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THE ATTITUDES AND OPINIONS OF INTENSIVE CARE NURSES ON THE USE OF PHYSICAL RESTRAINTS

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A research report submitted to the
Faculty of Health Sciences, University of the Witwatersrand, Johannesburg
In partial fulfilment of the requirements for the degree of
Master of Science in Nursing

Johannesburg, 2018

DECLARATION

I, MABONA EDNAH MALEHO declare that this Research Report is my own, unaided work. It is being submitted for the Degree of Master of Science in Nursing at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

_____

M.E Maleho

_____day of _____ 20____ in _____

Protocol Number :**M170535**

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My thanks and appreciation to God Almighty for your strength, I would never have made it without you and to Vivian Hebert my supervisor, for the support and I would never have been able to finish this research report without your guidance. To Professor Shelly Schmollgruber, thank you so much for assisting me with research and for all the support you gave me, I really appreciate.

I would like to present my thanks to all the nurses who took part in this research. To my husband (Joseph) and my sons Motheo Randy and Lefika Joe thank you so much for the support and love. My sisters Magrate Maleho and Sebopiwa Moeng thank you for your prayers and support.

I give honour and glory to God Almighty.

TITLE: THE ATTITUDES AND OPINIONS OF INTENSIVE CARE NURSES ON THE USE OF PHYSICAL RESTRAINTS

ABSTRACT

Background: Despite the uncertainty over the ability of physical restraints to maintain patient safety, as well as the potential for undesirable psychological and physical patient outcomes and ethical concerns, physical restraints use is still common in many ICUs in different countries. Physical restraints are prescribed by the physician but the ICU nurse remains the decision maker responsible in assessing the need, application and removal of physical restraints on patients in the ICU setting.

Purpose of the study: The purpose of this study was to describe nurses' attitudes and opinions on the use of physical restraints in adult ICUs of a tertiary academic hospital in Johannesburg, with the intention to suggest and create awareness to nurse educators on what needs to be included in the curriculum on topic of physical restraints. This may also provide guidance to policy makers on the best practice that need to be considered when implementing a policy in the clinical setting.

Method: A descriptive, non-experimental, quantitative survey design was used. Data was collected using an eighteen (18) item questionnaire developed by Freeman, Hallett and McHugh (2015) titled "Attitudes and opinions of ICU nurses on the use of physical restraints''. The questionnaire was divided into four sections. Convenience sampling was used and a sample size of 113 was used. Descriptive and comparative statistics were used for data analysis. The statistical test used includes Chi-square test and Fisher's exact test and testing was set at 5% level of significance

Results: Most nurses indicated that there is a need for physical restraints use in the ICU setting in order to provide an environment that is safe for the patient. Physical restraints as a management option were preferred over sedation. There was no consensus about the maximum time that an individual patient can be restraint, agitated behaviors such as pulling of endotracheal tubes and medical devices has been noted as the most reason for exceeding the maximum time that an individual patient can be restraint. Nurses were happy to discuss the use of physical restraints with relatives. There was a perceived need for training on use of physical restraints, availing a written policy on physical restraints and support from the medical staff.

There was association between ICU nurses' years of experience, report on availability of written policy on the use of physical restraints, reports on having training on the application of physical restraints and their attitudes and opinions on the use of physical restraints in some statements regarding such.

Conclusion: Nurses need support and guidance from other health care workers in cases of using physical restraints. There is need for availability of physical restraints policy to aid nurses' clinical decision making.

Relevance to clinical Practice: There have to be alternative methods and thorough patient assessment of managing agitated patients before implementation of physical restraints, these methods can be pain management and allowing relatives to be at the patient bed side.

Key words: Physical restraints, Attitudes, Opinions, Intensive Care, Nurses, Clinical decision making

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CHAPTER ONE

OVERVIEW OF THE STUDY

1.0 INTRODUCTION & BACKGROUND

Care of critically ill patients involves complicated decisions, which take place in a complex environment. Nurse practitioners should be ethically sensitive and well equipped with clinical decision-making skills in cases of physically restraining of an Intensive Care patient (de Casterlé, Goethals & Gastmans, 2015; Hoffman, Aitken & Duffield, 2009). In a systematic review of 200 studies, Tanner (2006) concluded that clinical-decision making is a form of engaged moral reasoning, which implies nurses should have the ability to determine what is wrong and right in a given situation and provide high quality patient care.

Different factors are known to influence nurse's clinical decision making, such as; experience, interpersonal relationship, working circumstances and speciality (Goethals, Casterlé & Gastmans, 2012; Hoffman, Aitken & Duffield, 2009). Hoffman, Aitken and Duffield (2009) concluded that expert nurses make clinical decisions that could prevent problems while novice nurses make decisions after a problem has occurred. Similarly, nurses have been found to develop clinical understanding and clinical skills over time through a proper educational background and clinical experience (Benner, 2011).

In contrast to the above findings, Hoffman, Donoghue and Duffield (2004) concluded that nurse's experience and educational level has a little influence in clinical decision making. The findings from this study claim that different practitioners act as supporting measures for nurses to make sound clinical decisions. The use of physical restraints on an ICU patient is based on nurse's clinical decision-making that is individualised for each patient. Physical restraints are well documented as being used in the United States of America, Canada, Asia, Europe and Africa (Benbenbishty, Adam & Endacott, 2010; Mehta *et al*., 2012). The United Kingdom is the only country where physical restraints are considered unacceptable and therefore not used (Bray *et al.*, 2004). Physical restraints use in ICU settings is more likely than in other hospital units due to the use of mechanical ventilation and other invasive procedures (Hofsø & Coyer, 2007). In 2012, a study performed by Mehta *et al*., found that critically ill patients, were physically immobilised at least once, during their admission to hospital. Only 25% of the patients (in the latter study) requiring life support were not routinely physically restrained (Mehta *et al*., 2012), despite legislation and accredited

standards which recommends minimisation of physical restraint use in many first world countries.

In the ICU setting, physical restraints are mostly used to maintain a safe environment for the patient (patient's safety). According to Freeman, Hallett and McHugh (2015), all ICU nurses agreed that application of physical restraints was in the best interest of the patient. In their study, Luk *et al*. (2015) suggest that agitated behaviour, such as pulling an endotracheal tube, climbing over bed rails and physically fighting of staff, which may cause injury to the patient and staff, are the reasons for physically restraining a patient.

In a systematic review of 52 articles, Rose *et al*. (2016) found that physical restraints were used to prevent removal of endotracheal tube, as well as naso-gastric tubes, urinary catheters and central lines which are needed in an ICU environment as these measures provide life-saving treatment. Physical restraints also allow for the reduction of sedation in order for a patient to be extubated early. Hofsø and Coyer (2007) state that extended use of sedation may lead to agitation and irrational behaviours, and more time needed for mechanical ventilation.

Contrary to the above positive reasons for uses of physical restraints, there are studies that claim that physical restraints impact negatively on ICU patients. In a systematic review of 52 articles, Rose *et al*. (2016) found that many studies of critically ill patients who were physically restrained were still able to remove the endotracheal tubes. Mion *et al.* (2007) concluded that 44% of hospitalised patients removed endotracheal tubes, naso-gastric tubes and central lines while physically restrained.

Physical restraints have reportedly been known to increase pressure sores, constipation, injury to the restrained limbs, infection rates such as ventilation association pneumonia, increased mortality and morbidity and accidental strangulation (Goethals, Casterlé & Gastmans, 2012; Langley, Schmollgruber & Egan, 2011). According to Bray *et al.* (2004) and Rose *et al.* (2016), physical restraints increase delirium, agitation and disorientation, which lead to patients removing medical devices and possible death.

The positive and negative outcomes of physical restraints have an impact on nurses' perceptions of the use of such. Mohler and Meyer (2013) concluded that although nurses have a negative feeling towards the use of physical restraints, there often is a need to use them in the clinical setting. The nursing staff in the above study claimed to feel uncomfortable, guilty, pity and sad when a patient is physically restrained, but it also makes

them more in control of the patient's safety. A study conducted by Saarnio and Isola (2010) found that nurses are of the opinion that patients benefits from the use of physical restraints and they often decide in favour of using such, when in doubt, in order to prevent a life-threatening event occurring.

Governing bodies in South Africa, such as the South African Medical Association (SAMA and the South African Nursing Council (SANC), as well as hospital policies have laws and regulations alluding to the use of physical restraints on individual patients. According to a tertiary Academic Hospital in Johannesburg, their hospital policy, which refers to physical restraints, states that physical restraints should be used with a written order from the medical officer. The South African Medical Association enforces the patient's constitutional rights, mainly that the principles of safe and up-to-date treatment must be rendered to all ICU patients, as well as any form of discrimination which states that all patients have the right to be cared and treated for in a safe environment without discrimination, in a human manner thus without any cruelty.

The SANC scope of practice also states that, registered nurses are required to promote the physical comfort and re-assurance of the patient, and the protection of the skin. (http:www.sanc.co.za/regulat/Reg-scp.htm). Nurse practitioners should advocate the use of other methods than physical restraints, which are also known to have complications as stated above.

Nurse practitioners have the legal responsibility to use the right, minimal restrictive type of restraints while decreasing the patient risk of complication caused by the application of physical restraints. As more medico-legal cases are happening in hospitals, nurse practitioners need to practice according to the country's law and regulations. Although the above is applicable to the application of physical restraints, it is ethically laden and nurses need to make ethically sound decisions that will not compromise patient care.

1.2 PROBLEM STATEMENT

The involuntary movement of individual patients is known world-wide to be associated with favourable and unfavourable outcomes of patients. A prescription from a physician is needed in many countries before physical restraints are used on an ICU patient, but the ICU nurse is the person primarily responsible for the needs assessment, application and discontinuation of physical restraints on the ICU patient (Luk *et al*., 2015). In practice, this is often not so as ICU nurses need to be proactive before a life-threatening event occurs.

There is a gap in the knowledge of what is actually implemented in the clinical setting and what is considered theoretically, therefore there is need to describe “nurses’ attitudes and opinions regarding the use of physical restraints’’, as they are the main instigators. The findings from this study will be used to make suggestions and create awareness to nurse educators on what needs to be included into curriculums on the topic of utilisation of physical restraints. This may also provide guidance to policy makers on the best practice that needs to be considered when implementing a policy in the clinical setting.

The research question to be answered in this research is:
What are registered “nurses attitudes and opinions on the use of physical restraints” in adult ICUs of a tertiary academic hospital in Johannesburg?

1.3 PURPOSE OF THE STUDY

The purpose of this study was to describe registered nurses attitudes and opinions on the use of physical restraints in adult ICUs of a tertiary academic hospital in Johannesburg.

1.4 RESEARCH OBJECTIVES

The objectives of the study are:

- To describe registered “nurses attitudes and opinions on the use of physical restraints” as opposed to alternative methods.
- To determine the association between ICU nurses years of experience and their “attitudes and opinions on the use of physical restraints.”
- To determine the association between ICU nurses reports on availability of written policy on physical restraints and their “attitudes and opinions on the use of physical restraints.”
- To determine the association between ICU nurses reports on having training in assessing the need for application of physical restraints and their “attitudes and opinions on the use of physical restraints.”

1.5 SIGNIFICANCE OF THE STUDY

The significance of this study is that in South Africa, there is no available data on the “attitudes and opinions of ICU nurses regarding the use of physical restraints.’’ Currently, at the hospital under study, there is a policy on the use of physical restraints because of the negative and positive outcomes on the patient. A prescription from a physician is needed

before physical restraints are used on ICU patients however the ICU nurses are the ones who primarily initiate the use of physical restraints.

Nurses have the moral or legal obligation to promote the well-being of patients through excellent nursing care; however, this care can be influenced by “nurses’ attitudes and opinions on the use of physical restraints.’’ A balance between the patient’s rights and the ICU nurse’s responsibility in providing a safe environment regarding the use of physical restraints in the ICU setting needs to be achieved. Hopefully, this study will provide suggestions on alternative methods to reduce the use physical restraints and possible support that nurses need in order to make a sound clinical decision on the use of physical restraints.

The following groups of people are dependent on the outcomes of this research:

- The critically ill patients.
- The critically ill patient’s family.
- The ICU clinicians.
- The institution (The tertiary academic hospital).

1.6 DEFINITIONS

1.6.1 THEORETICAL DEFINITIONS

- Tertiary Academic Hospital

A tertiary academic hospital is a highly specialised referral hospital, which admits patients from districts and provincial levels. It provides the service for undergraduate and postgraduate training in all areas of the health profession as demonstrated in National Heath Act 2003 and amended in March 2012.

- Scope of practice of nurses

Scope of practice is the parameter within which a category of nurse who has met the prescribed qualifications and registration requirements may practice. It describes the processes, actions and procedures that a registered nurse must undertake in order to keep within the terms of their professional license referred to in Act 33 of the Nursing Act, 2005.

- SANC (South African Nursing Council)

This is the statuary governing body entrusted to maintain the standards of nursing education and practice in South Africa. It is financially independent and autonomous, as demonstrated in the Nursing Act of 2005. (www.sanc.co.za/aboutSANC.htm).

- South African Medical Association

This is a trade union for doctors in South Africa. It regulates and guides the medical practitioners practice. It has a code of conduct and members should display integrity, accountability and professional ethical standards.

- The critically ill (in this study, the critically ill patient and an Intensive Care patient are the same.)

The critically ill patients depend on healthcare workers for most of their basic needs; they have a life threatening multi-system process that can result in significant disability or mortality (Bennet, Robertson & Al-Haddad, 2016).

- The critically ill patient's family

The critically ill patient's family are vulnerable and stressed, as they do not know what to expect from healthcare professionals and patients' outcomes. Nurses have to attend to the needs of stressed family members while providing care to the critically ill patient (Maxwell, Stuenkel & Saylor, 2007).

- The ICU clinicians

ICU clinicians include all staff working collaboratively to improve the patients' outcomes. This multidisciplinary team includes nurses, doctors, dieticians, physiotherapists, occupational therapies, pharmacists, pastoral care and social workers (Carlson, 2008: 11-13).

1.6.2 OPERATIONAL DEFINITIONS

- Intensive Care Unit/Critical Care Unit

This is a hospital unit where nurses, doctors, physiotherapists, occupational as well as speech therapists provide care for very ill patients needing ventilation and other devices to save their lives. Holistic care is thus provided with the use of technology (South African Society of Anaesthesia, 2013).

- Physical restraints

Physical restraints are materials attached to a patient's body, which cannot be removed easily by the patient (Freeman, Hallett & McHugh, 2015; Langley, Schmollgruber & Egan, 2011).

- Registered nurse

A person registered with SANC as a professional nurse and who is practicing in any institution. For this study, we are including Critical Care registered nurses with an additional Critical Care qualification (either on the level of a diploma or Masters). A registered nurse is someone who has completed a three-year diploma in general nursing, two-year bridging course from staff nurse to professional nurse, four-year diploma in general nursing or four-year degree in nursing science and a conversion of a foreign qualification to South African Nursing Council (SANC) equivalence. The professional nurse practices according to section 16 of the Nursing Act 33 of 2005.

- Clinical decision making

A discriminative thinking pattern that nurses engage in when making clinical judgements about the plan of care that needs to be provided to the patient. This critical thinking process can be influenced by many factors (Banning, 2008).

- Attitudes

Refers to the outlook, opinions, perceptions as well as approaches to the understanding of a concept (Altmann, 2008). It was measured in section three of the questionnaire and it also consisted of a 5 point Likert scale.

- Opinions

Opinions are views of judgment and thought formed against something. The nurses' judgment and thought about preventing the patient from moving and caring for this patient is an example where this word will be applied in this study (https://www.merriam-wester.com/dictionary/opinion). It was measured in section three of the questionnaire and it also consisted of a 5 point Likert scale.

1. 7 RESEARCH DESIGN

A descriptive, non-experimental, quantitative survey design was used. According to Polit and Beck (2012: 744), survey research is non-experimental research that obtains information about people's attitudes through direct questioning.

1.7.1 SETTING

The study setting was five (5) adult ICUs in a tertiary academic hospital in Johannesburg. The hospital serves as a referral hospital for major areas of Gauteng Province. It admits patients from district and provincial level. ICUs include multi-disciplinary, neuro surgery, trauma, cardiothoracic and coronary care unit.

1.7.2 RESEARCH METHOD

Research method is the techniques used to structure a study, gather and analyse information in a systematic manner (Polit & Beck, 2012: 741). It includes population and sample, data collection and data analysis. The research method will be elaborated further in Chapter 3.

1.7.3 POPULATION

Population refers to the entire cases in which the researcher is interested (Grove, Burns& Gray, 2013: 703). The target population for this study was all registered nurses practicing in adult ICUs of a tertiary academic hospital in Johannesburg: multi-disciplinary, neurosurgery, trauma, cardiothoracic and coronary care unit. The total population was 158 nurses.

1.7.4 SAMPLE AND SAMPLE METHOD

Convenience sampling, which involves the selection of readily available persons to participate in a study, was used (Polit &Beck, 2012:724). The sample size was calculated using a Rao Soft sample calculator where N=158, at a marginal error of 5%, confidence level of 95% and response distribution of 50%, the recommended sample size was n=113.

1.7.5 DATA COLLECTION

All the voluntary respondents were given an existing survey questionnaire titled “Attitudes and opinions of Intensive Care Unit nurses on the use of physical restraints.”

1.7.5.1 Instrument

A self-administered questionnaire, developed by Freeman, Hallett and McHugh (2015) at the University of Manchester in the United Kingdom, was used for this study. The questionnaire consisted of closed and open-ended questions divided into four sections, with a total number of 18 items. Section One was demographic questions. Section Two related to training and support. Section Three were statements that gathered information on what criteria were decided on for the use of physical restraints and in Section Four, the respondents could expand on their statement responses.

Section One was assessed using items 1 to 8, Section Two using items 9 to12 and with some open questions which allowed the respondent to expand on these areas, Section Three used items 13 to 15, with some open questions which allowed the respondent to expand on these areas and item 15 had 12 statements and utilised the five point Likert scale determining whether respondents agreed or disagreed with the statements about physical restraints. Section Four used items 16 to 18, and allowed the respondent to expand on any previous question. Permission to use the questionnaire was obtained (Appendix E). Table 1.1 presents a summary of questionnaire items.

Table 1.1 Sections and items of the questionnaire

SECTION	ITEMS
One	1-8
Two	9-12
Three	13-15
Four	16-18

1.7.5.2 Validity and reliability of the questionnaire.

The questionnaire was developed by Freeman, Hallett and McHugh (2015), who reviewed related literature and identified several key questions. A panel of ICU knowledgeable and experienced clinicians were consulted on this topic. It was then reviewed and refined by an educational expert experienced in the setting of this type of study to discuss and collaborate on the original designed questionnaire. The questionnaire was piloted on 10voluntary participants to assess whether they understood the questions and how long it took to complete. The original research for this questionnaire has been published as well.

1.8 DATA ANALYSIS

The data for the study was entered into an Excel spreadsheet prior to entering it into STATA version 14 for analysis. The statistical programmes used in this study to analysis the data obtained were descriptive and comparative statistics. Descriptive statistics was used to provide a picture of a situation as they occur (Grove, Burns & Gray, 2013:215); it was presented in graphs and recorded as percentages and numbers. Comparative statistics was used to explore relationship between variables; these variables are “years of experience, reports on availability of written policy and reports on having education in assessing the need for the application of physical restraints.” Quantitative content analysis was used for the open ended questions. According to Lock and Seele (2015), quantitative content analysis transforms observations of found categories into quantitative statistical data. It is suitable for the study of ethical issues, as it is applied quantitatively and it does not neglect context.

1.9 ETHICAL CONSIDERATION

The following were taken into consideration before the commencement of this research:

- Permission to use the questionnaire was obtained (Appendix E).

- The protocol was submitted for peer review at the Department of Nursing Education.
- The protocol was submitted to the University of the Witwatersrand postgraduate office for approval to conduct the study.
- Ethical clearance was obtained from the University of Witwatersrand Ethical Committee (Appendix C).
- Permission was obtained from the Academic Hospital Management to conduct the research (Appendix D).
- Participants were provided with information letters about participating in the study (Appendix B)
- Participants were informed that participation was voluntary and that they could withdraw anytime they wished.

1.10 VALIDITY AND RELIBILITY OF THE RESEARCH STUDY

Reliability was maintained by ensuring consistency and accurate data recording. A standardised data collection questionnaire was used throughout the study and data collection and gathering was carried out by the researcher alone to ensure reliability. Face and content validity was ensured by asking an expert to review the relevance of the questionnaire to South African content. Variables were not manipulated in order to prevent threats to internal validity. Inclusion and exclusion criteria were followed and an appropriate sample size was selected, the researcher ensured that the sample was a true representation of the population to enhance generalisation of the results.

1.11 STRUCTURE OF THE RESEARCH REPORT

The report is structured as follows:

Chapter 1: Overview of the research
Chapter 2: Literature review
Chapter 3: Research methodology
Chapter 4: Data presentations and results
Chapter 5: Discussions, results, occlusion, limitation and recommendations.

1.12 SUMMARY

In this chapter, an overview of this research has been given. Background, problem statement, purpose of the study and study objectives were explained and significance, research methods and ethical considerations were discussed. Chapter Two will present the literature review related to ICU nurses perception related to the topic of this study on the use of physical restraints.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to discuss the relevant literature concerning Intensive Care nurses and physical restraints. This chapter presents the literature review and discusses findings of the studies that explored and related to nurses' reasons on why, when, what and how and "attitudes and opinions on the use of restricting the movement by physical restraints'' internationally and nationally. It also provides current literature examining the factors related to clinical decision-making process and implementation of physical restraints.

An online search was conducted on PubMed, Science direct, Cochrane, Medline and Google Scholar database. The search terms included "definition of physical restraints," "positive and negative outcomes of use of physical restraints in intensive care units,'' "attitudes and opinions of nurses on the use of physical restraints,'' "in-service education and training,'' "factors affecting clinical decision making on the use of physical restraints," "family members," "physical restraints policy,'' "legal rights" and "patients' rights.''

The chapter is divided into several sectors beginning with the definition of physical restraints, positive outcomes of physical restraints, negative outcomes of physical restraints, "attitudes and opinions of nurses towards the use of physical restraints," factors affecting clinical decision-making on the use of physical restraints, training or teaching on the use of physical restraints, family members and use of physical restraints and lastly physical restraints policy, legal rights and patients' rights.

2.2 DEFINITION OF PHYSICAL RESTRAINTS

There is no universally acceptable precise or correct definition of physical restraints, but most definitions contain similar content. According to Mion *et al*. (2007), a physical restraint is any item placed on a patient in order to stop them moving freely; these items can be tied to the wrist/elbow/hands or chest with a bed sheet. Freeman, Hallett and McHugh (2015) also explained that physical restraints are materials attached to a patient's body which cannot be removed easily by the patient.

Furthermore, Bleijlevens *et al*. (2016) affirm that physical restraint is any method that prevents a patient's voluntary movement and normal access to the patient's body parts.

This was concluded in a study where a multidisciplinary internationally representative panel of experts approved a research definition of physical restraints and the majority (95.7%) were in agreement with the definition.

Given the different definitions of physical restraints, for the purpose of this study a physical restraint is an application of any type of restraint, being wrist and chest restraints and/or mittens and elbow splints, that cannot be removed easily by the patient (Mion *et al*., 2007)

2.3 PREVALENCE OF PHYSICAL RESTRAINTS

Hofsø and Coyer (2007) explained that physical restraint use is more likely in the Critical Care settings than in any other hospital units because of invasive procedures and the use of mechanical ventilation. Similarly, a study conducted by Hine (2007) found that Critical Care settings can cause agitation and increase stress by the presence of multiple invasive procedures, mechanical ventilation, pain, sensory overload and disruption to sleep cycle, and these increase the chances of using physical restraints.

In literature worldwide, there are differences in the frequency and the prevalence of physical restraint use in critically ill patients. Benbenbishty, Adam and Endacott (2010) examined physical restraints practices across European Intensive Care Units, and found that the implementation of physical restraints to immobilise a patient ranged from 0 to 100 % of patients. In Canadian Intensive Care Units, international literature indicates that the prevalence of physical restraints use ranges from 53% to 79% (Luk *et al*., 2015; Mehta *et al*., 2012). Chang, Wang and Chao (2008) and Liu, Chou and Yen (2009) indicate that physical restraints prevalence in Taiwan ranges from 55% to 59%.

Comparing the findings of the above studies to literature done in Africa, in Egypt Kandeel and Attia (2013), indicated that physical restraints prevalence ranges from 6% to 46%, while Ismael *et al*. (2014) states that prevalence ranges from 50% to 78%.In South Africa, researchers found that 48.4% of patients were restrained during the period their study was conducted (Langley, Schmollgruber & Egan, 2011).

Most of the studies on physical restraints do not indicate the type of ICU in which the studies were conducted. Literature claims that surgical ICUs have the highest prevalence ranges from, 59% to 87% (Curry *et al.*, 2008; Liu, Chou & Yen, 2009), followed by the respiratory ICUs with usage ranging from 50% to 78% (Ismael *et al*. 2014); Mehta *et al*. (2015) indicated that mixed ICUs physical restraints usage ranges from 31% to 78%.

Besides the frequency in which physical restraints are used in the Intensive Care Units, as stated above, there appears to be positive and negative aspects to their use. The latter aspects contradicts each other, which makes it difficult for nurses to make a decision on when to use restraints, and may have an effect on the differing views nurses have on whether or not restraints should be applied on a patient, which in turn can influence their "attitudes and opinions.''

2.4 POSITIVE OUTCOMES OF PHYSICAL RESTRAINTS

According to Luk *et al*. (2015) and Minnick *et al*. (2007), a positive aspect of the use of physical restraints in the Intensive Care Unit is to facilitate maintenance of therapy and reduce treatment interference (patient safety). Freeman, Hallett and McHugh (2015) explained that all nurses agreed that the application of physical restraints was in the best interest of the patient. This rationale concurred with a systematic review of 52 articles by Rose *et al.* (2016) where they found that physical restraints were used to prevent removal of endotracheal tubes, as well as nasogastric tubes, urinary catheters and central lines, which are needed in an ICU setting as they provide an environment of safety for the patient, which is lifesaving.

Similarly, Luk *et al*. (2015) conducted a study with the purpose of describing Canadian ICU nurses decision-making and the practices of physical restraints application and discontinuation, as well as the use of alternative measures. The study suggests that patient behaviour indicative of agitation (66%), which, as already mentioned above, was the most common reason for using physical restraint.

Minnick *et al*. (2007) concurred with the above studies where they described physical restraints rates and contexts in a United States hospital. The results showed the main reason cited for physical restraints use in the Intensive Care Unit was preventing the disruption of therapy (74.9%) and mainly the use of mechanical ventilation.

Besides therapy interruption and anxiety, reduction of sedation is also a positive contribution of using physical restraints. Hofsø and Coyer (2007) conducted a study with the purpose of providing a summary of the existing literature on physical and chemical restraints that can be used in the ICU setting. These authors stated that because of the known side effects of sedation, such as decreased gastrointestinal motility, depressed cardiovascular function, possible development of withdrawal, ventilation associated

pneumonia (VAP) and prolonged duration of mechanical ventilation, the ideal practice in the ICU was to reduce sedation as rapidly as possible in order to reduce side effects.

Despite the positive reasons for physical restraints, there are studies that claim physical restraints impact on ICU patients negatively and do not provide a safe environment for the patient.

2.5 NEGATIVE OUTCOMES OF PHYSICAL RESTRAINTS

In a systematic review of 52 articles, Rose *et al*. (2016) stated that many studies of critically ill patients with physical restraints in situ were still able to remove endotracheal tubes. DaSilva and Fonseca (2012) reviewed 50 articles on unplanned removal of the endotracheal tubes in Intensive Care Units. Studies indicated that patients' removal of endotracheal tubes occurs at a rate of 0.1 to 3.6 events per 100 intubation days. The use of physical restraints was amongst the factors that contributed to the patient removal of endotracheal tubes. It was concluded that physical restraints do not assist in securing the endotracheal tubes rather it increases the chances of patients removing them.

Mion *et al.* (2007) conducted a study to determine the prevalence of device removal, to describe patient contexts, examine unit-level adjusted risk factors and describe what leads to the removal of devices. The setting was 49 ICUs from a random sample of 39 hospitals in five states. Similarly, the results showed that 44% of hospitalised patients removed endotracheal tubes, naso-gastric tubes and central lines while physically restrained, concluding that device removal by ICU patients is common when physical restraints are used.

These findings above concurred with a study conducted by Curry *et al*. (2008) to determine characteristics of patients and nurses, and risk factors that affect removal of endotracheal tubes; 87% of patients removed endotracheal tubes while physically restrained.

Furthermore, a case control study was done to evaluate the effect of physical restraints on accidental extubation in adult Intensive Care Units. The study indicated that the incidence rate of patients' removal of endotracheal tubes was 8.7%, the use of physical restraints increased the risk by 3.11 times, nosocomial infection increased risk by 2.02 times and a score of 9 and greater on the Glasgow Coma Score, on admission to the unit, increased risk by 1.98% (Chang, Wang & Chao, 2008).

According to Bray *et al.* (2004) and Rose *et al.* (2016), physical restraints also increase the signs of delirium, agitation and disorientation in patients, which leads to patients removing medical devices that are lifesaving and can lead to complications and death.
In a randomised trial study, conducted by Mehta *et al*. (2015), to compare the factors and outcomes of delirious and non-delirious protocols of administration of sedation or not on the above patients, results indicated that delirious patients were more likely to be physically restrained and physical restraint use was independently associated with delirium onset.

Van Rompaey *et al*. (2009) determined the risk factors for delirium in Intensive Care patients in a prospective cohort study. Risk factors covered four domains, patient's characteristics, chronic pathology, acute illness and environmental factors. Odd ratios were calculated using univariate binary logistic regression and the results showed that environmental factors were the major contribution for delirium in Intensive Care patients.
Size, Leng and Lin (2012) examined the effectiveness of physical restraints in reducing falls among adults in acute care hospitals and nursing homes in nine articles. Most studies showed that physical restraints increased patients' disorientation and were not associated with the reduction of falls in critical care settings.

The long-term negative effect of physical restraints has been linked to post-traumatic stress disorder (PTSD). A study conducted by Hatchett, Langley and Schmollgruber (2010), in South Africa, determined the extent to which anxiety symptoms, depressive symptoms and post-traumatic stress symptoms were experienced by a sample of patients after discharge from Intensive Care Units. Their findings claimed that patients who remembered having physical restraints in the unit were six times more likely to develop symptoms of post-traumatic stress than those with no memory of physical restraint.

Similarly, a prospective observational study was conducted to explore the relationship between post-traumatic stress disorders, patient's memories of the Intensive Care Unit and sedation practices in Europe. Factors found to be related to the development of post-traumatic stress disorders were recall of delusional memories, prolonged sedation and physical restraints with no sedation (Jones *et al*., 2007).
Physical restraints have for years been known to cause problems in basic nursing care, such as: increased pressure sores, constipation, injury to the restrained limbs, increased mortality and morbidity and accidental strangulation (Goethals, Casterlé, & Gastmans, 2012). Kandeel and Attia (2013) investigated the practices of physical restraints among critical care nurses in El-Mausoura City, Egypt. The study revealed that redness, oedema and swelling were the most commonly reported physical restraints site complication. All

these signs and symptoms complicate patient care and impact negatively on the cost of healthcare in hospitals and health facilities.

2.6 "ATTITUDES AND OPINIONS OF NURSES TOWARDS THE USE OF PHYSICAL RESTRAINTS"

The positive and negative outcomes of physical restraints influence or have an impact on nurses' views and use of any type of restraints. Studies about critical care nurse's perceptions on the use of physical restraints are very few; most studies are for geriatric, psychiatric and nursing homes. Freeman, Hallett and McHugh (2015) conducted a study to determine "the experiences, attitudes and opinions of adult Intensive Care nurses in relation to the application of physical restraints." The results indicated that nurses believed physical restraints have to be used in ICU to maintain patient safety; others indicated some form of discomfort about such use.

Mohler and Meyer (2014) conducted a systematic review and synthesis of qualitative and quantitative studies to explore nurses' views on the uses of physical materials to prevent geriatric patients from moving; 31 publications were included in the review, 20 quantitative surveys, 10 qualitative survey and one mixed method study. Nurses in this study had negative feelings towards the use of physical restraints in the qualitative studies, but they felt there was a need to use them in their clinical setting despite these negative feelings. There was inconsistent feeling towards the use of physical restraints in the quantitative studies. In this study, nursing staff felt uncomfortable, guilty, sadness and pity for the patient but it also made them more in control of patient's safety. Physical restraints are often used in the geriatric setting when nurses are in doubt, and they use different strategies to cope with negative feelings when using physical restraints

Furthermore, Saarnio and Isola (2010) found that nurses felt guilty when using physical restraint but despite these feelings, it was seen as a way of maintaining safety for the older patients. Their study was conducted with the purpose of describing nursing staff perceptions on the use of physical restraints in institutional care of older people.

Contrary to the above, Hamers *et al*. (2009) conducted a study to investigate the attitudes and use of physical restraints in nursing home residents and to examine if these attitudes are influenced by country of residence and individual characteristics of nursing staff. Researchers found that nursing staff held neutral opinions about the use of physical restraints, but assessed the use of such as an important measure in their clinical practice. Nursing staff with longer clinical experience showed a more negative attitude towards

restraints use than those with less experience. Unit managers had the least positive attitudes towards the use of physical restraints. Gender and age was not related to attitudes between nursing staff from different countries.

The latter aspects contradict each other, thus making it difficult for nurses to make a safe decision on whether “to” or “not to” restrain the patient.

2.7 FACTORS AFFECTING CLINICAL DECISION MAKING AND THE USE OF PHYSICAL RESTRAINTS

Clinical decision-making is a process of critical thinking and discriminative thinking patterns with varying influences that nurses have to face when making judgements about patient care (Banning, 2008), and influenced by different factors, such as clinical experience, education, interpersonal relationship, speciality, age, gender and environment (Goethals, Casterlé, & Gastmans, 2012; Hoffman, Aitken & Duffield, 2009). Nurse practitioners should be ethically sensitive and well equipped with clinical decision-making skills in cases of physically restraining of an Intensive Care patient (de Casterlé, Goethals & Gastmans, 2015; Hoffman, Aitken & Duffield, 2009).

Clinical experience is often discussed as the influential aspect in the clinical decision-making process (Pretz & Folse, 2011; Ramezani-Badr *et al*., 2009). In a systematic review of 1317 articles, Banning (2008) found that most studies suggested clinical decision-making improves with experience of nursing patients within a specific speciality and this nursing experience improves nurses clinical decision-making skills. She further explained that experienced nurses’ use many forms of clinical decision-making processes, combined and independently, to solve nursing related problems.

The above findings are in agreement with Patricia Benner’s theory from Novice to Expert (2011). She developed a decision-making model that has five stages of skill acquisition in clinical nursing knowledge, which helps to view the application of nursing knowledge with the clinical decision-making process. The principle of Benner’s theory reflects changes in general aspects of decision-making and skill performance. She categorised nursing levels as; Novice, Advanced Beginner, Competent, Proficient and Expert, and each level has increased knowledge on past clinical experience.

According to Benner’s theory:

- Novice nurses are nursing students in their first year of nursing education. They have no background experience of the situation and cannot predict changes in particular patient situation.

- Advanced beginners are new graduates in their first job appointment. They have experience and can recognise a situation, but still require an experienced nurse or mentor to define a situation, set some priorities and integrate practical knowledge. They are guided by rules and oriented by completion of tasks.

- Competent nurses have two to three years of experience in the same area. They can recognise and determine which situation needs immediate attention and which can be attended to later. They depend on advanced planning and organisational skills.

- Proficient nurses have three to five years of experience. They have the ability to determine changing situations and can implement skilled responses to the situation as it occurs, and can modify plans in response to different situations. Clinical situations are viewed as a whole not in parts. They can identify an accurate decision based on the ability to recognise patterns from previous experience.

- Expert nurses have five years or greater of clinical experience in the same area. They know what needs to be done, and depend on understanding the whole situation; they only focus on relevant problems. They do not rely on rules or guidelines in given situations and only use tools when they are faced with a situation with which they are not familiar.

With this theory on the use of physical restraints, expert nurses are not guided in decisions to use physical restraints as they have acquired more skills and experience, they normally use them without conscious thought. Proficient nurses will decide whether to use physical restraints quickly and carry on with the decision. The competent nurses' decision on whether to use physical restraints will be based on previous real life clinical experience. The advanced beginner will seek advice from the preceptor for justification of use of physical restraints, while novice nurses will use hospital guidelines and protocols to make decisions whether to use them.

This concurred with Traynor, Boland and Buus (2010), as they concluded that nurses with more clinical experience often ignore or modify clinical guidelines and protocols and use

clinical experience as a reference point, and they are able to make decisions based on previous similar situations and gut feelings related to exposure to similar clinical situations.

Hoffman, Aitken and Duffield (2009) stated that expert nurses are more proactive, while novice nurses are reactive. Expert nurses anticipate what might happen and always plan the care of their patient and the accurate anticipation is a vital aspect of clinical decision-making in critical care. Pretz and Folse (2011), in their study, affirmed that with increased levels of clinical experience there is a preference for using intuition in clinical decision-making. This will help nurses determine whether the patient needs to be restrained or requires an alternative, such as sedation.

Al-Khaled, Zahran and El-Soussi (2011) examined nurses' related factors that influence their decisions to apply physical restraints and their practices while maintaining the patient on physical restraints. Fifty Intensive Care nurses and patients were included in the study and two separate tools were used to collect data. The results indicated that nurses with many years of experience and higher qualifications understood and performed better with the implementation of physical restraints than others.

Similar to the authors above, Ramezani-Badr *et al*. (2009) conducted a study to examine the reasoning strategies and clinical decision-making processes used by Critical Care nurses. It was found that nurses' use different decision making strategies and reasoning to evaluate and plan appropriate care for the patients. Three main themes emerged from the study: intuition, hypothesis testing and recognising similar situations. Clinical experience was used when nurses found that patient presentation was similar to what they had in mind. They recognised similar conditions from the past and compared them with the present situation in order to make proper clinical decision-making.

Contrary to the above literature, Hoffman, Donoghue and Duffield (2004) conducted a correlation study to determine the relationship between level of appointment, experience, occupational orientation (value role), area of practice, educational level, age and clinical decision making in Australian nurses. Results indicated there was no significant relationship found between experience and decision-making, and education was not significantly related to decision-making. The factors that accounted greatly for clinical-decision making followed in this order: professional occupational orientation, level of appointment, area of clinical speciality and age.

Choi and Song (2003) also indicated there was no relationship between education level, staffing and registered nurses attitudes with the use of immobilising and/or physical restriction. There was no significant relationship between years of experience or the nurse's attitudes (perception).

Some studies indicate that work relationships and environment plays a major role in the clinical decision-making process. de Casterlé, Goethals and Gastmans (2015) conducted a qualitative descriptive study with the purpose of understanding contextual influences on the process of decision-making in cases of physical restraints. Twenty-one in-depth interviews were carried out on nurses working in acute geriatric wards. The findings indicated that an interpersonal relationship with colleagues was the major factor influencing clinical decision-making. They further indicated that availability of materials, structure of the ward and the alternatives for physical restraints help in clinical decision-making on the use of physical restraints. Dowding *et al*. (2009) affirm that health care professional support is needed in clinical decision-making and nurses rely on co-workers to plan for the patient's needs.

2.8 TRAINING ON THE USE OF PHYSICAL RESTRAINTS

As one of the objectives has alluded to training on the use of physical restraints, it appears that other authors suggest the same. In-service education or teaching specific to physical restraints is needed to enhance positive attitudes, accurate knowledge and proper skills on the use of physical restraints (Eskandari *et al*., 2017; Azaba & Negin, 2013).

Azaba and Negin (2013) conducted a study to assess nurses' knowledge, attitudes and practice issues on the use of physical restraints in Intensive Care Units. A self-administered structured questionnaire was used to determine Intensive Care nurses' knowledge, attitudes and practice regarding the use of physical restraints and the factors that influence them. Results indicated there was a positive correlation between respondents' practice scores, knowledge and attitudes scores. They concluded that nurses' practice, regarding the use of physical restraints, is related to their knowledge and attitudes towards them.

Similarly, in a study conducted by Eskandari *et al*. (2017) to investigate the knowledge, attitudes, intention and practice of nurses towards physical restraint and factors influencing these variables, the results showed there was moderate knowledge and attitudes with high intentions to use physical restraints. More than half of the nurses who responded did not understand the reasons for physically restraining patients, while the remaining nurses considered using alternatives. There was association between knowledge, attitudes and

intention to practice of physical restraints. The study suggests there is need for continuous in-service education on the use of physical restraints in hospitals to improve knowledge, attitudes and practices towards the use of such.

Lan *et al*. (2017) found most studies acknowledge that because of nursing education on the use of physical restraints, there is improved knowledge and less complications and questions about the need for physically restraining patients. The authors claim that in hospitals and countries where the use of physical restraints are high, education on the topic was effective, as was evident in their study findings. This will have an influence on nurses' attitudes and opinion because they will be aware of the guidelines, positive and negative outcomes of physical restraints and nursing management of a restrained patient.
Al-Khaled, Zahran and El- Souzi (2011) found that nurses with knowledge perform better when it comes to implementation of physical restraints than others. Nurses' knowledge is related to their performance. In-service training programmes, for nurses working in Intensive Care Units, on the use of physical restraints and alternatives is recommended to improve nurse's knowledge, which will then influence their "attitudes and opinions on the use of physical restraints."

Contrary to the above studies, Chang *et al*. (2016) evaluated the effectiveness of in-service education on knowledge, attitudes, behaviours and technical changes among nursing staff in the Intensive Care Unit with regard to the use of physical restraints. A pre-test- post-test design using a quasi-experimental method was used. The participants were placed into two groups, the experimental group and the control group. The experimental group were taught the guidelines and techniques related to physical restraints for two hours, no educational intervention was done on the control group. The results indicated that technique and knowledge were higher than the pre-test scores but there was no significant difference in the pre-test scores on attitudes and behaviours.
In a similar study, Huang, Chuang and Ching (2009) studied the role of in-service education in quasi-experimental study to examine the effectiveness of an in-service education programme for improving nurses' attitudes, knowledge and self-reported practices related to physical restraints use. Fifty-nine (59) participants were in the intervention group and they received an in-service programme on physical restraints use, while 70 participants, who were in the control group received nothing. A three-scale survey instrument, which consists of the Knowledge of Physical Restraints Use (KPRU), the Attitudes of Physical Restraints Use and the Practice of Physical Restraints Use, was administered to the participants before and two weeks after the intervention. The results indicated there was a significant improvement in the intervention group in terms of self-reported practices ($p=0.048$),

knowledge (p=001) and attitudes (p=0.007) after the in-service education programme. However, there were no significant differences in participant attitudes towards the use the physical restraints between control and intervention group upon completion of the programme.

Furthermore, Suliman, Aloush and Al- Awamreh (2017) conducted a study with the aim of investigating nurses' knowledge, attitudes and practice of physical restraints in Intensive Care Units in Jordanian hospitals. Three hundred nurses completed the physical restraints questionnaire. Results showed nurses who had previously had education related to the use of physical restraints had higher scores on knowledge than nurses who did not have such education. No differences were found in relation to attitudes and practice between these categories. The study suggests there is need for continuous education to improve nurses' knowledge, attitudes and practice on the best practice for using physical restraints.

Taha and Ali (2013) conducted a study in Egypt to improve nurses' knowledge and practice issues regarding the use of physical restraints in Intensive Care Units. A quasi-experimental design with pre-post assessment was used in 38 nurses working in ICUs. This study was divided into three stages; a self-administered questionnaire was used first to assess nurses' nurse knowledge, and observe their practice and assessment sheet for patients. A training intervention was developed based on the analysis of data from the questionnaire and nurses were educated in seven sessions. Evaluation was done immediately and two months after implementation to determine whether the practice towards physical restraints had changed. Researchers found there were some deficiencies in nurses' knowledge and practices before educational intervention. Improvement was shown in the post and follow up evaluations. They concluded that in-service training in guidelines could have a positive effect on nurses' knowledge and practice issues on the use of physical restraints.

2.9 FAMILY MEMBERS AND THE USE OF PHYSICAL RESTRAINTS

The use of physical restraints on an ICU patient has an impact on family members. Family members are vulnerable and they trust the hospitals to provide the best care and safe environment while the patients are critically ill.

Kang *et al*. (2013) investigated the emotional response of family members of ICU patients who were physically restrained. Two hundred (200) family members participated in the study and data was collected using the instrument titled 'Instrument of family's emotional response towards physically restrained patients.' The results showed slight negative

emotional response towards the use of physical restraints, which may be due to lack of knowledge in restraint usage. They suggested that education of family members on the use of physical restraints would change the relatives' negative emotions.

In nursing home residents, Haut *et al*. (2010) determined family members' attitudes and opinions towards the use of physical restraints and compared the results to nursing staff. The results indicated family members had a positive attitude towards the use of physical restraints.

2.10 PHYSICAL RESTRAINTS POLICY, PATIENTS RIGHTS AND LEGAL ISSUES

The controversial issues around the use of physical restraints (the negative and positive outcomes) have led to the development of physical restraints policy in hospitals. According to Al-Khaled, Zahran and El-Soussi (2011) and Kalula and Petros (2016), policy and guidelines on the use of physical restraints should be developed to guide health practitioners in the management of patients where physical restraints cannot be avoided because of the negative outcomes.

This concurred with evidence based practice guidelines by Park and Tang (2007) who concluded that national guidelines and standards for use of physical restraints are recommended in Critical Care settings to assist health-care professionals on proper implementation to avoid undesirable outcomes. The guidelines were developed with the purpose of assisting health-care professionals to adopt physical restraints free care and assist hospitals that are still using physical restraints, to choose safe and least restrictive restraints and to move towards restraints free care.

According to the tertiary academic hospital in Johannesburg, their hospital policy referring to physical restraints states that they should be used with a written order from the medical officer. The medical officer should indicate the reasons for prescribing physical restraints, the type of restraints and the period that physical restraints will be used. There has to be a proper record keeping and observations of the restraints area; the time and date the physical restraints were applied, where the restraints were applied, conditions of the limbs before restraints and the time the restraints were removed for movement of extremities. In addition, the relatives must be informed about the reasons for restraining the patients and the progress of the patient's condition.

Despite this hospital physical restraints policy being in place, it appears it is not taken in to consideration. De Jonghe *et al*. (2013) stated that the common absence of medical orders from medical officers for initiation or removal of physical restraints indicates these decisions are mostly made by the nurses. Choi and Song (2003) affirm that most often nurses are the ones who decide to physically restrain patients, and sometimes with a physician's verbal instruction: this was only documented in 5.3% of the total incidents of restraint.

Conversely, even if a written order is required from the physician, international literature claims that the need assessment, application and discontinuation of physical restraints is mostly done by Intensive Care nurses (Al-Khaled, Zahran & El-Soussi, 2011; De Jonghe *et al*., 2013). Therefore, nurses should have the ability to assess the need for physical restraints based on the individualised patients' needs, taking into consideration autonomy and integrity of the patient (Park &Tang, 2007).

The South African Medical Association (SAMA) states that patients have the right to freedom and security, including freedom from cruel, inhuman, degrading treatment and violence.

The South African Nursing Council's (SANC) scope of practice also states that registered nurses are required to promote the physical comfort and re-assurance of the patient, and also protection of the skin.(SANC, Scope of practice for registered nurses http:www.sanc.co.za/regulat/Reg-scp.htm). Nurse practitioners have the responsibility to choose the correct, less restrictive type of restraints whilst at the same time taking into consideration patient safety. There has to be a balance between patient's rights, legal issues and patients' safety. This therefore indicates that decisions to use physical restraints are complex and ethically laden and nurses need to make ethically sound decisions that will not compromise patient care.

2.11 SUMMARY

This chapter summarised findings of studies that explored and related to nurses views, thoughts and feelings on restraining patients. An overview of the definition of physical restraints, positive and negative outcomes of physical restraints, "attitudes and opinions of nurses towards the use of physical restraints," factors affecting clinical decision-making on the use of physical restraints, training or teaching on the use of physical restraints, family members and use of physical restraints, and lastly physical restraints policy, legal rights and patients' rights were discussed.

The next chapter will discuss the research methods and design used in the study.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

Research methodology refers to the process or plan for conducting the specific steps of the study (Grove, Burns & Gray, 2013:701). In this chapter, a detailed description of the research design and research population, sample and sampling criteria, data collection procedure, details of the self-administered questionnaire, reliability and validity of the instrument used and data analysis strategies will be discussed.

3.2 OBJECTIVES OF THE STUDY

For consistency in this research study, the objectives are repeated.

- To describe registered “nurses attitudes and opinions on the use of physical restraints as opposed to alternative methods.”
- To determine the association between ICU nurses years of experience and their “attitudes and opinions on the use of physical restraints.”
- To determine the association between ICU nurses reports on availability of written policy on physical restraints and their “attitudes and opinions on the use of physical restraints.”
- To determine the association between ICU nurses reports on having training in assessing the need for application of physical restraints and their “attitudes and opinions on the use of physical restraints.”

3.3 RESEARCH DESIGN

According to Polit and Beck (2012:12) research designs are the overall plan the researcher uses to address the research question and specifications that enhance the integrity of the study. A quantitative, descriptive, non-experimental survey design was used to address the research question.

3.3.1 Quantitative

A quantitative research is a formal, objective, systematic process implemented to obtain numerical data for understanding aspects of the world. It is used to describe variables,

examine relationships between variables and determines cause and effect interaction between variables (Grove, Burns & Gray, 2013: 23).

The researcher systematically used the questionnaire developed by Freeman, Hallett and McHugh (2015) to describe “attitudes and opinions of Intensive Care nurses on the use of physical restraints.” Descriptive statistics were used for data analysis for better understanding of the findings. This method was used to determine if there was any relationship between the nurses attitudes and opinions and their demographic characteristics, their previous training on the use physical restraints and the presence of the physical restraints in the specific intensive Care Units.

3.3.2 Descriptive

Descriptive study design is used to provide a picture of a situation as it naturally occurs (Grove, Burns & Gray, 2013: 215) and involves observing and describing the behaviour of a subject without influencing it anyway. This design was considered most suitable because the purpose of the study was to describe “nurses’ attitudes and opinions on the use of physical restraints.”

3.3.3 Non-experimental

Non-experimental is when the researcher does not intervene by manipulating the independent variable (Polit & Beck, 2012:203). In this study, no manipulations were done and there were no control groups, therefore the study was non-experimental.

3.3.4 Survey Designs

According to Polit and Beck (2012: 744), survey designs are non-experimental researches that obtain information about people’s attitudes through direct questioning. The researcher can use questionnaires collected by mail or in person, or direct personal interviews to gather data about an identified population (Grove, Burns & Gray, 2013: 214). This design was considered because the researcher collected data using questionnaires, collected in person and the purpose of the study was to describe the attitudes and opinions of Intensive Care nurses on the use of physical restraints.

3.3.5 Setting

The study was conducted in five (5) adult ICUs in a tertiary academic hospital in Johannesburg, which serves as a referral hospital for major areas in Gauteng. The hospital admits patients from district and provincial levels and offers highly specialised services. It has a bed capacity of 1200 and provides both inpatient and out patients services.

The ICUs included Multi-disciplinary, Neurosurgery, Trauma, Cardiothoracic and Coronary Care Unit. The ICU levels are described according to SASA guidelines (2013). Neurosurgical and Coronary Care Units are described as level two ICUs as they admit patients with single organ dysfunction whereas Multi-disciplinary and Trauma are level three ICUs as they admit patients with multiple organ dysfunctions. Cardiothoracic is also considered level three as they admit patients with unstable haemodynamics and immediate post by-pass surgery.

The ICUs have a 44 bed capacity. The Multidisciplinary ICU is 12 bedded, Trauma ICU and Cardio thoracic ICU are nine bedded each, Neurosurgery ICU is eight bedded and Coronary Care Unit is six bedded. The nurse patient ratio is mostly one is to one but in the Coronary Care Unit, it is usually one nurse to two patients depending on the patient condition.

3.4 RESEARCH METHOD

Research method is the techniques used to structure a study, gather and analyse information in a systematic manner (Polit & Beck, 2012: 741) and includes population and sample, data collection and data analysis. A survey questionnaire developed by Freeman, Hallett and McHugh (2015) was used to gather information for this study.

3.4.1 Population

Population refers to the entire cases in which the researcher is interested (Grove, Burns & Gray, 2013: 703). The target population for this study were all registered nurses practicing in adult ICUs of a tertiary academic hospital in Johannesburg which includes multi-disciplinary, neuro surgery, trauma, cardio-thoracic and coronary care unit.
The total population was 158 (N=158) registered nurses working in the five ICUs comprising registered nurses with specialities and others having experience working in ICU.
Multi-disciplinary ICU had 39 registered nurses; 28 were ICU trained and 11 had ICU experience.

Trauma ICU had 38 registered nurses; 19 Trauma and emergency and ICU trained and 19 with ICU experience.

Neurosurgical ICU had 33 registered nurses; 26 were ICU trained and 7 had ICU experience.

Cardio thoracic ICU had 31 registered nurses; 22 were ICU trained in ICU and 9 had ICU experience.

Coronary care unit had 17 registered nurses; 12 ICU trained and 5 with ICU experience.

The registered nurses were of interest to the researcher as they are directly involved in patient care and can make independent clinical decisions in cases of emergency.

Exclusion criteria for this study were all registered nurses working in Paediatric and Neonatal Intensive Care Units and enrolled nurses working in the adults ICUs.

3.4.2 Sample and Sampling Method

Sampling is the selection of a group of people, events and behaviours with which to conduct a study (Grove, Burns & Gray, 2013:351). Convenience sampling, which involves the selection of readily available persons to participate in a study (Polit & Beck, 2012:724) was used in the study.

The sample size was calculated using a Rao Soft sample calculator where:

N= 158 - N was the total population that the researcher was interested in.

Marginal error of 5% -The marginal error is the amount of error that can be tolerated and a lower margin of error requires a larger sample size.

Response distribution of 50% - For each question, what the researcher expected the response to be, whether yes or no. Setting the response distribution to 50% is the most conservative assumption.

Confidence level of 95% - The amount of uncertainty the researcher tolerated. Higher confidence levels require a larger sample size.

The recommended sample size was 113.

3.4.3 DATA COLLECTION

Data collection is the systematic collection of information to meet the research objectives and answer the research question (Grove, Burns & Gray, 2013:45). An existing survey questionnaire was given to all the voluntary respondents titled “Attitudes and opinions of Intensive Care Unit nurses on the use of physical restraints.”

3.4.3.1 Data collection procedure

Once permission was obtained to conduct the study in the hospital (Appendix D), the researcher visited the various units and explained the purpose of the study to the operational manager (registered nurses according to SANC definition) and respondents. A voluntary information letter, explaining the study and its purpose was provided to the respondents (Appendix B). The survey questionnaire was distributed to the respondents who agreed to participate in the study (Appendix A).
The completed questionnaires were placed into an envelope and then into a sealed box in each ICU. The researcher collected the questionnaires twice a week and loaded data into Microsoft Excel. The researcher and supervisor were the only people who had access to raw data. The researcher availed her email address and telephone number during data collection to enhance communication. The researcher asked for assistance from the statistician available in the faculty.

3.4.3.2 Survey questionnaire

A self-administered questionnaire, developed by Freeman, Hallett and McHugh (2015) at the University of Manchester in the United Kingdom, was used for this study (Appendix A) after the permission had been obtained (Appendix E).The questionnaire was divided into four sections with 18 items. Section One was demographic questions, Section Two related to training and support, Section Three was statements that gathered information about uses and application of physical restraints and Section Four allowed the respondents to expand on their responses if they wished to do so.

Section One. This section had questions, which gathered information on the demographic details as well as professional data of the respondents (general information). The following characteristics of respondents were described: “Gender, Age, Years of Intensive Care experience, the highest level of qualification in nursing, courses they took for highest qualification, current nursing position, Intensive Care unit the respondent was working in and if this unit used physical restraints.” These characteristics helped to determine whether these variables influenced the respondents’ answers in the questionnaire.

Section Two. Questions from this section gathered information about training and support on the use of physical restraints. “Respondents were asked if their units had a written policy on physical restraints and if yes had they read it. They were also asked if they had training in assessing the need for application of physical restraints, and application of such

restraints." There were some open-ended questions, which allowed respondents to write comments if they felt that training was not adequate and offer additional information to improve training. These helped to determine whether the training and support offered to the respondents influenced their "attitudes and opinions on the use of physical restraints."

Section Three. This section gathered information about uses and application of physical restraints. Respondents were asked if there was a limited time that a patient could be restrained and if they were happy to discuss the use of physical restraints with families or visitors. They were asked to expand if they agreed on the above questions.

Respondents were asked approximately 12 statements on how much they agreed and disagreed with the statements about the use of physical restraints and which utilised the five point Likert scale (Strongly agree-1, Agree-2, Neither agree or disagree-3, Disagree-4, Strongly disagree-5). According to Polit and Beck (2012:732), this scale is made of several parts and measures of attitudes involving the conclusion of scores on a set of items that participant's rate for their degree of agreement or disagreement. This section helped to determine "nurses' opinions and attitudes on the use of physical restraints."

Section Four. This section allowed respondents to expand on their responses if they so wished. Respondents were asked what they thought about the use of physical restraints; "if they were not using restraints, what was their preferred method." If the respondents wanted to emphasise specific factors relating to the previous question, there was space in this section to do so. This section determined if there were any factors not included in the questionnaire which could influence nurses' thoughts on the use of restraints.

Section One was assessed using item 1 to 8, section Two using item 9 to12 , section Three using item 13 to 15,and Section Four using item 16 to18.

3.4.3.3 Validity and reliability of the questionnaire

According to Brink, Vander Walt and Van Rensburg (2012:165), instrument validity determines whether an instrument accurately measures what it is supposed to measure. They explained that 'content validity is the assessment on how well the instrument represents all components of the variable and is mainly used in the development of questionnaires.' In content validity, the questionnaire is developed based on literature review and then it is presented to the group of experts in the field to determine content

validity. Face validity means that the instrument appears to measure what is supposed to measure (Brink, Vander Walt & Van Rensburg, 2012:165).

The questionnaire was developed by Freeman, Hallett and McHugh (2015). Content and face validity was achieved, as they reviewed literature and several key questions were identified. A focus group of ICU experienced clinicians discussed the above key questions further and then an academic expert reviewed the questionnaire design. Ten (10) participants were then invited to part take in piloting the research, to confirm clarity of the questions and establish how long the questionnaire took to complete. The result of the original study using this questionnaire has been published.

3.4.3.4 Pre-testing procedure

A pre-test is the trial administration of an instrument to identify flaws or assess time requirements (Polit & Beck, 2012:738). The pre-test questionnaire was given to small number of population and conducted before the commencement of the study in order to refine the methodology and measure the effectiveness of the questions.

Thirty respondents were used for pre- testing the questionnaire. According to Perneger *et al*. (2015) a sample size of 30 respondents is recommended for pre- testing of a questionnaire because small sample sizes of five (5) to 15 respondents may fail to detect difficulties, which could arise while using the questionnaire.

There were no problems encountered during the pre-testing of the questionnaire therefore no modifications were done. The results used from the pre-testing were not included in the main study. On average, the questionnaire will take 20 to 30 minutes to complete.

3.4.4 DATA ANALYSIS

Data analysis was conducted to reduce, organise and give meaning to data (Grove, Burns & Gray, 2013:691). Data was captured using an Excel spreadsheet and imported into STATA version 14 for analysis. A statistician from post graduate research office assisted with the statistics. Descriptive statistics and comparative statistics were used to analyse data in this study. For open-ended questions, quantitative content analysis was used.

Descriptive statistics are used to measure the spread of a sample in a wider range of variables (Strydom, 2013). The respondents' gender, age, Intensive Care experience,

highest qualification, course for highest qualification, current nursing position, Intensive Care Unit they work in and if the unit uses physical restraints were described using frequency tables and percentages. Section Two (training and support) and Section Three (use of application) were also described using frequency tables and percentages, bar charts and pie charts.

Quantitative content analysis was used for the open-ended questions. According to Lock and Seele (2015), this is when observations of found categories are transformed into quantitative statistical data. It is suitable for the study with ethical issues, as it is applied quantitatively and does not neglect context. All the same words, or words with the same meanings (content), were identified and the numbers of respondents who included that word in their answer were calculated. Open-ended questions are added in order for participants to clarify answers that are often forgotten in closed-ended questions (Singer & Couper, 2017).

These open-ended questions were in item 11b if the respondent answered item 11 and 11a with a no, item 12b if the respondent answered 12 and 12a with a no, item 13b if the respondent answered it with a yes, and in items 14, 16, 17 and 18 the respondents were allowed to expand on their responses if they so wished.

Comparison data analysis was used to explore relationships between two variables. This comparison was conducted based on "ICU nurses' years of experience, reports on availability of written policy on physical restraint and reports on their education relating to the assessment needed for restraining patients." The chi-square test was used to compare the differences in mean scores and determine whether the difference was statistically significant. It is a non- parametric test used to determine whether the frequency found in each category is different from the frequency that would be expected (LoBiondo-Wood & Haber, 2010:575).

Logistic regression is a multivariate regression procedure that analyses relationships between two or more independent variables and a categorical independent variable and yields a predictive equation (Polit & Beck, 2012; 418). The nominal regression models were fitted because the outcome variable is nominal i.e. categorical and not ordered. The outcome variable was categorised into 'agree,' 'neither agree nor disagree' and 'disagree.' This was indicative in instances where the chi-square test or Fisher's Exact test gave a significant p-value ($p < 0.05$); a nominal logistic regression model was fitted to determine the association between the explanatory outcome and attitudes towards physical restraints.

A multinomial logistic regression model was fitted for each statement where the chi-square test, or Fisher's Exact test, was found to be significant with the following explanatory variables: "years of experience, reports on availability of written policy and reports on having training in assessing the need for the application of physical restraint." These variables were fitted into the model as they have been reported to be associated with attitudes and opinions on physical restraint in the literature (Al-Khaled, Zahran & El-Soussi, 2011; Azaba & Negin, 2013; Eskandari *et al*., 2017).

3.4.4.1 Variables

According to Grove, Burns and Gray (2013:721), variables are characteristics of persons, qualities or situations that vary and are subject to change.

3.4.4.2 Independent variable

A researcher can manipulate an independent variable in order to make an effect on the dependent variable. It influences other variables and causes change (Grove, Burns & Gray, 2013:145). The independent variables in this study were gender, age, Intensive Care experience, highest level of qualification in nursing, course for highest qualification in nursing and ICU in which respondents were working.

3.4.4.3 Dependent variable

The dependent variable reflects the response to the independent variable, it is the outcome variable (Brink, Vander Walt & Van Rensburg, 2012:91). Grove, Burns and Gray (2013: 145) explained it is the assumed effect the researcher wants to explain, and for this study was to describe "nurses' attitudes and opinions on the use of physical restraints."

3.5 ETHICAL CONSIDERATION

It is the researchers' responsibility to ensure that ethical issues are considered during research. The purpose of research is to develop new knowledge but this does not have to take priority over the rights and interest of participants. Grove, Burns and Gray (2013: 693) explained that ethical considerations are principles of respect for persons, benefits and justice relevant to conduct of research. The University of Witwatersrand's ethical consideration is in accordance with the Declaration of Helsinki, ensuring there is respect for

all human subjects and their health and rights are protected. Informed consent, permission to conduct the study, anonymity and confidentiality were discussed in order to abide with the Declaration of Helsinki.

3.5.1 Informed Consent

According to LoBiondo-Wood and Haber (2010), informed consent is a legal principle that governs the participants' ability to reject or accept participation in a research study. It ensures participation is voluntary and that the participants are protected from harm. Participants' agreement to voluntary participation in a study should be reached after acquiring essential information about the research (De Vos *et al*., 2011:17; Grove, Burns & Gray, 2013: 45).

The researcher provided information letters to the respondents (Appendix B) and they were given sufficient time to understand the content. The information letter had adequate information that the respondents needed in order to understand the purpose of the study. Respondents were free to withdraw from participating in the study at any time and no penalty was to be imposed on them.

3.5.2 Permission to Conduct Study

Ethical research is necessary to generate new knowledge whilst at the same time ensuring the rights of the participants are protected. Research institutions should have institutional review boards to assess feasibility of proposed research studies and determine if they meet ethical standards in order to protect the rights of the participants (LoBiondo-Wood & Haber, 2010). Ethical review and clearance is necessary to ensure a balance between benefits and risks of the study and prevent research misconduct.

The following were done in order to obtain permission to conduct the study:

- The research proposal and questionnaire were submitted to the University of the Witwatersrand Postgraduate Committee (Faculty of Health Sciences) for permission to undertake the research; permission was obtained.
- The research proposal and questionnaire were submitted to the University of the Witwatersrand Human Resource Ethics Committee to ensure compliance with ethical standards. Clearance certificate issued, Certificate Number: M170353 (Appendix C).
- Permission to conduct the study was obtained from the Chief Executive Officer of a tertiary academic hospital in Johannesburg (Appendix D)

- Written permission to conduct the study was obtained from the authors, Freeman, Hallett and McHugh (2015) (Appendix E).
- Verbal permission to conduct the study was obtained from the unit managers and nursing service managers of the five ICUs under study.

3.5.3 Anonymity

Anonymity means keeping the participants' identities a secret in the study; even the researcher should not be able to link participants with their data (Brink, Vander Walt & Van Rensburg, 2012:37). Anonymity was ensured because numbers were assigned to the questionnaires and the raw data was kept in a sealed box in the operational manager's office and was only accessible to the researcher and the supervisor.

3.5.4 Confidentiality

According to Grove, Burns and Gray (2013:690), confidentiality is the management of research data so that participants' identities are not linked to their responses. Confidentiality was ensured, as the researcher and the supervisor were the only ones who had access to raw data. The researcher and supervisors computers which were password enabled were only accessible to them, to ensure confidentiality.

3.6 VALIDILITY AND RELIABILITY OF THE STUDY

According to Brink, Vander Walt and Van Rensburg (2012:165), instrument validity determines whether an instrument accurately measures what it is supposed to measure and must be consistent and accurate. Face and content validity was ensured by asking an expert to review the relevance of the content of the questionnaire to the South African context. Variables were not manipulated to prevent threats to internal validity. Refer to the explanation of the reliability and validity of the instrument in this Chapter.

De Vos *et al*. (2011:200) refer to the reliability of the data collection questionnaire to the accuracy and precision of a questionnaire. A standardised data collection questionnaire was used throughout the study and data collection and gathering were carried out by the researcher alone. Reliability was maintained in this research ensuring consistency and accurate data recording. Inclusion and exclusion criteria were followed and an appropriate sample size was selected, the researcher ensured the sample was a true representation of the population to enhance generalisation of the results.

3.7 SUMMARY

This chapter described research methodology of the study. The research design, study setting, population, sample and sample method, survey questionnaire, data collection and data analysis were discussed. Validity and reliability related to this study and ethical consideration were explained. The next chapter will present data analysis and discussion of the results.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTON

In this chapter, the results and approach to data analysis will be described. According to Grove, Burns and Gray (2013: 45), data analysis is used to reduce, organise and give meaning to data. The research findings will be discussed, described and analysed using descriptive and comparative statistics. The statistical tests used include Chi-square test and Fisher's Exact test, and testing was set at 5% level of significance.

4.2 APPROACH TO DATA ANALYSIS

The data was analysed using STATA version 14. Firstly, data was entered into an Excel spreadsheet and to process the data in preparation for analysis, the data was checked for errors in recording, duplicate and missing values. In order to achieve the study objectives, descriptive and comparative statistics were used. Descriptive statistics were used for interpretation of variables in Section One (general information): gender, age, years of Intensive Care experience, highest level of qualification in nursing, course they have for highest qualification, current nursing position, Intensive Care Unit in which they work and if the unit uses physical restraints.

The open-ended questions were analysed using quantitative content analysis. The same words, or those with the same meanings (content), were identified and the numbers of respondents that included the word in their answer were calculated. Frequency distribution tables were used to provide description of the data, and percentages in the findings were at the nearest one decimal point. Pie charts and bar charts were used to present this data.

As previously stated, a comparison of the proportion of nurses who agreed, disagreed, or neither agreed nor disagreed to questions concerning their attitudes towards physical restraint was conducted using the chi-square test of comparison, where all proportions were above 5, or a Fishers Exact test where some proportions were equal to or greater than 5. In instances where the chi-square test or Fisher's Exact test gave a significant p-value ($p < 0.05$), a nominal logistic regression model was fitted to determine the association between the explanatory outcome and attitudes towards physical restraints. The nominal regression models were fitted because the outcome variable was nominal, i.e. categorical and not

ordered. The outcome variable was categorised into ‘agree,’ ‘neither agree nor disagree’ and ‘disagree.’

For each statement where the chi-square test or Fisher’s Exact test was found to be significant, a multinomial logistic regression model was fitted with the following explanatory variables: years of experience, reports on availability of written policy and reports on having training in assessing the need for the application of physical restraints. These variables were fitted into the model as they have been reported to be associated with “attitudes and opinions on physical restraint” in the literature (Al-Khaled, Zahran & El-Soussi, 2011; Azaba & Negin, 2013; Eskandari *et al*., 2017).

4.3 RESULTS AND DISCUSSION OF FINDINGS

4.3.1. Section One: General Information

This section relates to respondents general information, which comprised eight variables. The variables include “gender, age, years of Intensive Care experience, highest level of qualification in nursing, course for highest qualification, current nursing position, Intensive Care Unit they work in and lastly if the unit uses physical restraints.” **Table 4.1**.presents these results.

Table 4.1 General information for nurse respondents for the total sample (n=113)

Item	Category	Frequency	Percentage
Q1	"Gender		
	Male	21	18.6%
	Female	92	81.4%
Q2	Age		
	18 to 25 years	3	2.7%
	26 to 35 years	23	20.3%
	36 to 45 years	37	32.7%
	46 to 50 years	40	35.4%
	>50 years	10	8.9%
Q3	Years of ICU experience		
	1 year	12	10.6%
	2 to 5 years	33	29.2%
	6 to 10 years	27	23.9%
	11 to 15 years	18	15.9%
	16 to 20 years	12	10.6%
	>20 years	11	9.8%
Q4	Highest level of qualification in nursing		
	Diploma	88	77.9%
	Bachelor Degree	20	17.7%
	Master's Degree	4	3.5%
	Doctoral Degree	1	0.9%
Q5	Course for highest qualification		
	Critical care nursing	71	62.8%
	Trauma and emergency nursing	4	3.5%
	Degree	10	8.9%
	Diploma	21	18.6%
	Nursing education	1	0.9%
	Administration and education	5	4.4%
	Child health nursing	1	0.9%
Q6	Current nursing position		
	Professional nurse	109	96.4%
	Unit manager	2	1.8%
	Area manager	2	1.8%
	Nursing service manager	-	-
	Others (please specify)	-	-
Q7	Intensive Care Unit they work in		
	Multidisciplinary	33	29.2%
	Neurosurgery	23	20.4%
	Trauma	30	26.5%
	Cardio-thoracic	17	15.0%
	Coronary care unit	10	8.9%
Q8	Does the unit use physical restraints		
	Yes	113	100.0%
	No"	-	-

The majority of the nurse respondents were females as they accounted for more than three quarters of the sample. Of the total sample (n= 113), females accounted for 81.4 % (n=92) and males 18.6% (n=21). Findings in this study indicate that nursing is a profession dominated by females.

These findings are similar to a study in Canada, where Twomey and Medus (2016) indicated males accounted for less than 7% of the nursing workforce and to a study by Kalula and Petros (2016), where 89% of respondents were females. According to SANC statistics dated 31 December 2015, of the total number of 136 854 nurses, 90.9% (n=124 399) were females while 9.1% (n=12 455) were males, which indicates nursing is predominately a female profession. The results are presented in **Figure 4.1**

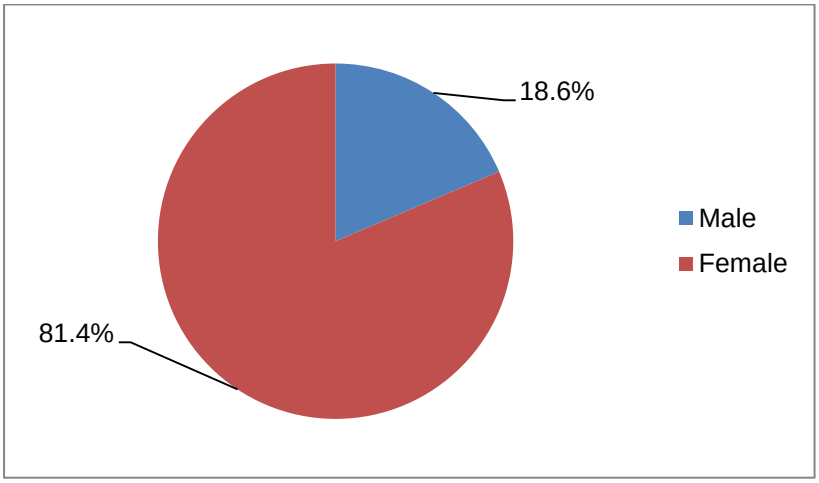


Figure 4.1 Gender of nurse respondents

In this study, 35.4% (n=40), which is the largest group, of nurse respondents were between the ages of 46 to 50 years, 32.7% (n=37) were in the ages of 36 to 45 years, 8.9% (n=10) were greater than 50 years and the least (2.7%; n=3) number of respondents were between 18 to 35 years. The young nurses accounted for only 23.0% (n=26) in ages between 18 to 35 years.

Findings from this study are consistent with the South African Nursing Council (SANC) statistics of 2016, where more than half of registered nurses (57%) in South Africa were aged between 40 and 59 years. It can be extrapolated from these study findings that majority of nurse respondents are slightly older. The results are presented in **Figure 4.2.**

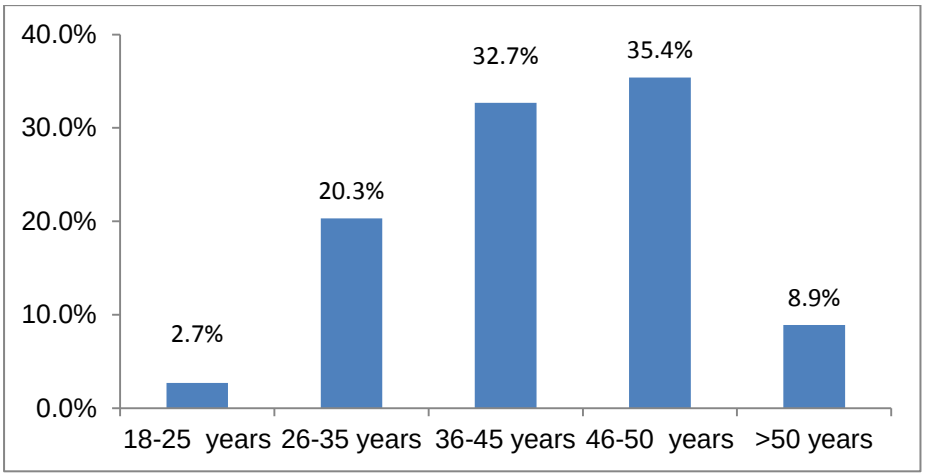


Figure 4.2 Age distribution of nurse respondents

Most (29.2%; n=33) of the nurse respondents in this study had 2 to 5 years of Intensive Care experience, followed by 23.9%(n=27) with6 to 10 years of ICU experience, with the least nurse respondents (9.8%; n=11) having more than 20 years' experience.

Findings from this study indicate that more than half of the nurse respondents (63.7%; n=72) had less than 10 years of Intensive Care experience compared to one Egyptian study of Kandeel and Attia (2013), where more than half the respondents (64%; n=98) had less than 5 years of ICU experience. It can be extrapolated from this study's findings that the nursing population is older regarding the age distribution but they have less Intensive Care experience. The results are presented in **Figure 4.3.**

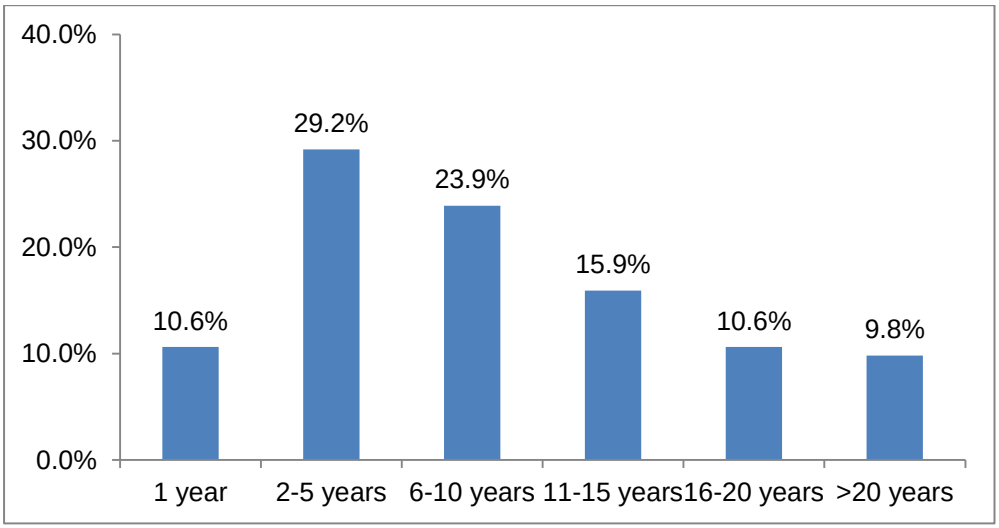


Figure 4.3 Distribution of years of intensive care experience

Of the total sample (n=113), the majority (77.9%; n=88) of nurse respondents held a diploma as their highest level of qualification in nursing, 17.7% (n=20) had a Bachelor degree, 3.5% (n=4) had a Master's degree and only one nurse respondent (0.9%; n=1) held a doctoral degree.

The findings of this study are not similar to those of Dolan and Lobby (2017), where the majority of participants (69%) had a Bachelor of Science degree in nursing. **Figure 4.4** presents the results.

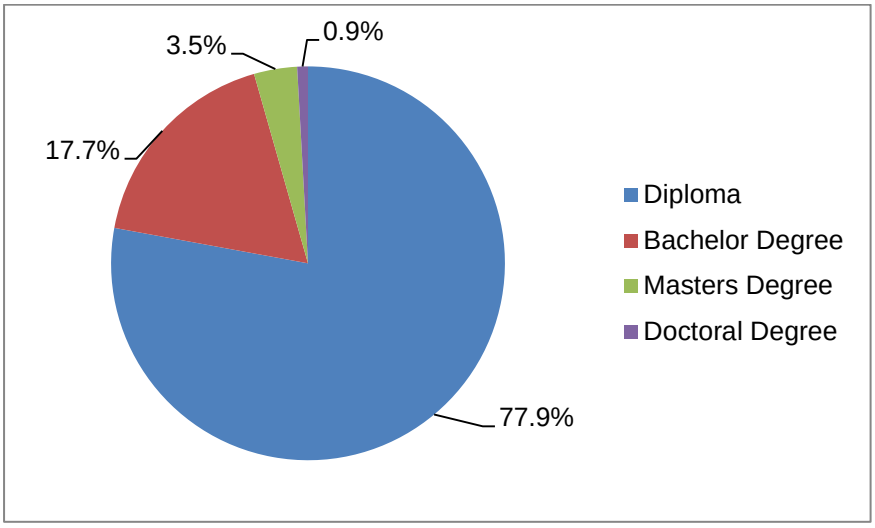


Figure 4.4 Level of qualification of nurse respondents

Of the respondents (n=113), the majority (62.8%; n=71) had Critical Care nursing as a course for their highest qualification and the least (0.9%; n=1) number had nursing education and child health nursing each as their highest qualification. This was an open-ended question and six categories were found. The results indicated there are more Critical Care nurses as the study was conducted in Intensive Care Units.

The largest (96.4%; n= 109) group of nurse respondents were professional nurses, and unit managers and area managers had a similar number of respondents (1.8%; n=2) each. Most of the nurse respondents (29.2%; n=33) practice in the Multi-disciplinary unit, then Trauma unit (26.5%; n=30), Neuro-surgery (20.4%; n=23), Cardiothoracic (15.0%; n=17) and lastly Coronary care unit (8.9%; n=10). The findings from this study indicate that all the ICUs of the tertiary academic hospital are well represented taking into consideration the staffing in each ICU. The results are presented in **Figure 4.5.**

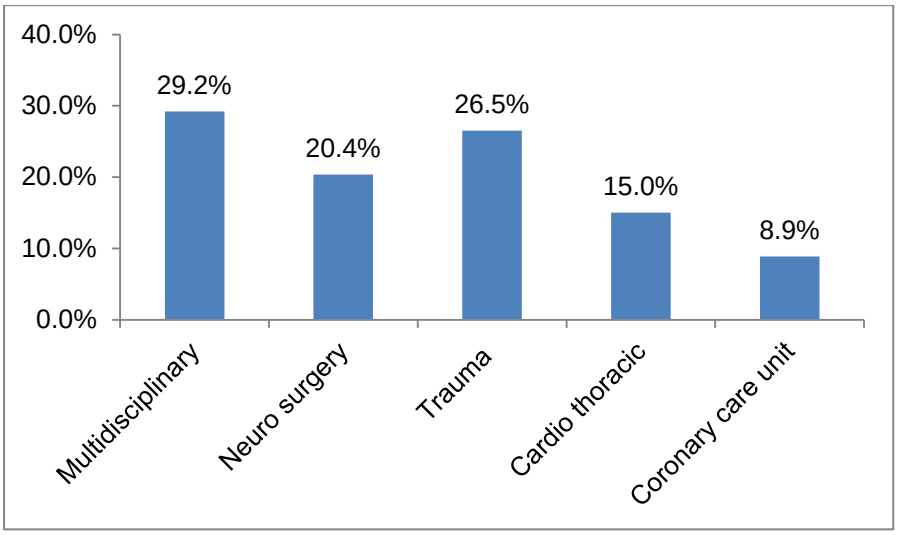


Figure 4.5 Distribution of nurse respondents ICU workplace

All the nurse respondents (n=113) indicated the units they were working in used physical restraints.

4.3.2 Section 2: Training and support

This section of the questionnaire relates to training and support, which comprised eight items. The items are linked depending on whether the respondents responded with a Yes or No in the previous item. Item 11b was an open-ended question; “respondents were to write comments about additional training or training they felt they needed in assessing the need for physical restraints if they responded to items 11 and 11a with a No.” This also applies to item 12b, “respondents were to write comments about additional training or training they felt they needed in the application of physical restraints if they responded to items 12 and 12a with a No.” The results for closed ended questions are summarised in **Table 4.2.**

Table 4.2 Training and support on the use of physical restraints

Item	Category	Frequency	Percentage
Q9	"Does the unit have written restraint policy?		
	Yes	47	41.6%
	No	55	48.7%
	Don't know	11	9.7%
Q10	If yes, I have read it (*n=47*)		
	All of it	20	42.6%
	Some of it	13	27.6%
	None of it	14	29.8%
Q11	Training in assessing the need for application of physical restraints		
	Yes	58	51.3%
	No	55	48.7%
Q11a	If yes, do you feel this training was adequate (*n=58*)		
	Yes	54	93.1%
	No	4	6.9%
Q12	Training in how to apply physical restraints		
	Yes	62	54.9%
	No	51	45.1%
Q12a	If yes, do you feel this training was adequate (*n=62*)		
	Yes	52	83.9%
	No"	10	16.1%

Item 9 enquired if the unit had a written policy on physical restraints; 48.7% (n=55) of respondents reported there was no written policy on physical restraints, 41.6% (n=47) of nurses respondents said yes, while 9.7% (n=11) reported they did not know. There is a written hospital policy on physical restraints at the tertiary academic hospital in Johannesburg where the study was conducted. Findings from this study indicate that more than half of the nurse respondents (58.4%; n=66) stated there was no written policy on physical restraints and they do not know whether there is such a policy.

In a study done in South Africa by Kalula and Petros (2016), 39% of nurses knew about hospital policy on physical restraints, which is comparable to this study's findings as 41.6% agreed there was a written policy on physical restraints. The results are presented in **Figure 4.6.**

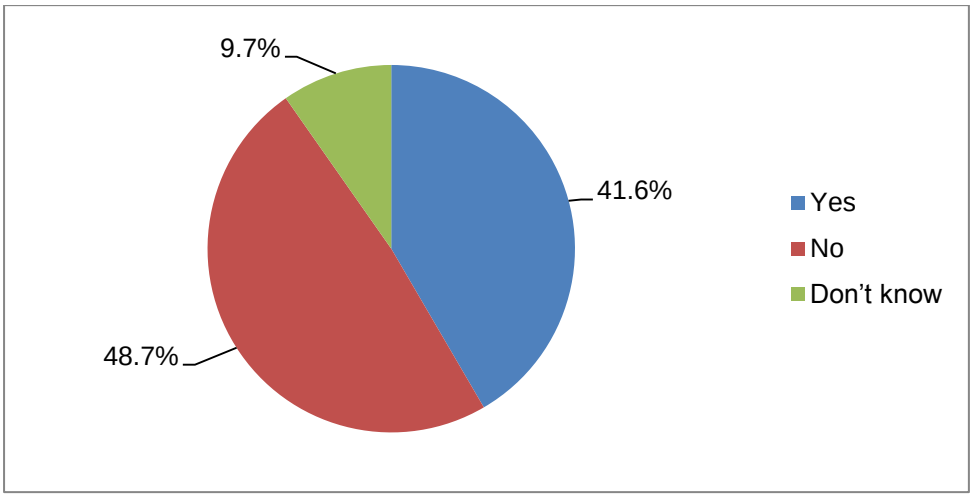


Figure 4.6 Respondents on availability of written policy on physical restraints in the unit.

Of the 47 nurse respondents who indicated there was a written policy on the use of physical restraints, (42.6%; n=20) had read all of the policy, 27.6% (n=13) had read some it and 29.8% (n=14) nurse respondents had not read it.

The findings from this study are similar as those by Freeman, Hallett and McHugh (2015), where the majority (78.4%; n=29), who indicated there was a physical restraints policy in place, had read the policy completely in hospital 1. It can be extrapolated from these findings that more than half (57.4%; n=27) knew about the hospital policy and had read some of it, but the others none of it, which is contrary to Freeman, Hallett and McHugh (2015),as more than half of the respondents had read the policy completely. **Figure 4.7** presents the results.

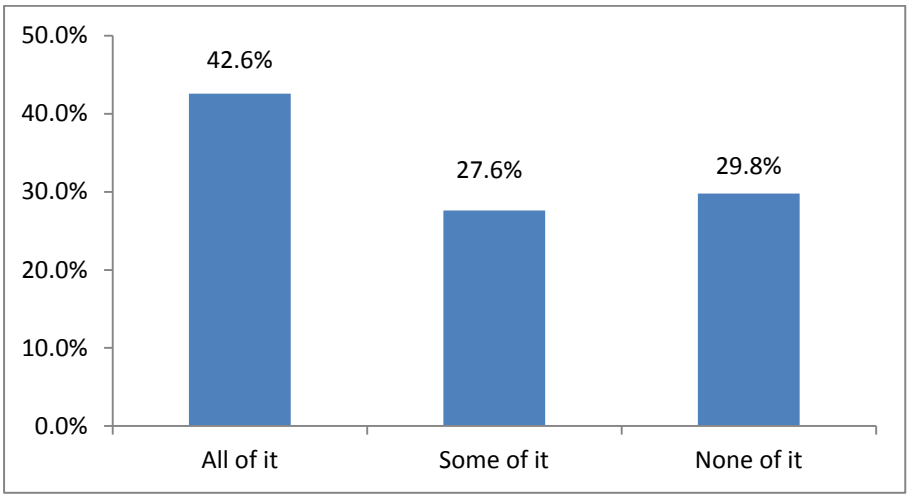


Figure 4.7 Respondents on "whether they have read physical restraint policy"

Item 11 enquired if the nurse respondents had training in assessing the need for the application of physical restraints. Of the total sample (n=113), 51.3% (n=58) indicated they had had training in assessing the need for the application of physical restraints, while 48.7% (n=55) indicated they had no training.

The findings from this study are comparable to a study by Freeman, Hallett and McHugh (2015), where the majority (64.7%, n=44) of the respondents had training in assessing the need for physical restraints. It can be extrapolated from this study that there is a marginal difference between the respondents who are trained and not trained, which is similar to Freeman, Hallett and McHugh's (2015) findings in hospital 2, as 58.6%(n=17) indicated they had had training while 41.4%(n=12) did not. Furthermore they found a major difference between the trained (64.7%; n=44) and untrained (35.3%; n=24) in the total number of respondents in the two hospitals which is not similar to this study. **Figure 4.8** presents the results.

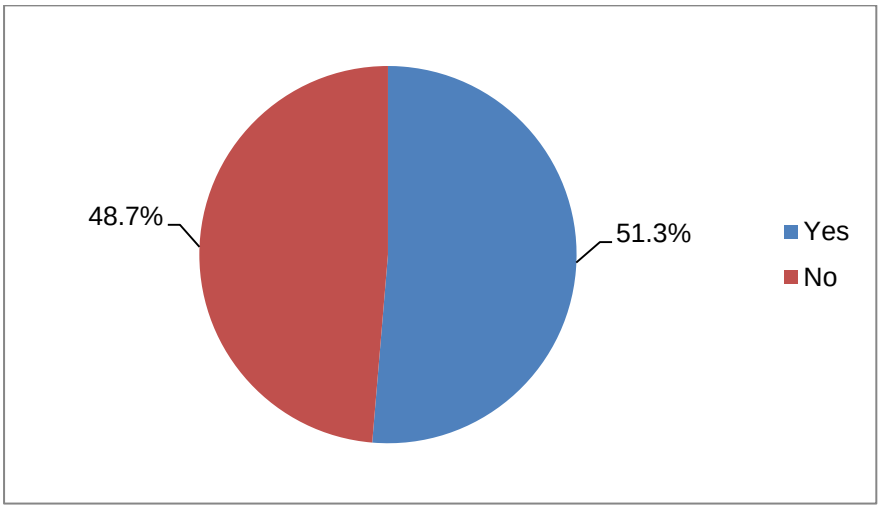


Figure 4.8 Nurses' responses on whether they had training in assessing the need for the application of physical restraints.

Of the 58 nurse respondents who had had training in assessing the need for application of physical restraints, an overwhelming majority (93.1%; n=54) agreed they felt the training was adequate, whilst 6.9% (n=4) felt the training was not adequate. **Figure 4.9** presents the results.

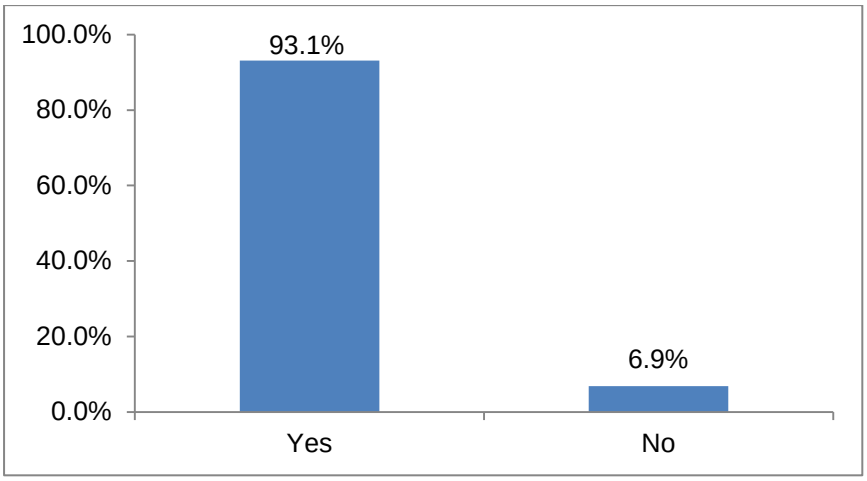


Figure 4.9 Adequacy of training in assessing the need for application of physical restraint.

Nurse respondents who responded with a **No** in items 11 (n=55) and 11a (n=4) were to write comments about additional training or training they felt they needed. The total number of responses was 59 and 10 categories were formed from these responses. The categories included; "*how*," "*when*," "*types*," "*indications*," "*interventions*," "*alternatives*," "*complications*," "*medical legal issues*," "*availability of policy*" and "*no training needed*." Most (23.7%; n=14) of the respondents identified the need for training on how to apply physical restraints on an ICU patient.

The findings from this study are comparable to a study by Freeman, Hallett and McHugh (2015), where the majority of respondents indicated there was a need for training on application of physical restraints. It can be extrapolated from this study, that there is a need for continuous training on the use of physical restraints.

Of the respondents (n=113), the more than half (54.9%; n=62) indicated they had had training in how to apply physical restraints, whilst 45.1% (n=51) indicated they had received no training.

These findings are not similar to those of Kalula and Petros (2016), where less than 15% of the nurses reported having had training in application of physical restraints. **Figure 4.10** presents the results.

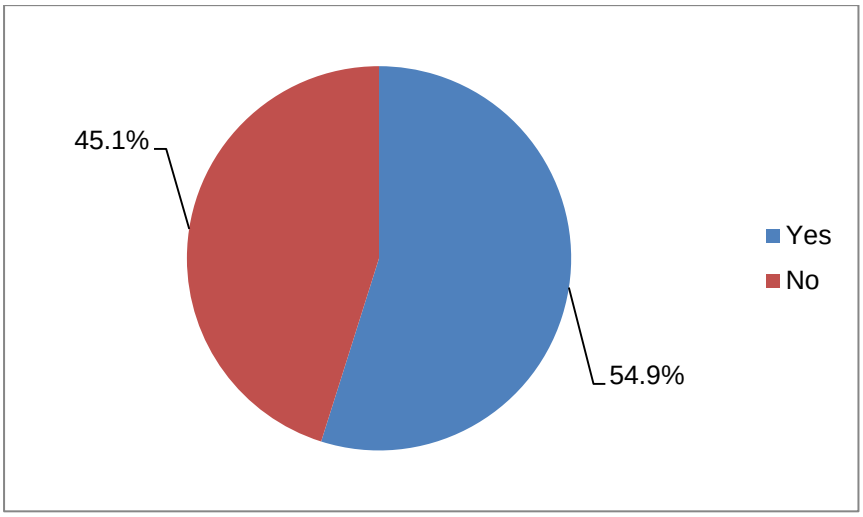


Figure 4.10 Nurses' responses on whether they had training on how to apply physical restraints.

Of the 62 respondents who indicated they had had training in how to apply physical restraints, an overwhelming majority (83.9%; n=52) agreed that the training was adequate, whilst 16.1% (n=10) indicated the training was not adequate. **Figure 4.11** presents the results.

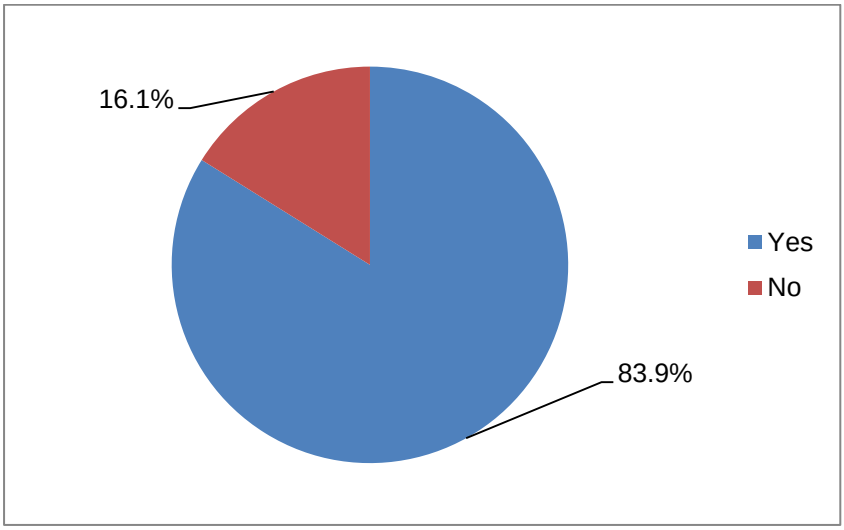


Figure 4.11 Respondents on adequacy of training

Nurse respondents who responded with a **No** for items 12(n=51) and 12a (n=10) were to write any comments about additional training or training they felt they needed. The total number of responses was 61 and 10 categories were formed from these responses, these are; "*patient assessment*," "*proper application*," "*indications,*" "*types,*" "*alternatives,*"

"*management of patient*," "*physical restraint policy,*" "*prescription by medical officers,*" "*complications*" and "*no training needed*." Most of the respondents (16.4%; n=10) indicated they needed training on complications of physical restraints, whilst 3.3% (n=2) indicated they required training on alternatives to physical restraints. It can be extrapolated from this study that there is a need for continuous training on the use of physical restraints.

4.3.3 Section Three: Use and application

This section of the questionnaire, which had five items, related to uses and application of physical restraints, contained open and closed-.ended questions. Items 13,13a and 13b were linked to each other depending on whether the respondents answered with a yes or no. In item 14, the respondents had to indicate if they were happy to discuss the use of physical restraints with families or visitors; further-more they had to expand on the answer if they so wished. The results for items 13, 13b1 and 14 are summarised in **Table 4.3**.

Table 4.3 Use and application of physical restraints.

Item	Category	Frequency	Percentage
Q13	"Is there a limited time that an individual patient can be physically restrained?		
	Yes	34	30.1%
	No	60	53.1%
	Not sure	19	16.8%
Q13b1	Is this time ever exceeded? (n=34)		
	Yes, often	28	82.4%
	Yes, sometimes	5	14.7%
	No, never	1	2.9%
Q14	Are you happy to discuss the use of physical restraints with families or visitors?		
	Yes, always	93	82.3%
	Yes, sometimes	17	15.0%
	No, never"	3	2.7%

The majority (53.1%; n=60) of nurse respondents indicated there was no time limit for an individual patient to be restrained in the unit, 30.1%(n=34) indicated there was a limited time that patients could be physically restrained, and 16.8%(n=19) were not sure whether or not there was a time limit. Findings from this study indicate that nurse respondents held different opinions on limited time that an individual patient could be restrained. **Figure 4.12** presents the results.

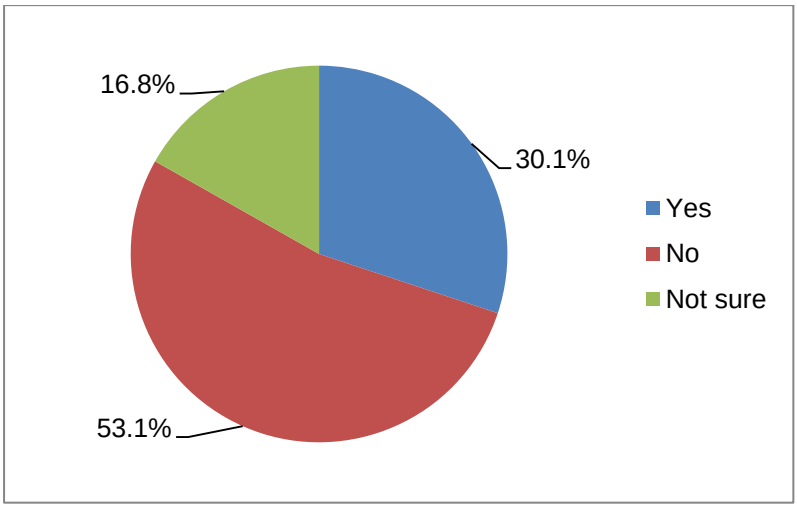


Figure 4.12 Respondents on limited time that an individual patient can be restrained

Of the 34 nurse respondents who indicated there was a limited time that an individual patient could be restrained, one fifth (20.6%; n=7) indicated the patient could be restrained for days and one respondent (2.9%; n=1) stated that the patient could be restrained for 20 minutes. The period the respondents indicated ranged from "*15 minutes to days*" and 9 categories were found.

Findings from this study are similar to those by Freeman, Hallett and McHugh (2015), where there was no agreement about the time that an individual patient could be restrained. It can be extrapolated from the study that there is no agreement on the maximum of time that a patient could be physically restrained.

An overwhelming majority (82.4%; n=28) of the nurse respondents indicated that this time was often exceeded, while 14.7% (n=5) indicated it was exceeded sometimes and only one (2.9%; n=1) indicated the time is never exceeded.

Comparing these findings to Freeman, Hallett and McHugh (2015), there are no similarities because the majority (56.2%; n=9) indicated that the time was exceeded sometimes and the least number of respondents (12.5%; n=2) indicated the time is often exceeded. **Figure 4.13** presents the results.

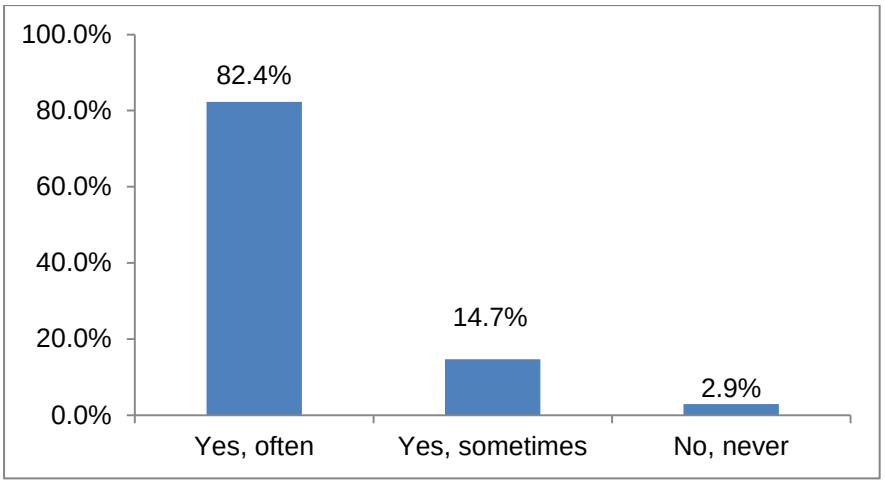


Figure 4.13 Respondents on whether the maximum time a patient could be in physical restraints was ever be exceeded

The 33 respondents who indicated that the maximum time a patient can be physically restrained is yes-often (n=28) and sometimes (n=5) exceeded, were to outline the reasons this occurred. Eight categories were found; "*restless*," "*confusion*," "*aggressive,*" "*avoid self-extubation*," "*patient condition differs*," "*inadequate sedation*," "*staff busy*" and "*staff shortage*." Almost one third (30.3%; n=10) of nurse respondents indicated that this time was exceeded because the patient was restless, followed by 24.2% (n=8), who indicated that time is exceeded in order to avoid self-extubation. Shortage of staff and when staff were busy was noted by least respondent (3.0%; n=1) each.

These findings were similar to Freeman, Hallett and McHugh's (2015) as two participants indicated that time was exceeded mostly when there was a shortage of staff which lead to poor staff ratios. It can be extrapolated from the findings that the time is exceeded mainly for the patients' safety.

Of the total sample (n=113), the majority (82.3%; n=93) indicated they were always happy to discuss the use of restraints with families or visitors, whilst 2.7% (n=3) indicated they were never happy to do so.

The findings are not similar to those of Freeman, Hallett and McHugh (2015), as all their respondents were happy to discuss the use of physical restraints with families or visitors. Comparing the findings to a study by Eskandara *et al*. (2017) the majority (68.9%; n=213) indicated they never discuss with relatives or visitors the reasons for use of physical restraint which is not similar to this study's findings. **Figure 4.14** presents the results.

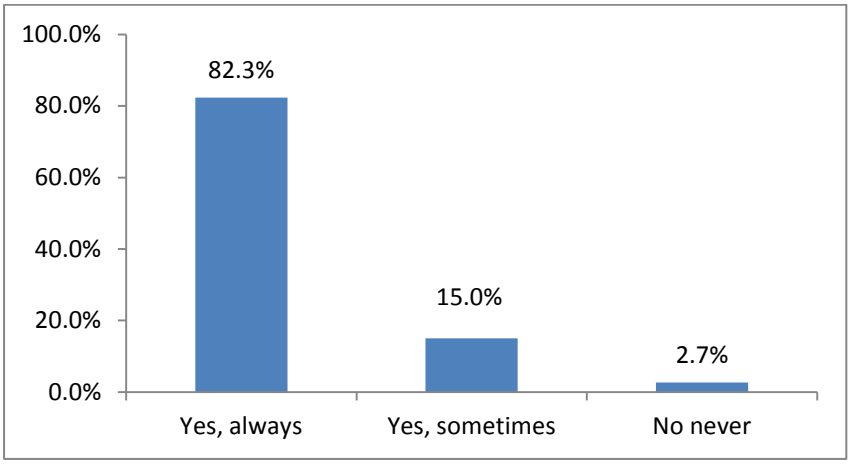


Figure 4.14 Nurses' responses to discussing the use of physical restraints with families or visitors.

Nurse respondents were to expand on their answers, if they wished, regarding discussing the use of physical restraints with families or visitors. Eighty-three nurses responded to the question and five categories were identified; "*reasons for using them*," "*alleviate the family members concerns,*" "*opinions of relatives*," "*do not discuss because of lack of prescription*" and "*do not discuss because of lack of confidence to handle the relatives.*" More than half of the respondents (61.4%; n=51) explained that the family members should know the reasons for application of physical restrained and 35.0% (n=29) explained that discussing the use of physical restraints with families or visitors would alleviate their concerns. The least number of respondents (1.2%; n=1) explained that lack of prescription by doctors makes it difficult to discuss with relatives, while the other one indicates lack of confidence to handle relatives.

Freeman, Hallett and McHugh (2015) found most of their respondents indicated that the uses of physical restraints were for patients' safety and they were confident in discussing with family and relatives. In their study, some respondents had negative experiences because of the impact of physical restraints on family; one respondent indicated that physical restraints were distressing to family members and they could not cope with seeing their loved ones being restrained.

Question 15 gathered information on whether the respondents agreed or disagreed with the 12 statements about the use of physical restraints in Critical Care. The statements were on a 5 point Likert scale. The scale rating was as follows: strongly agree=1, agree =2, neither

agree nor disagree=3, disagree =4 and strongly disagree=5. During data capture the scale was reversed as follows: strongly agree=5, agree=4, neither agree nor disagree=3, disagree=4 and strongly disagree=1. **Table 4.4** summarised the findings from the 12 statements.

Table 4.4 Respondents on how much they agreed or disagreed with the statements about the uses of physical restraints by ICU nurses.

Item	Statement	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree	
		f	%	f	%	f	%	f	%	f	%
Q15a	"By using physical restraints a patient's sedation can be reduced safely	45	39.8%	39	34.5%	11	9.7%	7	6.3%	11	9.7%
Q15b	It is preferable to use physical restraints rather than increase the patient' sedation	23	20.4%	36	31.8%	21	18.6%	14	12.4%	19	16.8%
Q15c	The use of physical restraints allows for other duties to be completed	11	9.7%	41	36.3%	14	12.4%	23	20.4%	24	21.2%
Q15d	Medical staff are more keen to suggest the use of physical restraints than the nursing staff	6	5.3%	12	10.6%	25	22.1%	54	47.8%	16	14.2%
Q15e	Physical restraint is prescribed and applied unnecessarily	23	20.4%	20	17.7%	21	18.6%	37	32.7%	12	10.6%
Q15f	Getting a colleague to hold the patient's hand is preferable to using physical restraints when nursing care is required	12	10.6%	23	20.4%	25	22.1%	35	31.0%	18	15.9%

Table 4.4 continued

Item	Statement	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree	
		f	%	f	%	f	%	f	%	f	%
Q15g	Physical restraint as a management option has to be suggested as medical staff would not think of it.	10	8.8%	36	31.9%	27	23.9%	30	26.6%	10	8.8%
Q15h	Physical restraint is used more when we are short staffed	4	3.5%	14	12.4%	4	3.5%	40	35.4%	51	45.2%
Q15i	Physical restraints are sometimes applied without prescription	34	30.1%	46	40.7%	8	7.1%	14	12.4%	11	9.7%
Q15j	Patient sometimes end up re-sedated even when we use physical restraints	13	11.5%	72	63.7%	12	10.6%	9	8.0%	7	6.2%
Q15k	Families don't appear to mind the use of physical restraints as they know it is for the patient's safety	11	9.7%	35	31.0%	33	29.2%	24	21.3%	10	8.8%
Q15l	I do not believe in the use of physical restraints with patients in ICU"	3	2.6%	8	7.1%	26	23.0%	33	29.2%	43	38.1%

During data interpretation, the respondents who strongly agreed and agreed were grouped as one, as well as those who disagreed and strongly disagreed to the statements.

The majority (74.3%; n=84) of respondents agreed with the statement that “by using physical restraints a patients’ sedation can be reduced.”

Comparing this study’s findings to a study by Freeman, Hallett and McHugh (2015), of the total sample (n=73), the majority (57.5%; n=42) agreed to the above statement, which is similar to this study.

Of the total sample (n=113), more than half (52.2%; n=59) of the respondents indicated “it was preferable to use physical restraints rather than increase the patients sedation.”

These findings were similar to Freeman, Hallett and McHugh’s (2015) study, as 52.1% (n=38) of their respondents also agreed that physically restraining a patient allows nurses to decrease the amount of sedation given. Hofsø and Coyer (2007) also indicated the ideal treatment in ICU was the reduction of sedation as soon as possible in order to reduce complications.

There was almost a balance of scores from respondents who agreed and disagreed that “the use of physical restraints allowed for other duties to be completed,” of the total sample (n=113), 46.0% (n=52) agreed, 41.6% (n=47) disagreed and 12.4% (n=14) neither agreed nor disagreed.

These study findings are not similar to those of Freeman, Hallett and McHugh (2015), where 50.6% (n=37) disagreed verses 35.6% (n=26) who agreed. It can be extrapolated from the findings that the responses to this statement were dispersed across the scales 1, 2, 4 and 5 with 3 having fewer responses.

There was a strong majority (62.0%; n=70) of respondents who disagreed with the statement which claimed that “medical staff are more keen to suggest the use of physical restraints than the nursing staff,” followed by 22.1% (n=25) whom neither agreed nor disagreed and lastly 15.9% (n=18) who did agreed.

Freeman, Hallett and McHugh (2015) found similar findings, as their majority (58.9%; n= 43) disagreed, 39.7% (n=29) neither agreed nor disagreed and 1.4% (n=1) agreed to the statement. Choi and Song (2003) indicated that most often nurses are the ones who decide

to physically restrain the patient, and sometimes because of verbal instruction from a physician.

There was a small difference between the respondents who agreed (38.1%; n=43) and disagreed (43.3%; n=49) that “physical restraints were prescribed and applied unnecessarily.”

This findings was similar to Freeman, Hallett and McHugh (2015) in terms of the majority (83.6%; n=61) disagreeing with the statement, but there was no similarity between the respondents who agreed and disagreed, in their study only (5.5%; n=4) agreed to the statement.

The (46.9%; n=53) of the nurses disagreed that “getting a colleague to hold the patients hand was preferred to using physical restraints when nursing care is required,” while 31.0%(n=35) agreed and 22.1%(n=25) neither agreed nor disagreed.

These findings are not similar to Freeman, Hallett and McHugh (2015) as their majority (46.5%; n=34) was in agreement with the statement.

There are only a few respondents (40.7%; n=46) who agreed compared to those that disagreed (35.4%; n=40) with the statement regarding “physical restraints being a management option suggested by nurses, as medical staff would not think about it.” Only 23.9% (n=27) of the respondents neither agreed nor disagreed.

This study’s finding was not similar to Freeman, Hallett and McHugh (2015), where the majority (50.7%; n=37) disagreed with the statement and there was a major difference between respondents who agreed (19.25; n=14) and disagreed (50.7%; n=37). It can be extrapolated from this study’s finding that responses to this statement were dispersed across the scale.

There was a strong majority (80.5%; n=91) in disagreement that “physical restraints are used more often when there is shortage of staff.” Freeman, Hallett and McHugh (2015) found similar results, as their majority (72.6%; n=53) disagreed with the statement.

There was an overwhelming (70.8%; n=80) agreement that “physical restraints are sometimes applied without prescription.” These findings were not similar to those in a study

by Freeman, Hallett and McHugh (2015), where the majority (46.6%; n=34) of their respondents disagreed with the statement.

The majority (75.2%; n=85) of respondents agreed that “patients sometimes end up re-sedated, even when physical restraints are used.” Sixteen (14.2%) disagreed with the above statement while 10.6% (n=12) neither agreed nor disagreed.

This study’s findings were similar to a study by Freeman, Hallett and McHugh (2015), where the majority (50.6%, n=37) agreed to the above statement, but there was a difference in terms of distribution of responses. In their study 15.1% (n=11) disagreed and 34.2% (n=25) neither agreed nor disagreed.

Of total sample (N=113), 40.7% (n=46) agreed, 30.1% (n=34) disagreed and 29.2% (n=33) neither agreed nor disagreed that “families do not mind the use of physical restraints as they know it’s for the patient’s safety.”

This study’s findings are similar to the study by Freeman, Hallett and McHugh (2015) in that majority (76.7%; n=56) agreed, and dissimilar because there was no response for disagreement and 23.3% (n=17) neither agreed nor disagreed to the statement. It can be extrapolated from this study finding that the responses to the statement were dispersed across the scale.

The majority (67.3%; n=76) of respondents disagreed with the statement that “they do not believe in the use of physical restraints with patients in ICU,” 23% (n=26) neither agreed nor disagreed while 9.7% (n=11) agreed.

Findings from the study were similar to Freeman, Hallett and McHugh (2015), as the majority (89.0%; n=65) disagreed. In their study, there was no response for agreement to the statement and 11.0% (n=8) neither agreed nor disagreed. **Figure 4.15** presents the results for question 15.

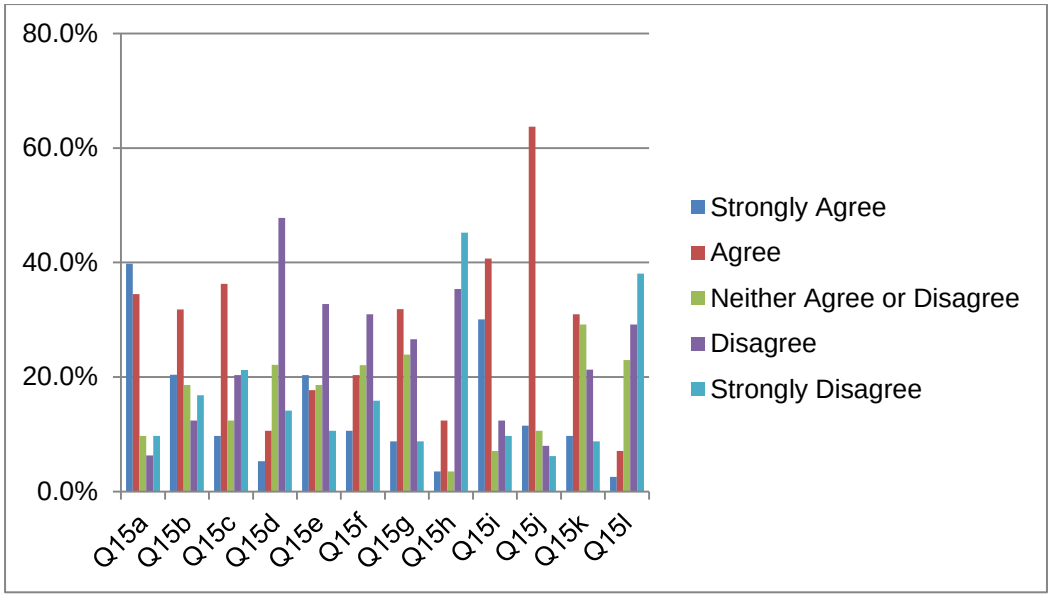


Figure 4.15 Responses on how much respondents agreed and disagreed with the statements about the uses of physical restraints by ICU nurses.

4.3.4 Section Four: Uses of physical restraints in Critical Care

This section allowed the respondents to expand on their responses if they so wished and had three open-ended questions on the uses of physical restraint in Critical Care. Not all the respondents completed this section; question 16 was completed by 78 respondents, question 17 by 87 respondents and question 18 by 57 respondents.

Question 16 enquired about what respondents thought about the use of physical restraints in Critical Care. Twelve categories were found from the responses; "*prevent self-extubation*," "*patient safety*," "*necessary,*" "*prevent medico-legal hazards*," "*need for prescription by doctors*," "*enable nurses to assess the patient level of consciousness*," "*used when nurses are busy*," "*prevent nursing staff exhaustion*," "*used to reduce patient's sedation*," "*patients not responding to sedation,*" "*overused*" and "*should be banned*." More than one third (39.7%; n=31) of respondents indicated physical restraints were used to prevent self-extubation (to prevent accidental removal of the endotracheal tube), followed by 21.8% (n=17) who indicated they were for patient's safety and 16.6% (n=13) indicated they were necessary in the ICU when used correctly with no complications.

These findings were similar to the study by Freeman, Hallett and McHugh (2015), where the majority of respondents indicated it was necessary to use physical restraints in the Critical Care settings for patient safety, but in the best interest and with adequate assessment. Luk *et al.* (2015) found the most common (66%; n=111) reason for application of physical

restraints was pulling at the endotracheal tube and other lines (patient's safety), which is similar to the findings from this study. In contrary to the findings of this study, Kalula and Petros (2016) found the majority of respondents indicated that physical restraints made it easier to monitor the patents healing process.

The majority (83.9%; n=73) of respondents indicated they preferred "*sedation*" for the management of agitated patients if they don't use physical restraint, 12.6%(n=11) stated "*counselling and orientating the patient to the ward*," 2.3%(n= 2) indicated "*there was no other way except to physically restraint the patient*" and 1.2%(n=1) stated that they would "*ask the close relative to stay with the patient*."

These findings were not similar to the study by Freeman, Hallett and McHugh (2015), as the majority of their respondents preferred talking to the patient, orientation and holding hands as an alternative measure when not using physical restraints and explained the risk for over sedation. Four respondents in their study noted the involvement of relatives compared to one in this study finding. Comparing this study findings to Luk *et al*. 2015, the majority (27%; n=26) preferred communication, which included reorientation, and sedation (21%; n=20) was the second best alternative measure when not using physical restraints.

In relation to issues related to physical restraints usage, most (61.4%; n=35) of the respondents felt "there *was a need for proper management of patients on physical restraints,*" "*followed by training on how to use physical restraints*" (12.2%; n=7). The other respondents indicated that "*families do not agree with the use of physical restraints*" (8.7%; n=5), 5.2% (n=3) were "*concerned that doctors prescribe verbally*" while 3.5% (n=2) indicated "*there was need for a physical restraint policy*." The other categories that had one respondent each were; "*need for prescription by doctors*," "*should be included in the ICU chart*," "*they make the patient irritable*," "*ethical concerns*" and "*unnecessary to be used in ICU*."

This study's findings were similar to those of Freeman, Hallett and McHugh (2015), where the majority of respondents felt there was knowledge deficit about the use of restraints, and the application and the documentation was not done properly. In their study, they found that nursing staff needed support from medical staff in order to decide on the use of physical restraints.

4.3.5 Descriptive statistics used to determine the comparative and associations of the three variables.

The 12 statements concerning the "attitude and opinions of nurses regarding physical restraints" were compared and associated with three variables in the questionnaire. The three variables were "years of ICU experience, availability of written policies and having had training" in the latter. In instances where the chi-square test or Fischer's Exact test for the comparison of the variables had a significant p-value ($p < 0.05$), an association using nominal (unadjusted) and multinomial (adjusted) logistic regression models was used to determine the association. The outcomes for the associations were categories in agree, neutral and disagree.

4.3.5.1 The years of ICU experience and "the attitudes and opinions on the use of physical restraints."

The demographic data of years of experience of respondents were grouped into two groups and was for the comparisons and associations. The groups were <10 years and >10 years of experience. From the total population (N=113) in this study, 72 respondents were in the <10 years and 41 in the>10 years of experience (refer to Table: 4.6).

Table: 4.5 Years of experience

Years of experience	Numbers: (n)	Percentages: %
< 10 years of experience	72	63.7
>10 years	41	36.3

Table 4.6 Comparison of proportions between ICU nurses' years of ICU experience and "their attitudes and opinions on the use of physical restraints."

Statement	Response	</= 10 years (n=72)		>10 years (n=41)		p-value
		n	%	n	%	
"By using physical restraints a patient's sedation can be reduced safely	Agree (n=84)	52	61.9	32	38.1	0.849
	Neither agree nor disagree (n=11)	8	72.7	3	27.3	
	Disagree (n=18)	12	66.7	6	33.3	
It is preferable to use physical restraint rather than increase the patient's sedation	Agree (n=59)	40	67.8	19	32.2	9.451
	Neither agree nor disagree (n=21)	11	52.4	10	47.6	
	Disagree (n=33)	21	63.6	12	36.4	
The use of physical restraint allows for others duties to be completed	Agree (n=52)	34	65.4	18	36.6	0.106
	Neither agree nor disagree (n=14)	12	85.7	2	14.3	
	Disagree (n=47)	26	55.3	21	44.7	
Medical staff are more keen to suggest the use of physical restraints than the nursing staff	Agree (n=18)	14	77.8	4	22.2	0.190
	Neither agree nor disagree (n=25)	18	72.0	7	28.0	
	Disagree (n=70)	40	57.1	30	42.9	
Physical restraint is prescribed and applied unnecessarily	Agree (n=43)	28	65.1	15	34.9	0.072
	Neither agree nor disagree (n=21)	9	42.9	12	57.1	
	Disagree (n=49)	35	71.4	14	28.6	
Getting a colleague to hold the patients hand is preferable to using physical restraint when nursing care is required"	Agree (n=35)	26	74.3	9	25.7	0.113
	Neither agree nor disagree (n=25)	12	48.0	13	52.0	
	Disagree (n=53)	34	64.2	19	35.8%	

Key: *=statistical significance

Table 4.6continued

Statement	Response	</=10 years (n=72)		>10 years (n=41)		p-value
		n	%	n	%	
"Physical restraint as a management option has to be suggested as medical staff would not think of it	Agree (n=46)	29	63.0%	17	37.0%	0.080
	Neither agree nor disagree (n=27)	13	48.1%	14	51.9%	
	Disagree (n=40)	30	75.0%	10	25.0%	
Physical restraint is used more when we are short staffed	Agree (n=18)	14	77.8%	4	22.2%	0.426
	Neither agree nor disagree (n=4)	3	75.0%	1	25.0%	
	Disagree (n=91)	55	60.4%	36	39.6%	
Physical restraint is sometime applied without prescription	Agree (n=80)	49	61.3%	31	38.7%	0.429
	Neither agree nor disagree (n=8)	7	87.5%	1	12.5%	
	Disagree (n=25)	16	64.0%	9	36.0%	
Patients sometimes end up re-sedated even when we use physical restraint	Agree (n=85)	30	65.2%	16	34.8%	0.644
	Neither agree nor disagree (n=12)	13	39.4%	20	60.6%	
	Disagree (n=16)	29	85.3%	5	14.7%	
Families do not appear to mind the use of physical restraint as they know it's for the patients safety	Agree (n=46)	8	72.7%	3	27.3%	**0.000***
	Neither agree nor disagree (n=33)	9	34.6%	17	65.4%	
	Disagree (n=34)	55	72.4%	21	27.6%	
I do not believe in the use of physical restraints with patients in ICU"	Agree (n=11)	30	65.2%	16	34.8%	**0.002***
	Neither agree nor disagree (n=26)	13	39.4%	20	60.6%	
	Disagree (n=76)	29	85.3%	5	14.7%	

Key: *=statistical significance

The results show a significant difference in ICU nurses' responses to the statement, "*Families don't appear to mind the use of physical restraint as they know it's for the patients' safety"* (p<0.001), based on their years of experience. Of ICU nurses with less than 10 years of experience, 72.4% (n=55) disagreed to the statement compared to27.6% (n=21)with more than 10 years of experience. There was 65.4% (n=17) of ICU nurses with more than 10 years of experience who were neutral about the same statement compared to 34.6% (n=9) with less than 10 years of experience. There was 72.7% (n=8) of ICU nurses with less than 10 years of experience who agreed to the statement on "families not appearing to mind the use of physical restraint" compared to 27.3% (n=3) of ICU nurses with more than 10 years of experience.

The results show a significant difference in ICU nurses responses to the statement that: "*I do not believe in the use of physical restraints with patients in ICU"* (p=0.002) based on their years of experience. There was 60.6%(n=20) of ICU nurses with more than 10 years of experience who were neutral to the statement on believing in the use of physical restraint in ICU compared to 39.4%(n=13) of ICU nurses with less than 10 years of experience. There were more 85.3% (n=29) ICU nurses with less than 10 years of experience who disagreed to the statement in comparison to 14.7% (n=5) ICU nurses with less than 10 years of experience who also disagreed. There was65.2% (n=30) of ICU nurses with less than 10 years of experience who agreed to the statement compared to 34.8% (n=16) of ICU nurses with less than 10 years of experience.

Table 4.7: The association between ICU nurses' years of experience and their attitudes and opinions on the statement: "*Families do not appear to mind the use of physical restraint as they know it's for the patients' safety*."

	Unadjusted		**Adjusted**	
	OR (95% Confidence interval)	**p-value**	**OR (95% Confidence interval)**	**p-value**
Years of experience (base≤ 10 years)				
≥ 10 years	-1.13 (-2.56 - 0.00)	0.049	-1.01 (-2.15 - 0.14)	0.087
Adjusted= adjusted for reports on availability of written policy on physical restraint and reports on having training in assessing the need for the application of physical restraint				

Key: OR = Odds Ratio

The table shows ICU nurses with more than 10 years of experience were less likely (Coefficient: -1.13 (-2.56 - 0.00),to disagree or be neutral than agree to the statement: "Families don't appear to mind the use of physical restraint as they know it's for the patients' safety" compared to nurses with less than 10 years of experience (p=0.049). However, when adjusting for ICU nurses reports on the availability of policy on physical restraint and having training in assessing the need for the application of physical restraint, there was no association between ICU nurses' years of experience and their attitudes and opinions on the statement above.

Table 4.8: The association between ICU nurses' years of experience and their attitudes and opinions on the statement "*I do not believe in the use of physical restraints with patients in ICU."*

	Unadjusted		**Adjusted**	
	OR (95% Confidence interval)	**p-value**	**OR(95% Confidence interval)**	**p-value**
Years of experience (base≤ 10 years)				
≥ 10 years	0.02 (-1.40 – 1.44)	0.980	0.13 (-1.33 – 1.59)	0.860
Adjusted= adjusted for reports on availability of written policy on physical restraint and reports on having training in assessing the need for the application of physical restraint				

Key: OR= Odds Ratio

The table shows that for both the univariate and multivariate models, there was no association between ICU nurses' years of experience and their attitudes and opinions on the statement "I do not believe in the use of physical restraints with patients in ICU" as shown by the adjusted multinomial regression model (p>0.05).

4.3.5.2The availability of any written policy present in ICU units and "the attitudes and opinions on the use of physical restraint."

The nurses' reports on the availability of a written policy on physical restraints were categorised into three responses being, yes, no and I do not know. The number of responses for the mentioned categories were yes (n=47), no (n= 55) and 11 don't know.
(Refer to table: 4.9.)

Table 4.9: Comparison of the proportions between ICU nurses reports on availability of written policy on physical restraint and their "attitudes and opinions on the use of physical restraint."

Statement	Response	Yes		No		Don't know		p-value
		n	%	n	%	n	%	
"By using physical restraints a patient's sedation can be reduced safely	Agree (n=84)	36	42.9%	39	46.4%	9	10.75	0.861
	Neither agree nor disagree (n=11)	3	27.3%	7	63.6%	1	9.1%	
	Disagree (n=18)	8	44.4%	9	50.0%	1	5.6%	
It is preferable to use physical restraint rather than increase the patient's sedation	Agree (n=59)	26	44.1%	27	45.8%	6	10.1%	0.419
	Neither agree nor disagree (n=21)	5	23.8%	14	66.7%	2	9.5%	
	Disagree (n=33)	16	48.5%	14	42.4%	3	9.1%	
The use of physical restraint allows for others duties to be completed	Agree (n=52)	24	46.2%	22	42.4%	6	11.5%	0.142
	Neither agree nor disagree (n=14)	4	28.6%	6	42.8%	4	28.6%	
	Disagree (n=47)	19	40.4%	27	57.5%	1	2.1%	
Medical staff are more keen to suggest the use of physical restraints than the nursing staff	Agree (n=18)	6	33.3%	10	55.6%	2	11.1%	0.156
	Neither agree nor disagree (n=25)	7	28.0%	13	52.0%	5	20.0%	
	Disagree (n=70)	34	48.6%	32	45.7%	4	5.7%	
Physical restraint is prescribed and applied unnecessarily	Agree (n=43)	22	51.2%	17	39.5%	4	9.3%	0.147
	Neither agree nor disagree (n=21)	4	19.0%	14	66.7%	3	14.3%	
	Disagree (n=49)	21	42.9%	24	49.0%	4	8.1%	
Getting a colleague to hold the patients hand is preferable to using physical restraint when nursing care is required"	Agree (n=35)	13	37.1%	17	48.6%	5	14.3%	0.112
	Neither agree nor disagree (n=25)	6	24.0%	16	64.0%	3	12.0%	
	Disagree (n=53)	28	52.8%	22	41.5%	3	5.7%	

Key: *=statistical significance

Table 4.9 continued

Statement	Response	Yes		No		Don't know		p-value
		n	%	n	%	n	%	
"Physical restraint as a management option has to be suggested as medical staff would not think of it	Agree (n=46)	17	37.0%	24	52.2%	5	10.85	0.893
	Neither agree nor disagree (n=27)	11	40.7%	13	48.2%	3	11.1%	
	Disagree (n=40)	19	47.5%	18	45.0%	3	7.5%	
Physical restraint is used more when we are short staffed	Agree (n=18)	9	50.0%	8	44.4%	1	5.6%	0.662
	Neither agree nor disagree (n=4)	3	75.0%	1	25.0%	0	-	
	Disagree (n=91)	35	38.5%	46	50.5%	10	11.0%	
Physical restraint is sometime applied without prescription	Agree (n=80)	28	35.0%	42	52.5%	10	12.5%	0.084
	Neither agree nor disagree (n=8)	5	62.5%	2	25.0%	1	12.5%	
	Disagree (n=25)	14	56.0%	11	44.0%	0	-	
Patients sometimes end up re-sedated even when we use physical restraint	Agree (n=85)	33	38.8%	43	50.6%	9	10.6%	0.263
	Neither agree nor disagree (n=12)	7	58.3%	3	25.0%	2	16.7%	
	Disagree (n=16)	7	43.8%	9	56.2%	0	-	
Families do not appear to mind the use of physical restraint as they know it's for the patients safety	Agree (n=46)	19	41.3%	21	46.7%	6	13.0%	0.259
	Neither agree nor disagree (n=33)	10	30.3%	21	63.7%	2	6.0%	
	Disagree (n=34)	18	52.9%	13	38.3%	3	8.8%	
I do not believe in the use of physical restraints with patients in ICU"	Agree (n=11)	7	63.6%	4	36.4%	0	-	**0.000***
	Neither agree nor disagree (n=26)	2	7.7%	22	84.6%	2	7.7%	
	Disagree (n=76)	38	50.0%	29	38.2%	9	11.8%	

Key: *=statistical significance

The results show a significant difference in ICU nurses responses to the statement "*I do not believe in the use of physical restraints with patients in ICU"* (p=0.000), based on their reports on the availability of written policy on physical restraint. There were(50.0%) more ICU nurses who answered 'yes' to the availability of written policy on physical restraint who disagreed compared to those ICU nurses who answered 'no' (38.2%) or 'I do not know' (11.8%) to the availability of written policy on physical restraint who also disagreed. There were (84.6%) more ICU nurses who answered 'no' to the availability of written policy on physical restraint who were neutral to the above statement compared to ICU nurses who answered 'yes' (7.7%) or 'I do not know' (7.7%) to the availability of written policy on physical restraint and were also neutral.

Table 4.10: The association between ICU nurses' reports on availability of written policy on physical restraint and statement "*I do not believe in the use of physical restraints in ICU patients."*

	Unadjusted		**Adjusted**	
	OR(95% Confidence interval)	**p-value**	**OR(95% Confidence interval)**	**p-value**
Reports on availability of written policy on physical restraint (base=no)				
Yes	2.67 (-4.19--1.14)	0.001	-1.23 (-2.86-0.40)	0.140
I don't know	-2.61 (-4.18--1.05)	0.001	0.17 (-1.19-1.53)	0.805
Adjusted= adjusted for years of experience on physical restraint and reports on having training in assessing the need for the application of physical restraint				

Key: OR= Odds Ratios

ICU nurses who answered 'yes' to the availability of written policy on physical restraint, were twice more likely to disagree, or be neutral, than agree to the statement "I do not believe in the use of physical restraints with patients in ICU," than those who answered 'no'. Adjusting for years of experience and reports on having training in assessing the need for the application of physical restraints, there was no significant association between ICU nurses' reports and their attitudes and opinions (p=0.140).

The table also show those who answered 'I do not know,' to the availability of written policy on physical restraint, were less likely to disagree, or be neutral, than to agree with the above statement than nurses who answered 'no'. Adjusting for years of experience and reports on having training in assessing the need for the application of physical restraint there was no

significant association between ICU nurses' reports and their attitudes and opinions on the statement above (p=0.805).

4.3.5.3 ICU nurses reports on having training in assessing the need for the application of physical restraints and their "attitudes and opinions on the use of physical restraints."

The respondent's responses to the above statement were categorised into two categories for statistical analysis. The two categories were either (Yes) or (No). The results for those that answered No was n= 58 and the Yes was n=55. Refer to **Table 4.11**

Table 4.11 Comparison of the proportions between ICU nurses' reports on having training in assessing the need for the application of physical restraints and their "attitudes and opinions on the use of physical restraints."

Statement	Response	Yes n=58		No (n=55)		p-value
		n	%	n	%	
"By using physical restraints a patient's sedation can be reduced safely	Agree (n=84)	50	59.5%	34	40.5%	**0.009***
	Neither agree nor disagree (n=11)	4	36.4%	7	63.6%	
	Disagree (n=18)	4	22.2%	14	77.8%	
It is preferable to use physical restraint rather than increase the patient's sedation	Agree (n=59)	39	66.1%	20	33.9%	**0.005***
	Neither agree nor disagree (n=21)	8	38.1%	13	61.9%	
	Disagree (n=33)	11	33.3%	22	66.7%	
The use of physical restraint allows for others duties to be completed	Agree (n=52)	25	48.1%	27	51.9%	0.221
	Neither agree nor disagree (n=14)	6	42.9%	8	57.1%	
	Disagree (n=47)	27	57.4%	20	42.6%	
Medical staff are more keen to suggest the use of physical restraints than the nursing staff	Agree (n=18)	10	55.6%	8	44.4%	0.251
	Neither agree nor disagree (n=25)	9	36.0%	16	64.0%	
	Disagree (n=70)	39	55.7%	31	44.3%	
Physical restraint is prescribed and applied unnecessarily	Agree (n=43)	18	41.9%	25	58.1%	0.924
	Neither agree nor disagree (n=21)	11	52.4%	10	47.6%	
	Disagree (n=49)	29	59.2%	20	40.8%	
Getting a colleague to hold the patients hand is preferable to using physical restraint when nursing care is required"	Agree (n=35)	17	48.6%	18	51.4%	**0.002***
	Neither agree nor disagree (n=25)	13	52.0%	12	48.0%	
	Disagree (n=53)	28	52.8%	25	47.2%	

Key: *=statistical significance

Table 4.11 continued

Statement	Response	Yes n=58		No (n=55)		p-value
		n	%	n	%	
"Physical restraint as a management option has to be suggested as medical staff would not think of it	Agree (n=46)	31	48.6%	15	32.6%	0.208
	Neither agree nor disagree (n=27)	15	52.0%	12	44.4%	
	Disagree (n=40)	12	52.8%	28	70.0%	
Physical restraint is used more when we are short staffed	Agree (n=18)	6	67.4%	12	66.7%	1.000
	Neither agree nor disagree (n=4)	3	55.6%	1	25.0%	
	Disagree (n=91)	49	30.0%	42	46.2%	
Physical restraint is sometime applied without prescription	Agree (n=80)	41	33.3%	39	48.7%	0.415
	Neither agree nor disagree (n=8)	4	75.0%	4	50.0%	
	Disagree (n=25)	13	53.8%	12	48.0%	
Patients sometimes end up re-sedated even when we use physical restraint	Agree (n=85)	45	51.3%	40	47.1%	0.416
	Neither agree nor disagree (n=12)	4	50.0%	8	66.7%	
	Disagree (n=16)	9	52.0%	7	43.7%	
Families do not appear to mind the use of physical restraint as they know it's for the patients safety	Agree (n=46)	25	52.9%	21	45.7%	0.162
	Neither agree nor disagree (n=33)	20	60.6%	13	39.45	
	Disagree (n=34)	13	38.2%	21	61.8%	
I do not believe in the use of physical restraints with patients in ICU"	Agree (n=11)	7	63.6%	4	36.4%	0.469
	Neither agree nor disagree (n=26)	15	57.7%	11	42.3%	
	Disagree (n=76)	36	47.4%	40	52.6%	

Key: *=statistical significance

The results shows a significant difference in ICU nurses' response to the statement that *"by using physical restraints a patients sedation can be reduced safely"*(p=0.009), based on their reports on having had training in assessing the need for application of physical restraints. More 59.5% (n=50) who reported having had training in assessing the need for application of physical restraints, agreed with the above statement compared to40.5% (n=34) who reported not to have had training in assessing the need for application of physical restraints but agreed with the statement above. There was 77.8% (n=14) of ICU nurses who reported not having training in assessing the need for application of physical restraints who disagreed with the above statement compared with 22.2% (n= 4) who reported having had training in assessing the need for application of physical restraints who also disagreed with the statement.

The results show a significant difference in ICU nurses' responses to the statement that *"it is preferable to use physical restraints rather than increase the patient's sedation"* (p=0.005), based on their reports on having training in assessing the need for application of physical restraints. Of the ICU who reported having training in assessing the need for application, 66.1% (n=39), agreed to the statement compared to 33.9% (n=20)of ICU nurses who reported not having had training in assessing the need for application of physical restraints but who also agreed with the statement. There was 66.7% (n=22) of ICU nurses, who reported not having had training in assessing the need for application of physical restraints who disagreed with the above statement in compared to 33.3% (n=11) ICU who reported having had training in assessing the need for application of physical restraints and who disagreed with the statement.

The results show a significant difference in ICU nurses responses to the statement that *"getting a colleague to hold the patients hand is more preferable to using physical restraint when nursing care is required"* (p=0.002), based on reports on having training in assessing the need for the application of physical restraints. There was51.4% (n=18) of ICU nurses who reported not having had training in assessing the need for application of physical restraints who agreed to the above statement compared with 48.6% (n=17) ICU nurses who reported having had training in assessing the need for application of physical restraints and who also agreed with the statement. There was 52.8% (n=28) of ICU nurse who reported having training in who disagreed with the statement compared to47.2% (n=25) ICU nurses who reported not having had training in assessing the need for the application of physical restraints but who also disagreed.

Table 4.12: The association between ICU nurses' reports on having training in assessing the need for the application of physical restraint and their attitudes and opinions on the statement that"*by using physical restraints, a patients' sedation can be reduced safely*."

	Unadjusted		**Adjusted**	
	OR (95% Confidence interval)	**p-value**	**OR (95% Confidence interval)**	**p-value**
Reports on having training in assessing the need for the application of physical restraint (base=yes)				
No	1.64 (0.44-2.83)	0.007	1.79 (0.54-3.04)	0.005
Adjusted= adjusted for years of ICU experience and reports on having written policy on physical restraint				

Key: OR= Odd ratio

The table shows ICU nurses who answered 'no' to having training in assessing the need for the application of physical restraints were more likely (Coefficient: 1.64(0.44-2.83) to disagree, or be neutral, than agree with the statement "by using physical restraints a patients' sedation can be reduced safely" than nurses who answered 'yes' to having training in assessing the need for the application of physical restraint (p=0.007).

Adjusting for years of experience and reports on the availability of written policy on physical restraint, ICU nurses who answered 'no' to having training in assessing the need for the application of physical restraints were more likely (Coefficient: 1.79 (0.54-3.04) to disagree or be neutral than agree to the statement: "By using physical restraints a patients' sedation can be reduced safely" than nurses who answered 'yes' to having training in assessing the need for the application of physical restraint (p=0.005).

Table 4.13: The association between ICU nurses' reports on having training in assessing the need for the application of physical restraint' and their attitude and opinions on the statement *"it is preferable to use physical restraint rather than increase the patients' sedation."*

	Unadjusted		**Adjusted**	
	OR (95% Confidence interval)	**p-value**	**OR(95% Confidence interval)**	**p-value**
Reports on having training in assessing the need for the application of physical restraint (base=yes)				
No	1.36 (0.46-2.26)	0.003	1.66 (0.66-2.65)	0.001
Adjusted= adjusted for years of ICU experience and reports on having written policy on physical restraint				

Key: OR= Odds Ratio

The table shows that ICU nurses who answered 'no' to having training in assessing the need for the application of physical restraint were more likely (Coefficient: 1.36(0.46-2.26) to disagree, or neither agree nor disagree, than agree to the statement than nurses who answered 'yes' to having training in assessing the need for the application of physical restraint (p=0.003).

When adjusting for years of experience and reports on the availability of written policy on physical restraint, ICU nurses who answered 'no' to having training in assessing the need for the application of physical restraint were more likely (Coefficient: 1.66 (0.66-2.65) to disagree or neither agree nor disagree than agree to the statement than ICU nurses who answered 'yes' to having training in assessing the need for the application of physical restraint (p=0.001).

Table 4.14: The association between ICU nurses' reports on having training in assessing the need for the application of physical restraint and their attitudes and opinions on the statement *"Getting a colleague hold the patient hand is preferable to using physical restraint when nursing care is required"*

	Unadjusted		**Adjusted**	
	OR(95% Confidence interval)	**p-value**	**OR (95% Confidence interval)**	**p-value**
Reports on having training in assessing the need for the application of physical restraint (base=yes)				
No	1.57 (0.66-2.49)	0.001	1.75 (0.75-2.75)	0.001
Adjusted= adjusted for years of ICU experience on physical restraint and reports on having written policy on physical restraint				

Key: OR= Odd Ratio

The table shows that ICU nurses who answered 'no' to having training in assessing the need for the application of physical restraint were more likely (coef; 1.57(0.66-2.49) to disagree or neither agree nor disagree than agree to the statement: "Getting a colleague hold the patient hand is preferable to using physical restraint when nursing care is required" than nurses who answered 'yes' to having training in assessing the need for the application of physical restraint (p=0.001).

When adjusting for years of experience and reports on the availability of written policy on physical restraint, ICU nurses who answered 'no' to having training in assessing the need for the application of physical restraint were more likely (coef; 1.75 (0.75-2.75) to disagree or neither agree nor disagree than agree to the statement: "Getting a colleague hold the patient hand is preferable to using physical restraint when nursing care is required" than nurses who answered 'yes' to having training in assessing the need for the application of physical restraint (p=0.001).

4.4 DISCUSSION OF THE MAIN FINDINGS

The purpose of this study was to describe "nurses' attitudes and opinions on the use of physical restraints in adult ICUs" of a tertiary academic hospital in Johannesburg. The findings from this study will be used to make suggestions and create awareness for nurse educators on what needs to be included in the curriculum regarding utilisation of physical

restraints. This may also provide guidance to policy makers on the best practise that need to be considered when implementing a policy in the clinical setting.

The distribution of the sample revealed 81.4% (n=92) females and 18.6% (n=21) males. Most (68.1%; n=77) of the nurse respondents were between the ages of 36 to 50, 23.0% (n=26) were between ages of 18 to 35 years and only 8.9% (n=10) were more than 50 years. More than half (63.7%; n=72) of the nurses' had less than 10 years of Intensive Care experience and 36.3% (n=41) had more than 10 years of intensive care experience. Most (77.9%; n=88) of the nurse respondents held a diploma as their highest level of qualification in nursing, 17.7% (n=20) had a Bachelor's degree, 3.5% (n=4) had a Master's degree and only (0.9%) respondent held a doctoral degree. The majority (62.8%; n=71) of nurses had Critical Care nursing as their course for highest qualification in nursing.

Most (96.4%; n=109) of the respondents were professional nurses, while unit mangers and area managers accounted for 1.8% (n=2) each. (29.2%; n=33) nurse respondents practised in Multidisciplinary ICU, followed by Trauma ICU (26.5%; n=30), Neuro-surgical (20.4%; n=23), Cardio-thoracic (15%; n=17) and lastly Coronary Care Unit (8.9%; n=10). The study findings indicate that all the ICUs of the tertiary academic hospital were well represented, taking into consideration the staffing in each ICU. All the ICUs were represented according to SASA guidelines (2013). All (100%, n=113) the respondents agreed they use physical restraints in their respective units.

Regarding support (written policy on physical restraints), most (48.7%; n=55) respondents reported there was no written policy on the use of physical restraints, 41.6% (n=47) indicated there was a policy, while 9.7% (n=11) indicated they did not know if there was a written policy. There is a written policy on physical restraints at the tertiary academic hospital in Johannesburg where the study was conducted. Of the 47 respondents who indicated that there was a written policy, almost half (42.6%; n=20) had read all the policy, 27.6% (n=13) had read some of it and 29.8% (n=14) had not read it. These results were similar to a study by Freeman, Hallett and McHugh (2015), where the majority (78.4%; n=29) of respondents in hospital 1 had completely read the physical restraints policy; the difference was that more than half in their study had read the policy completely.

In relation to training, there was a marginal difference between respondents who had had training (51.3%; n=58) and those who did not have training (48.7%; n=55) in assessing the need for the application of physical restraints. Freeman, Hallett and McHugh (2015) found similar results in hospital 2 as 58.6% (n=17) indicated they had had training while 41.4%

(n=12) did not have training. Comparing these findings to the total number of respondents in their study, there was a major difference, 64.7% (n=44) were trained and 35.3% (n=24) did not have training. Of the 58 respondents who had had training, an overwhelming majority (93.1%; n=54) felt training was adequate, whilst 6.9% (n=4) felt the training was not adequate. Of the 59 respondents who had no training (n=55) and felt that training was not adequate (n=4), the majority (23.7%; n=14) identified the need for training on how to apply physical restraints. These findings are comparable to Freeman, Hallett and McHugh (2015), where the majority indicated that there is need for training.

More than half (54.9%; n=62) indicated they had had training on how to apply physical restraints, whilst 45.1(n=51) indicated they had had no training. Of the 62 respondents who had had training, most (83.9%; n=52) agreed the training was adequate, while 16.1% (n=10) indicated training was not adequate. Of the 61 respondents who had had no training (n=51) and indicated that training was not adequate (n=10), the majority (16.4%; n=10) indicated they needed training on the complications of physical restraints.

In relation to use and application of physical restraints, most (53.1%; n=60) respondents indicated there was no limited time that an individual patient could be restrained, 30.1% (n=34) indicated there was a limited time and 16.8% (n=19) were not sure. Of the 34 respondents who agreed there was a limited time that an individual patient could be restrained, the majority (20.6%; n=7) indicated the patient could be restrained for days, whilst only one respondent (2.9%; n=1) indicated that patient could be restrained for 20 minutes. Results from this study are similar to those of Freeman, Hallett and McHugh (2015) findings, as there was no agreement about the time a patient could be on restrained. Most (82.4%; n=28) nurse respondents indicated this time was often exceeded, 14.7% (n=5) indicated it was exceeded sometimes and only one (2.9%; n1) indicate the time is never exceeded. Comparing these results to those of Freeman, Hallett and McHugh (2015), there were no similarities as they found that most (56.2%; n=9) indicated the time was exceeded sometimes and the least (12.5%; n=2) indicated time was often exceeded. Of the 33 respondents who indicated that the maximum time a patient could be restrained (n=28) was often and sometimes (n=5) exceeded, the majority (30.3%; n=10) indicated it was because the patient was restless, followed by 24.2% (n=8) who indicated that time was exceeded in order to avoid self-extubation. This indicates that it was mainly for patient safety (Luk *et al*., 2015; Rose *et al.,* 2016).

Regarding discussing the use of physical restraints with visitors and family, most (82.3%; n=93) of the respondents were always happy, 15.0% (n=17) sometimes, while 2.7%(n=3)

indicated they were never happy in discussing the use of physical restraints with family or visitors. There are no similarities when compared to a study by Freeman, Hallett and McHugh (2015), as all the respondents were always happy in discussing the use of physical restraints with families or visitors. Of 83 respondents who expanded on their answer, more than half (61.4%;n= 51) indicated that family members have to know the reasons for the application of physical restraints and 35.0% explained that discussing the use of physical restraints with family or visitors alleviated their concerns. Some (1.2%; n=1) explained that the lack of a prescription from doctors and lack of confidence to handle relatives made it difficult to discuss the use of physical restraints with them. Freeman, Hallett and McHugh (2015) found that most respondents were confident in discussing the use of physical restraints with relatives or visitors and others were had negative experiences because of the impact it had.

In relation to whether respondents agreed or disagreed to statements on the uses of physical restraints in ICU, the majority (74.3%; n=84) agreed the “patients’ sedation can be reduced when physical restraints are used.” Comparing this study’s findings to a study by Freeman, Hallett and McHugh (2015), the majority (57.5%; n=42) agreed to the statement, which is similar to this study. More than half (52.2%; n=59) of the respondents preferred physical restraint usage rather than the patients’ sedation being increased. This study’s findings are similar to those of Freeman, Hallett and McHugh (2015), where 52.1% (n=38) agreed to the statement. Hofsø and Coyer (2007) also indicated that the ideal treatment in ICU is to reduce sedation as rapidly as possible in order to reduce complications.

There was almost a balance in scores from the respondents who agreed and disagreed that “the use of physical restraints allows other duties to be completed;” 46.0% (n=52) agreed, 41.6% (n=47) disagreed, whilst 12.4% (n=14) neither agreed nor disagreed. These study findings are not similar to Freeman, Hallett and McHugh (2015), where 50.6% (n=37) disagreed verses 35.6% (n=26) who agreed. There was a strong majority (62.0%; n=70) in disagreement that “medical staff are more keen to suggest the use of physical restraints than the nursing staff,” followed by 22.1% (n=25) who neither agreed nor disagreed and lastly 15.9% (n=18) who agreed to this statement. Freeman, Hallett and McHugh (2015) found similar findings, as the majority (58.9%; n= 43) disagreed with the statement. Choi and Song (2003) indicated that most often nurses are the ones who decide to physically restrain the patient, and sometimes because of a physician’s verbal instruction.

A marginal difference was noted between the respondents who agreed (38.1%; n=43) and disagreed (43.3%; n=49) that “physical restraints were prescribed and applied unnecessary.”

These findings are similar to Freeman, Hallett and McHugh (2015) in terms of the majority (83.6%; n=61) disagreed with the statement, but dissimilar with the difference between the respondents who agreed and disagreed. In their study only 5.5% (n=4) agreed to the statement. Most (46.9%; n=53) of the nurses disagreed that "getting a colleague to hold the patients hand is preferable to using physical restraints when nursing care is required," 31.0%(n=35) agreed while 22.1%(n=25) neither agreed nor disagreed with the statement. These findings are not similar to Freeman, Hallett and McHugh (2015), where the majority (46.5%; n=34) were in agreement with the statement.

There was almost a balance of respondents who agreed (40.7%; n=46) and disagreed (35.4%; n=40) that "physical restraints as a management option has to be suggested, as medical staff would not think about it." This study's finding is not similar to Freeman, Hallett and McHugh (2015), as their majority (50.7%; n=37) disagreed to the statement and there was a major difference between respondents who agreed (19.25; n=14) and disagreed (50.7%; n=37).The majority (80.5%; n=91) disagreed that "physical restraint is used more often when there is shortage of staff." Freeman, Hallett and McHugh (2015) found similar results as their majority (72.6%; n=53) also disagreed to the statement.

Most (70.8%; n=80) nurses agreed, "physical restraints is sometimes applied without prescription." The findings are not similar to the study by Freeman, Hallett & McHugh (2015) as their majority (46.6%; n=34) disagreed to the statement and responses were dispersed across the scale, unlike this study's finding where most responses were strongly agreeing and agree. The majority (75.2%; n=85) agreed that even when physical restraints are in place, "the patients sometimes end up re-sedated," (14.2%; n=16) disagreed while (10.6%; n=12) neither agreed nor disagreed. The study's findings are similar to those Freeman, Hallett and McHugh (2015), where the majority (50.6%, n=37) agreed to the statement but differed in terms of distribution of responses. In their study, 15.1% (n=11) disagreed and 34.2% (n=25) neither agreed nor disagreed.

There was almost an equal distribution of responses, which (40.7%; n=46) agreed, (30.1%; n=34) disagreed and (29.2%; n=33) neither agreed nor disagreed that "families do not mind the use of physical restraints as they know it's for patients' safety." These findings are comparable to a study by Freeman, Hallett and McHugh (2015) in that the majority (76.7%; n=56) agreed, but were dissimilar because there was no response for disagreement and only 23.3% (n=17) neither agreed nor disagreed to the statement. The majority (67.3%; n=76) disagreed to the statement "I do not believe in the use of physical restraints with patients in ICU," 23% (n=26) neither agreed nor disagreed, while 9.7% (n=11) agreed.

Findings from the study are similar to those of Freeman, Hallett and McHugh (2015), as their majority (89.0%; n=65) disagreed. In their study there was no response for agreement to the statement and 11.0% (n=8) neither agreed nor disagreed.

In relation to respondents' opinions on the use of physical restraints, most (39.7%; n=3) indicated that physical restraints were used to avoid self-extubation (accidental removal of the endotracheal tube) followed by 21.8% (n=17) who indicated it was for patients safety. This is similar to the study by Freeman, Hallett and McHugh (2015), where the majority of their respondents indicated it was necessary to use physical restraints in the Critical Care settings, and so that patients could be safe, if used with adequate assessment. Luk *et al.* (2015) found the most common (66%; n=111) reason for application of physical restraints was pulling at the endotracheal tube and other lines (patients' safety), which is similar to the findings from this study.

Regarding preferred method of managing agitated patients when not using physical restraints, the majority (83.9%; n=73) preferred sedation. This study's finding is not comparable to a study by Freeman, Hallett and McHugh (2015), where the majority of respondents preferred talking to the patient, orientation and holding of hands as alternative measures to using physical restraints, and explained the risk for over sedation. Comparing this study's findings to Luk *et al*. (2015), the majority (27%; n=26) preferred communication, which included reorientation, and sedation (21%; n=20) being the second best alternative measure when not using physical restraints.

In relation to anything that needs to be highlighted on the use of physical restraints, most (61.4%; n=35) of the respondents felt there was a need for proper management of patients on physical restraints, followed by training on how to use physical restraints (12.2%; n=7). Some of the respondents (8.7%; n=5) indicated families disagree with physical restraints usage and 5.2% (n=3) were concerned that doctors prescribe verbally, and 3.5% (n=2) indicated there was a need for a physical restraint policy. This study's findings are similar to those of Freeman, Hallett and McHugh (2015), where the majority felt there was knowledge deficit on restraint usage, and application and documentation was not done accordingly. In their study, they found nursing staff required support from medical staff before application of physical restraints.

With regard to years of ICU experience, in this study there was a significant difference in ICU nurses responses to the statement "Families don't appear to mind the use of physical restraint as they know it's for the patients' safety" ($p<0.001$) based on their years of ICU experience. The unadjusted multinomial regression model, to assess the association

between ICU nurses years of ICU experience and their attitudes and opinions on the statement showed that ICU nurses with more than 10 years of ICU experience were less likely to disagree or neither agree nor disagree than to agree to the statement compared to nurses with less than 10 years of ICU experience.

This indicates that with more years of experience nurses use clinical experience as a reference point and gut-feeling based on exposure to similar situation (Pretz & Folse, 2011; Traynor, Boland & Buus, 2010). It may also indicate that with greater clinical experience, the nurses are less empathetic, as they were less likely to disagree to the statement, and nurses with less clinical experience are empathetic. However, recognising similar situations might have influenced their attitudes and opinion towards the statement.

With the adjusted multinomial regression, there was no association between ICU nurses' years of experience and their attitudes and opinions on the statement that "families do not appear to mind the use of physical restraints, as they know it is for the patients' safety." These findings are similar to Choi and Song (2003) and Hoffman Donoghue and Duffield (2004) who showed no significant relationship between years of experience, decision-making and nurses' attitudes.

The results in this study also showed a significant difference in ICU nurses responses to the statement "I do not believe in the use of physical restraints with patients in ICU" (p=0.002) based on their years of experience. For both the unadjusted and adjusted multinomial regression there was no association between ICU nurses years of experience and their attitudes and opinions on the statement. According to Choi and Song (2003) and Hoffman Donoghue and Duffield (2004) no significant relationship was found between years of experience, decision-making and nurses' attitudes which is similar to the results in this study.

*In relation to ICU nurses reports on availability of written policy on physical restraints***,** there was a significant difference in ICU nurses' responses to the statement "I do not believe in the use of physical restraints with patients in ICU"(p=0.000) based on their reports on the availability of written policy on physical restraint. The unadjusted multinomial regression showed nurses who answered yes to the availability of physical restraints policy twice as likely to disagree, or neither agree nor disagree, than agree to the statement than nurses who answered no.

The findings indicate that having an understanding of written policy on physical restraints would make nurses in favour of the use of physical restraints with ICU patients. Al-Khaled,

Zahran and El-Soussi (2011) and Kalula and Petros (2016), concluded that a policy and guidelines on the use of physical restraints guides health practitioners in the management of patients where physical restraints cannot be avoided because of the negative outcomes. The nurses who answered with a no to availability of written policy on physical restraints might be lacking understanding of the benefits of physical restraints, and how to manage the patient in order to avoid the negative outcomes of physical restraints. There was no significant association between ICU nurses' reports on availability of written policy on physical restraints and their attitudes and opinions on the use of such when adjusting for years of ICU experience and having had training in assessing the need for the application of physical restraints.

The results also showed that ICU nurses who answered I do not know to the availability of written policy on physical restraints were two times less likely to disagree or be neutral than agree to the statement "I do not believe in the use of physical restraints with patients in ICU" than ICU nurses who answered with a no. This indicates that ICU nurses who do not know about the availability of written policy on physical restraints agreed to the statement compared to those who indicated there was no written policy on physical restraints. This might also indicate lack of knowledge on the benefits and management of patients in physical restraints to avoid negative outcomes. There was no significant association between ICU nurses' reports on availability of written policy on physical restraints and their attitudes and opinions on the statement when adjusted for years of ICU experience and having had training in assessing the need for the application of physical restraints.

Regarding nurses reports on having training in assessing the need for application of physical restraints, the results shows a significant difference in ICU nurses' responses to the statement "by using physical restraints a patients sedation can be reduced safely'' ($p=0.009$) The unadjusted and adjusted multinomial regression model showed that ICU nurses who answered 'no' to having had training were more likely to disagree or to neither agree nor disagree than agree to the statement than nurses who answered 'yes.'

Hofsø and Coyer (2007) indicated that physical restraints have a positive contribution to reduction of sedation. This indicates that lack of knowledge (those who indicated that they had no training) contributed to the nurses' responses to the statement. Azaba and Negin (2013) found there was a positive correlation between respondents practice, knowledge and attitude scores and this is the case in this study's findings, as nurses who had had training had knowledge which influenced their attitudes and opinions on the use of physical restraints.

The results show a significant difference in ICU nurses' responses to the statement "it is preferable to use physical restraints rather than increase the patient's sedation" (p=0.005). For both the unadjusted and adjusted multinomial regression model, the ICU nurses who answered 'no' were more likely to disagree, or to neither agree nor disagree, than agree to the statement than nurses who answered 'yes' to having training.

Literature suggests that the ideal practice in the Intensive Care Unit is to reduce sedation as rapidly as possible in order to reduce the side effects (Hofsø & Coyer, 2007). These findings indicated that nurses who did not have training in assessing the need for physical restraints were not in agreement with literature's suggestions, which may be due to lack of knowledge and therefore influences their attitudes and opinions. Eskandari *et al*. (2017) found an association between knowledge, attitudes and intention to practice of physical restraints, which is similar to the findings in this study.

The results show a significant difference in ICU nurses' responses to the statement referring to "getting a colleague to hold the patients hand being preferred more than to using physical restraint when nursing care was required" (p=0.002). The unadjusted and adjusted multinomial regression model showed that ICU nurses who answered 'no' to having training were more likely to disagree, or to neither agree nor disagree, than agree to the statement than nurses who answered 'yes.'. The study's findings indicate that nurses who did not have training favoured physical restraints when nursing care was required compared to those who had had training.

4.5 SUMMARY

This chapter discussed the descriptive and comparative statistics that were used to describe and analyse the data collected. The data and interpretation of findings were discussed in relation to other studies in literature. The next chapter will discuss the summary of the research findings, the limitations of the study, conclusions and recommendations.

CHAPTER FIVE

SUMMARY OF STUDY, MAIN FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

5.1 INTRODUCTION

In this final chapter a summary of the whole study will be presented. This includes main research findings, limitation of the study and recommendations for clinical practice, nursing education and further research. The chapter concludes with the conclusion from the main findings.

5.2 SUMMARY OF THE STUDY

5.2.1 Purpose of the Study

The purpose of this study was to describe “nurses’ attitudes and opinions on the use of physical restraints in adult ICUs” of a tertiary academic hospital in Johannesburg, with the intention of making suggestions and creating awareness to nurse educators on what needs to be included in the curriculum on the topic of utilisation of physical restraints. This may also provide guidance to policy makers on the best practise that needs to be considered when implementing a policy in the clinical setting.

5.2.2 Objectives of the Study

The objectives of the study were to:

- To describe registered “nurses attitudes and opinions on the use of physical restraints” as opposed to alternative methods.
- To determine the association between ICU nurses years of experience and their “attitudes and opinions on the use of physical restraints.”
- To determine the association between ICU nurses reports on availability of written policy on physical restraints and their “attitudes and opinions on the use of physical restraints.”
- To determine the association between ICU nurses reports on having training in assessing the need for application of physical restraints and their “attitudes and opinions on the use of physical restraints.”

5.2.3 Methodology

Ethical clearance (Appendix C) was obtained from the University of the Witwatersrand Human Research Ethical Committee. Permission to use the questionnaire for data collection was obtained from the developers (Appendix E). Permission to conduct the study was obtained from the hospital which was to be utilised (Appendix D).

The target population for this study was all registered nurses practicing in adult ICUs of a tertiary academic hospital in Johannesburg, which included Multi-disciplinary, Neuro-surgery, Trauma, Cardio-thoracic and Coronary Care Unit. The sample size was calculated using a Rao Soft sample calculator, where N= 158, at a marginal error of (5%), confidence level of 95% and response distribution of 50%, the recommended sample size was n= 113. Convenience sampling was used to select the study respondents.

The questionnaire used in the study was developed by Freeman, Hallett and McHugh (2015) at the University of Manchester, in the United Kingdom. It had four sections with a total of 18 items. Section One was demographic questions, Section Two related to training and support, Section Three was statements that gather information about uses and application of physical restraints and Section Four allowed the respondents to expand on their responses if they wished to do so. To test feasibility of the questionnaire, pre-testing of the questionnaire was conducted with 30 (n=30) respondents prior to conducting the study.

To meet the study's objectives, a descriptive, non-experimental, quantitative survey design was used. Descriptive and comparative statistics were used to analyse the data. A statistician from post graduate research office assisted with statistics.

5.3 SUMMARY OF MAIN FINDINGS

The purpose of this study was to describe nurses' attitudes and opinions on the use of physical restraints in adult ICUs of a tertiary academic hospital in Johannesburg, with the intention to suggest and create awareness to nurse educators on what needs to be included in the curriculum on the topic of utilisation of physical restraints. This may also provide guidance to policy makers on the best practise that need to be considered when implementing a policy in the clinical setting.

Of the total sample (n=113), the distribution revealed a majority of females (81.4%; n=92) and less males (18.6%; n=21). Most (68.1%; n=77) of the respondents were in the age

group between 36 and 50 and more than half (63.7%; n=72) had less than 10 years of Intensive Care experience. The majority (77.9%; n=88) held a diploma as their highest level of qualification in nursing and most (62.8%; n=71) had Critical Care as their course for highest qualification. The majority (96.4%; n=109) were professional nurses and 29.2% (n=33) practised in Multi-disciplinary ICU. All the respondents agreed that the unit they were working in used physical restraints.

In relation to support (written policy on physical restraints), findings showed that most (48.7%; n=55) of the nurses indicated there was no written policy on physical restraints, verses 41.6% (n=47) who indicated there was and 9.7% (n=11) who did not know if there was a policy or not. Of the 47 respondents who indicated that there was a written policy, the majority (42.6%; n=20) had read it all.

With regard to training, a marginal difference was noted between respondents who had training (51.3%; n=58) and those who did not (48.7%; n=55). Of the 58 nurses who had training, the majority (93.1%; n=54) agreed the training was adequate, of the 59 nurses who did not have training and those that felt that training was not adequate, most (23.7%; n=14) identified the need for training on how to apply physical restraints. The majority (54.9%; n=62) had training on how to apply physical restraints and 45.1% (n=51) had no training. Of the 62 respondents who had training, the majority (83.9%; n=52) agreed the training was adequate. Of the 61 respondents who did not have training and those that felt training was not adequate, most (16.4%; n=10) identified the need for training on complications of physical restraints.

The *first objective* was to describe registered “nurse’s attitudes and opinions on the use of physical as opposed to alternative methods.”

Regarding limited time that an individual patent can be restrained, most (53.1%; n=60) nurses indicated there was no limited time verses 30.1% (n=34) who agreed and 16.8% (n=19) who were not sure. There was no consensus from the 34 respondents on the maximum time a patient could be physically restrained. Time ranged from 15 minutes to days, with one fifth (20.6%; n=7) noting that patients could be restrained for days. Of the 34 respondents, the majority (82.4%; n=28) agreed that the maximum time a patient can be physically restraint is often exceeded. Of the 33 respondents who agreed the maximum time is often and sometimes exceeded, most (30.3%; n=10) outlined that this happens because the patient is restless followed by avoiding of self-extubation (24.2%; n=8). The findings showed that time is mostly exceeded for patient safety.

The majority (82.3%; n=93) were always, 15.0% (n=17) were sometimes, while 2.7% (n=3) were never happy when it came to discussing the use of physical restraints with relatives. Of the 83 respondents who expanded on their answer, most (61.4%; n=51) identified the need for families to know the reasons for application of physical restraints and 35.0% (n=29) indicated that counselling alleviates family member's concerns.

Regarding the statements on the use of physical restraints in Critical Care, the majority (74.3%; n=84) agreed that "by using physical restraints patient sedation could be reduced safely" and more than half (52.2%; n=59) indicated "it was preferable to use physical restraints rather than increasing the sedation." There was almost a balance of scores from the respondents who agreed (46.0%; n= 52) and disagreed (41.6%; n=47) that "the use of physical restraints allows for other duties to be completed." Most (62.0%; n=70) disagreed that "medical staff were more keen to suggest the use of physical restraints than nursing staff." There was a marginal difference between respondents who agreed (38.1%; n=43) and disagreed (43.3%; n=49) that "physical restraints were prescribed and applied unnecessary." Most (46.9%; n=53) disagreed that "getting a colleague to hold the patient's hand was preferable to using physical restraints when nursing care was required."

There was almost a balance of scores from respondents who agreed (40.7%; n=46) and disagreed (35.4%; n=40) that "physical restraints as a management option has to be suggested as medical staff would not think of it." The majority (80.5%; n=91) disagreed that "physical restraints is used more often when there is shortage of staff." Most (70.8%; n=80) agreed that "physical restraints were sometimes applied without prescription." The majority (75.2%; n=85) agreed that "patients sometimes end up re-sedated even when physical restraints were used." The responses to the statement "families do not appear to mind the use of physical restraints as they know it is for patient safety'' were dispersed across the scale, 40.7% (n=46) agreed, 30.1% (n=34) disagreed, whilst 29.2% (n=33) neither agreed nor disagreed. Most (67.3%; n=76) of the respondents disagreed to the statement "I do not believe in the use of physical restraints with patients in the ICU.''

In relation to respondent's opinion on the use of physical restraints in ICU, most (39.7%; n=31) respondents indicated they were used to prevent self-extubation and for patient safety (21.8%; n=17). Most (83.9%; n=73) indicated they prefer sedation if they do not use physical restraints. The majority (61.4%; n=35) of the nurse respondents highlighted a need for proper management of patients on physical restraints.

The *second objective* was to determine the association between ICU nurses' years of ICU experience and their "attitudes and opinions on the use of physical restraints."

In this study there was a significant difference in ICU nurses' responses to the statements "Families don't appear to mind the use of physical restraint as they know it's for the patients'' safety ($p<0.001$) and "they do not believe in the use of physical restraints with patients in ICU" ($p=0.002$) based on their years of ICU experience.

The unadjusted multinomial regression model to assess the association between ICU nurses' years of ICU experience and the statement "Families don't appear to mind the use of physical restraint as they know it's for the patients' safety" showed that ICU nurses with more than 10 years of ICU experience were less likely to disagree, or to neither agree nor disagree than to agree to the statement compared to nurses with less than 10 years of ICU experience. With the adjusted multinomial regression there was no association between ICU nurses' years of experience and their view that families do not appear to mind the use of physical restraint as they know it's for the patients' safety.

For both the unadjusted and adjusted multinomial regression there was no association between ICU nurses' years of ICU experience and their opinion on believing to use or not use physical restraints on patients in ICU.

The *third objective* was to determine the association between ICU nurses reports on the availability of written policy on physical restraints and their "attitudes and opinions on the use of physical restraints."

There is a significant difference in ICU nurses' responses to the statement "I do not believe in the use of physical restraints with patients in ICU" based on their reports on the availability of written policy on physical restraint ($p=0.000$).

The unadjusted multinomial regression showed that nurses who answered 'yes' to the availability of physical restraints policy were twice likely to disagree, or to neither agree nor disagree, than agree to the statement than nurses who answered 'no.' There was no significant association between ICU nurses' reports on availability of written policy on physical restraints and their attitudes and opinions on the use of such with adjusted multinomial regression.

The results also showed that ICU nurses who answered 'I do not know' to the availability of written policy on physical restraints were two times less likely to disagree, or to neither agree nor disagree, than agree to the statement "I do not believe in the use of physical restraints with patients in ICU" than ICU nurses who answered with a 'no' to the availability of written policy on physical restraints. There was no significant association between ICU nurses reports on availability of written policy on physical restraints and their attitudes and opinions on the statement with adjusted multinomial regression.

The *fourth objective* was to determine the association between ICU nurses' reports on having training in assessing the need for application of physical restraints and their "attitudes and opinion on the use of physical restraints."

In this study there was a significant difference in ICU nurses' responses to the statements "when using physical restraints, a patients' sedation can be reduced safely" (p=0.009), and "It is preferable to use physical restraints rather than increase the patient sedation" (p=0.005). There was also a significant difference in the responses of respondents in "getting a colleague to hold a patients' hand as being preferred more than to using physical restraint when nursing care is required'' (p=0.002). This was based on their responses on having had training in assessing the need for application of physical restraints.

5.4 LIMITATION OF THE STUDY

The following limitations of the study were identified.

The use of one tertiary academic hospital in Johannesburg, therefore it is difficult to generalise the findings to all nurses in South Africa.

The questionnaire used for this study was used once, and not all the objectives were met, therefore it was difficult to compare findings for comparative statistics.

Most of the reviewed literature was from developed countries.

The investigation was of nurses' attitudes and opinions on the use of physical restraints without comparing them to doctors' attitudes and opinions, because the doctors have to prescribe physical restraints before application.

5.5 RECOMMENDATIONS OF THE STUDY

Based on the study findings, the following recommendations for clinical practice, further research and nursing education are suggested.

5.5.1 Clinical nursing practice

The nurses in ICU, with less experience should be encouraged to attend seminars or in-service education on the use of physical restraints, and there is need for continuous education for those who have had training.

There is need for continuous professional development for nurses working in ICU.

There is a need for education on alternative methods before application of physical restraints, such as involvement of relatives to calm the patient and pain management.

The hospital should provide articles and videos on the use of physical restraints in the ward to improve nurses' knowledge and practice issues on the use of physical restraints.

The written policy on physical restraints should be available in the ward where every staff member can have access to it.

During review of the policy on physical restraints, doctors, nurses, patients who have been restrained and family members should be involved.

5.5.2 Nursing Education

The use of physical restraints should be included in both basic and post-graduate nursing courses. These should include, but not be limited to, the indications, management and complications in order to improve nurses' knowledge and practice issues.
At the end of nursing courses, there has to be practical examination to assess the nurses' management of patients on physical restraints and alternative measures.

5.5.3 Further research

There is need for replication of this study in other institutions in South Africa in order for generalisation of findings to South African nurses.

A study needs to be conducted to compare ICU doctors and ICU nurses 'perceptions on the use of physical restraints, because implementation of physical restraints requires team work.

Further research is indicated for alternatives measures of managing agitated patients and factors associated with accidental removal of devices.

Qualitative research to explore views of ICU nurses on the use of physical restraints and associated factors is required.

5.6 CONCLUSION

The majority of respondents indicated physical restraints were used for patients' safety and there was a need for physical restraints usage in the ICU setting. There was no agreement about the maximum time that an individual patient could be restrained, and most of the respondents indicated that the time was often exceeded because of agitated behaviours and pulling out of endotracheal tubes and medical devices. Most of the nurse respondents were happy to discuss the use of physical restraints with relatives and family.

Interestingly some respondents preferred physical restraints to sedation but they gave no reason why. The respondents also indicated that "patients sometimes ended up being sedated even when they were restrained." The majority of respondents in this study disagreed that "physical restraints were used more when there was a shortage of staff," while there were equal numbers who indicated that "physical restraints allowed for other duties to be completed."

There was a perceived need for medical staff support on the use of physical restraints. It was noted that medical staff are not interested in suggesting the use of physical restraints but they are supposed to prescribe them before they can be applied. There were a few respondents who claimed that restraints were over prescribed and applied unnecessarily. Most of the respondents identified the need for training on assessing the need for application of physical restraints and how to apply them.

There was association between ICU nurses' years of experience, reports on availability of written policy, reports on having training in assessing the need for application of physical restraints and their attitudes and opinions on the use of physical restraints in some statements regarding the use of such.

Nurses need support and guidance from other health care workers in cases of using physical restraints. There is need for availability of physical restraints policy to aid nurses' clinical decision making.

5.7 SUMMARY

This chapter was a summary of the study. It included the main findings from the study, limitations and the conclusion.

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Appendix A

ATTITUDES AND OPINIONS OF INTENSIVE CARE UNIT NURSES ON THE USE OF PHYSICAL RESTRAINTS

DATA COLLECTION INSTRUMENT

This questionnaire will take you about 20-30 minutes to complete.

Throughout the questionnaire the term physical restraint will be used and this refers to the application of restraints, which are purpose made, such as hand ties or gloves.

Section One: General Information

1. What is your gender

Male	
Female	

2. What is your age?

18-24	
26-35	
36-45	
45-50	
>50	

3. How many years of intensive care experience do have?

1 year	
2-5 years	
6-10 years	
11-15 years	
16-20 years	
>20 years	

4. What is your highest level of qualification in nursing?

Diploma	
Bachelor Degree	
Master's Degree	
Doctoral Degree	

5. What course do you have for your highest qualification?

6. What is your current nursing position?

Professional Nurse	
Unit manager	
Area manager	
Nursing service manager	
Others (Please specify)	

7. Which intensive care unit do you work in?

Multidisciplinary	
Neuro surgery	
Trauma	
Cardio thoracic	
Coronary care unit	

8. Does the unit you are working in use physical restraints?

Yes	
No	

If yes then continue to section two, question 9

If no then please go to question 11and do not complete section 3

Section Two: Training and Support

For the following questions please tick the appropriate box.

9. Does your unit have a written policy on physical restraint?

Yes	
No	
Don't know	

10. **If yes,** I have read

All of it	
Some of it	
None of it	

11. Have you had any training in **assessing the need** for the application of physical restraint?

Yes	
No	

11a. **If yes**, then do you feel this training was adequate?

Yes	
No	

11b**. If no**, then please write any comments about what additional training or training you feel you need

---

---

12. Have you had any training in **how to apply** physical restraints?

Yes	
No	

12a**. If yes**, then do you feel this training is adequate?

Yes	
No	

12b. **If no,** please write any comments about what additional training or training you feel you need below

---

Section Three: Use and Application

13. Is there a limited time that an individual patient can be restrained in your unit?

Yes	
No	
Not sure	

13a**. If yes**, how long is the maximum of time a patient can be physically restraint for?

Minutes

13b. Is this time ever exceeded?

Yes, often	
Yes, sometimes	
No, never	

If yes, then briefly outline why you think this occurs.

---

14. Are you happy to discuss the use of physical restraint with families or visitors?

Yes, always	
Yes, sometimes	
No, never	

Please expand on your answer here if you wish.

---

15. For the following, please say how much you agree or disagree with the statements about the use of physical restraints by nurses in critical care.

Statement	Strongly Agree	Agree	Neither agree nor disagreed	Disagree	Strongly disagreed
a).By using physical restraints a patients sedation can be reduced safely	1	2	3	4	5
b). It is preferable to use physical restraint rather than increase the patients sedation	1	2	3	4	5
c). The use of physical restraint allows for others duties to be completed	1	2	3	4	5

d). Medical staff are more keen to suggest the use of physical restraint than the nursing staff.	1	2	3	4	5
e). Physical restraint is prescribed and applied unnecessarily	1	2	3	4	5
f). Getting a colleague to hold the patients hand is preferable to using physical restraint when nursing care is required.	1	2	3	4	5
g). Physical restraint as a management option has to be suggested as medical staff would not think of it.	1	2	3	4	5
h). Physical restraint is used more when we are short staffed.	1	2	3	4	5
i). Physical restraint is sometime applied without prescription	1	2	3	4	5
j). Patient sometimes end up re-sedated even when we use physical restraint	1	2	3	4	5
k). Families don't appear to mind the use of physical restraint as they know it's for the patients safety	1	2	3	4	5
l). I do not believe in the use of physical restraints with patients in ICU.	1	2	3	4	5

Section Four

This section will allow you to expand on your responses, if you wish.

16. What do you think about the use of physical restraint in critical care?

---

17. If you don't use physical restraint what would be your preferred method of managing agitated patients?

---

18. Are there any issues related to the use of physical restraint you would like to highlight?

I would like to take this opportunity to thank you for completing the questionnaire.

Can you please put the questionnaire in a sealed envelope and place it in a sealed box in the operational manager's office

Appendix B

THE ATTITUDES AND OPINIONS OF INTENSIVE CARE UNIT NURSES ON THE USE OF PHYSICAL RESTRAINTS

INFORMATION LETTER

Dear Colleague,

My name is Mabona Ednah Maleho. I am a second year student at University of the Witwatersrand, in the Department of Nursing Education doing degree of Master of Science in Nursing (Intensive Care Nursing). You are invited to participate in the research to determine the attitudes and opinions of registered nurses regarding the use of physical restraints in ICU in order to create awareness on educators on what needs to be included in the curriculum on physical restraints and assist policy makers on best practice that needs to be considered when implementing a policy in the clinical setting.

The use of physical restraints is common in ICUs but their use is associated with both positive and negative outcomes for the patient .A prescription from a physician is needed in many countries before physical restraints are used on an ICU patient but the ICU nurse is the person primary responsible for the needs assessment, application and discontinuous of physical restraints utilization on the ICU patient. In practice this is often not so as ICU nurses need to be proactive before a life threatening event occurs. There is a gap in the knowledge of what is considered theoretically and what is actually implemented in the clinical setting.

Participation in the study is entirely voluntary. The questionnaire will take you about 20-30 minutes to complete. This is not a test .You may withdraw from the study anytime if you wish to. I assure you that your personal information will not be given in writing of this research report to ensure confidentiality. .

Please note that there won't be any personal benefit attached to participating in this study but it will create awareness on educators on what needs to be included in the curriculum on physical restraints and assist policy makers on best practice that needs to be considered when implementing a policy in the clinical setting.

The appropriate authorities and research committees of the University of the Witwatersrand, Gauteng Department of Health and Hospital Management have approved the study and its procedures.

Thank you for taking the time to read this information letter. For further information regarding the study or your rights as a study participant please contact me in the Department of Nursing Education or on the following telephone number 083 502 9233 and my email address is malehoedna83@gmail.com

For reporting of complaints or any problem contact the Human Research Ethical committee chairperson and administrator.

Chairperson: Peter-Cleaton-jones1@wits.ac.za

Administrator: MsZaneleNdlovu

MrRhulaniMkasi

Mr Lebo Moeng

Email: HREC-Medical. Research office@wits.ac.za

Yours faithfully

Mabona Ednah Maleho

Appendix C

R14/49 Ms Mabona Ednah Maleho

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M170535

NAME: (Principal Investigator)	Ms Mabona Ednah Maleho
DEPARTMENT:	Nursing Education Charlotte Maxeke Johannesburg Academic Hospital
PROJECT TITLE:	The Attitudes and Opinions of ICU Nurses on the Use of Physical Restraints
DATE CONSIDERED:	26/05/2017
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Vivien Hebert
APPROVED BY:	Professor P. Cleaton-Jones Chairperson, HREC (Medical)
DATE OF APPROVAL:	11/08/2017

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary in Room 10004,10th floor, Senate House/3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand. I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially review May and will therefore be due in the month of May each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature — Date 17/08/2017

Supervisor — Date 17/08/2017

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix D

Ms. Mabona Ednah Maleho
University of the Witwatersrand
Department of Nursing Education
Faculty of the Health Sciences
NHRD REF : GP_2017RP15_717

Dear. Ms. Mabona Ednah Maleho

RE: "The attitudes and Opinions of ICU Nurses on the use of Physical Restraints"

Permission is granted for you to conduct the above recruitment activities as described in your request provided:

1. The hospital will not in any way incur or inherit costs as a result of the said study.
2. Your study shall not disrupt services at the study sites.
3. Strict confidentiality shall be observed at all times.
4. Informed consent shall be solicited from patients participating in your study.
5.

Please liaise with the Head of Department and Unit Manager or Sister in Charge to agree on the dates and time that would suit all parties.

Kindly forward this office with the results of your study on completion of the research.

Supported / ~~not supported~~

Ms. M.M Pule
Nursing Director
Date: 2017/08/21

~~Approved~~ / not approved

Ms. G. Bogoshi
Chief Executive Officer
23.08.2017

Appendix E

PERMISSION TO USE THE QUESTITIONAIRE

From: Samantha Freeman [mailto:Samantha.Freeman@manchester.ac.uk]
Sent: 27 February 2017 05:14 PM
To: Viv Herbert
Subject: RE: Request to duplicate study in South Africa

Dear Viv,

Thank you for your email and of course you can replicate the study please see the attached questionnaire if that useful. If you could just reference the study in any work / publication.

I'm carrying out a further study of agitation management at the moment so would be good to keep in touch.If you are interested I will be curating, with a colleague, a twitter chat about the topic on 17th May. My twitter link is @Sam_Freeman_

Best wishes,

Sam

Samantha Freeman

Lecturer in Adult Nursing

Programme Director MSc Advanced Practice and Leadership

NMC Revalidation Lead

Division of Nursing, Midwifery & Social Work |School of Health Sciences |

Faculty of Biology, Medicine and Health|University of Manchester |Room 5.340 Jean McFarlane Building | Oxford Road| Manchester | M13 9PL

Tel: +44 (0) 161 306 7607

From: Viv Herbert [mailto:Viv.Herbert2@wits.ac.za]
Sent: 24 February 2017 09:14
To: Samantha Freeman
Subject: Request to duplicate study in SouthAfrica

24/02/2017

Good morning Samantha Freeman

My name is Viv Herbert and I am a lecturer in the nursing department of the University of the Witwatersrand in South Africa. I am going to supervise a student doing her MSc in Nursing and both our interest in in the physical restraining of ICU patients. We have seen as your article titled “Physical restraints: experiences, attitudes and opinions of adult intensive care unit nurses” that this practice appears to be on the increase. We have on observation in the units in our institution seen this. No formal study has been done as yet in our country on the opinions or attitudes of our ICU nurses. We would thus like to ask you permission to replicate your study. We are also very willing to share our findings and will cite you throughout the research. We are also very willing if you would like a copy of the research report when we have finished.

If you do give us permission would you mind sending us the instrument or is the variables all in the article.

We thank you kindly and hope we can share our interest on this topic with you.

Viv Herbert