gebruik maak, is aangewend vir hierdie studie. Vier openbare hospitale is ingesluit in hierdie studie, wat geleë is in die Kaapse Metropool. Die studie is uitgevoer in die operasiekamer om meer inligting te bekom oor die chirurgiese telpraktyk soos dit voorkom in die natuurlike omgewing. Die grootte van die bevolking was N=164, eindig en bekend, dus was geen steekproefneming nodig op advies van die statistikus. Alle verpleegpersoneel wat voldoen het aan die insluitingskriteria is genooi om deel te neem aan die studie. Toestemming om die studie te doen is verkry van die Gesondheidsnavorsing-kommitee by Stellenbosch Universiteit en die Nasionale Gesondheids Navorsings Raad verkry. Data versameling was gedoen by die deelnemers se werksplek nadat n inligtingsessie gehou is en toestemming verkry is. Data is geanaliseer deur n statistikus en aangebied in frekwensies,tafels en histogramme. Die vergelykings was gedoen met behulp van die Pearson chi kwadraattoets vir veskille in verpleging kategorie of die Man-Whitney U – toets vir verskille in die jare van ervaring.

Resultate: Bevindinge dui daarop dat daar ’n ernstige kennistekort is aan die basiese chirurgiese telprosedures, en is verder deur die afdeling van die vraelys oor kliniese praktyk onderstaun. In die algemeen het deelnemers die hoof faktor wat kliniese praktyk beïnvloed as oorhandiging gedurende skofveranderings geidentifiseer. Daar word voorgestel dat daar verhoogde bewustheid en opleiding ten opsigte van chirurgiese telpraktyke geïmplimenteer word.

Slotsom: Hernude aanspreeklikheid vir korrekte chirurgiese telling moet onder die teaterpersoneel bevorder word deur die hertoepassing van die telbeleid en identifisering van goeie praktyke. Daar moet geen toleransie wees vir afwyking van die telbeleid en van aanbevole praktyk nie aangesien die veiligheid van pasiënte in gedrang kan wees. Die tyd saam met peri-operatiewe personeel om chirurgiese telbeleid te versterk en om

standardisering te verseker, is ten opsigte van die finansiële implikasies van regs en dissiplinêre stappe teen fasiliteite en personeel meer waardevol.

Sleutelwoorde: Onbewustelike behoud van chirurgiese items, chirurgiese telbeleid, vreemde voorwerpe.

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ABBREVIATIONS

CS	Community service nurse
OM	Operational manager
EN	Enrolled nurse
RPN	Registered professional nurse
SATS	South African theatre sisters

CHAPTER 1:
FOUNDATION OF THE STUDY

1.1 INTRODUCTION

Unintended retention of surgical items in surgical cavities is a rare but persistent and serious medical error that increases mortality and morbidity rates. Surgical items are defined as any object used during a surgical procedure. The cost implications for the facility and severe patient complications are significant and safety procedures to prevent this occurring, is vital.

1.2 SIGNIFICANCE OF THE PROBLEM

By scientifically exploring and describing existing practices, the risk of potential medicolegal hazards and patient harm associated with variability of practice could be reduced. This could lead to decreasing costs involved caused by litigation, improve standards of patient care, and service delivery by registered theatre scrub sisters in provincial hospitals in the Western Cape.

1.3 RATIONALE

The counting of surgical items is a high risk, high frequency activity performed to ensure adequate control of swabs, instruments and sharps (needles and blades) during surgical procedures (Edel, 2012:228). Unintended retained, surgically placed items have been associated with increased morbidity and mortality (Whang, Mogel, Tsai & Palmer, 2009:79). Operating room costs dramatically increase due to the additional time spent searching for the missing surgical item (Woodhead, 2009:359). According to Binderspad and Govender (2011:23), the incidence has been estimated at between one in 100 to 5000 surgical procedures.

Standardising the count procedure includes the timing of when counts should occur, including the initial and closing counts, and further counts when new items are added to the field, or when permanent relief of either the perioperative practitioner or circulating nurse occurs (Goldberg & Feldman, 2012:207).

According to Wilson and Walker (2009:362), there are usually many contributing factors in the evolution of errors, but it is important to recognise that human beings are fallible and mistakes do occur. Variation in practice can occur due to the employment of staff from other facilities (Edel, 2012:230). Riley, Manias and Polglase (2006:371) supported this in their observation that count practices vary between institutions, and that disparities do exist in how guidelines are interpreted and applied. Rowlands and Steeves (2010:410) identified bad

behaviour, general chaos and communication difficulties as challenges faced by perioperative practitioners that affect the outcome of surgical counts.

In the researcher's experience as a lecturer in operating room nursing science, it is observed that variability of surgical counts exist in the practice of nursing staff in the Cape Metropole central hospitals in which the researcher's students gain their clinical experience. Implementation of standardisation and the reinforcement of correct counting practice are proven to decrease incorrect counts and foreign object retention.

1.4 RESEARCH PROBLEM

The incidence of retention of surgical items is a medico-legal problem in operating rooms in South Africa. It is evident in practice that the counting procedures differ amongst staff members and hospitals. This could be attributed to variation of knowledge of best practice guidelines and institutional policy.

1.5 RESEARCH QUESTION

What is the impact of deficit of knowledge of operating room nurses regarding surgical counting practices in provincial hospitals in the Cape Metropole district?

1.6 RESEARCH AIM

The aim of this study was to determine operating room nurses' knowledge of surgical item counting at provincial hospitals in the Cape Metropole district, in order to recommend standardisation and reinforcement of correct counting practices, thereby minimising the incidence of incorrect counts and foreign object retention.

1.7 RESEARCH OBJECTIVES

The objectives for this study were to:

- determine the knowledge of operating room nurses regarding surgical item counting practices in the operating room
- To determine current surgical counting practices of operating room nurses
- To determine the factors that influence surgical item counting practices

1.8 CONCEPTUAL FRAMEWORK

Bandura's social cognitive theory aims to adjust or modify a person's behaviour to ensure positive outcomes and it is intended for use in any situation in which change of behaviour is required (George, 2011:554). Social cognitive theory proposes that there is triadic reciprocal interaction between behaviour, cognition, other personal factors and environmental

influences operating interactively as determinants of each other (Bandura, 1986:23). Competent functioning requires both skills and self-beliefs of efficacy to use them effectively (Bandura, 1986:391). Perceived self-efficacy is one's judgements of one's capability to execute an action.

Surgical count is a desired behaviour to ensure no retention of surgical items. Operating room nurses who understand the benefits of compliancy to swab count policy are more likely to alter their practices. People learn by observing others and may assume control over their own behaviour, by evaluating their behaviour by reward or positive feedback. If correct behaviour is modelled and reinforced, it encourages the person to engage in that action. Competent functioning requires both skills and self-beliefs of efficacy to use them effectively (Bandura, 1986:391).

According to Bandura (1986:391), people often do not behave optimally even though they know full well what to do, how people judge their capabilities and perception of self-efficacy affects their motivation and behaviour. This study seeks to determine the knowledge, the current surgical count practices and factors that influence the environment that has an effect on the ability to perform the desired behaviour adequately.

The conceptual map (See Fig:1.1) illustrates that human functioning is a continuous reciprocal interaction between behavioural, cognitive, personal and environmental influences, as interacting determinants of each other (Bandura,1986:24).

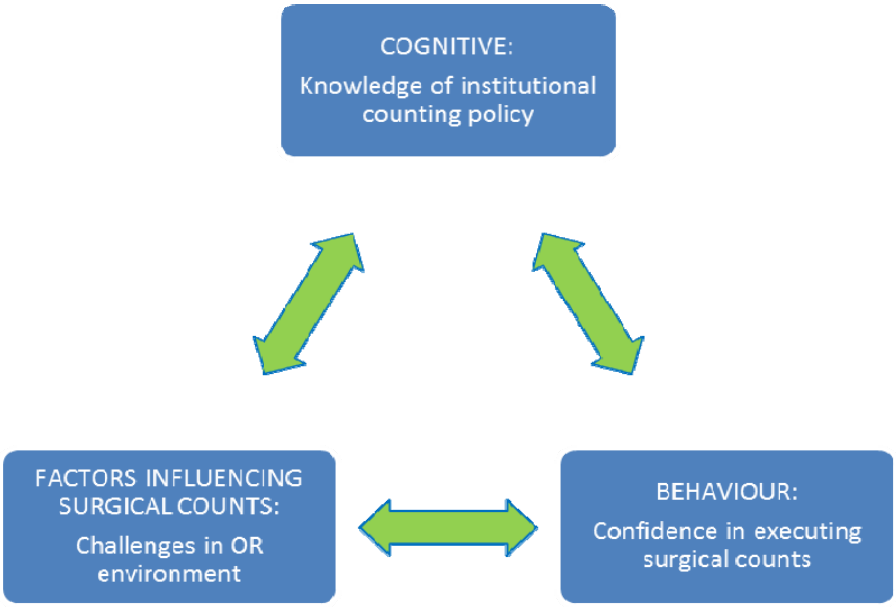

Figure 1.1: Graphic illustration of conceptual map

1.9 RESEARCH METHODOLOGY

This is the process or plan for conducting the study and it includes the research design, population and sampling, data collection instrument, pilot study, data collection and analysis (Burns & Grove, 2009:719).

1.9.1 Research design

A design is the blue print for conducting a study (Burns & Grove, 2009:236). A descriptive, cross-sectional design with a quantitative approach by means of a self-administered questionnaire was used for this study. Descriptive study designs are conducted to gain more information about the characteristics within a particular field of study, the purpose is to provide a picture of situations as they naturally happen (Burns & Grove, 2009:237).

1.9.2 Study setting

The study was conducted in operating theatres to gain more information about surgical counting practices as it occurs in the natural setting. The public hospitals included in the research study are situated in the Cape Town Metropole. They were two central hospitals providing level 3 surgery; one regional hospital providing level 2 surgery; one district hospital providing level 1 surgery (Department of Health, 2007:93-96). The four hospitals were chosen to allow equal opportunity of respondents where various levels of patient surgery are provided in the Northern and Southern district of the Cape Metropole.

1.9.3 Population and sampling

For the purpose of this study, on advice of the statistician, Mrs Tonya Esterhuizen (Biostatistics Unit Stellenbosch University) the population was finite and known, therefore sampling was not required. Instead, all nurses meeting the inclusion criteria were invited to participate in the study N=164. Those who agreed to participate and complete the questionnaire partook in the survey.

1.9.4 Data collection tool/instrumentation

A questionnaire is a printed self report form designed to elicit information that can be obtained from a subject's written responses (Grove, Burns & Gray, 2013:425). Since the research design was a descriptive survey, the choice of a questionnaire was an acceptable data collection method.

Section A of the questionnaire established the demographic information of the respondents; section B surveyed the professional data of the respondents. Section C determined the knowledge base related to counting practices and documentation. Section D surveyed the

clinical practice regarding surgical counting practice. Lastly, section E surveyed the factors influencing counting procedure.

1.9.5 Pre-test

The questionnaire was pretested to 10% (n=13) of the respondents in the sample and the data obtained was excluded from the main study. The test was done to establish clarity, face and content validity of the questionnaire. Furthermore, the time it would take to complete the questionnaire was ascertained.

1.9.6 Validity and reliability

Reliability of an instrument denotes the consistency of the measures obtained in a study (Grove, Burns & Gray, 2013:389). Validity of an instrument determines the extent to which it actually reflects, or is able to measure, the construct being examined (Grove, Burns & Gray, 2013:393). According to Strydom (2011:173), content validity is concerned with the representativeness or sampling adequacy of the content of an instrument.

The content of the questionnaire was determined by international and national literature regarding surgical counting practices, the research objectives, the researcher's clinical experience and the opinion of operating room nurse experts including perioperative trained managers in the operating room environment with more than ten years of experience who contributed to the formulation of questions in the questionnaire. Surgical count policies and guidelines from credible international literature, the Association of periOperative Registered Nurses and the World Health Organisation Guidelines for Safe Surgery, were used as guides to formulate the questions pertaining to surgical count practices.

Face validity concerns the superficial appearance or face value of a measurement procedure (De Vos *et al*., 2011:173). The readability, comprehension and time to complete the instrument was assessed by the pre-testing of the instrument. A statistician was consulted to evaluate whether the questionnaire represented the content domain the researcher intended to measure.

1.9.7 Data collection

The data collection occurred between March and August, 2015 in the operating room departments of the hospitals. To ensure confidentiality the consent forms and questionnaires were supplied to the respondents who were instructed to submit their documents in the self-sealing envelope, and then to post them into a secured box located centrally in the operating theatre.

The questionnaires and consent form boxes were collected by the researcher. Colour coding was used to distinguish the different facilities to ensure anonymity, and a register was kept of the number of consent forms and questionnaires distributed to the various facilities to ensure they were equal.

1.9.8 Data analysis

Data analysis reduces, organises and gives meaning to the data (Burns & Grove, 2009:44) and ensures the clear understanding of the various constitutive elements of data (Mouton, 2009:108). Data was entered into a Microsoft Excel® spreadsheet and analysed using IBM SPSS version 22 programme. A statistician was consulted to guide the analysis of the data obtained from the questionnaires, to interpret the meaning of analysis in partnership with the researcher. Descriptive analysis techniques were used to analyse the data of this study.

1.10 ETHICAL CONSIDERATIONS

Permission was requested to conduct this study from the Health Research Ethics Committee at Stellenbosch University (ethics reference number: S14/07/140.) Following this, permission was obtained from the National Research Board to access the Provincial Government of the Western Cape hospitals and the most suitable date to commence research in the operating room theatres was negotiated with the hospital managers at their respective facilities.

1.10.1 Informed consent

Informed consent was obtained from the respondents, which implied that the researcher imparted information to the subjects, but also that the prospective subjects comprehended the information and agreed to participate (Burns & Grove, 2011:122). Consent was voluntary and the respondents were informed that they may withdraw from the study at any time without penalty.

1.10.2 Right to privacy, anonymity and confidentiality

According to Burns & Grove (2011:114), the respondents were assured of their right to privacy and their identity will remain anonymous. Privacy, confidentiality and anonymity were ensured by asking respondents to place the anonymously completed questionnaires in a sealed box.

The respondents were assured that only the researcher, the statistician, the research supervisor and the Health Research Ethics Committee of Stellenbosch University would have access to the study data for auditing purposes.

Anonymity was ensured by assigning codes to the hospitals and questionnaires to safeguard the hospital and respondents' identity. Furthermore, clinical mentors in each hospital were trained as field workers to assist with the distribution and collection of the questionnaires.

1.10.3 Right to protection from discomfort and harm

The general principle of beneficence, states that no harm should befall research subjects and prevents discomfort and harm (Burns & Grove., 2011:118). This was ensured by informing the respondents about the objectives of this study and how this study could contribute to improving nursing practice and that their participation may assist in attaining this objective.

1.10.4 The right to fair selection and treatment

Selection of respondents was fair. Their selection was based on reasons directly related to the problem being studied, and who were directly involved with surgical counting practices (Burns & Grove, 2011:118). Furthermore, their identity and that of the hospitals was assured.

1.10.5 The right to self-determination

According to Burns and Grove (2011:110), this ethical principal is based on respect for persons and it indicates that humans are capable of controlling their own destiny. The researcher ensured this ethical principle by providing information to the respondents about the study, allowing them to choose whether to participate and gave them the option to withdraw from the study without penalty.

1.11 OPERATIONAL DEFINITIONS

Nurse: A person registered in a category under section 31(1) in order to practice nursing or midwifery in terms of the Nursing Act, No 33 of 2005. In this study, "nurse" is used as a general term, including professional, enrolled and auxiliary nurses.

Agency nurse: Nursing services provided by agency nurses employed on a casual contract basis (Manias, Aitken, Pearson, Parker & Wong, 2003:269-70)

Circulating nurse: An international term referring to a member of the non-sterile team who directs and co-ordinates the activities of the intra-operative environment during the surgical procedure (Phillips, 2007:57)

Community service nurses: Registered nurses who have completed their diploma or degree at a registered training institution and who are in the process of completing one year of community service in the public sector (Kruse, 2011:4)

District, central & regional hospitals: Public healthcare in South Africa is managed by the provincial departments of health. It is divided between primary healthcare clinics and level 1 (district), level 2 (regional) and level 3 (central) hospitals (Von Holdt & Murphy, 2006:2). Each level provides for more specialised and intensive clinical care than the level below it.

EN (enrolled nurse): A person who completed a two-year enrolment certificate course, registered with the South African Nursing Council in terms of section 16 of the Nursing Act, 50 of 1978, and renders basic nursing care under direct and indirect supervision of a registered professional nurse (Republic of SA, 1978:13)

RPN (registered professional nurse): A person who is qualified and competent to practise comprehensive nursing independently in the manner and to the level prescribed and who is capable of assuming responsibility and accountability for such practice (Republic of South Africa, 2005:25)

Perioperative team: This includes the anaesthetist, anaesthetic nurse assistant, circulating nurse, scrub nurse, surgeon and assistant (Phillips, 2007:59).

Scrub person: A member of the sterile team who passes instruments and facilitates the surgical procedure. In South Africa it is a registered or enrolled nurse (Phillips, 2013:56).

Standard: This is an authoritative statement describing accountability, values and priorities (Phillips, 2013:16)

Surgical counts: Swabs/sponges, sharps and instrument counts are performed throughout the procedure that it is done before and after use. Counts are performed for patient and personnel safety, infection control and inventory purposes (Phillips, 2013:480).

1.12 DURATION OF THE STUDY

Data collection commenced 25 March 2015 and ended 14 August 2015.

Table 1.1: Study programme

Facility	Data collection started	Data collected from facility	Data analysis
A	25 March 2014	11 April 2015	October 2015
B	07 April 2015	09 May 2015	October 2015
C	09 June 2015	10 July 2015	October 2015
D	03 August 2015	14 August 2015	October 2015

1.13 CHAPTER OUTLINE

Chapter 1: Foundation of the study: This chapter outlined the scientific foundation of the study including the rationale, research aim and objectives, a brief overview of the research methodology and the conceptual framework for the study.

Chapter 2: Literature review: The literature review related to retention of foreign objects and the conceptual framework selected for this research study is presented in this chapter.

Chapter 3: Research methodology: Provides a detailed description of the research methodology used in this study.

Chapter 4: Results: This chapter describes the data analysis and interpretation study.

Chapter 5: Discussion, conclusions and recommendations: This chapter presents a discussion on the research findings, followed by the study conclusions and recommendations derived from this research study.

1.14 SIGNIFICANCE OF THE STUDY

The study may contribute the promotion of best practices in the operating room regarding surgical counts and has the potential to reduce medico-legal hazards and patient harm associated with variability of practice.

The desired outcome would be to avoid misinterpretations of existing policy at institutions, which in turn causes practice variation and increases the risk of unintentional foreign object retention. Surgical counts need to be observed, deviation from policy identified and eliminated to ensure positive outcomes.

1.15 SUMMARY

Retention of surgical items is a preventable medical legal risk and has lasting consequences for both the patient and healthcare worker. This study aimed to determine operating room nurses's knowledge regarding surgical item counts to recommend standardization and reinforcement of correct counting practices, thereby minimizing the incidence of incorrect counts and foreign object retention. Although many studies have aimed to understand the reasons for retention of surgical items, the researcher has not been able to identify a study that has been conducted in South Africa on the actual counting procedure by nurses in the operating room.

1.16 CONCLUSION

In Chapter 1, an introduction and rationale to the research study was provided. The aim, objectives, research methodology, ethical considerations and conceptual framework used for the study was outlined. Chapter 2 will discuss the literature related to unintended retention of surgical items.

CHAPTER 2:
LITERATURE REVIEW

2.1 INTRODUCTION

The literature review presented in this chapter, examined published literature on unintended retention of surgical items in surgical cavities. Objectivity in the conceptualisation of the problem was derived from a review of the literature and development of a framework. According to Parahoo (2014:117), a literature review enables the researcher to provide a rationale for the current study; and to place the current study in the context of what is known and unknown about the phenomenon. Furthermore, it assists in the development of the conceptual or theoretical basis for the study. The literature review was critically analysed, which identified the most suitable design for this phenomenon, a descriptive, cross sectional design with a quantitative approach.

2.2 ELECTING AND REVIEWING THE LITERATURE

Electronic data bases such as Pubmed, CINAHL and Science Direct were searched for current publications using keywords such as unintended retention of surgical items, surgical counts, counting policy and foreign objects.

2.3 FACTORS INFLUENCING ACCURATE COUNTING PRACTICE

According to Edel (2012:228), counting is a high-risk, high frequency activity and policies pertaining to it require annual validation for consistency of best practice among all surgical team members. Although equipment counts are required during surgery, there are factors that influence counts and retention of surgical items. Manual counting is dependent on human performance and environmental factors may affect subsequent recounts, which increases the chance of human error (Norton, Michelli, Gedney & Felkerson, 2012:112). According to Wilson and Walker (2009:362), there are usually many contributing factors in the evolution of errors, but it is important to recognise that human beings are fallible and there will always be mistakes.

Jackson and Brady (2008:319) warned that each operating room has its own set of distractors. It is imperative that the surgical team members do their best to ensure the safety of the patient during counts, particularly because of unavoidable distractions that occur in the operating room. The most common distractors observed in the operating room are changes in the surgical procedure, shortage of staff and change of shift.

Another factor is staff members who work with multiple preceptors as they rotate through the speciality areas in operating rooms. Opportunities exist for practitioners to develop their own styles and independent ways of interpreting and following policies and procedures (Edel, 2012:229).

2.4 VARIABILITY OF PRACTICE

Variation in practice of the counting process is identified by research as an important factor that influences incorrect counts. Numerous studies suggest that differences in surgical count practices and diverse styles of individuals increases the risk for incorrect counts and retained surgical items (Edel, 2012:228).

Edel (2012:231) found that scrub nurses adhered to institutional policies regarding the counting process but the extent of variability and policy interpretation is wide. Reason's (2005:57) study of human error showed that deviation from routine practice leads to error. Independent styles and ways of interpretation and following of policies and procedures regarding surgical counting differ from person to person. Edel (2012:228) supported that some variation is acceptable but broad ranges of policy interpretation can result in different practices that vary from stated policy and procedure.

Variation in practice can occur due to the employment of staff from other facilities (Edel, 2012:230). Riley *et al*. (2006:371) supported this in the observation that count practices vary between institutions and that disparities do exist in how guidelines are interpreted and applied. Furthermore, rather than referring directly to the written policy, nurses tend to rely on each other if they are unsure about the necessity to conduct a full count of instruments and disposables. This practice should be avoided at all cost. Observation and evaluation of actual practice by supervisors and preceptors are vital to ensure that practice consistently corresponds with policy.

2.5 OPERATING ROOM DYNAMICS

Rowlands and Steeves (2010:410) identified bad behaviour, general chaos and communication difficulties as challenges faced by perioperative practitioners that affect the outcome of surgical counts. The risk of retention of surgical items after surgery significantly increases in emergency surgeries, with unplanned changes in procedure and with a patient's higher body-mass index (Gawande, Studdert, Orav, Brennan & Zinner, 2003:229). These high-risk situations contribute to incorrect surgical counts and retained surgical items. Gawande *et al*., (2003:234) suggested the useful measure for detecting inadvertently retained surgical items in high-risk cases, is routine intraoperative radiographic screening.

Their study identified that in 88% of cases a final count that was erroneously thought to be correct, was in fact incorrect.

Norton *et al*. (2012:112) identified that human error caused by communication breakdown, is the most common cause of retention of surgical items. Reason (2005:56) identified characteristics that increase human error such as: uncertain dynamic environments, moments of intense time stress interleaved with long periods of routine activity.

When an incorrect count occurs, inequities of power between surgical team members may be difficult to overcome. Surgeons are not keen to re-explore the wound or allow radiography to verify that a missing item is not in the patient's wound (Jackson & Brady, 2008:325).

Riley *et al.* (2006:372) identified that power relationships in the communication between nurses and surgeons, and among nurses, could possibly result in errors in the surgical count. Their study highlighted that relationships between the members of the perioperative team and the ability to maintain a balance between adhering to policy and professional judgement, played a major role in the counting process. These characteristics are very common in the operating room environment and justifies why surgical count practice needs detailed attention to ensure patient safety.

2.6 NEGATIVE CONSEQUENCES OF UNINTENDED RETENTION OF ITEMS

Unintended retained, surgically placed items have been associated with increased morbidity and mortality (Whang *et al.*, 2009:79). Operating room costs dramatically increase due to the additional time spent looking for the missing surgical item (Woodhead, 2009:359). The cost can be significant as it may lead to patient harm, increased hospital stay and litigation (Norton *et al*., 2012:112). Medical errors occur and when they do, they have lasting consequences for both the patient and physician (East & Snyckers, 2011:74).

Besides the litigation proceedings against the institution and disciplinary measures of staff that arise due to retention of surgical items, the seriousness of patient complications should not be underestimated. Following the alert of an incorrect count, the patient endures prolonged anaesthesia and exposure to unnecessary radiation. Furthermore, literature identified the following complications patients experience due to surgical body retention: pain, infection, abscess, fistula formation and intestinal obstruction (Jackson & Brady, 2008:315).

To complete surgery without retention of surgical items, depends entirely on the efficiency and vigilance of the perioperative team. Unintended retention of surgical items is considered avoidable, but has the potential to occur although procedures are meticulously carried out.

Counting errors are more frequent when no definite counting policy is in place (Jackson & Brady, 2008:320). Deviation in counting practice increases the risk of unintended surgical object retention. The meticulous timing and conducting of counts should be standardised, to ensure application of the process at the appropriate time and with precision. The standard should reflect in practice to avoid incorrect counts and retention of surgical items.

2.7 SOUTH AFRICAN GOVERNANCE FOR THE CONTROL OF UNINTENDED RETENTION OF SURGICAL ITEMS

In South Africa, both health professionals, that is the primary surgeon and the nurse, have a co-responsibility in swab counting to ensure patient safety. According to Searle (2008:177), the doctor does not have the exclusive right to clinical responsibility in patient care.

According to the scope of practice for registered nurses as stipulated in the South African Nursing Council Regulation: 2598: Chapter 2 (g), it is the responsibility of the registered nurse, to facilitate body mechanics and to guard against bodily deformities of patients in their execution of the nursing regimen. The requirements to practise as a perioperative nurse in the public sector is registration with the regulating body, South African Nursing Council, the qualification of a diploma or certificate in nursing at an accredited institution guided by a curriculum prescribed by the regulating authority of nursing (Searle, 2008:58).

Disciplinary action can include suspension or revocation of a licence to practice as a healthcare professional or removal from the nursing register as determined by the South African Nursing Council. According to Searle (2008:168), the dependent function of the nurse is to obey the law that authorises her practice (South African Nursing Council Regulation 2598), as well as common and relevant statutory laws in the execution of her duties. The nurse acts as a responsible person and is accountable for her own acts of commission and omission (Searle, 2008:168). Unless the nurse observes the provisions of the Nursing Act, she becomes criminally liable; and unless she observes other health-related legislation, she may become civilly and criminally liable (Searle, 2008:168). Disciplinary cases tried by a Nursing Council follow the pattern set by the courts (Searle, 2008:184). The council abides by the concept of the adversary system, according to which both sides argue their cases without intervention by the members of the disciplinary committee (Searle, 2008:184).

2.7.1 Counting procedure in South African provincial hospitals

In South Africa's public hospitals, swabs, needles and instruments counting is a procedure in the operating room done before the surgery commences and at different stages during surgery. The primary responsibility for accounting for all swabs, sharps and instruments

before, during and after every surgical procedure rests with the circulating nurse and scrub person (Phillips, 2013:23).

In South Africa, swab counts are commonly recorded on a dry wipe (white) board in the operating room. It is the perioperative practitioner's responsibility to initiate counts at different stages of the surgical procedure and report any count discrepancies to the surgical team for corrective action. All items used during surgery should be accounted for before the end of the procedure to ensure no unintended retention of swabs, needles and instruments occur.

2.7.2 Best practice guidelines

Literature identified gaps in practice between well-designed patient safety action steps and sufficient and consistent provider adherence to these action steps (Berger & Sanders, 2008:1). Standardising the count procedure includes the timing of when counts should occur, including the initial and closing counts and further counts when new items are added to the field (Goldberg & Feldman, 2012:207).

The WHO Guidelines for Safe Surgery (2009:73) recommends guidelines for counting of all swabs (sponges), sharps, and instruments at the following times: before the start of the procedure, before the closure of a cavity within a cavity, before wound closure begins, at skin closure and at the time of permanent relief of either the perioperative practitioner or circulating nurse.

2.8 QUALITY ASSURANCE MEASURES: THE VALUE OF INSTITUTIONAL POLICY FOR QUALITY ASSURANCE OF COUNTING PROCEDURE

Counting practice is an important aspect of patient care. A standardised procedure and the reinforcement of it is recommended to ensure staff compliance to policies and procedures. Implementation of standardising and reinforcing counting practices has proved to decrease incorrect counts and surgical items retention (OR manager, 2007:1).

2.8.1 Avoidance of variation in counting practice

Variation in counting practice procedure has the potential to increase the risk of retention of surgical items, especially in complicated surgical procedures. Standardising the counting procedure reduces the risk for retention of surgical items and allows for continuity and efficiency within the surgical team. Monitoring of the strict adherence to hospital policy pertaining to surgical counts will provide a consistent platform to increase best practice.

2.8.2 Accountability of the perioperative team

Fostering renewed accountability of the perioperative team for accurate counting is strongly recommended by re-enforcing the counting policy and identifying poor practice. Non-adherence to policy and deviation from recommended practice that compromises patient safety should never be tolerated.

2.8.3 Training

Reinforcing the surgical count policy to ensure the application thereof is standardised, is valuable to avoid legal proceedings and disciplinary measures lodged against the facility and staff (Edel, 2012:236).

It is important for the perioperative and circulating nurse to know at which stage of the surgery counts should be performed (Jackson & Brady, 2008:315). This could be supported by an institutional policy that provides minimal standards as to when counts should be done during surgery, with the aim of not interrupting the surgical procedure at critical stages. Standardising the count procedure includes the timing of when counts should occur: the initial and closing counts, relief counts and counts when new items are added to the sterile field (Goldberg & Feldman, 2012: 207).

2.8.4 Performance evaluation

Continuous evaluation of staff competency to ensure adherence to institutional policy should occur. Furthermore, Edel (2009:230) suggested a regular review of policies is required to identify opportunities for educational updates and interventions.

2.8.5 Regular audits

Each institution is responsible for measuring compliance to standardised practice (Norton, Michelli, Gedney & Felkerson, 2012:226). In order to ensure compliance to stipulated policy guidelines, institutional managers should regularly review and evaluate existing policy. The review and reporting of discrepancies need to occur with the input of all staff. This will promote ownership of the policy and contribute to maximum compliance. The perioperative practitioners are required to report discrepancies to the surgical team at any stage of the counting procedure. The steps to be taken to retrieve the identified missing item immediately should be stipulated in the counting policy. Pennsylvania Patient Safety Authority (2009:43) suggested that, should wound closure have commenced, it should immediately cease. The surgeon should explore the wound and radiography must be performed of the entire surgical field. It is recommended that recruitment of additional senior personnel should occur to assist with and witness the search. The surgeon is required to dictate what actions are to be taken in response to the incorrect count and the results of the search. Incident reports are to

be written by the nursing personnel involved and reported to the operating room supervisor. The patient's operating sheet should reflect the missing item and when recorded in the theatre register should be marked in bold.

2.9. SUMMARY

The literature review conducted illustrates there are numerous factors that influence surgical counting practices. Deviation from practices should be identified and guidelines should be available to guide existing practices to eliminate retention of surgical items.

Chapter 3 explains the research methodology used to establish the knowledge, practices and factors that influence surgical counting practices of operating room nurses.

2.10 CONCLUSION

One of the key responsibilities of perioperative practitioners to their patients is to monitor the surgical counting of equipment. This practice should be guided by existing policies and compliance to stipulated guidelines of policy is dependent on regular evaluation of staff to ensure it is applied effectively to prevent unintentional retention of surgical items.

CHAPTER 3:
RESEARCH METHODOLOGY

3.1 INTRODUCTION

In this chapter, the research methodology applied to determine operating room nurse's knowledge of surgical item counting at provincial hospitals in the Cape Metropole district, is described.

3.2 AIM AND OBJECTIVES

The aim of this study was to determine operating room nurses' knowledge of surgical item counting at provincial hospitals in the Cape Metropole district, in order to recommend standardisation and reinforcement of correct counting practices thereby minimise the incidence of incorrect counts and unintended retention of surgical items.

The objectives for this study were:

- To determine the knowledge of operating room nurses regarding surgical item count practices in the operating room
- To determine current surgical counting practices of operating room nurses
- To determine the factors that influence surgical item counting practices.

3.3 STUDY SETTING

Data was collected in a natural setting, which was the operating room departments of four provincial hospitals in the Cape Metropole.

3.4 RESEARCH DESIGN

A research design is a blueprint for obtaining answers to the research question under study, and directs the methodological steps to be followed to conduct the study (Grove, Burns & Gray, 2013:43). To achieve the research objectives and to address the research problem the researcher adopted a descriptive, cross-sectional design with a quantitative approach.

Quantitative research generates numerical information, which is analysed statistically to describe situations, or examine relationships among variables suitable for this research question under study. Its focus was concise and narrow.

A descriptive study design was utilised to gain more information about surgical counting practices as it occurs naturally, in order to determine what others are doing in similar situations (Burns & Grove, 2009:238). No manipulation of the variables was involved, which

provides a clear picture of the phenomenon under study (Burns & Grove, 2011:256). This allows understanding of the phenomenon within a specific timeframe, since the time available to do this study was limited (Burns & Grove, 2009:242).

The features of this study were in accordance with the quantitative research paradigm. The researcher maintained objectivity through structured data collection. A self-administered, structured questionnaire was utilised, which enabled the researcher to quantify the responses by means of statistical analysis guided by a statistician.

3.5 POPULATION AND SAMPLING

A population consists of all the types of individuals or elements that meet certain criteria for inclusion in the research project (Grove, Burns & Gray, 2013:44). Sampling is a process of selecting subjects who are representative of the population being studied (Grove, Burns & Gray, 2013:40; Strydom, 2008:195). The target population in this study are nurses working in public hospital operating room departments in the Cape Metropole district (N=279). Statistically, the population was small and as recommended by Strydom (2008:195) and on the advice of the statistician, the entire population, which was finite and known were included. Not all hospitals in the Cape Metropole district agreed to partake in this study.

All nurses n=164 meeting the inclusion criteria, on day and night duty, were invited to participate in the study. Those who agreed to participate and complete the questionnaire became the sample.

3.5.1 Inclusion criteria

The nurses identified for this study were all registered professional nurses (RPNs), community service (CS) nurses and enrolled nurses (ENs) involved with surgical counting in provincial hospital theatres, in the Cape Metropole district of South Africa.

The total population of registered professional nurses, community service and enrolled nurses in the seven hospitals identified for this study in the Cape Metropole district consisted of N=279. Four hospitals gave permission for the study to be conducted in their operating theatres, resulting in a sample n=164.

The inclusion criteria for the selected hospitals were:

- Classification as a central health facility
- Classification as a district hospital
- Classification as a regional hospital
- Located in the Cape Town Metropole district of South Africa

3.5.2 Exclusion criteria

Professional nurses who assisted with anaesthesia were excluded from this study. According to the researchers' experience, they are not commonly involved in surgical counting practices.

3.6 INSTRUMENTATION

The instrument used in this study was a self-administered questionnaire (see Appendix 4). A questionnaire is a printed self-report form designed to elicit information that can be obtained from a subject's written responses (Grove, Burns & Gray, 2013:425). Since the research design was a descriptive survey, the choice of a questionnaire was an acceptable data collection method using a paper and pen format. A structured questionnaire enhanced objectivity and supported statistical analysis. The instrument was designed by the researcher based on her clinical experience, the research aim and objectives and the published literature. The divisions of the questionnaire are represented in Table 3.2.

Table 3.1: Division of questionnaire

Section	Number of items	Level of measurement	Aspects covered
A	3	Nominal	Demographic data
B	15	Nominal & Ordinal	Professional data
C	15	Nominal	Knowledge of surgical counts
D	15	Likert scale	Clinical practice
E	16	Binary scale	Factors influencing the counting practice

Sections A and B of the questionnaire consisted of 18 closed-ended questions designed to established the demographic and professional data of the respondents. Sections C and D each contained 15 dichotomous and multiple-response statements with Likert scales to determine the knowledge and clinical practice regarding surgical counting practice. Section E surveyed the factors influencing counting procedure by providing a checklist of declarative statements of which the respondents could "tick" as many statements as they thought may have affected their surgical counting practices. Since the checklist is not exhaustive, a further optional space was provided for the respondents to add additional comments.

3.7 PRE-TEST

Apart from gaining an overview of the literature and discussions with a representative group of experts who are the nursing managers in the perioperative field, the researcher pre-tested the instrument used in the study.

A group of perioperative nurses who fit the inclusion criteria were selected to participate in the pre-test of the instrument in draft format. The researcher submitted the questionnaire to thirteen respondents in the field of operating room nursing who were familiar and actively involved in surgical counting practice. This field-testing of the instrument prior to using the final instrument in the actual study is important to iron out any potential problems (de Vos *et al.*, 2011:240) and to ascertain that the content was valid. The pre-test of the instrument highlighted certain aspects of the questionnaire that were not clearly defined and may have led to the misinterpretation of the questions through poor wording or confusing questions. The respondents were consulted regarding ways to improve the questionnaire that could have influenced the integrity of the data collected. Based on their recommendations, the questionnaire was refined.

Furthermore, a statistician assessed the questionnaire to determine whether any irregularities existed hindering data-analysis. The statistician recommended wording of "sloppy scrub sisters" should be described in more detail to ensure it was interpreted correctly. Furthermore, grammatical errors and numbering were corrected. The respondents identified that the section E's statements were confusing. The wording was changed to provide more clarity.

The average time taken to complete the questionnaire was ascertained and consensus was that it took approximately 15 minutes to complete.

3.8 VALIDITY AND RELIABILITY

According to LoBiondo-Wood and Haber (2014:290), the strength of the findings in nursing studies depends on the measuring instrument's accuracy and consistency in its reflection of the concepts being tested. The following section elaborates on the measures used to enhance the validity and reliability of the researcher-developed instrument for this study.

3.8.1 Validity

Validity refers to whether a measurement instrument accurately measures what it is supposed to measure (LoBiondo-Wood & Haber, 2014:292). As mentioned previously, the literature included in the questionnaire obtained from international and national reviewed literature regarding surgical count practices, and policies and guidelines to ensure the measurement instrument is aligned with the research in question.

3.8.1.1 Content validity

This aspect of validity concerns the degree to which an instrument has an appropriate sample of items for the construct being measured and adequately covers the construct

domain (Polit & Beck, 2010:377). The questionnaire was developed from constructs that had been identified from peer reviewed literature, the application of the identified theoretical framework of the study, the research objectives, and the researcher's clinical experience. The literature reviewed was published by internationally renowned bodies, such as the World Health Organisation's Guidelines for Safe Patient Care and organisations for perioperative nursing. As previously mentioned, the questionnaire was assessed during the pre-test for face and content validity, including possible bias in the wording of the constructs. Consultation with perioperative trained managers in the operating room environment with more than ten years of experience, contributed to the formulation of questions in the questionnaire. Furthermore, the statistician involved in this study, contributed to the level of validity and reliability.

3.8.1.2 Face validity

This measure of validity is the most obvious and according to Brink, Van der Walt and Van Jaarsveld (2012:166), the weakest kind of instrument validity. This refers to the superficial appearance of the instrument and whether it measures the appropriate construct, especially for the people who will be completing the instrument (Polit & Beck., 2010:377). Face validity was ensured by consulting with peri-operative nursing experts and the research supervisor. The respondents were asked to give feedback regarding the technical layout, clarity of the questions and relevance of the items. This was done to estimate the extent to which the questionnaire fulfils its purpose in collecting accurate information regarding the research in question.

Consensus was reached between the researcher, the supervisor and statistician regarding the final wording and content based on the feedback from the panel of experts who were perioperative nursing managers, to ensure the measurement included all the major elements of the construct being measured.

3.8.2 Reliability

Reliability occurs when an instrument measures the same construct more than once and results in the same outcomes (De Vos *et al*., 2011:177). The reliability of the content and construction of the instrument was pre-tested during the study. The instrument was pre-tested under the same conditions with similar subjects in the same way, which supports pre-test reliability.

3.9 DATA COLLECTION

The data collection was preceded by the pre-test of the instrument and the main study occurred between March and August 2015 at the respondents' place of employment. Nurses

working on day and night duty were approached to participate. Data was collected via the nurse managers of each hospital, following a meeting.

The meeting was held with the theatre managers to discuss the length of time they anticipated would be needed for the respondents to complete the questionnaires. The responsibility for distribution and collection of the questionnaires was requested of the trained field workers, who were the clinical mentors in the operating theatres, in order to minimise service interruption. They were fully informed of their responsibility in ensuring anonymity and confidentiality, including the placement of sealed collection boxes. Initially, three weeks for data collection was negotiated with each hospital.

Following the meeting with the theatre managers, an information session regarding the study was held with possible respondents to inform them about the aims and objectives of the study. The information session was scheduled at a most convenient time at the respondents' place of employment to reduce service delivery interruption. The measures taken by the researcher to protect the identity of the hospital and the nurses were explained. The separation of the consent forms from the questionnaires in two sealed boxes was emphasized to assure the respondents' anonymity, confidentiality and secrecy. Furthermore, it was explained that only the researcher, the research supervisor, the statistician and the Health Research Ethics Committee of University of Stellenbosch for potential auditing purposes, would have access to the data.

Consent forms were provided and respondents were requested to place the forms in a sealed box marked "consent forms." Following this, each respondent was provided with a questionnaire and a blank, opaque, self-sealing envelope. The respondents were requested to place the completed questionnaire in the envelope, to seal it and to post it into the sealed box marked "questionnaires." A register was kept of the number of consent forms and questionnaires delivered and collected from each hospital. The questionnaires and consent form boxes were collected by the researcher. Colour coding was used to distinguish the different facilities thereby ensuring anonymity.

3.10 DATA MANAGEMENT AND ANALYSIS

The management of the raw data and the analysis thereof are described here.

3.10.1 Data management

The questionnaire boxes were collected from each hospital in August 2015. Each questionnaire was numbered and colour-coded according to their location. The consent forms and questionnaires matched in terms of numbers returned from each hospital. Data

was captured on a Microsoft Excel spreadsheet by the researcher. The sections of the questionnaire were separated in Excel sheets to facilitate analysis. Each variable was abbreviated and entered into one column. Each row represented a respondent. For Section C, the dichotomous variables were allocated numbers. For example 1 for “true” and 2 for “false.” For Section C, the multiple-choice answers were numbered 1 “yes”, 2 “sometimes” or 3 “no”. Section D provided a checklist of statements. Each “tick” was numbered 1.

The research supervisor and the researcher randomly checked the data captured for accuracy. Typographical errors were found and the data re-entered.

3.10.2 Data analysis

Descriptive and inferential analysis were performed for this study. Ordinal data in this study included years of experience since qualifiying. Nursing categories according to qualification were measured as nominal data. Measures of central tendency were analysed for example the age of the respondents and their years of experience.

Inferential statistics enables a researcher to make inferences from a sample to a large population (Brink *et al*., 2012:190) and to determine whether statistical differences are present in the data between groups or variables. In this study, Pearson’s chi-square test was applied to measure differences between the nursing categories based on qualification (nominal data) and their respones to the knowledge and clinical practice variables. The Mann-Whitney U-test compared the ordinal data of years of experience of the respondents with their responses to the knowledge and clinical practice variables. A p-value of $p<0.05$ represented a statistically significant difference between variables with a 95% confidence level.

3.11 SUMMARY

A descriptive survey with a quantitative approach was used in this study. The sample consisted of the entire population of RPNs, CSs and ENs working in the operating rooms in four provincial hospitals. Data was collected by means of a self-administered, structured questionnaire compromising mainly of closed-ended questions and Likert scales. Validity and reliability and ethical considerations were explained. The raw data was submitted for descriptive and inferential statistical analysis and various measures were employed to ensure data quality.

3.12 CONCLUSION

This chapter explained the methodology used for the research, including the design, population, pre-test, instrumentation, reliability and validity. In addition, the process of data

collection and the methods of analysis were described. The ethical considerations were explained. The following chapter discusses the analysis of data and the interpretation of the research findings of this research study.

CHAPTER 4:
FINDINGS/RESULTS

4.1 INTRODUCTION

The previous chapters described the literature review and the research methodology used to conduct this study. This chapter outlines the analysis and interpretation of the data that was collected.

4.2 DATA ANALYSIS

Analysis of data is described by Brink *et al*. (2012:177) as categorising, ordering, manipulating and summarising the data and then describing the data in meaningful terms.

4.2.1 Data preparation

As explained in Chapter 3, raw data from the questionnaire was personally entered by the researcher onto an Excel spreadsheet. The program used by the statistician required numerical values to calculate statistics (Kruger, De Vos, Fouché & Venter, 2005:221). Each row was numbered to represent a respondent. Each column was labelled or coded according to the variable being measured. For missing data, the cell was left blank.

The raw data in the spreadsheet was cross-checked by the research supervisor and another peri-operative nurse against the questionnaires for accuracy. The spreadsheet was submitted to the statistician for descriptive and inferential analysis.

4.2.2 Descriptive statistics

Descriptive statistics are used to summarise and describe the data (Polit & Beck, 2010:391).

For the first objective to determine knowledge of counting was scored by calculating all the correct responses to the 15 knowledge questions, and this score was expressed as a percentage out of a maximum possible score of 15. Mean and standard deviation of knowledge scores were presented in order to describe the level of knowledge in the sample. A 95% confidence interval was used to make inferences about the level of knowledge of the population.

The second objective entailed individual descriptive analysis of section D surgical counting practice items. These items were measured on a 3-point categorical scale. Responses were summarised using frequency tables and bar charts to assess the proportion of each

response in the sample and 95% confidence intervals were used to make inferences to the population.

The third objective entailed individual descriptive analysis of section E factors influencing surgical counts items. These items were measured on a binary scale. Responses were summarised using frequency tables and bar charts to assess the proportion of each response in the sample and a 95% confidence interval was used to make inferences about the population.

Descriptive data including measures of central tendency were graphically displayed, expressing the most typical or average scores in a distribution (Brink *et al.*, 2012:185).

4.2.3 Inferential statistics

Burns and Grove (2007:408) explained that inferential statistics should represent the sample population, allowing for generalisations to be made from that population. The results of the of Pearson Chi Square test for differences between nursing categories, and Mann Whitney test for differences between variables of years of experience, were not significant.

4.3 QUESTIONNAIRE RESPONSE RATE

A response rate is calculated by dividing the number of returned questionnaires by the number of the study sample (Brink *et al*, 2006:177). One hundred and sixty four questionnaires were distributed to four hospitals who had agreed to participate in the study. Seventy-six questionnaires were returned indicating a response rate of 51% (see Table 4.1). Although Burns and Grove (2007:403) recommended that incomplete questionnaires should be excluded, the incomplete questionnaires in this study were included since the data obtained was sufficient for analysis.

Table 4.1: The study population and response rate per hospital

Hospital	Staff establishment	Study sample (n)	Number of questionnaires returned (n)	Response rate (%)
Hospital 1	65	n=65	n=44	67.6
Hospital 2	61	n=61	n=12	19.6
Hospital 3	12	n=12	n=9	75
Hospital 4	11	n=11	n=11	100
TOTAL	**149**	**n=149**	**n=76**	**51%**

4.4 SECTION A: DEMOGRAPHIC DATA

Section A of the questionnaire required the respondents to indicate their demographic profile with regard to their gender and age.

4.4.1 Variables 01 and 02: Gender (n =76/100%)

Table 4.2 illustrates that the majority of the respondents were female (n=70/92. This is consistent with the statistical gender profile of nurses in South Africa according the regulatory body, the South African Nursing Council (Republic of South Africa, 2010:np)

Table 4.2: Gender of respondents

Variable	Gender	n	%
02	Female	70	92.1
01	Male	6	7.9
TOTAL		**76**	**100**

4.4.2 Variable 03: Age in years (n=75/100%)

One respondent omitted the age question, thus this variable was analysed on 75 responses. The mean age was 43.72 with a standard deviation of 8.664 years. The majority of the respondents (n=75) were between 40 and 50 years of age. Figure 4.1 illustrates the age distribution of the respondents.

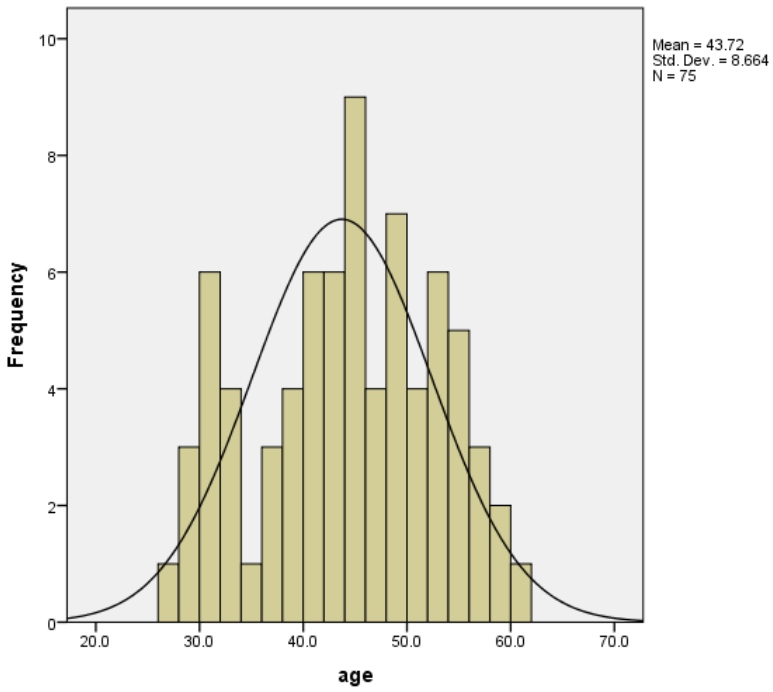

Figure 4.1: Age distribution of respondents

4.5 SECTION B: PROFESSIONAL PROFILE

Section B of the questionnaire required the respondents to indicate their professional profile with regard to nursing category, level of nursing education, post-basic qualification, years of experience after qualification, duty shift and whether they were employed full-time, part-time or via a nursing agency.

4.5.1 Variables 04–07: Nursing category

The majority of the respondents were registered professional nurses (RPN) (n=56/73.7%), followed by operational managers (n15=19.7%). Enrolled nurses (n=4/5.3%) and community service nurses (n=1/1.3%) were in the minority. One respondent did not indicate a nursing category (see table 4.3 below).

Table 4.3: Nursing category

Variable	Category	n	%
04	Registered professional nurses (RPN)	56	73.7
07	Operational managers	15	19.7
06	Enrolled nurses	4	5.3
05	Community service nurses	1	1.3
TOTAL		**76**	**100**

4.5.2 Variables 08–10: Level of basic nursing education

The level of basic education as shown in Table 4.4 confirms that the majority of RPNs (n=55/72.4%) obtained a diploma in general nursing and some (n=17/22.4%) had a nursing degree. The enrolled nurses (n=3/3.9%) indicated they had obtained an enrolment certificate. One respondent did not indicate the level of basic nursing education.

Table 4.4: Level of basic nursing education

Variable	Nursing education	n	%
08	Diploma	55	72.4
09	Enrolment certificate	3	3.9
10	Degree	17	22.4
TOTAL		**75**	**100**

4.5.3 Variables 11–12 Post-basic nursing qualification in operating room nursing (n=21/27.4%)

Table 4.5 shows that few respondents (n=3/23.7%) had a post-basic qualification in operating room nursing. The majority of the respondents (n=18/3.9%) did not have a post-basic qualification specific to operating room nursing.

Table 4.5: Post-basic qualification in OR nursing

Qualification in OR nursing	n	%
No	18	23.7
Yes	3	3.7
TOTAL	**21**	**27.4**

4.5.4 Variable 13: Years of experience after qualification:

The years of experience of the respondents ranged from less than one year to 30 years. Eight respondents' data on this variable was missing.

4.5.5 Variables 14–15: Duty shift

In provincial hospitals, no elective surgery is performed at night. Thus, the majority of respondents in this study worked during the day (n=62/81.6%). Table 4.6 shows the number of staff on day duty and night duty at each of the hospitals in the study.

Table 4.6: Duty shift

Variable	Duty	n	%
13	Day duty	62	81.6
14	Night duty	14	18.4
TOTAL		**76**	**100**

4.5.6 Variables 16–18: Type of employment

The majority of respondents were permanently employed (n=74/97.4%). One respondent was a community service nurse and the other was employed by a nursing agency (see table 4.7 below).

Table 4.7: Type of employment

Variable	Employment	n	%
16	Permanent employment at the hospital	74	96
17	Community service nurse	1	2
18	Employment by a nursing agency	1	2
TOTAL		**75**	**100**

4.6 SECTION C: SURGICAL COUNTS KNOWLEDGE

Section C of the questionnaire required the respondents to answer "true" or "false" to 15 declarative statements to establish their knowledge of the correct procedure for surgical counts.

4.6.1 Variables 19–20: Surgical counts are conducted by two persons, by a scrub and circulating nurse.

The majority of the respondents (n=75/98.7%) correctly indicated that surgical counts are conducted by two persons: a scrub and circulating nurse (see table 4.8 below). This is supported by the *WHO Guidelines for Safe Surgery* (2009:72) who cited that the South African Theatre Sister Association recommends two persons conducts a surgical counts as a standard in their guidelines.

Table 4.8: Knowledge: Surgical counts are conducted by two persons

Variable	To my knowledge...	True		False	
		n	%	n	%
19-20	Surgical counts are conducted by two persons, by a scrub and circulating nurse.	75	98.7	1	1.3

4.6.2 Variables 21–22: Surgical counts are conducted for certain surgical procedures only

Table 4.9 shows that more than half the respondents (n=43/56.6%) wrongly indicated that surgical counts are conducted for certain surgical procedures only. Four respondents did not complete this statement. *WHO Guidelines for Safe Surgery* stipulated that “a full count of sponges, sharps, and instruments (especially tapes, clips and drill bits) should be performed when the peritoneal, retroperitoneal, pelvic and thoracic cavities are entered. Counts should be done for any procedure in which these items could be retained in the patient” WHO Guidelines for Safe Surgery (2009:72).

Table 4.9: Knowledge: Surgical counts are conducted for certain surgical procedures

Variable	To my knowledge...	True		False	
		n	%	n	%
21-22	Surgical counts are conducted for certain surgical procedures only	29	38.2	43	56.6

4.6.3 Variables 23–24: I should keep the total number of swabs to a minimum used during surgery

Almost 30% (n=22) of the respondents incorrectly indicated (see table 4.10 below) that this statement is false and again, one respondent omitted a response.

Table 4.10: Knowledge: Keep the total amount of swabs to a minimum

Variable	To my knowledge...	True		False	
		n	%	n	%
23-24	I should keep the total amount of swabs to a minimum used during surgery.	53	69.7	22	28.9

4.6.4 Variables 25–26: If there is a change in personnel, surgical counts can be omitted

Although 88.2% (n=67) of the respondents identified this statement as false, 11.8% (n=9) indicated it to be acceptable as illustrated in Table 4.11 below. When a change of staff occurs, all equipment should be recounted between the leaving staff member and the replacement, including the circulating nurse. This is found in the *WHO Guidelines of Safe Surgery*, where it is recommended that "a protocol for transfer of information and responsibility should be clearly delineated in hospital policy WHO *Guidelines for Safe Surgery* (2009:72)."

Table 4.11: Knowledge: A change in personnel, surgical counts can be omitted

Variable	To my knowledge...	True		False	
		n	%	n	%
25-26	If there is a change in personnel, surgical counts can be omitted.	9	11.8	67	88.2

4.6.5 Variables 27–28: When a surgical count is interrupted, the count for those items can be continued

Seventy-five per cent of the respondents correctly indicated this statement is false, six respondents did not complete the statement and 17.1% (n=13) indicated this to be acceptable practice (see table 4.12 below). *WHO Guidelines for Safe Surgery* (2009:73) specifies that if a count is interrupted counting should be started again from the beginning. Ideally, the same two persons should perform all counts.

Table 4.12: Knowledge: When a surgical count is interrupted, it can continue

Variable	To my knowledge...	True		False	
		n	%	n	%
27-28	When a surgical count is interrupted, the count for those items can be continued.	13	17.1	57	75

4.6.6 Variables 29–30: Recording of all swabs, needles, blades and instruments used should be done according the hospital policy

WHO Guidelines for Safe Surgery (2009:73) recommends that the counts should be recorded on a count sheet or nursing record (see table 4.13 below). Furthermore, it is recommended that a hospital policy should be available, specifying how records should be kept. For this variable, not all respondents acknowledged that hospital policy should be followed. 3.9% (n=3) indicated that recording should not be done according to hospital policy.

Table 4.13: Knowledge: Recording of all swabs, needles, blades & instruments used are counted according policy

Variable	To my knowledge...	True		False	
		n	%	n	%
29-30	Recording of all swabs, needles, blades and instruments used should be done according the hospital policy.	3	3.9	73	96.1

4.6.7 Variables 31–32: Surgical counts should be done aloud

All respondents agreed with this statement (see table 4.14 below). It is recommended by the WHO that items should be viewed, or visible to the counters (WHO *Guidelines for Safe Surgery*, 2009:72).

Table 4.14: Knowledge: Surgical counts should be done aloud

Variable	To my knowledge...	True		False	
		n	%	n	%
31-32	Surgical counts should be done aloud.	76	100	0	0

4.6.8 Variables 33–34: Only x-ray detectable swabs are used intra-operatively

Only 93.4% (n=71) marked this statement as being true. This result is of concern since all perioperative nurses should know that non-x-ray detectable swabs are not used in any surgery (see table 4.15 below). This is substantiated by WHO *Guidelines for Safe Surgery* (2009:72). However, vascular loops are not x-ray detectable and it is advisable that manufacturers address this shortcoming.

Table 4.15: Knowledge: Only x-ray detectable items are used

Variable	To my knowledge...	True		False	
		n	%	n	%
33-34	Only x-ray detectable items are used intra operatively	71	93.4	5	6.6

4.6.9 Variables 35–36: Surgical counts are conducted to control swabs, needles, blades and instruments

All respondents indicated this statement is true (n=76/100%) (see table 4.16 below).

Table 4.16: Knowledge: Surgical counts are done to control swabs, needles, blades & instruments

Variable	To my knowledge...	True		False	
		n	%	n	%
35-36	Surgical counts are conducted to control swabs, needles, blades and instruments.	76	100	0	0

4.6.10 Variables 37–38: In the event of a count discrepancy closure of the cavity continues as usual

The majority of the respondents disagreed with this statement (n=62/81.6%). Furthermore, four (n=4/5.3%) respondents omitted a response and ten (n=10/13.2%) indicated that closure continuous despite a discrepancy in the count (see table 4.17 below). WHO stipulates that every healthcare facility should have a policy for the procedure to follow in the event of a discrepant count. When a count is incorrect, personnel must perform a recount, and, if they are unable to reconcile the counts, they should immediately notify the surgeon and the operating room supervisor. A search should be conducted of the surgical field, the swab buckets and linen containers. If the counts remain unreconciled, it is recommended that the patient is x-rayed. The results are documented on the count sheet and in the patient's record WHO *Guidelines for Safe Surgery* (2009:73).

Table 4.17: Knowledge: Event of count discrepancy closure of cavity continues

Variable	To my knowledge...	True		False	
		n	%	n	%
37-38	In the event of a count discrepancy closure of the cavity continuous as usual.	10	13	62	81.6

4.6.11 Variables 39-40: Surgical counts are recorded and controlled on a dry erase board during the surgical procedure

All respondents agreed with this statement (n=76/100%)

4.6.12 Variables 41–42: Surgical counts should be recorded as correct or incorrect on the patient's operating sheet

Ten (n=10/13.2%) respondents incorrectly indicated this statement is false, omitting this from the patient's operating sheet (see table 4.19 below). The recording process is clearly stipulated in the *WHO Guidelines for Safe Surgery* as described in variables 37-38.

Table 4.18: Knowledge: Surgical counts should be recorded in patient's record

Variable	To my knowledge...	True		False	
		n	%	n	%
41-42	Surgical counts should be recorded correct or incorrect on the patients operating sheet.	66	88.2	10	13.2

4.6.13 Variables 43–44: Items intentionally left in a wound are not documented in a patient's records

The majority of the respondents (n=67/88.2%) correctly indicated that this statement is false, while two respondents omitted an answer and seven (n=7/9.2%) indicated that items intentionally left in a wound are not documented in a patient's records (see table 4.20 below). Omitting to record items left intentionally in the wound, can lead to miscommunication, and verification of what type and amount of items left behind can result in retention of items in the surgical wound. It is stipulated by the WHO Guidelines that instruments and swabs intentionally left with the patient should be documented on the count sheet and in the patient's record by the nursing staff (WHO *Guidelines for Safe Surgery,* 2009, 73).

Table 4.19: Knowledge: Items left in wound are not recorded

Variable	To my knowledge...	True		False	
		n	%	n	%
43-44	Items intentionally left in a wound are not documented in patient's records.	7	9.2	67	88.2

4.6.14 Variables 45–46: Surgical counts are conducted in standardised multiples of five

The majority of respondents (n=73/96.1%) correctly indicated that this statement is true (see table 4.21 below). The respondents in this study could have misconstrued this statement since suture needles and scalpel blades may not be used in multiples of five. However, swabs are always used in multiples of 5 as recommended by WHO *Guidelines for Safe Surgery* that specifies swabs should be packaged in standardised multiples of five and counted in multiples of 5 (WHO *Guidelines for Safe Surgery,* 2009,73). A concern is that the supply of pre-packaged swabs in multiples of 5 is sometimes inconsistent in provincial hospitals in the Cape Metropole due to the failure of suppliers to meet tender obligations. Thus, hospitals are required to create bundles of 5 out of bulk supplies to meet the patient care needs. In the event of a bundle containing less or more than 5 swabs, the bundle should be removed from the sterile field and isolated from other swabs (WHO *Guidelines for Safe Surgery*, 2009:73). It should be brought to the attention of the operating room supervisor who should inform the procurement department.

Table 4.20: Knowledge: Surgical counts are conducted in multiple of fives

Variable	To my knowledge...	True		False	
		n	%	n	%
45-46	Surgical counts are conducted in standardized multiple of fives.	73	96.1	3	3.9

4.6.15 Variables 47–48: Items included in the surgical count can be removed from the operating room before the final count is completed

As shown in Table 4.22, the majority of respondents disagreed with this statement by selecting the "false" option. (n=67/88.2%). However, two (n=2/2.6%) omitted a response to this statement and seven (n=7/9.2%) indicated that items included in the surgical count may be removed from the operating room before the final count is completed. WHO *Guidelines*

for Safe Surgery (2009:73) specifies that items included in the count should not be removed from the operating room until the final count is completed and the counts are reconciled.

Table 4.21: Knowledge: Items included in surgical count can be removed from operating room

Variable	To my knowledge...	True		False	
		n	%	n	%
45-46	Items included in the surgical count can be removed from the operating room before the final count is completed.	7	9.2	67	88.2

Table 4.23 shows the findings with regard to the incorrect answers provided by the respondents for eight identified variables that are the minimum requirements for safe counting practices according to WHO *Guidelines for Safe Surgery*. This is a great concern for patient safety since the statements incorporate the fundamental safety procedures to be followed for every surgical procedure.

Table 4.22: Knowledge responses for minimum safe practice

Variable	To my knowledge...	Incorrect answer	
		n	%
19-20	Surgical counts are conducted by two persons, by a scrub and circulating nurse.	1	1.3
21-22	Surgical counts are conducted for certain surgical procedures only.	27	35.5
25-26	If there is a change in personnel, surgical counts can be omitted	7	9.2
33-34	Only x-ray detectable swabs are used intra-operatively.	2	2.6
37-38	In the event of a count discrepancy, closure of the cavity continues as usual.	10	13
41-42	Surgical counts should be recorded as correct or incorrect on the patients records and operating sheet	10	13
43-44	Items intentionally left in a wound are not documented in the patient's operating sheet	7	9.2
47-48	Items included in the surgical count can be removed from the operating room before the final count is completed.	5	6.5

4.7 SECTION D: SURGICAL COUNTS–CLINICAL PRACTICE

This section evaluated the clinical practice of the respondents. They were asked to choose whether the given statement is typical of what they do in the theatre and to choose only one option per statement by marking the appropriate column.

4.7.1 Variables 49–51: Perform surgical item counts according hospital policy to prevent surgical item retention

The majority, (n=74/97.4%) indicated that they perform counts according to policy. Two respondents (n=2/2.6%) selected "no." These results differ slightly from variables 29 and 30 where the statement on adherence to hospital policy under Section C *To my knowledge* showed that 73 (n=73/96.1%) indicated their recording of all swabs, needles, blades and instruments used should be done according to the hospital policy. Three (n=3/3.9) respondents indicated that the statement is false. This confirms the findings of both Sections C and D that not all the respondents follow hospital policy.

Table 4.23: Clinical practice: Perform surgical counts according hospital policy

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
49-51	Perform surgical item counts according hospital policy to prevent surgical item retention.	74	97.4	2	2.6	0	0

4.7.2 Variables 52–54: Do surgical counts of swabs, needles and instruments continuously throughout the surgical procedure with the same scrub nurse and circulating nurse

Table 4.25 shows that the majority of respondents indicated that they do perform counts continuously with the same team members (n=73/96.1%), yet two (n=2/2.6%) indicated sometimes, and one respondent marked (n=1/1.3%) "no." WHO *Guidelines for Safe Surgery* (2009:72) confirms, ideally the same two persons should perform all counts.

Table 4.24: Clinical practice: Do surgical counts continuously throughout the procedure

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
52-54	Do surgical counts of swabs, needles & instruments continuously throughout the surgical procedure with the same scrub nurse and circulating nurse.	73	96.1	2	2.6	1	1.3

4.7.3 Variables 55–57: Check all items used before and after use for completeness

The majority of respondents indicated that they do check all items used before and after use for completeness (n=74/97.4%). All nurses should check the items for completeness before and after use. However, in some low-risk surgical procedures such as cystoscopy and cataract surgery, counting can be exempted but must be stipulated in the counting policy. WHO *Guidelines for Safe Surgery* (2009:72) states this should be an exception rather than a general rule.

Table 4.25: Clinical practice: Check all items used for completeness

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
55-57	Check all items used before and after use for completeness.	74	97.4	2	2.6	0	0

4.7.4 Variables 58–60: Open up swabs when counting to check for presence of the X-ray detectable strip

Ninety-four point seven per cent (n=72) showed they open up of swabs when counting to check for the x-ray detectable strip. The minority of the respondents indicated “sometimes” (n=1/1.3%) and “no” (n=1/1.3%). WHO *Guidelines for Safe Surgery* (2009:73) specifies that swabs should be completely separated one by one during counting before the commencement of surgery and at various stages of closure. Such packages should be separated from the other swabs and removed from the sterile field. Gibbs (2012:6715) states that the most common retention of surgical item is the “cotton gauze surgical sponge”, which has been found in the abdomen/pelvis, chest and increasingly in the vagina. Furthermore, she stated that swabs have been retained when only 10 swabs were used and a small biopsy or skin incision was made. Therefore, all swabs must be accounted for in all cases in which swabs are used and an incision is made. The size of the incision or the length of the case is no indication for omitting a swab count.

Table 4.26: Clinical practice: Open swabs when counting to check for presence of the X-ray strip

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
58-60	Open up swabs when counting to check for presence of the X – ray detectable strip.	72	94.7	1	1.3	1	1.3

4.7.5 Variables 61–63: Maintain an organised, sterile field to ensure accounting for all items during and after the surgical procedure

The majority (n=74/97.4%) indicated that they maintained an organised sterile field to ensure accounting for all items during and after the surgical procedure. However, for novice operating room scrub nurses, maintaining an organised sterile field may be challenging. Furthermore, major surgery sometimes involves numerous sets of instruments and thus, it is incumbent on training schools, mentors and operating room supervisors, to assist staff with developing good organisational skills (Rowlands & Steeves, 2010:413).

Table 4.27: Clinical practice: Maintain an organized sterile field

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
61-63	Maintain an organized sterile field to ensure accounting for all items during and after the surgical procedure.	74	97.4	2	2.6	0	0

4.7.6 Variables 64-66: Ensure the circulating nurse documents the initial surgical count on the dry erase board and additional swabs, needles & instruments that are added or removed from the sterile field

For this statement two respondents (n=2/2.6%) indicated that they sometimes ensure the circulating nurse documents the initial surgical count on the dry erase board is done and one respondent indicated they do not (n=1/1.3%). WHO recommends that other recording strategies, such as using a dry erase board (writing board) to track counts, is important in accordance with the hospital protocol WHO *Guidelines for Safe Surgery* (2009:72). It is common practice in the South African nursing schools who teach operating room technique, that all swabs, loose needles, blades, sutures, tapes and vascular clamps are recorded on the dry erase board that also includes the patient's name, folder number, surgical procedure, and the day's date.

Table 4.28: Clinical practice: Ensure the circulating nurse documents the surgical counts on the whiteboard

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
64-66	Ensure the circulating nurse documents the initial surgical count on the whiteboard and additional swabs, needles & instruments added or removed from the sterile field.	73	96.1	2	2.6	1	1.3

4.7.7 Variables 67–69: Report surgical count status to the surgeon at different stages of closure of the surgical cavity, who should give verbal acknowledgement

For this statement one respondent selected “no” and one respondent selected “sometimes” for this critical control measure. Although the majority (n=74/96.4%) indicated they do report the surgical count status, it can be determined that in some operating procedures, nurses deem it unnecessary to count or report on count status. WHO *Guidelines for Safe Surgery* (2009:73) insists that the results of the count should be announced audibly to the surgical team, who should verbally acknowledge the count.

Table 4.29: Clinical practice: Report surgical count status to the surgeon

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
67-69	Report surgical count status to the surgeon at different stages of closure of the surgical cavity, who should give verbal acknowledgement.	74	97.4	1	1.3	1	1.3

4.7.8 Variables 70–72: Perform surgical counts before the procedure to establish a baseline

Although the majority of respondents (n=75/98.7%) indicated they do perform surgical counts before the procedure to establish a baseline, one respondent (n=1/1.3%) checked the “no” column. Surgical counts generally include instruments, swabs, needles and blades, with additional equipment for specialised surgery. The instrument check sheet is commonly

included in the sterile instrument container and it is the responsibility of the scrub sister to verify the contents with the circulating nurse. Should the check sheet differ from the contents of the instrument container, the operating room supervisor should be notified and the set removed from circulation until complete. Performing surgical counts before the procedure to establish a baseline, is ratified by WHO *Guidelines for Safe Surgery* (2009:72) and Gibbs (2012:6715) as described in variables 60-63.

Table 4.30: Clinical practice: Perform surgical counts: before the procedure to establish a baseline

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
70-72	Perform surgical counts: before the procedure to establish a baseline.	75	98.7	1	1.3	0	0

4.7.9 Variables 73–75: Perform surgical counts: Before closing of a cavity within a cavity

The majority (n=73/96.1) indicated they do perform counts in surgery with cavities such as abdominal hysterectomy. However, one indicated “no” and another two indicated “sometimes”. Four counts are mandatory for retroperitoneal surgery and in total abdominal hysterectomy where the cervix is sutured forming an extra cavity. This is endorsed by WHO *Guidelines for Safe Surgery* (2009:72).

Table 4.31: Clinical practice: Perform surgical counts: Before closing of a cavity within a cavity

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
73-75	Perform surgical counts: Before closing of a cavity within a cavity	73	96.1	2	2.6	1	1.3

4.7.10 Variables 76–78: Perform surgical counts: Before wound closure begins

Not all respondents performed surgical counts before wound closure begins as a safety measure, as indicated by one respondent (n=1/1.3%) who marked “no” on the questionnaire. WHO recommends counts should be done for any procedure where items could be retained

in the patients, and counts must be conducted at least at the beginning and the end of every eligible case WHO *Guidelines for Safe Surgery* (2009:72).

Table 4.32: Clinical practice: Perform surgical counts: Before wound closure begins

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
76-78	Perform surgical counts: Before wound closure begins	75	98.7	0	0	1	1.3

4.7.11 Variables 79–81: Perform surgical counts: At skin closure or end of a procedure

For this statement only 70 (n=70/92.1%) respondents indicated they perform the above mentioned routinely. “No” and “sometimes” were collapsed for this statement since counts should be performed at skin closure for all surgeries. Two respondents did not answer the question. WHO *Guidelines for Safe Surgery* (2009:72) recommendation as in variable 80-3, is also relevant to this statement.

Table 4.33: Clinical practice: Perform surgical counts: At skin closure or end of procedure

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
79-81	Perform surgical counts: At skin closure or end of a procedure	70	92.1	2	2.6	2	2.6

4.7.12 Variables 82-84: Perform surgical counts: At the time of permanent relief of either the scrub person or circulating nurse

From the results it was determined that performing surgical counts: At the time of permanent relief is not practiced by all the respondents although n=69 (90.8%) indicated they do adhere to the above mentioned protocol, four (n=4/5.3%) indicated they do not. One (n=1/1.3%) respondent indicated “sometimes” and two (n=2/2.6%) omitted this question. It can be deduced that seven respondents, almost 10% of the sample in this study, do not perform these counts during staff change. Performing surgical counts at the time of permanent relief is a critical omission in patient safety (see Table .4.35)

Table 4.34: Clinical practice: Perform surgical counts at the time of permanent relief

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
82-84	Perform surgical counts at the time of permanent relief of either the scrub person or circulating nurse.	69	90.8	1	1.3	4	5.3

4.7.13 Variables 85–87: Perform surgical counts when additional items are added to the surgical field—they are counted and recorded

The majority indicated performing surgical counts when additional items are added to the surgical field are counted and recorded (n=73/96.1%). However, one (n=1/1.3%) respondent indicated this is performed sometimes and two (n=2/2.6%) omitted this question. Performing surgical counts when additional items are added to the surgical field and documentation thereof is mandatory according to WHO *Guidelines for Safe Surgery* (2009:72).

Table 4.35: Clinical practice: Perform surgical counts when additional items are added to the sterile field

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
85-87	Perform surgical counts when additional items are added to the surgical field, they are counted and recorded	73	96.1	1	1.3	0	0

4.7.14 Variables 88–90: Inform the surgeon and nurse manager in case of a count discrepancy

Not all respondents inform the surgeon and nurse manager in the case of a count discrepancy (n=1/1.3%). This could be due to intimidation of the scrub nurse by the surgeons who are reluctant to explore a cavity. According to Jackson and Brady (2008:319), when incorrect counts occur, imbalances of power between the surgical team members may be difficult to overcome.

Table 4.36: Clinical practice: Inform the surgeon and nurse manager in case of a count discrepancy

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%

88-90	Inform the surgeon and nurse manager in case of a count discrepancy.	75	98.7	1	1.3	0	0

4.7.15 Variables 91–93: Ensure the results of the surgical counts are recorded as correct or incorrect in patient's records

Only 71 respondents (n=71/93.4%) ensure that the results of the surgical counts are recorded as correct or incorrect in the patient's record, as a critical principle of record keeping. However, two respondents (n=2/2.6%) indicated they ensured the results of the surgical counts are recorded as correct or incorrect in the patient's record, sometimes or not at all. Three respondents omitted this question. WHO *Guidelines for Safe Surgery* (2009:72) stipulates the results must be recorded whether correct or incorrect.

Table 4.37: Clinical practice: Ensure the results of the surgical counts are recorded in patient's records

Variable	When I scrub I...	Yes		Sometimes		No	
		n	%	n	%	n	%
91-93	Ensure the results of the surgical counts are recorded as correct or incorrect in patient's records.	71	93.4	1	1.3	1	1.3

Further analysis was done on the incorrect knowledge responses for three minimum safe practice questions and is presented in Table 4.39. "Sometimes" and "no" was collapsed since all nurses should adhere to the fundamental clinical practice safety measures.

Table 4.38: Responses for clinical practice critical questions

Variable	When I scrub for a case I…	Incorrect answer	
		n	%
58-60	Open up swabs when counting to check for presence of the X-ray detectable strip.	2	2.63
67-69	Report surgical count status to the surgeon at different stages of closure of the surgical cavity, who should give verbal acknowledgement.	1	1.4
82-84	Perform surgical counts at the time of permanent relief of either the scrub person or circulating nurse	5	6.5

4.8 SECTION E: FACTORS INFLUENCING THE COUNTING PROCEDURE

In this section the respondents were required to indicate whether any of the listed factors ever affected the respondent's surgical counting practices.

4.8.1 Variable 94: Different styles of surgical counting procedure

Almost 29% of the respondents (n=22/28.9%) checked the box indicating that different styles of surgical counting procedures have affected their counting practice. However, 54 (n=54/71.1%) did not respond to this question. It is imperative that a standard method is used throughout hospitals in the Western Cape. Furthermore, staff that is hired via employment agencies, should be oriented to the method used at the hospital in which they are deployed. Variation in practice of the counting process is identified by research as an important factor that influences incorrect counts. Numerous studies suggest that differences in surgical count practices and diverse styles of individuals, increases the risk for incorrect counts and retained surgical items (Edel, 2012:228).

4.8.2 Variable 95: Change from routine counting practice

Less than half the respondents in this survey (n=21/27.7%) indicated that they had experienced change from routine counting practice in the work environment. Fifty-five respondents (72.4%) did not answer this question. Numerous studies suggest that differences in surgical count practices and diverse styles of individuals, increases the risk for incorrect counts and retained surgical items (Edel, 2012:228).

4.8.3 Variable 96: Staff from other facilities count differently

Only 31.6% (n=24) checked the box indicating that staff from other facilities count differently. More than half the respondents omitted this question (n=52/68.4%) omitted this question. Variation in practice can occur due to the employment of staff from other facilities (Edel, 2012:230). Riley *et al*. (2006: 371) supported staff from other facilities count differently in the observation that count practices vary between institutions, and that disparities do exist in how guidelines are interpreted and applied.

4.8.4 Variable 97: Untidy sterile field due to disorganised (sloppy) scrub sisters

Untidy sterile field due to disorganised (sloppy) scrub sisters factor has been experienced by 33 (43.4%) of the respondents in this study, while 43 (56.6%) omitted this question. Rowlands and Steeves (2010:413) cited respondents in their study who spoke about "sloppy individuals" who struggle to find missing "sponges" under a pile of instruments on the Mayo stand." Therefore, organised sterile fields may contribute to the prevention of unintended retention of surgical items.

4.8.5 Variable 98: General chaos during surgery

Half the respondents in this study (n=38/50.0%) who responded to this question indicated that general chaos during surgery affected their counting practice. The other 50% omitted this question. One respondent working at a large tertiary institution commented that for this variable, life-saving procedures have affected her surgical counting practice. It can be deduced that the verbal requests and the stress during the procedure is distracting. Another respondent wrote that noise make it difficult to hear and affects her concentration. Rowlands and Steeves (2010:410) identified bad behaviour, general chaos and communication difficulties as challenges faced by perioperative practitioners that affect the outcome of surgical counts.

4.8.6 Variable 99: Communication difficulties amongst staff

Less than half the respondents (n=32/42.1%) indicated that communication difficulties amongst staff affected their counting practice and the majority (n=44/57.9%) omitted the question. One respondent from a large tertiary hospital commented that language is sometimes a barrier. In the multicultural milieu in the Cape hospital operating rooms, both medical and nursing staff are often from different countries. Norton *et al*. (2012:112) identified that human error caused by communication breakdown, is the most common cause of retention of surgical items. According to Gibbs (2012:6718), effective communication includes the use of a comprehensive surgical patient safety checklist such as the WHO safety checklist used in provincial hospitals in the Western Cape. A checklist "brings all surgical providers together for a least a few moments to have a shared mental model for the patient's surgical care (Gibbs, 2012:6718)".

4.8.7 Variable 100: Surgeons reluctant to explore wound when incorrect counts occur

Half the respondents (n=38/50.0%) indicated that surgeons are reluctant to explore the wound when incorrect counts occur. The other half omitted the question. One respondent from a tertiary hospital wrote that after long procedures, surgeons are in a hurry to conclude the procedure. Length of surgery causes fatigue and decreases concentration and is well documented in literature. When an incorrect count occurs, inequalities of power between surgical team members may be difficult to overcome. According to a study by Jackson and Brady (2008:325), surgeons are indeed reluctant to re-explore the wound or allow radiography to verify that a missing item is not in the patient's wound.

4.8.8 Variable 101: Increase in patient body mass of the patient

For this statement, few respondents (n=28/36.8%) acknowledged that an increase in patient body mass affected their surgical count practice. Forty-eight respondents (n=48/63.2%)

omitted the question. According to Gawande *et al*. (2003:229), the risk for retention of surgical items following surgery significantly increases with overweight patients.

4.8.9 Variable 102: Unexpected change in planned surgical procedure

Half the respondents (n=38/50.0%) indicated that unexpected change in planned procedure affected their counting practice. The other 50% omitted the question. One respondent noted that more instrument packs are opened during unexpected changes in surgery, usually in a hurry, with no time to count the instruments before they are used. Reason (2005:56) identified characteristics that increase human error such as uncertain dynamic environments, moments of intense time stress interleaved with long periods of routine activity.

4.8.10 Variable 103: Emergency procedures

Slightly over half the respondents (n=39/51.3%) acknowledged that emergency procedures affected their counting practice. However, n=37 (48.7%) omitted the question. One respondent acknowledged that she does not sometimes have time to count before the first incision. The burden of disease in South Africa includes vehicle trauma and interpersonal trauma, where the severity of the patient's condition does not allow for checking of instruments although counting of the first batch of swabs can be done. In the researcher's clinical experience, the instrument trays for emergency surgeries are densely populated with numerous instruments. It is virtually impossible to count them all ahead of a lifesaving procedure. The risk of retention of surgical items after surgery significantly increases in emergency surgeries, with unplanned changes in procedure and with a patient's higher body-mass index (Gawande *et al.,* 2003:229). These high-risk situations contribute to incorrect surgical counts and retained surgical items. Gawande *et al*. (2003:234), suggested the useful measure for detecting inadvertently retained surgical items in high-risk cases, is routine intraoperative radiographic screening.

4.8.11 Variable 104: Long procedures

Thirty-eight (n=38/50.0%) respondents indicated that long procedures influenced their counting practice, with the remaining respondents omitting the question. One respondent observed "tiredness, hunger, painful legs and lack of water lead[s] to shortcuts."

4.8.12 Variable 105: Large surgical teams with different requests

For this statement, 34 (44.7%) of the respondents agreed that the size of the team and their different requests, influenced their counting practice. However, 55.3% (n=42) omitted this question. It is incumbent on managers to provide another scrub nurse team to share the responsibilities for more than one surgical team operating on one patient. An example of this

would be in an abdominal-peritoneal resection for bowel cancer. In a hermeneutic phenomenology study by Rowlands and Steeves (2010:417), the respondents found that the fast pace of the operating room environment, “being rushed”, not having enough time to adequately “take care of my patients”, pressure to increase turn-over time, all contributed to errors. Furthermore, they noted that the operating room environment is noisy. During surgery with large teams, it is recommended that conversation be kept to a minimum to allow for clear instructions to be spoken and heard.

4.8.13 Variable 106: Shortage of staff

More than half the respondents in this study (n=40/52.6%) indicated that shortage of staff influenced their counting practice. However, 36 (47.4%) omitted this question. Shortage of experienced operating room staff is a global concern (Terry, Bisanzo, McNamara, Dreifuss, Chamberlain, Nelson, Tiemeier, Waters and Hammerstedt, 2012:183). In the hospitals included in this research study, student nurses and agency staff are used as circulating and anaesthetic nurse assistants. One respondent wrote that “inexperience staff e.g. students have to assist in counting” which appears to be problematic. According to Terry *et al.* (2012:184), Sub-Saharan Africa has a proportional shortage of the world’s healthcare force, which is only 3% but shoulders 25% of the world’s disease burden. The efficiency of the health system in South Africa is jeopardized by the shortage of doctors, nurses and other allied healthcare professionals.

4.8.14 Variable 107: Handover during change of shift

More than half the respondents (n=45/59.2%) indicated that shift change affected their counting practice. Less than half the respondents omitted the question (n=31/40.8%). It is specified by WHO that when there is a change in personnel, a protocol for transfer of information and responsibility should be clearly delineated in hospital policy (WHO *Guidelines for Safe Surgery*, 2006:72).

4.8.15 Variable 108: Multiple mentors demonstrating how to conduct surgical counts

Few respondents (n=22/28.9%) indicated that multiple mentors’ method of surgical count demonstrations affected their counting practice. The majority of respondents (n=54/71.1%) omitted this question. Another factor is that staff members who work with multiple preceptors as they rotate through the speciality areas in operating rooms, might be taught different methods of surgical counts. According to Edel (2012:229), opportunities exist for practitioners to develop their own styles and independent ways of interpreting and following policies and procedures. Furthermore, variation in practice can occur due to the employment of staff from other facilities (Edel, 2012:230).

4.8.16 Variable 109: Misinterpretation of the surgical count policy

Few respondents (n=22/28.9%) indicated that the surgical count policy of the hospital they work in is misinterpreted. The majority of respondents (n=54/71.1%) omitted this question. Riley *et al*. (2006:371) supported misinterpretation of the surgical count policy in the observation that count practices vary between institutions, and that disparities do exist in how guidelines are interpreted and applied.

In Table 4.4 below, the results of Section E are summarised in descending order from the most problematic for the respondents to the least.

Table 4.39: Knowledge responses for critical questions

Variable	Factors	Most common	
		n	%
107	Handover during change of shift	45	59.2
106	Shortage of staff	40	52.6
103	Emergency procedures	39	51.3
102	Unexpected change in planned surgical procedure	38	50
104	Long procedures	38	50
100	Surgeons reluctant to explore wound when incorrect counts occur	38	50
98	General chaos during surgery	38	50
105	Large surgical teams with different requests	34	44.7
97	Untidy sterile field due to disorganised scrub sisters	33	43.4
99	Communication difficulties amongst staff	32	42.
101	Increased patient body mass	28	36.8
96	Staff from other facilities count differently	24	31.6
109	Misinterpretation of the surgical count policy	22	28.9
108	Multiple mentors demonstrating how to conduct surgical counts	22	28.9
94	Different styles of surgical counting procedures	22	28.9
95	Change of the routine counting practice	21	27.6

4.9 SUMMARY

In this chapter the results and statistical analysis of the data obtained from the questionnaire were presented. The results showed that for the respondents who made choices in the dichotomous and multiple-choice scales, have knowledge and clinical practice deficits in surgical count procedures. Moreover, those who did not respond, may be unsure about best practice guidelines on this critical function. In Chapter 5, the discussion and conclusions is presented including recommendations for remedial interventions and further research.

CHAPTER 5:
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The aim of this study was to determine operating room nurse's knowledge of surgical item counting in provincial hospitals in the Cape Metropole district in order to standardise and reinforce correct counting practices to minimise the incidence of incorrect counts and foreign object retention. In this chapter, conclusions on the results reported in the previous chapter are presented. Recommendations for remedial measures are made, suggestions for future research are proposed and the limitations of this study are stated.

5.2 DISCUSSION

In this section, the discussion is presented according to the demographic, professional profile and the objectives of the study.

5.2.1 Demographic and professional profile

The majority of respondents were female, and aged between 27 and 60 years. The years of experience ranged from 6 months to 30 years. The majority of the respondents in this study had diploma (n=55/72.4%) in basic nursing (n=17/22.4%) had a degree and (n=18/3.9%) had an enrolment certificate. Few respondents had a post-basic qualification in OR nursing (n=3/3.7%). Most worked day duty and were permanently employed

5.2.2 Objective 1: To determine the knowledge of operating room nurses regarding surgical item count practices in the operating room

The majority of the respondents had a lack of knowledge as demonstrated by only 14 respondents of 76 (n=14/18%) answering the 15 knowledge questions correctly. The remaining respondents selected the incorrect answers, which was ratified in Section D (clinical statements) where differently word constructs on clinical practice were evaluated.

The majority of respondents identified that surgical counts are done for certain surgical procedures only. This deficit in knowledge can have consequences on the outcome of surgical counts and patient well-being if nursing staff believe this can be applied to certain procedures only. It has been stated in literature that any deviation from the existing policy increases the risk for error, such as unintended surgical object retention. The meticulous timing and conducting of counts should be standardized, to ensure application of the process at the appropriate time and with precision. The standard should reflect in practice to avoid incorrect counts and retention of surgical items. Edel (2012:228) supports that some

variation is acceptable but broad ranges of policy interpretation, can result in different practices that vary from stated policy.

Any lack of knowledge regarding surgical counting practices potentially has an effect on the individual's ability to perform the desired behaviour adequately. Bandura's theory justifies the need to adjust or modify a person's behaviour in order to ensure positive outcomes in individual responsibilities. Furthermore, it is intended for application in any situation that requires change of behaviour (George, 2011:554). One of Bandura' concepts, social-cognitive theory, can be applied to safe practice by operating room nurses. For example, operating room nurses who been taught and have studied surgical counting practice and who understands the importance thereof, are more likely to alter their behaviour. However, role-modelling and mentorship by leaders in operating room departments are vital in sustaining altered behaviour.

5.2.3 Objective 2: To determine current surgical counting practices of operating room nurses

It would appear from the results that although many of the respondents selected or identified the correct answer, a small but important number of respondents incorrectly answered the fundamental safety measures. These include opening up swabs when counting to check for the presence of the X-ray detectable strip; reporting surgical count status to the surgeon at different stages of closure of the surgical cavity, who should give verbal acknowledgement; and performing surgical counts at the time of permanent relief of either the scrub person or circulating nurse.

All operating room nurses should be aware of these critical aspects of surgical counting practices and should be consistently demonstrated in their clinical practice. Fostering renewed accountability of the perioperative team for accurate counting is strongly recommended by re-enforcing the counting policy and identifying poor practice. People learn by observing others and may assume control over their own behaviour. This can be affected by nurses practicing self-reflection. Moreover, reinforcement by managers utilising mechanisms of positive behaviour rewards. If correct behaviour is modelled and reinforced it encourages the person to engage in that action. Competent functioning requires both skills and self-beliefs of efficacy to use them effectively (Bandura, 1986:391).

The results indicate that there is a deficit in the compliance of the surgical counts policy. Non-adherence to policy and deviation from recommended practice, that compromises patient safety, should be avoided.

5.2.4 Objective 3: To determine the factors that influence surgical counting practices

Consensus was reached by the respondents who answered this question that the overall factor influencing surgical counting practice is handover during change of shift. WHO (2009:72) stipulates that when there is a change in personnel, a protocol for transfer of information and responsibility should be clearly delineated in hospital policy. According to the researcher's clinical experience as a clinical evaluator of operating room theatre students, protocols are not available in all hospitals.

Jackson and Brady (2008:319) warn that each operating room has its own set of distracters. It is imperative that the surgical team members do their best to ensure the safety of the patient during counts, particularly because of unavoidable distractions that occur in the operating room. The most common distracters observed in the operating room are changes in the surgical procedure, shortage of staff and change of shift. It is indicated in this study by more than half of the respondents that change of shift and a shortage of staff has an influence on their counting practices.

According Bandura's social cognitive theory it is believed that human functioning is a continuous reciprocal interaction between behaviour, cognitive and environmental factors. This study results show that knowledge, current surgical counting practices and the factors that influence the environment, has an effect on the ability to perform the desired behaviour adequately.

5.3 LIMITATIONS OF THE STUDY

Limitations are restrictions or problems in a study that may decrease the generalisability of the findings (Grove, Burns & Gray, 2013:598).

Authority was granted by the National Health Research Board (Ref: WC_2015RP28_623) to conduct the research. Seven hospitals were then approached to participate in the study with an estimate of N=279 nurse respondents, according to the staff establishment of the chosen hospitals.

Four hospitals replied to the researcher's email request. Subsequently, the population reduced from the planned estimate of n=279 RPNs and ENs to n=164 RPNs and ENs who were available during the data collection period. Furthermore, 13 respondents were excluded from the main study since they participated in the pre-test of the instrument.

Despite the size of the population, the findings were drawn from tertiary, district and regional hospitals operating departments in the Cape Metropole district and are generalisable to other public hospitals in the Western Cape.

5.4 RECOMMENDATIONS

- Standardisation of surgical counting practice should be realised across both the public and private sector hospitals in the Western Cape, since staff do part-time work in both sectors. Standarisation has been demonstrated internationally to reduce the incidence of unintended retention of surgical items.
- Through in-service training sessions, communication of audit results of near misses or actual retention of surgical items may raise awareness of the critical need for accurate and consistent surgical counting practice in all disciplines of surgery.
- Perform regular assessments of staff to monitor their competency level and determine their compliance with the surgical count policy in each hospital. This can be verified by auditing of patient operating records.

5.5 FUTURE RESEARCH

This study has provided baseline information of the knowledge and clinical practice of nurses involved with surgical counts. The following areas for future research are proposed:

- Perform a duplication of this study in other surgical settings such as minor procedure theatres and community service centres.
- Conduct a follow-up intervention study (action research) after the implementation of a surgical count for safe surgery training strategy. The purpose would be to determine if there had been any significant change in the respondents' knowledge and clinical practices after training.

5.6 DISSEMINATION

The findings of this study will be presented at the Department of Health Nursing Speciality Forum, where a group of nurse experts are mandated to develop policy and maintain standards of nursing care. In addition, presentation of these findings will be offered to the Red Cross War Memorial Children's Hospital Research Forum; the South African Theatre Sisters annual general meeting 2016 and the Western Cape College of Nursing's Research Forum. It is hoped that the dissemination of the findings at these meetings, and by means of article writing, will raise awareness of this critical shortcoming in perioperative nursing practice.

5.7 CONCLUSION

In this chapter the results of the study were discussed according to the research objectives. The results from this study showed that there is a need to develop one standard for surgical counts in provincial hospitals in the Cape Metropole district. The knowledge of operating room nurses in this study is inconsistent with international recommendations for safe practice.

It can be concluded that the knowledge and clinical practices of the respondents working in the operating room departments of the tertiary, regional and district hospitals in the Cape Metropole district appears to be inadequate for safe patient care.

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APPENDICES

APPENDIX 1: ETHICAL APPROVAL FROM STELLENBOSCH UNIVERSITY

UNIVERSITEIT•STELLENBOSCH•UNIVERSITY
jou kennisvennoot • your knowledge partner

Approval Notice
Response to Modifications- (New Application)

27-Nov-2014
Beukes, Robertha RD

Ethics Reference #: S14/07/140

Title: **Knowledge of operating room nurses for surgical counting practices in practice at provincial hospitals in the Cape Metropole.**

Dear Ms Robertha Beukes,

The Response to Modifications - *(New Application)* received on 27-Oct-2014, was reviewed by members of Health Research Ethics Committee 1 via Expedited review procedures on 27-Nov-2014 and was approved.
Please note the following information about your approved research protocol:

Protocol Approval Period: 27-Nov-2014 -27-Nov-2015

Please remember to use your protocol number (S14/07/140) 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 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 Tel: +27 21 483 9907) and Dr Helene Visser at City Health (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

If you have any questions or need further assistance, please contact the HREC office at 219389156.

Included Documents:
MOD_Declaration M Cohen
Consent form
MOD_Proposal summary

APPENDIX 2: PERMISSION OBTAINED FROM INSTITUTIONS / DEPARTMENT OF HEALTH

Western Cape Government
Health

Tygerberg Hospital

REFERENCE: Research Projects
ENQUIRIES: Dr G Marinus
TELEFONE: 021 938-6267

ETHICS NO: S14/07/140

Knowledge of operating room nurses for surgical counting practices in practice at provincial hospitals in the Cape Metropole.

Dear Ms Beukes

PERMISSION TO CONDUCT YOUR RESEARCH AT TYGERBERG HOSPITAL

In accordance with the Provincial Research Policy and Tygerberg Hospital Notice No 40/2009, permission is hereby granted for you to conduct the above-mentioned research here at Tygerberg Hospital.

DR D ERASMUS
CHIEF EXECUTIVE OFFICER
Date: 6 February 2015

Western Cape Government
Health

STRATEGY & HEALTH SUPPORT
Health.Research@westerncape.gov.za
tel: +27 21 483 6857; fax: +27 21 483 9895
5th Floor, Norton Rose House,, 8 Riebeek Street, Cape Town, 8001
www.capegateway.gov.za)

REFERENCE: WC_2015RP28_623
ENQUIRIES: Ms Charlene Roderick

9 Paddock Crescent
Westridge
Mitchell's Plain
7798

For attention: **Robertha Beukes**

Re: KNOWLEDGE OF SURGICAL COUNTING PRACTICES OF OPERATING ROOM NURSES IN PROVINCIAL HOSPITALS IN THE CAPE METRO POLE

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.

Please contact the following people to assist you with any further enquiries in accessing the following sites:

Karl Bremer Hospital	**L Naude**	**Contact No. 021 918 1222**
Mowbray Maternity Hospital	**S Fawcus**	**Contact No. 021 659 5579**
New Somerset Hospital	**D Stokes**	**Contact No. 021 402 6408**
Victoria Hospital	**M Moodley**	**Contact No. 021 799 1237**

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.

2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final report within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).

3. The reference number above should be quoted in all future correspondence.

We look forward to hearing from you.

Yours sincerely

A HAWKRIDGE.

DR A HAWKRIDGE
DIRECTOR: HEALTH IMPACT ASSESSMENT
DATE: 8 APRIL 2015.

CC L BITALO — **ACTING DIRECTOR: NORTHERN/TYGERBERG**
CC K GRAMMER — **DIRECTOR: SOUTHERN/WESTERN**

Western Cape Government
Health

GROOTE SCHUUR HOSPITAL

Enquiries: Dr Bernadette Eick
E-mail : Bernadette.Schmitz@westerncape.gov.za

Ms. R. D. Beukes
University of Stellenbosch
Private Bag X1,
Stellenbosch
7602

E-mail: robeukes@gmail.com

Dear Ms R. D. Beukes

RESEARCH PROJECT: Knowledge Of Operating Room Nurses For Surgical Counting Practices In Practice At Provincial Hospitals In The Cape Metropole

Thank you for your letter in which you request permission to conduct a research at Groote Schuur Hospital.

Before permission can be given, please complete the attached Annexure 2 and obtain a letter from the Head of Nursing, Mrs. M. Ross (Maureen.Ross@westerncape.gov.za) granting permission to conduct the research and return to my office.

Yours sincerely

DR BERNADETTE EICK
CHIEF OPERATIONAL OFFICER
Date: 11th March 2015

G46 Management Suite, Old Main Building,
Observatory 7925

Tel: +27 21 404 6288 fax: +27 21 404 6125

Private Bag X,
Observatory, 7935

www.capegateway.go.v.za

APPENDIX 3: PARTICIPANT INFORMATION LEAFLET AND DECLARATION OF CONSENT BY PARTICIPANT AND INVESTIGATOR

PARTICIPANT INFORMATION LEAFLET

Knowledge of surgical counting practices of operating room nurses in provincial hospitals in the Cape Metro pole.

PRINCIPAL INVESTIGATOR: ROBERTHA BEUKES

CONTACT NUMBER: 083 395 0901

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 nursing 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?

- Retention of swabs, needles, blades and instruments in patients after undergoing a surgical procedure, remains a challenge in the operating room.

- The implications for the patient, staff and the facility are significant and safety procedures to prevent this, is vital. By doing this study, data will be collected to determine the knowledge and practice of surgical counts by operating room nurses in order to develop a universal standard for the Western Cape.

- The study will be conducted at seven provincial hospitals in the Cape Metro Pole. Only registered nurses, enrolled nurses and community service nurses working in the operating room environment, conducting surgical counts will take part in this study. The study will include both day and night nursing staff.

Why have you been invited to participate?

- As a registered professional scrub nurse, enrolled nurse and community service nurse, involved with conducting surgical counts in the operating room, your input is valuable to determine the current knowledge and clinical practice of surgical counts.

What will your responsibilities be?

- You will be required to complete the consent form before partaking in this study. Participation is entirely voluntary and anonymous, and you may at any stage withdraw from this study without any penalties or consequences.
- On completion of the consent you will be given a questionnaire to complete, to answer questions in the form of numbers, tick offs and multiple choice questions. No

names of participants or hospital names are attached to the questionnaires. The questionnaire will take approximately 10 minutes to complete.

- On completion the questionnaire and consent form it should be placed together in a secured box marked research, which will be in a designated area in the operating room complex where you are working. The researcher will deliver and collect all the consent forms and questionnaires in person.
- There will be no names affixed to any form; codes will be assigned to each questionnaire therefore the study will be conducted anonymously. The researcher will not be able to identify the participants by either hospital or individual names.

Will you benefit from taking part in this research?

- The data generated through your participation in this research project will benefit both staff and patients as it may lead to safe patient care by ensuring no surgical items are left behind, thereby increasing the standard of service delivery.
- In-service training programmes can be developed to improve patient care and ensure safe surgery.

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

- No risks have been identified by means of your participation in this project.

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

- No risks have been identified by means of your participation in this project.

Who will have access to your questionnaire?

- The information collected will be treated as confidential and will be protected. Only the researcher, supervisor, statistician and Health Research Ethics Committee of University of Stellenbosch will have access to the information.
- The identity of the participant will remain anonymous, used in the thesis at the end of the study.

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 this study. There are no costs involved for partaking in this study.

Is there anything else that you should know or do?

- 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 nursing staff..
- You will receive a copy of this information and consent form for your own records.

Appendix 4: Instrument

KNOWLEDGE OF SURGICAL COUNTING PRACTICES OF OPERATING ROOM NURSES IN PROVINCIAL HOSPITALS IN THE CAPE METROPOLE

INSTRUCTIONS:

- ✓ Please answer all the questions by marking your choice / view / experience with a tick (√), e.g.:

  Are you a Nurse?

✓	Yes
	No

- ✓ Please use a black ballpoint pen to complete the questionnaire.
- ✓ This questionnaire consists of 4 pages and will take approximately 10 minutes to complete.
- ✓ Place the completed questionnaire in the self-sealing envelope provided. Post it in the sealed "Questionnaires" box.

SECTION A: DEMOGRAPHIC PROFILE

NO.	DEMOGRAPHIC INFORMATION
01-02	Indicate your gender Male ☐ Female ☐
03	Indicate your current age Years: ☐

SECTION B: PROFESSIONAL PROFILE

NO.	PROFESSIONAL INFORMATION
04-07	Indicate your nursing category Professional nurse ☐ Operational Manager ☐ Community Service Nurse ☐ Enrolled nurses ☐
08-10	Indicate your level of nursing education Enrolment certificate ☐ Diploma ☐ Degree ☐
11-12	Do you have any post basic nursing qualification in operating room nursing? ☐ Yes ☐ No

13	How many years of experience in operating room (after qualification) do you have? Years:
14-15	In the past 12 months, did you work in the operating room mostly day or night duty? Day duty Night duty
16-18	Today I am ... Permanently employed at the hospital Community service nurse Employed by a Nursing Agency to work at the hospital

SECTION C: SURGICAL COUNTS – KNOWLEDGE

In this section, please indicate whether you believe the statement to be "true" or "false". Surgical counts are defined as the counting of swabs, instruments, needles and blade.

Choose only one option per statement by marking the appropriate column with a tick (√).

NO.	To my knowledge...	True	False
19-20	Surgical counts are conducted by two persons, by a scrub and circulating nurse.		
21-22	Surgical counts are conducted for certain surgical procedures only.		
23-24	I should keep the total number of swabs to a minimum used during surgery to enhance control.		
25-26	If there is a change in the members of nursing staff who performed the initial swab, instrument and needle count, surgical counts can be omitted.		
27-28	When a surgical count is interrupted, the count for those items can be continued without beginning again.		
29-30	Recording of all swabs, needles, blades and instruments used should be done according the hospital policy.		
31-32	Surgical counts should be done aloud.		
33-34	Only x-ray detectable swabs are used intra-operatively.		
35-36	Surgical counts are conducted to control swabs, needles, blades and instruments.		
37-38	In the event of a count discrepancy, closure of the cavity continues as usual.		
39-40	Surgical counts are recorded and controlled on a white board (writing board) during the surgical procedure.		
41-42	Surgical counts should be recorded as correct or incorrect on the patients operating sheet.		
43-44	Items intentionally left in a wound are not documented in patient's records.		
45-46	Surgical counts are conducted in standardized multiples of fives.		
47-48	Items included in the surgical count can be removed from the operating room before the final count is completed.		

SECTION D: SURGICAL COUNTS – CLINICAL PRACTICE

In this section, please choose whether the given statement is typical of what you do in the theatre, by indicating “yes”, “sometimes” or “no”.

Choose only one option per statement by marking the appropriate column with a tick (√).

NO.	When I scrub for a case I ….	Yes	Sometimes	No
49-51	Perform surgical item counts according hospital policy to prevent surgical item retention.			
52-54	Do surgical counts of swabs, needles & instruments continuously throughout the surgical procedure with the same scrub nurse and circulating nurse.			
55-57	Check all items used before and after use for completeness.			
58-60	Open up swabs when counting to check for the presence of the X –ray detectable strip.			
61-63	Maintain an organized and tidy sterile field to ensure an accurate count of all items during and after the surgical procedure.			
64-66	Ensure the circulating nurse documents the initial surgical count on the dry erase board (writing board) and additional swabs, needles & instruments added or removed from the sterile field.			
67-69	Report surgical count status to the surgeon at different stages of closure of the surgical cavity, who should give verbal acknowledgement.			
70-72	Perform surgical; counts: before the procedure to establish a baseline.			
73-75	Perform surgical counts: Before closing of a cavity within a cavity,			
76-78	Perform surgical counts: Before wound closure begins,			
79-81	Perform surgical counts: At skin closure or end of a procedure,			
82-84	Perform surgical counts: At the time of permanent relief of either the scrub person or circulating nurse.			
85-87	Perform surgical counts when additional items are added to the surgical field, they are counted and recorded.			
88-90	Inform the surgeon and nurse manager in case of a count discrepancy.			
91-93	Ensure the results of the surgical counts are recorded as correct or incorrect in the patient’s records.			

SECTION E: FACTORS INFLUENCING THE COUNTING PROCEDURE

In this section, please indicate by marking the column with a tick (√) if any of the following factors have affected your surgical counting practice?

The last column provides you with an opportunity to add your comments about each factor.

NO.	In my work environment I have experienced….	(√)	Comments (Optional)
94	Different styles of surgical counting procedure		
95	Change from routine counting practice		
96	That staff from other facilities count differently		
97	That an untidy sterile field due to a disorganized scrub sisters may affect counting accuracy		
98	General chaos during surgery such as noise, idle chatter and telephones ringing influences my counting accuracy		
99	Communication and interpersonal difficulties amongst staff		
100	Surgeons not keen to explore wound when incorrect counts occur		
101	Increase in patient body mass of the patient		
102	Unexpected change in planned surgical procedure		
103	Emergency procedures		
104	Long procedures		
105	Large surgical teams with different requests		
106	Shortage of staff		
107	Handover of surgical counts during change of nursing shift		
108	Multiple mentors with different methods demonstrating how to conduct surgical counts		
109	Misinterpretation of the surgical count policy by nurses		

Thank you for your willingness to participate in this research study. Place the completed questionnaire in the self-sealing envelope provided. Post it in the sealed "questionnaires" box

Appendix 7: Declarations by language and technical editors

Lize Vorster Communication

To whom it may concern

This letter serves as confirmation that I, Lize Vorster, performed the Language Editing and Technical Formatting of Robertha Devona Beukes' thesis. Language editing is done in track changes so the student has full control over the final quality of the document. Technical formatting entails complying with the Stellenbosch University's technical requirements for theses.

Yours sincerely
Lize Vorster
Language Practitioner

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