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NURSES' PERCEPTIONS OF THEIR ROLE IN THE MANAGEMENT OF SEDATION IN INTENSIVE CARE UNITS

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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, Noluvuyo Tshibha, declare that this research report is my own work. It is being submitted for the degree of Master of Science (in Nursing) in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

Signature …….

……day of …… 2018

Protocol Number M140831

DEDICATION

My gratitude goes to my wonderful mother for her love and support and of cause my friends for their support throughout my studies. To everyone who encouraged me to press on thank you so much.

ACKNOWLEDGEMENTS

Would like to thank the Almighty God for his love and presence in my life during this time of study, to him be the glory for everything I have and who I am.

My heartfelt gratitude goes to the following people:

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To all the participants in the study: the ICU team.

To all my friends for their motivation, prayers and support

ABSTRACT

Background: Sedation is regarded as a common and essential part of treatment for intensive care patients. Clinicians frequently sedate critically ill patients to aid the following: patient-ventilation synchrony, relief of anxiety, promotes sleep or rest, prevent patient self-harm, induce amnesia, alleviate agitation, promote hemodynamic instability, and reduce intracranial pressure. Sedation should be administered with the aim of reaching predetermined end results, because both unsatisfactory and over sedation can lead to negative consequences for patients. The current sedation practice in intensive care has changed, hence the need to explore nurses' role.

Setting: The study was conducted in the adult ICUs (n=5) of a 1,200 bedded university-affiliated, public sector hospital, and tertiary/quaternary level institution in Johannesburg. These ICUs included: trauma, cardiothoracic, coronary care, neurosurgery and multi-disciplinary unit.

Purpose of the Study: The purpose of this study was to explore nurses' perceptions of their role in the management of sedation in the intensive care units of a major public sector hospital in Johannesburg, with an intention of making recommendations for clinical practice and education of intensive care nurses.

Methods: A non-experimental, quantitative, descriptive and cross-sectional design was utilised to achieve the study objectives. A sample size of 80 (n=80) nurses participated in the study. The questionnaire used in the study was developed by Walker and Gillen (2006). It comprised of 29 items with a combination of multiple responses which included dichotomous responses, a 5-point Likert Scale and open ended questions. Descriptive and inferential statistics were used to analyse the data. Statistical tests included the Proportions test, univariate and multivariate regressions and Chi-squared tests. Testing was done on the 0.05 (p=0.05) level of significance.

Results: The findings of the study showed that nurses have a high (>97%) percentage of agreement that they have a major role in sedation management for the care of critically ill patients. An equal (56.3%) percent of nurses agreed that sedation scoring is used in the assessment of the sedation level and that, sedation is titrated by the nurse in collaboration with medical personnel to a pre-determined target level. Most (58.7%) of the nurses rated themselves (out of 10) with a high confidence level (M = 7.45). However, a statistically ($p<0.05$) significantly difference in nurse's perceptions of this role depends on age >50 years (OR = 38.98, 95% CI = 0.99-1.535.79; p=0.051) experience >6 to 10 years (OR = 0.26, 95% CI = 0.07-0.99, p = 0.048) and contribution of this nurse as knowledge and skills are required in order to provide effective sedation for patients.

Recommendations from this study are to incorporate a multi-disciplinary team approach within a locally developed sedation protocol. This should be supported by an education programme aiming to improve decision-making about sedation management for all nurses at the bedside.

Key words: sedation, intensive care, mechanical ventilation, nurses

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LIST OF ABBREVIATIONS

AACN	American Association of Critical Care Nurses
ICU	Intensive Care Unit
MAAS	Motor Activity Assessment Scale
RN	Registered Nurse
SANC	South African Nursing Council
SASA	South African Society of Anaesthesiologists
SAS	Sedation Agitation Scale
USA	United States of America

CHAPTER ONE

OVERVIEW OF THE STUDY

1.0 INTRODUCTION

Chapter one provides an overview of the study. The reader is introduced to the background of the study. The problem statement, the significance of the study, objectives and researcher assumptions are included. In addition to this, the research methodology and ethical considerations will also be briefly discussed.

1.1 BACKGROUND OF THE STUDY

Since the 1990s the focus of research in intensive care has been on the sedation practices and findings of pharmacological inconsistencies and sedation assessment tools in use for sedation (Pinder & Christensen, 2008). Although few articles define sedation, Porter and McClure (2013) defined sedation as reducing anxiety, stress, immobility or excitement through the administration of a drug agent or drugs. The dictionary defines the term sedation as the administration of a sedative drug to elicit a state of calm or sleep, or it is a state of calm or sleep produced by a sedative. The South African society of anaesthesiologists sedation guidelines (SASA, 2015) defined sedation as a drug induced depression of consciousness, with a continuum that varies from minimal sedation and anxiolysis, and moderate sedation and analgesia, to deep sedation, and finally general anaesthesia, These definitions share similar meaning.

In the intensive care setting, there are many reasons as to why sedation is prescribed. Egerod (2002) felt that the indications of sedations were unclear resulting in inappropriate sedation practices. Common ground from current research is that sedation is given with the aim of relieving anxiety, pain and stress (Stephens & Ablordeppey, 2016). It also aims to improve compliance and tolerance with medical invasive procedures and machines like a mechanical ventilator and the endotracheal tube. Overall sedation is given to critically ill patients to promote patient comfort and safety. Sedation can result in complications for the critically ill patient if not given appropriately. The two complications are prolonged sedation and or over-sedation which have the following adverse outcomes such as

increased length stay in ICU, delays the return of the patient to a functional status. Under-sedation results in anxiety, increase in agitation and exposes the patient to risk for injury (Gillis, Cashman & Hagerman, 2011).

The majority of the studies concluded that the management of sedation involves a multidisciplinary team. Most researchers agreed that physicians are the ones who prescribe sedation. Grap, Munro, Wetzel, Best, Ketchum, Hamilton, Arief, Pickler and Sessler (2012) realised that most sedation prescriptions were written with broad parameters allowing nurses to make the final judgement. Nurses are the ones administering the prescribed sedation. They are left with the responsibility of decision-making regarding administration of sedation (Walker & Gillen, 2006). Accurate sedation assessment is essential to ensure proper management of sedation.

Many studies suggested that there are existing factors that influence sedation administration that nurses face. Egerod (2002) concluded that the experience of nurses in the field is a factor as experienced nurses showed a better quality of sedation management in the results of this study. Guttormson, Chlan, Weinert and Savik (2010) however revealed that the attitude of nurses, their beliefs and the knowledge gap of sedation practices influences the administration of sedation. A study by Grap *et al.* (2012) revealed that the nurses' had an attitude of preferring a deeply sedated patient and that affected the practice of sedation. This is also supported by the findings of the Guttormson's *et al.* (2010) study.

The optimal management of sedation can improve the quality of care and lessen the duration of mechanical ventilation (Egerod, Christensen & Johansen, 2006). The literature states that the best way to achieve optimal sedation is by using sedation scales, tools and guidelines. Samuelson, Lundberg and Fridlund (2007) stated that protocols play an important role in ensuring a proper targeted sedation level or management of sedation. Hughes, McGrane and Pandharipande (2012) also agreeing stated that the use of sedation protocols reduces the duration of mechanical ventilation and the length of stay in ICU. Walker and Gillen (2006) revealed in their study that the nurse's judgement and sedation scoring were the best measures of the sedation level. Most journals supported the use of daily interruption sedation saying it is beneficial. Whereas, Anifantaki, Prinianakis, Vitsaksaki, Katsouli, Mari, Symianakis, Tassouli, Tsaka and Georgopolous (2009)

disagreed by stating that both daily interruption and the use of nursing protocols were neither beneficial nor harmful in an adult medical-surgical ICU where their study was conducted. Further, Newton, Pop and Duvall (2013) stated between 1996 to 1999 a set of 25 sedation assessment tools were published of which only three were tested for validity and reliability, and since then more scales have been published and tested for reliability but are still not enough for the whole world.

1.2 PROBLEM STATEMENT

In South Africa, there are currently no available published studies on sedation practices for nurses. Doctors prescribe sedation in broad parameters allowing nurses to make their judgments on administering sedation regarding the dose and frequency. The targeted or preferred depth of sedation to ensure patients safety and comfort are not known. Nurses are the administrators of sedation, and there is little understanding of the process of decision-making for nurses regarding assessment and management of sedation to ensure patients are not over-sedated or under-sedated. This study intended to explore the current sedation practices in the ICUs regarding sedation levels, sedation assessment methods and sedation complications and the process intensive care nurses use to make decisions regarding assessment and management of sedation.

The study attempted to address the following research question:

- **What are the nurses' perceptions of their role in sedation management?**

1.3 PURPOSE OF THE STUDY

The purpose of this study was to explore nurses' perceptions of their role in managing sedation in intensive care units of a public sector hospital in Johannesburg, with the intention of making recommendations for clinical practice and education of intensive care nurses.

1.4 OBJECTIVES

The objectives of the study were:

- To investigate nurses perceptions of their role in sedation management in intensive care units.
- To describe nurses perceptions of the management of sedation in intensive care units.
- To identify, the constraints that influence the effective management of sedation in intensive care units.

1.5 SIGNIFICANCE OF THE STUDY

Sedation has become an integral part of the critically ill patient's treatment during mechanical ventilation (Samuelson, *et al.,* 2007). Although there has been a rising interest in the management of sedation in patients who are critically ill, a gold standard in the management of sedation in ICU for enhancing the delivery of sedatives to these patients has not been found. Titration of medicine doses and sedation protocols based on regular, subjective sedation assessment by nurses has established variable success internationally (O'Connor, Bucknall & Manias 2008). Continued individual development on sedation practices is encouraged among nurses. Various tools for assessment of sedation in critically ill patients are provided by many researchers from literature. This study intended to contribute in the body of knowledge of sedation practices for nurses working in the ICU units and express that sedation assessment, and management is different from pain assessment

1.6 RESEARCHER'S ASSUMPTIONS

A paradigm is a method of observing natural occurrences, opinions of the world, that contains a set of philosophical assumptions and that directs processes to a certain study (Polit & Beck, 2012). This study was based on the following meta-theoretical, theoretical and methodological assumptions.

1.6.1 Meta-theoretical Assumptions

Burns and Grove (2009) stated that assumptions are concepts that are taken for granted or considered as truth, even though they have not been tested scientifically. The meta-theoretical assumptions in Nursing include the human being, the environment, health and nursing.

- **The Person**

Benner and Wrubel (1989) described a person as a self-interpreting being who is defined throughout living life. According to these theorists, the person is viewed as a creative, generative being who lives in the setting of meaning and whose actions and understandings form a comprehensible whole (Benner & Wrubel, 1989). The person in this study is the critically ill patient in the ICU and the family of the patient to whom the patient belongs, which then encompasses the community where the patient goes back to after. The second group is the nurses who look after the patient in the illness and are given some responsibility to make decisions regarding the care of the patient in the absence of the clinician. These are the individuals who belong to families who then form communities.

- **Environment**

Masters (2015) described an environment as "the physical surrounding as well as the local, regional, national and worldwide cultural, social, political and economic conditions that are associated with human beings health". Florence Nightingale was also noted for her focus on aspects of the environment that contribute to the health and healing of the patients; she understood that the environment played a role in a patients healing of body and mind (Rubert, Long & Hutchinson, 2003). Today the healing environment includes a patient centred approach, a pleasing physical setting and a supportive organisational culture. In this study, the environment is the ICU setting which is a specialised area and is limited regarding the number of beds available unable to accommodate everybody. The majority of the patients admitted to the ICU area usually require life support or mechanical support depending on the ICU setting and patient's condition. A lot of procedures done or mechanical support used on the patients admitted in this area usually leave them in pain or experiencing discomfort or need to be sedated depending on the patient's condition.

The ICU environment consists of certain features like monitors, ventilators, intravenous pumps, bright lighting, and noise from all these equipment and healthcare workers talking at the bed side and other fancy or advanced machinery. Continuous monitoring of critically ill patients had been a good thing in critical care, but all this has led to patient's complaining about the effects of these settings in the ICU's (Morton & Fontaine, 2013). The noise level, not being able to tell between day and night and continuous disturbance of sleep through continuous activity, have all been uncomfortable for ICU patients (Morton & Fontaine, 2013), which has a negative effect on the process of recovery for these patients. The actual design of the ICU room may also contribute to the development of ICU delirium.

Critical illness is an event that leads to stressful experience by being a life threatening illness. The ICU setting its self and therapeutic procedures cause discomfort for these patients (Samuelson, *et al.,* 2007). The importance of the patients' ICU room has been proved by many studies to be the place where stressful experiences of many patients take place. Investigating patient's experiences would then assist in how a healing environment can be created (Olausson, Lindahl & Ekburgh, 2013).

- **Health**

The WHO defines health as state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1946). Nursing practice must make sense regarding the human experience. The efficacy of the care will be hindered when the nursing care does not match the person's perceived state of health (Benner & Wrubel, 1989). Nursing is focussed on the relationship between disease and the lived experience of health. Holistically comes from the Greek word meaning, and it means all. Holistic medicine deals with the human body in total. Holistic care highlights that each consist of the body, mind and soul as unified total (Papathanasiou & Kourkouta, 2013). Florence Nightingale encouraged the holistic approach as she recognised the environment, touch, lighting, music and silent reflection in therapy.

The holistic approach is governed by the following principles (Papathanasiou & Kourkouta, 2013).

- Each is capable of increasing own knowledge and skills and behaviour for himself and others.
- People take some responsibility for their good health status, recovery and taking care of themselves,
- A person belongs to himself. Therefore his decisions and developments belong to himself.
- The focus recovery is the individual, not the disease or injury.
- The relationship between health care professionals and their patients should be one of mutual collaboration.
- Health care professionals providing care for others intervene on behalf of the individual only when the individual asks for help, or his health cannot be fully satisfied.

- **Nursing**

Nursing is the care of the critically ill patient. Benner and Wrubel (1989) described Nursing as a relationship based on caring in an enabling condition of connection and concern. These authors further explained that nurses promote healing through assisting the patient to maintain human ties and concerns and it is the human connection that gives people the courage whether of their illness. Intensive care nursing is the specialised care that is provided for extremely ill patients, those whose life is threatened by illnesses or injuries (Wilkin & Slevin, 2004). The nurse that specialises in intensive care accepts a range of roles in the clinical practice these include: the role of being an advocate, using sound judgement (critical thinking), demonstrating care to patients, working within a multidisciplinary team, showing understanding of the cultural diversities and can conduct teaching to the patient and family (Wilkin & Slevin, 2004).

1.6.2 THEORETICAL ASSUMPTIONS

Theoretical assumptions refer to theoretical models and concepts used as a point of departure in the study (Polit & Beck, 2012), and include operational definitions.

The following theoretical assumptions applied to the study:

- Providing care and comfort for the critically ill patient in a holistic and person-centred manner.
- Promotion of healing and a discomfort free recovery for the critically ill patient in the ICU's.
- Prevention of over-sedation and under-sedation of critically ill patients requiring sedation in the ICU's hence delaying recovery.
- Proper management of sedation practices on critically ill patients in the ICU's by the use of sedation scales, protocols and guidelines is to be emphasised in the ICU's.

Critically ill patients admitted to the ICU's experience a lot of discomfort due to the procedures that are done on them and the equipment used on them as well as the environment its self. The latest research does support the use of light sedation to critically ill patients to help prevent discomfort, and the traumatic experience throughout the ICU stay. The use of sedation scales, sedation protocols and guidelines to ensure proper sedation practices has been supported by many studies. Nurses are the ones exposed to the patients and can assess when the patient is experiencing discomfort and administer the prescribed sedatives

1.6.2.1 Operational terms

Definitions for the study are as follows:

- **Intensive care unit**

An intensive care unit is a specifically designated area in the hospital, with specialised equipment and skilled personnel, for the care of critically ill patients requiring immediate and continuous attention (De Beer, Brysiewicz & Bhengu, 2011). For this study, five (n=5) intensive care units were utilised, namely trauma, cardiothoracic, coronary care, neurosurgery and general (multi-disciplinary) unit.

- **Critically ill patient**

Critically ill patient are patients are characterised by dysfunction or failure of one or more organs or systems of the body, and for survival, they depend on advanced instruments to monitor the observations and for the progress of recovery and treatment (Gupta, Bhagotra, & Gulati, 2004). For this study, the critically ill patient's health problems will encompass medical and surgical elective and emergency, diagnostic categories.

- **Sedation**

Newton, Pop and Duvall (2013) defined sedation as "a medically induced state implemented to facilitate procedures or care, and assessment of patient's sedation levels concerns their levels of sleep rather than their levels of consciousness". Whereas Blanchard (2002) defined sedation on four levels: namely (i) minimal (anxiolysis); (ii) moderate sedation or analgesia (conscious sedation); (iii) deep sedation or analgesia and (iv) anaesthesia. For this study, sedation refers to commonly prescribed sedation agents administered to critically ill patients to promote sleep and comfort in the ICUs.

- **Intensive care nurse**

A person registered as a professional nurse by the South African Nursing Council (SANC), who has undergone an advanced education and training programme in intensive care nursing and has the direct responsibility for caring for patients in the ICUs. SANC defines the ICU nurse as a specialist nurse (SANC, 2014).

This research was conducted in the five major ICU's at the major public hospital in Gauteng and all registered nurses who have worked there a minimal of 6 months were invited to participate. Most of the nurses that participated in the study were ICU trained with an additional post-basic qualification after registration as a nurse.

- **Perceptions**

Perceptions are defined as a certain idea or a belief or an image that someone has as a result of how he/she sees or understands something (Wehmeir, McIntosh & Turnbull, 2005). In this study, nurses' understanding of their role in the management of sedation will be measured using a survey questionnaire by Walker and Gillen (2006).

1.6.3 METHODOLOGICAL ASSUMPTIONS

Methodological assumptions reflect the researcher's assumptions about the nature of the research process. The methodological assumptions guiding this study are in line with the scientific method of inquiry. It proposes that the dimensions of the research process following step by step, starting with the problem statement, objectives, paradigmatic perspective, ethical considerations, research design and methods up to writing the report and publication of results (Burns & Grove, 2009).

The researcher believes in nursing as a holistic approach to patient care which includes patient's aspects of physical, mental, social and spiritual. A patient as a whole should be taken into consideration in the delivery of care. Nursing care is an integration of knowledge, skills, experience and individual attributes. Clinical judgment is determined by the skills acquired through the process of integrating education, experiential knowledge and evidence based practice guidelines.

The researcher believes that nursing as a science relies heavily on evidence-based practice. Evidence based practice is the integration of the best available external evidence based on systematic research with individual clinical expertise and patient values to facilitate decision making. The purpose of this research study is to explore the nurses' perceptions of their role in sedation management in the adult intensive care units.

1.7 OVERVIEW OF THE RESEARCH METHODOLOGY

The research methodology refers to the overall plan that guides the study. It enables the researcher to have control over factors that could interfere with the desired oucome (Burns & Grove, 2009). A non-experimental, quantitative, descriptive and cross-sectional design

was utilised to achieve the objectives of the study. The study respondents were intensive care registered nurses affiliated with the intensive care units at a 1,200 bed capacity university-affiliated public hospital in Johanesburg, using a self-administered questionnaire by Walker and Gillen (2006). The intensive care units included: trauma ICU, general ICU, cardiothoracic ICU, coronary care and neurosurgical ICU.

Ethical clearance and permission to conduct the study were sought from the relevant University Research Committees, the Department of Health and the hospital. Participation in the study was voluntary, and respondents were free to withdraw at any point in time.

After permission was achieved from the hospital and unit managers, written consent was obtained from the respondents who agreed to participate. Descriptive and inferential statistics were used to analyse results of the study, with statistical software STATISTICA version 13.2 used for statistial purposes.

Reliability of the study was maintained by ensuring the researcher was the sole data collector of the data, the sample size was achieved purposively and the data verified by a biomedical statistician to ensure the accuracy of findings. The validity of research was maintained by ensuring the data collection instrument was verified by intensive care nurse and education experts and specialists to fit into the South African context.

1.8 ETHICAL CONSIDERATIONS

The following ethical issues were taken into consideration:

- Submission of protocols for peer review to the Department of Nursing Education to assess the feasibility of the study was done.
- Submission of protocols to the University Postgraduate Committee for permission to conduct the study was acquired.
- Application for clearance to research the Committee for Research on Human Subjects (Medical) of the University of the Witwatersrand was made, and granted.
- Application to Hospital Management and Department of Health (Gauteng) for permission to research the hospital was acquired.

- Before inclusion in the study, a written informed consent was obtained from the ICU nurses.
- To ensure confidentiality and anonymity of participants, code names were used during data collection and reporting.
- Participation in the study was voluntary, and participants were allowed to withdraw from the study at any time without penalty.

1.9 OUTLAY OF THE STUDY

The proposed outlay of the study was as follows:

Chapter One	Overview of the study
Chapter Two	Literature review
Chapter Three	Research design and methods
Chapter Four	Data analysis and results of the study
Chapter Five	Summary of the study, main findings, recommendations and conclusion

1.10 SUMMARY

This chapter has outlined the overview of the study starting with the background of the tittle, sedation followed by the problem statement, objectives of the study, significance and the importance of the study. The researcher also included the paradigmatic perspectives of the study and an overview of the methodology, the research design, setting of the study, population and sample, data collection, data analysis, validity and reliability and ethical consideration.

CHAPTER TWO
LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews the literature around sedation practices in intensive care units. It was undertaken to assist the researcher to build a logical framework for the study and to situate the study in the current body of knowledge. The literature review focuses on the current changes in ICU sedation practices and will explore the evidence supporting them. The chapter concludes with a summary.

2.2 SEDATION

At present in the literature, there is no clear definition of the term sedation. The dictionary defines it as "the action of an administering of a sedative drug to produce a state of calm or sleep" (Oxford Dictionary, 2007). Within the intensive care setting, Egerod (2009) reported sedation as a broad term that may include agents for sedation, analgesia and paralysing agents. Also, four levels of sedation are defined by Blanchard (2002) as:

- minimal sedation (anxiolysis)
- moderate sedation or analgesia (conscious sedation)
- deep sedation or analgesia, or
- anaesthesia.

Sedatives are one of the many medications administered in the ICUs. They are used in conjunction with analgesics and less frequently with neuromuscular paralysing agents. Analgesics are often used in combination with sedatives to treat pain and to assist the patient to tolerate the endotracheal tube used to facilitate mechanical ventilation (Rowe & Fletcher, 2008). Benzodiazepines used to relieve symptoms of anxiety are also frequently used. Prolonged use of paralysing agents may lead to long-term neuromuscular complications. As such, and it should only be administered to the patient if deemed clinically necessary (Jacobi, Fraser, Coursin, Riker, Fontaine, Whittbrodt, Chaflin, Masica, Bjerke, Coplin, Fuchs, Kelleher, Marik, Nasraway, Murray, Peruzzi & Lumb, 2002).

Studies more generally suggested that paralysing agents only be administered to deeply sedated patients (Bennett & Hurford, 2011; Kress & Hall, 2006; Hughes *et al.* 2012).

Sedation is an integral part of the treatment of intubated patients, with an estimated 50 to 70 percentage of patients receiving some form of sedation or analgesic, continuously or intermittently, at some point during a stay in ICU (Pun & Dunn, 2007). In the past, sedatives were used to keep patients flat (motionless), heavy sedation was very much common practice for all patients (Rowe & Fletcher, 2008). It documented in the literature that the ICU is a frightening and stressful environment for patients, whereby mechanical ventilation is a necessity to maintain life and promote recovery. To ensure mechanical ventilation and therapeutic interventions are effective, sedation is administered to reduce patient's anxiety and discomfort (Jacobi *et al.* 2002). Egerod (2002:832) quoted Weinert, Chlan and Gross (2001), by stating that "sedative agents are normally prescribed by doctors, and administered by nurses with a wide range of discretion". Pinder and Christensen (2008), Weir and O'Neill (2008), and Guttorsom *et al.* (2010) have also suggested that inconsistencies exist in current practices.

The goals for sedation are not only to facilitate mechanical ventilation, and therapeutic interventions, but the issue of patient safety and comfort are also under scrutiny (Pun & Dunn, 2007). For example, in one study (Kollef, Ahrens, Schaiff, Prentice & Sherman, 1998) it was indicated that heavy sedation is related to an increased mechanical ventilation time and ICU length of stay. In another study, De Jonghe, Bastuji-Garin, Fangio, Lacherade, Jadot, Appere-De-Vecchi, Rocha and Oulin (2005) reported that these outcomes might also have further implications for patients, such as an increased incidence of ventilator associated pneumonia (VAP), decreased mobility and increased health costs. Evidence based guidelines are being introduced to increase consistency and improve sedation practices (Jacobi *et al.* 2002). Newer interventions suggest targeting lighter sedation, and a daily interruption of sedative infusions (wake-up call) have proven to shorten the duration of mechanical ventilation and length of ICU stay and decreased the incidence of complications associated with prolonged intubation (Pinder & Christensen, 2008; Schweikert & Kress, 2008).

2.3 ASSESSMENT OF SEDATION

Sedation assessment tools include the emergence of sedation scoring tools. Sedation scoring tools aim to reduce subjectivity in sedation assessment by creating consistency and objectivity. Sedation scoring tools provide descriptors of specific patient behaviour that a number is assigned to. Many sedation scoring tools have been developed to assist practitioners in assessing and managing sedation in critically ill patients. Reliable scoring tools can improve communication amongst nurse's doctors, improve the consistency in drug administration and be used in combination with sedation protocols to improve the precision of sedative titration as patient needs change over time (Sessler, Gosnell, Grap, Brophy, O'Neal, Keane, Tesoro & Elswick, 2002).

Sedation scoring system usually includes descriptions of some of the following: agitation, pain, consciousness hemodynamic variables, anxiety, synchrony with the ventilator and reaction to tracheal suctioning. Not all assess both agitation and sedation. Some sedation scoring tools view sedation and agitation as part of the same concept with divergent ends on a continuum, for example, the Sedation-Agitation Scale (SAS). Whereas other scoring tools treat these two as two separate concepts completely, for example, the Ramsay Scale. In some cases, agitation is considered not part of a sedation scoring tool. Even though the scoring tools are different in design, they require the assessment of the patient's response to a stimulus. The assessment is based on the patient's ability to respond to a stimulus. This response is assessed by the scoring system. Most sedation-scoring tools have a numerical value attached to clinical findings. A change in the score over a period is used to evaluate the effectiveness of sedation strategy to a predetermined target level.

The aim of these scoring tools is to assess the level of sedation so sedatives can be titrated enabling patients to be more comfortable, cooperative and compliant with their care.

Table 2.1 provides a comparison of the Richmond Agitation Scale with two more recently developed sedation-scoring tools including the SAS and the Motor Activity Assessment Scale (MAAS), which was derived from the SAS (Devlin, Boleski, Peterson, Jankowski, Horst & Zarowitz, 1999). The SAS has seven levels that offer three levels each for advancing sedation and agitation, with level one for the calm and cooperative patient.

There are explicit behavioural descriptors at each level of both the SAS and the MAAS (Devlin, *et al*, 1999).

Table 2.1 Comparison of commonly used sedation scoring tools in intensive care units

"Ramsay Sedation Scale (RSS)	
1. Anxious and agitated or restless or both 2. Cooperative, orientated or tranquil 3. Responding to commands only	4. Brisk responses to light glabellar tap 5. Sluggish response to light glabellar tap 6. No response to light glabellar tap
Richmond Agitation-Sedation Scale (RASS)	
+4 Combative. Overtly combative or violent, immediate danger to staff **+3 Very agitated.** Pulls on or removes tube(s) or exhibits aggressive behaviour **+2 Agitated.** Frequent non-purposeful movement or patient-ventilator dyssynchony **+1 Restless.** Anxious or apprehensive but movements not aggressive or vigorous. **0 Alert and calm**	**-1 Drowsy.** Not fully alert, but has sustained (>10 seconds) awakening, with eye contact to voice **-2 Light sedation. Briefly** (<10 seconds) awakens with eye contact to voice **-3 Moderate sedation**. Any movement (but no eye contact) to voice **-4 Deep sedation.** No response to voice, but any movement to physical stimulation **-5 Unarousable.** No response to voice or physical stimulation
Sedation-Agitation Scale (SAS)	
7. **Dangerous agitation**. Pulling of ET tube, trying to remove catheters, climbing over bed rail. 6. **Very agitated**. Does not calm. Despite frequent verbal reminding of limits; requires physical restraints, biting ET tube. 5. **Agitated**. Anxious or mildly agitated, attempting to sit up, calms down to verbal instructions. 4. **Calm and cooperative**. Calm awakens easily, follows commands. 3. Sedated. Difficult to arouse, awakes to verbal stimuli or gentle shaking but drifts off again, follows simple commands. 2. **Very sedated**. Arouses to physical stimuli but does not communicate or follow commands may move spontaneously. 1. **Unarousable**. Minimal or no response to noxious stimuli does not communicate or follow commands.	
Motor Activity Assessment Scale (MAAS)	
0. **Unresponsive**. Does not move with noxious stimuli. 1. **Responsive only to noxious stimuli**. Open eyes OR raises eyebrows OR turns head toward stimulus OR moves limb with the noxious stimulus. 2. **Responsive only to touch or name**. Open eyes OR raises eyebrows OR turns head toward stimulus OR moves limb when touched or name is loudly spoken. 3. **Calm and co-operative**. No external stimulus is required to elicit movement AND patient are adjusting sheets or clothes purposively and follows command. 4. **Restlessness and cooperative**. No external stimulus is required to elicit movement AND picking of sheets or tubes OR uncovering self and follows command. 5. **Agitated**. No external stimulus is required to elicit movement AND attempting to sit up OR moves limbs out of bed AND does not consistently follow commands (e.g. will lie down when asked but soon reverts to attempts to sit up or move limbs out of bed) 6. **Dangerously agitated, uncooperative**. No external stimulus is required to elicit movement AND patient are pulling at tubes or catheters OR thrashing side-to-side OR striking at staff OR trying to climb out of bed AND does not calm down when asked."	

Source: Devlin *et al.*, 1999; Sessler *et al.* 2002; Sessler, Grap & Ramsay, 2008;

- Richmond Agitation-Sedation Scale

The Richmond Agitation Sedation Scale (RASS) was developed by Sessler *et al*. (2002) in a collaborative effort with critical care physicians, nurses and pharmacists. It is a 10-point scale, with four levels of anxiety or agitation, one level to denote alert or calm and five levels of sedation culminating in unarousable. The values and definitions are displayed in **table 2.1.**

The RASS was tested in the second phase of the original study by the developers. Inter-rater reliability between nurse educator and 27 RASS trained nurses on 101 patient encounters was high (r = 0.964). Correlations between RASS and the Ramsay Sedation Scale (r = 0.78) and the Sedation Agitation Scale (r = 0.78) confirmed validity.

Reliable sedation tools can enhance communication among caregivers, improve consistency in drug administration, to be used in sedation protocols and improve the precision of medication titration as patient needs change over time. The routine adjustment of sedation target as needed is strongly endorsed in recent evidence based guidelines. Unfortunately, studies indicate that sedations scales are underused in ICUs.

The RASS aims to provide a structured assessment of sedation and agitation to assist titration of sedative medications and to evaluate agitated behaviour.

- Sedation Assessment Scale

The Sedation Assessment Scale was developed by Riker, Picard and Fraser (1999). It has 7 levels with 3 levels of agitation (levels 5 to 7), a 'calm cooperative' level (level 4) and three levels of sedation (levels 1 to 3). All levels are defined by multiple (3 or 4 criteria). The reliability of the scale was tested in the original study and demonstrated as Kappa = 0.92.

- Motor Activity Assessment Scale

The Motor Activity Assessment Scale was developed by Devlin *et al.* (1999). It is a 7 point scale, with three levels of agitation (levels 4 to 6), a calm and cooperative level (level 3)

and three levels of sedation (levels 0 to 2). All levels are defined by multiple (3 to 4) criteria.

The reliability of the scale was tested in the original study and demonstrated as Kappa = 0.83 (95% CI = 0.72 to 0.94). Inter-rater reliability tested between three nurses and one doctor was demonstrated at r = 0.81).

2.4 SEDATION PROTOCOLS, GUIDELINES AND EVIDENCE-BASED PRACTICE

Clinical guidelines are a method to facilitate practitioner's adherence to evidence-based practice. They were specifically developed to combat complications associated with the use of sedative medications in intensive care units. Hewitt-Taylor (2004), Blackwood, Alderdice, Burns, Cardwell, Lavery, and Halloran (2011) and Davidson, Winkelman, Gelinas and Dermenchyan (2015) state that guidelines are developed in the form of recommendations or algorithms.

Barr, Fraser, Puntillo, Ely, Gelinas, Dasta, Davidson, Devlin, Kress, Joffe, Skrobik and Jaeschke (2013) developed global guidelines for pain, agitation and delirium on behalf of the American Society of Critical Care Medicine. The guidelines are referred to by the acronyms and known as the PAD guidelines. It intends to minimise the use of sedation in the hope of reducing complications associated with its use in invasively mechanically ventilated adult patients in intensive care units.

Among the currently recommended strategies are targeting light sedation, using validated scales, protocolized and daily sedation interruption (Sneyers, Latterre, Perreault, Wouters & Spineware, 2014; Sessler & Pedram, 2009). **Table 2.2** presents the summary of recommendations supported by levels of evidence for these strategies.

Table 2.2 Recommended guidelines for management of pain, agitation and delirium

Recommendations	Level of evidence
PAIN	
Pain should be routinely monitored in all adult ICU patients	+1B
Vital signs should be used as a cue to further assess pain	+2C
The behavioural Pain Scale (BPS) and the Critical Care Pain Observation Tool (CPOT) are recommended for patients unable to self-report	B
Intravenous opioids are the first-line choice to treat non-neuropathic pain in critically ill patients.	+1C
All available opioids when titrated to similar pain intensity endpoints are equally effective.	+IC
Pre-emptive analgesic therapy and/or non-pharmacologic interventions should be administered before invasive painful procedures.	+2C
AGITATION	
The Richmond Agitation Scale (RASS) and Sedation-Agitation Scale (SAS) are valid and reliable sedation assessment tools for measuring quality and depth of sedation in adult ICU patient.	B
Objective measure of brain function (Bispectral Index, Patient State Index) should be used ONLY in patients receiving neuromuscular blockade.	+2B
Analgesia-first sedation should be used in mechanically ventilated adult patients.	+2B
Sedative medications should be titrated to maintain a light rather than deep level of sedation in adult ICU patients, unless clinically contraindicated.	+1B
Daily sedation interruption or light target level of sedation be routinely used in adult ICU patients using mechanical ventilation.	+1B
Non-benzodiazepines sedatives (propofol or dexmedetomidine) rather than benzodiazepines to improve clinical outcomes.	+2B
DELIRIUM	
Routine monitoring of delirium should be done in adult ICU patients.	+1B
Confusion Assessment Method for ICU (CAM-ICU) and the Intensive Care Delirium Screening Checklist (ICDSC) are valid and reliable delirium monitoring tools in adult intensive care units."	A

Source: Barr *et al.,* 2013; Riker & Fraser, 2013; Davidson *et al.*, 2015.

There is strong evidence supporting the implementation of guidelines. Brook and colleagues (1999) demonstrated that patients who had their sedation managed with a protocol and nurse led decision making versus clinician orders had reduced need for

ventilation and both a reduction in ICU and hospital stay. Another study, from a surgical ICU, reported a reduction of 2.1 days of mechanical ventilation for patients who had their sedation managed using a sedation scale and sedation protocol. Two further studies which explored the impact of a sedation protocol versus doctors' orders (Quenot, Ladoire, Devoucouz, Doise, Cailloid, Cunin, Aube, Blettery & Charles, 2007; De Jonghe *et al.* 2005) also demonstrated patient benefits; reduction in ventilator associated pneumonia and mechanical ventilation, and earlier wakening and reduced mechanical ventilation respectively. In contrast, Adam, Rosser and Manji (2006) showed no benefit of a sedation protocol to their group of cardiac patients' length of stay, despite a 43% reduction in sedation costs as a consequence of the protocol's implementation. There is some concern that using protocols to drive (down) sedation may have resulted in more adverse effects. Adverse events in critical care often refer to unplanned extubations or invasive line removal. There is varying evidence supporting their fears, Girard, Kress, Fuchs, Thomason, Schweikert, Pun, Taichman, Dunn, Pohlman, Kinniry, Jackson, Canonico, Light, Shintani, Thompson, Gordon, Hall, Dittus, Bernard and Ely (2008) reported an excess of 10% in his study. Interestingly through, amongst those who did self-extubate, very few required re-intubating, indicating that perhaps these patients were ready for extubation. Whereas, although many studies have reported unplanned extubations (Brattebo, Hofoss, Flaaten, Muri, Gjerde & Pisek, 2004); Chanques, Jaber, Barbotte, Violet, Sebanne, Perrigault, Mann, Lefrant & Eledjam, 2006; Quenot *et al.* 2007), no statistical differences were found between the control and intervention groups. As such, current evidence would suggest that the use of sedation protocols and a more wakeful ICU population does not result in excess of adverse events.

Studies have also highlighted inconsistencies among practitioners in adherence to evidence-based guidelines. For example, in a study by Egerod, Albarran, Ring and Blackwood (2013) they conducted a cross-sectional survey of nurses attending a European Conference. Data collection used a self-administered questionnaire, 291 nurses participated in this study. This study revealed that out of 22 European countries only 53% (n = 148) used sedation protocols. The Nordic countries reported significantly more use of sedation and pain assessment tools (91% vs 67%) respectively, and more collaborative decision making on sedation (83% vs 61%) when compared with Non-Nordic countries. As a consequence, Nordic nurses also reported significantly less use of physical restraints (14% vs 38%), less use of neuromuscular blocking agents (3% vs 16%) and received more

sedation education (92% vs 76%). Delirium assessment was not performed routinely in most settings. This study creates an awareness of sedation practices while paving the way forward for improvement in sedation management.

Randen and Bjork (2010) conducted a study in Norway and found that daily interruption of sedation (DIS) or analgesia-based sedation practice was not perceived as practice in intensive care units among their study participants (n = 86). In another study, Roberts, de Wit, Didomenico, Epstein and Devlin (2010) reported that 57 (44%) of 130 nurses in their American study had performed DIS at least once in the past. These authors also reported that nurses were less likely to preform DIS with patients on higher doses of continuous midazolam, a fraction of inspired oxygen greater than 50%, positive end expiratory pressure greater than 5 mmHg and in patients either deeply sedated or agitated. This study concluded that institutional policies need to take into account the nurse and patient factors that affect DIS performance by nurses. Other studies have also reported similar results (Sneyers *et al.*, 2014).

2.5 SEDATION MANAGEMENT

Sedation requirements vary for each patient, optimal sedation management is vital in improving patient outcomes (Jackson, Proudfoot, Cann & Walsh, 2009). Diverse drugs are used for sedation; although these drugs are used to help the patient they still carry the potential to cause harm as a result of over-sedation or under-sedation (Whitehouse, Snelson & Grounds, 2014)

2.5.1 Optimal Sedation

Optimal sedation states are proposed as those where the patient is calm, easily rousable; while ensuring the patient is not under or over sedated (Pun & Dunn, 2007). The consensus around what constitutes ‘optimal’ is noted to be variable in ICU practice; it appears that ‘optimal’ varies between patients and can be dependent upon their medical and treatment needs. ‘Optimal’ sedation is viewed as unique and individual assessment (Jackson, Proudfoot, Cann & Walsh, 2009). Therefore, at the outset, the definition of optimal or adequate sedation is problematic.

A fundamental finding is that many guidelines pertaining to delivering optimal sedation originate from the USA (Jacobi *et al.* 2002; Knape, Adriaensen, van Aken, Blunnie, Carlsson, Dupont & Pasch, 2007; Shah 2000; Shapiro, West, Nathens, Harbrecht, Moore, Bankey, Freeman, Johnson, McKinley, Minei, Moore, & Meier, 2007). It is a noteworthy observation as ICU clinical practice differs from the US. In the US patients are nursed in single rooms and at a 1:3 nurse-to-patient ratio; both practices that are not standard elsewhere. Furthermore, a majority of US ICUs are not closed units, wherein patient care is solely managed by intensivists as is the case in most ICUs elsewhere; this ultimately has consequences for the way in which care/treatments are managed.

Moreover, the sedation guidelines invariably differ in their recommendation of what is an appropriate 'optimal' sedation level. Shapiro *et al.* (2007) recommend a RASS score of 0 to -2 but another guideline suggests clinicians should aim for a RASS of -3 (University of Pennsylvania Medical Center, 2003). To add to the confusion, Knape *et al.* (2007) refer to the Ramsay scale and suggest aiming for a score of 2 or 3. Ultimately the wealth of sedation scales available complicates the pursuit of optimal, as does the diverse recommendations. However, a commonality was noted amongst the guidelines offered, that the practitioner should decide the sedation target depending on their patient's needs.

2.5.2 Over-sedation

Over sedation exposes the patient to increased cardiovascular instability, prolonged mechanical ventilation, morbidity (e.g. ventilator associated pneumonia) and delirium (Ramsay, 2000).

- Delirium

There is emerging evidence that many cases of delirium are related to sedative effects of anxiolytics and analgesic drugs such as benzodiazepines, that ICU nurses are responsible for managing (Jacobi *et al.*, 2002; Sessler & Pedram, 2009).

A delirium is a form of acute brain dysfunction that can occur in up to 80% of mechanically ventilated patients and, a strong predictor of adverse outcomes in patients who are critically ill. Also, delirium is characterised by fluctuating levels of arousal during

the day, which is associated with sleep-wake cycle disruption and reversed at night time (Jacobi *et al.* 2002). It can be found to have a relatively early onset, as little as two days following ICU admission, it can last for 3 to 6 days and up to 10% of patients discharged from ICU may be delirious (Ely, Shintani, Truman, Speroff, Gordon, Harrell, Inouye, Bernard & Dittus, 2004).

Delirium may be associated with altered mental status and various motor subtypes: hypoactive, hyperactive or mixed (Ely, Margolin, Francis, May, Truman, Dittus, Speroff, Gautam, Bernard & Inouye, 2001; Bourne, 2008; Svenningsen & Tonnesen, 2011). The hyperactive subtype is a cause of agitation whereby patients tend to be fidgety and paranoid. In contrast, the hypoactive form leaves patients quiet, withdrawn and paranoid. It is often overlooked in practice as the patients may appear calm and less demanding (Ely *et al.* 2001). Mixed delirium has features of both hyper- and hypoactive deliriums (Bourne, 2008).

2.5.3 Under-sedation

Under sedation contributes to ventilator asynchrony, patient anxiety, autonomic hyperactivity and increased risk of self-extubation and hypoxia (Ramsay, 2000).

- Agitation

If patients are under sedated this manifests as agitation. Agitation is a result of both physical and psychological distress. It is defined as "a sustained state of apprehension and autonomic arousal in response to real or perceived threat" (Pinder and Christensen, 2008:5). The physical and psychological distress is multifactorial, a combination of "acute physiologic abnormalities, pain, anxiety, sleep disturbances, polypharmacy, withdrawal syndromes, and delirium (Honiden & Seigel, 2010:187).

Agitation is common amongst critically ill patients in intensive care units. Woods, Mion, Connor, Viray, Jahan, Huber, McHugh, Gonzales, Stoller and Arroliga (2004) reported 16% of mechanically ventilated patients developing severe agitation, and Fraser and Riker (2000) reported it more frequently – 46%; the latter study included non-ventilated and mechanically ventilated patients. It is important to avoid and manage agitation effectively

and efficiently in ICU because it can subsequently affect diagnoses and treatments. Agitated patients affect a patient's ability to cooperate with therapeutic interventions or monitoring (Crippen, 1999). Ultimately agitation can lead to prolonged weaning from mechanical ventilation, and a longer ICU stays (Cohen, Gallagher, Pohlman, Dasta, Abraham & Papadokos, 2002). The psychological impact of prolonged agitated states is relatively unknown (Pinder & Christensen, 2008), although an area currently being explored as ICU patients are being kept in more wakeful states.

There are some recognised causes for agitation (Doherty, 1991) such as physiological disorders of hypoxia, pain or metabolic disturbance, environmental issues such as unnatural lighting or excessive noise and personal distress or anxiety. Pharmacological reasons for agitation are associated with the use of sedatives or a combination of sedation with other factors. These potential causal factors need to be approached systematically to ensure appropriate treatment and management is chosen (Doherty, 1991).

Ultimately treatments chosen must reflect the needs of the patient. Some treatments will require being initiated immediately, and others will be less urgent and imitated after diagnostic tests, but all interventions will require the collaboration of both medical and nursing staff, Doherty (1991:754) asserted that nursing care could maximise patient recovery. As with delirium, there are recommended pharmacological and non-pharmacological interventions for agitation management. It is recommended that non-pharmacological management should be considered before pharmacological intervention (Jacobi *et al.* 2002), use of polypharmacy and agitation are associated (Pun & Dunn, 2007).

Sedatives and analgesics are recommended as a source of pharmacological management of agitation, but there is no universal agreed method. Unfortunately, treatment of agitation in this way is a vicious circle, as both sedatives and analgesics are associated with the development of agitation, and there is an added risk of accumulation and dependency occurring (Pun & Dunn, 2007). Haloperidol also noted as treatment of delirium earlier, is recommended for the treatment of agitation in ICU patients (Jacobi *et al.* 2002; Ely *et al.* 2004). However, there is still limited evidence of its effectiveness short and long term (Pun & Dunn, 2007).

2.6 NURSES ROLE IN SEDATION MANAGEMENT

Davidson *et al.* (2015) highlighted in their study that the development of guidelines for pain, agitation and delirium affect nurses in many roles associated with intensive care. Walker and Gillen (2006) indicated that the quality of care is dependent on how nurses perceive their roles. Weinert and Calvin (2007) conducted a cohort study to describe the epidemiology of sedation and adequacy for mechanically ventilated patients in ICU. Data collection included observations using validated tools, 312 (n = 312) patients participated in the study. The results revealed that out of 18,050 observations 85% sedation assessments were judged adequate, but about 17% of patients were found to be judged over- or under-sedated. The study concluded that this discrepancy influences the interpretation of sedation adequacy and sedation management.

In a cross-sectional survey of Irish nurses conducted by Walker and Gillen (2006), they found that the nurse has a big role in sedation management for critically ill patients. This included assessing patients and titrating sedation in collaboration with medical personnel to an agreed target level. However, the influence of the nurse's role depends on experience and confidence because effective management also needs knowledge and skills. This study supported a team-based approach within a locally devised sedation protocol.

Guttormston *et al.* (2010) conducted a cross-sectional survey to determine the factors that influence nurse sedation administration. Data were collected utilising a self-administered questionnaire, a total of 423 (out of 1250) nurses participated in this study. The results of this study revealed that most nurses agreed that sedation is necessary for patient comfort; the effectiveness of sedation was positively correlated with nurse's report of sedation practice ($p<0.001$) and intention to give sedation ($p<0.001$). The attitudes of nurses were not different regarding individual or practice setting characteristics. The study concluded that nurse's attitudes influence sedation management practices.

Aitken, Marshall, Elliott and McKinley (2009) conducted a study that aimed to understand how nurses make decisions regarding sedation management. Data collection included observations, using a 'think aloud' approach and individual interviews in the follow-up, 5 expert nurses participated in this study. The study revealed attributes and concepts most frequently used related to sedation were anxiety, agitation, pain and comfort and

neurological status. These were related to assessment (pre 58%; post 65%), physiology (pre 10%, post 9%) and treatment (pre 31%; post 26%) aspects of care. This study concludes that decision making is complex and involves a range of attributes that focus on assessments aspects of care.

In a follow-up study, Aitken, Marshall, Elliott and McKinley (2011) aimed to describe decision making related to assessment and sedation management. Using the same data collection methods described in the earlier study, five self-identified expert nurses participated in this study. Data analysis compared the two data collection techniques. The results of the study revealed, 130 management decisions were identified through observation when compared with 209 assessment decisions (209) through 'think a loud' technique. This study concludes that the two data collection methods result in different decision tasks.

Other studies that explored nurse's perceptions of sedation revealed the nurses' attitudes accounted for a third of the variance found in the intention to sedate mechanically ventilated patients (Guttormson *et al.* 2010). Furthermore, they highlighted that the nurses held beliefs that sedation should be to reduce patients' recall of their stay in ICU, particularly mechanical ventilation, which they perceived as being uncomfortable for the patient. They reported that 15% of their respondents felt that "no response to noxious stimuli or no spontaneous movement was an appropriate sedation level for patients" (Guttormson *et al.* 2010:49). These findings are in stark contrast to the current guidelines around sedation management (Intensive Care Medicine 2007). Weinert and Calvin's (2007) study also illustrated the problems using clinical judgment to assess patients need for sedation. They reported a marked discrepancy in the 'personal judgment' of over sedation assessment, wherein patients were noted to be non-rousable in 32% of cases and motionless in 21% of cases. It was proposed that nurses tend to judge the more deeply sedated patients as being 'optimally' sedated. It also raised the question of a nurse's experience and the influence on their sedation practice. Weir and O'Neill (2008) reported that the nurses whom they interviewed tended to be of the opinion that a lack of clinical experience among nurses could at times lead to inadvertently over-sedating of patients.

2.7 SUMMARY

The intensive care unit environment, life threatening illnesses, acute stress response, and therapeutic procedures are the cause of discomfort in critically ill patients. Critically ill patients experience stressful events caused by the presence of endotracheal tube, pain, feelings of thirst, anxiety, fear, sleep disturbances, night mares and hallucination. Sedatives and analgesics are administered to enable patients to tolerate many intensive care therapies that ICU patients endure from all the stress experienced during the ICU stay. The use of sedation protocols and guidelines with regular subjective sedation assessment has proven variable success globally. Clinical guidelines are a method to facilitate practitioners adherence to evidence –based practice intended to combat complications associated with the use of sedative medications.

CHAPTER THREE

RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

This chapter serves to describe the research design, the setting, population, sample and sampling, the inclusion and exclusion criteria and the methods of the study in detail, as well as data collection, a description of the instrument used in data collection. Following this, validity and reliability of the study will be outlined. Lastly, in concluding this chapter, the relevant ethical considerations will be discussed in greater detail.

3.2 PURPOSE AND OBJECTIVES

For consistency, the purpose and objectives of this study are repeated.

The purpose of this study was to explore nurses' perceptions of their role in managing sedation in intensive care units of a public sector hospital in Johannesburg, with the intention of making recommendations for clinical practice and education of intensive care nurses.

To meet this purpose the following objectives were set:

- To investigate nurses' perceptions of their role in sedation management in intensive care units.
- To describe nurses perceptions of the management of sedation in intensive care units.
- To identify, the constraints that influence the effective management of sedation in intensive care units.

3.3 RESEARCH DESIGN

A study design guides researchers on how to collect, analyse and interpret observations and serves as a logical model for the various stages of the research. A quantitative, non-

experimental, descriptive, cross-sectional design was utilised in this study. The most appropriate means to collect the data was a self-administered survey.

Quantitative research involves an empirical investigation of phenomena that lend themselves to precise measurement and quantification, often involving rigorous and controlled design (Polit & Beck, 2012). A quantitative design was ideal for this study as it intended to explain nurse respondents' perceptions of their role in the management of sedation in the participating intensive care units.

Non-experimental research is when the researcher collects data without introducing an intervention, also known as an observational study (Polit & Beck, 2012). The study is usually carried out in its natural location, and no manipulation of variables is involved (Lo-Biondo-Wood & Haber, 2014). A non-experimental design was ideal for this study as it took place in the natural location, i.e. in intensive care units at the selected hospital and there was no manipulation regarding the involvement of treatment or any intervention given to respondents.

A descriptive design observes, describes and documents aspects of a situation as it naturally occurs. It sometimes serves as a starting point for generating a hypothesis or developing a theory (Polit & Beck, 2012). Also, it is used to gain more information about a particular or specific area of study and may be used to develop a theory, and no manipulation of variables is involved (Burns & Grove, 2009). Methods, which describe phenomena in a descriptive research include structured and unstructured interviews, interviews and questionnaires. Protection of bias is achieved by connecting conceptual and operational definitions of variables, sample selection and size, valid and reliable measuring instruments and the data collection methods (Burns & Grove, 2009). In this study, descriptive design was ideal as it was used to gain more information on the nurse respondents' perceptions of their role in the management of sedation in the participating intensive care units. A self-administered questionnaire was used to collect data to avoid bias.

As this study was conducted over a short period it was cross-sectional. The aim of cross-sectional study design is usually to describe a population and to find the prevalence of the

outcome of interest (Polit & Beck, 2012). Cross-sectional studies provide information concerning a certain situation at a given time.

3.4 STUDY SETTING

The study was conducted in adult ICUs at a university affiliated, tertiary level public sector hospital in Johannesburg, Gauteng province. It is also a referral hospital, with intensive care units for critically ill and injured patients with different profiles, offering a range of services to patients on admission to the hospital, as well as a referral from within the hospital and other hospitals in the province or neighbouring provinces.

The levels of intensive care units are described according to the guidelines provided by the South African Society of Anaesthesiology (SASA, 2013). The general ICU, cardiothoracic and trauma units are considered level I ICUs as they provide highly specialised care for patients with multiple organ failures, while the coronary care and neurosurgery were considered level II as they provide care for single organ failure.

The hospital has a 1,200 bed capacity attending to the needs of a diverse population, and patients who make use of the facilities have no medical aid and make use of this public service by the government for their health care. All patient care is provided under the supervision and direction of a medical specialist. They are specialist doctors who hold an additional qualification in the speciality of intensive care medicine. Being academic tertiary units, all the units have access to a designated clinical nurse instructor. Nursing staff consists of both nurses trained in intensive care nursing the AACN defines it as speciality within nursing that deals specifically with human responses to actual or potential life threatening health symptoms and diagnosis (AACN, 2015), and those not, but hold a general nursing qualification "registered person, a person who is registered as a nurse or as a midwife in terms of the nursing Act (SANC)

3.5 RESEARCH METHODS

Research methods refer to the steps, procedures and strategies for gathering and analysing data. They include the data collection strategies, population, sample and sampling methods and data analysis (Burns & Grove, 2009; Polit & Beck, 2012).

3.5.1 Target Population

A target population is an integral population, which the researcher usually samples from an accessible population and hopes to generalise the study findings (Polit & Beck, 2012). The target population for this study comprised nurses working in the adult intensive care units in the selected institution. They included the nurses working in the general ICU, medical and surgical ICU, trauma ICU and neurosurgical ICU.

A preliminary record review undertaken in June 2013 indicated there was approximately 105 (N=105) intensive care registered nurses working in these units.

3.5.2 Sample and Sampling Methods

Following discussion with a statistician, a sample size of 80 nurses (n=80) was decided upon to provide a good representation of the population from which the sample was drawn: a large sample was necessary to obtain a confidence of 95%. A total population sampling method was used to select the nurses provided they are suitable and meet the inclusion criteria of the study.

Inclusion criteria for prospective respondents included:

- Registered by the South African Nursing Council with an additional qualification in intensive care nursing;
- Working in either the general ICU, trauma ICU, cardiothoracic ICU, coronary care unit, or neurosurgical ICU; and
- More than six months clinical experience in the selected Intensive Care unit.

The exclusion criterion included enrolled nurses and auxiliary nurses, as their category of nursing were not expected to have the skills and in-depth knowledge of the roles of intensive care nurses in the sedation management of adult critically ill patients.

3.5.3 Data Collection

Data collection is the process of gathering information to address a research problem by the research objectives (LoBiondo-Wood & Haber, 2014).

3.5.3.1 Instrument

In this study a survey questionnaire developed by Walker and Gillen (2006) and identified in the literature and previously published studies was used to achieve the study objectives. The questionnaire contains 29 items divided into three sections (refer **Appendix A**). The first section (Section A) collects demographic data from the respondents (8 items), section B asks respondents about the nurses' role in sedation management (13 items), while the third section (Section C) addresses respondent's perceptions of the management of sedation (8 items). Each statement in section B was scored on a 5-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree) with a middle value 3 (do not know). Section C utilised a variety of response items, such as dichotomous responses, open-ended responses, a 4-point Likert Scale and a 5-point Likert Scale. No statements on the questionnaire were worded in the negative. The constraints that influence the effective management of sedation in intensive care units will then be addressed based on the age of the respondents, years of experience in the field of ICU, education level of the in terms of speciality and individual confidence about management of sedation.

3.5.3.2 Validity and Reliability of the Instrument

The developers assessed face and content validity in the sample of the original study (Walker & Gillen, 2006). Also, it was tested on a convenience sample of 107 intensive care nurse respondents in intensive care units of a large teaching hospital (Walker & Gillen, 2006). No other studies were found utilising this questionnaire on independent samples of intensive care nurses; these authors did not comment on validity and reliability of the instrument.

After verification by five local domain experts, i.e. medical specialists (n=2) and Intensive Care registered and nurse education experts (n=3), the questionnaire was found to apply to the South African context however it was suggested that question six of the questionnaire intrument be modified to 1. ICU nurse, 2. Shift leaders, 3. Clinical instructor, 4. Unit manager, to distinguish the participating group which is more appropriate to the South African setting.

3.5.3.3 Procedure

Permission was obtained from the Chief Executive Officer (CEO) of the hospital being requested to participate in the study (refer **Appendix E**). Once obtained, permission from the nursing services manager was sought and after that the unit manager was approached, informed about the study, research purpose and significance to practice and their permission sought. The researcher will visit the units and observed the respective allocation register for selection of participants. Those respondents who agreed to participate received an information letter outlining the study and its procedures (refer **Appendix B**) and a consent form to complete (refer **Appendix C**). The respondent placed the completed questionnaire in an envelope and posted it in a sealed box in the respective unit to be distributed to all the registered nurses with an intensive care speciality about n=105 at the time of data collection. At the end of the data collection period the researcher alone opened the boxes.

3.5.4 Data Analysis

Descriptive and inferential statistics were used when analysing the collected data. Descriptive statistics are used to describe and integrate data while inferential statistics are used to make judgments (conclusions) about the population (Polit & Beck, 2012). Inferential statistics this group of statistics is concerned with the characteristics of populations and uses sample of data to make an inference about a population (Nieswiadomy, 2008). Additionally subgroups were identified during data analysis and subjected to post hoc analysis.

Statistical assistance was obtained from a statistician from the Medical Research Council (MRC). Statistical tests included: the proportions test, factor analysis and chi-square test to compare and explore relationships between variables.

Thematic analysis was applied to the qualitative written responses (third section of the questionnaire) using content analysis (Elo & Kyngas, 2008) and verified by the supervisor.

3.6 PRE- TESTING PROCESS

A pre-testing process was conducted before the commencement of the main study. The data collection tool was used on five (n=5) nurse respondents in the units at the selected study site. A pre-testing process is a small scale trial run on all the aspects planned for use in the main study. It intended to help the researcher to fine tune for the main study and to determine whether the methodology, sampling, instrument and analysis are adequate and appropriate (De Vos, Strydom, Fouche & Delport, 2011).

The purpose of the pre-testing process was to identify and prevent any difficulties before the main study and to make changes to the data collection instrument if necessary. Participants indicated that the language was understandable and no recommendations were made to change the instrument. Each participant took an average of 10 to 15 minutes to complete the questionnaire.

Following the consultation with the statistician, the results of the pre-testing process were exluded from the data analysis of the main study.

3.7 VALIDITY AND RELIABILITY OF THE STUDY

Validity of an instrument determines how well the instrument reflects the construct being examined (Burns & Grove, 2009), reliability is the degree to which an instrument can be dependent upon to yield consistent results if used over and over again on the same population, or if used by different researchers (Polit & Beck, 2012). The following were observed to ensure achievement of validity and reliability of the study.

The reliability of the study was maintained by the following:

- Maintaining the consistency of data collection through compliance with data collection instrument.
- The data collection process was done entirely by one researcher.
- Data collection within the stipulated three month time frame.
- Data were verified by the statistician for accuracy, and a large sample was utilised.

The validity of the study was maintained by the following:

- A small group of Intensive Care nurse experts and specialists assessed the instrument (Walker & Gillen, 2006) for verification.
- Convenience sampling was used to obtain broader representativeness of the situation.
- A non-threatening environment was created by assuring respondents that participation was voluntary, anonymity would be ensured, and withdrawal from the study was applicable without any consequences.
- The instrument was handed to the participant alone, and when completed it was placed in a sealed box, which was only opened after the data collection process was finished for data analysis to take place.
- A small pre-testing procedure was also conducted on five (n=5) respondents to enhance the validity and reliability of the study.

3.8 ETHICAL CONSIDERATIONS

Most of the nursing research contains humans as participants so that certain structures need to be put in place to ensure that the study conforms to ethical principles. Each study design needs to be inspected to determine whether the rights of the participants have been sufficiently protected (Polit & Beck, 2012).

As a student of the University of the Witwatersrand, all research are expected to adhere to the Declaration of Helsinki for protection of human subjects, as well as the Singapore Declaration of Research Integrity. This ensures "all human research undertaken by staff and students in the Faculty of Health Sciences or hospitals or clinics, by staff or students of any faculty is safe, ethical, soundly based, and respects individual rights" (Cleaton-Jones, Milani & Tiemessen, 2012).

The South African Nursing Council (SANC) designed a code of ethics for nursing in South Africa as ethics forms an important part of the nursing profession. In the nursing practice, the main responsibility is focused towards ensuring protection, promotion and restoration of health for individuals, families, groups and communities with the aim of preventing illness and preserving life for human beings (SANC, 2013). Nurses are accountable for

executing practice with the required respect for the rights of all humans. It encompasses rights to cultural, life, choice and dignity without considering the age, colour, culture, disability or illness, nationality, politics, racial and social status (DENOSA [2005] cited in Brink, van der Walt & van Rensburg, 2012). The researcher's role as a professional nurse is to deliver a holistic health approach to the individuals of the community that is driven by honesty.

3.8.1 Permission to Conduct Research

Submission of protocols to the University Postgraduate Committee for permission to conduct the study was achieved. Application for clearance to conduct research from the Committee for Research on Human Subjects (Medical) of the University of the Witwatersrand was granted, and application to Hospital Management and Department of Health (Gauteng) for permission to conduct research at the hospital (refer **Appendix E**), was also obtained.

3.8.2 Informed Consent

Participant's were invited to participate in the study and informed that participation was voluntary and participant's were allowed to withdraw from the study anytime they wish, and there would be no penalty. According to (Burns & Grove, 2009), informed consent is an explained procedure where individuals are provided with appropriate, adequate and understandable information with regards to their participation in a research study.

Before the inclusion into the study, a written informed consent were obtained from the participants (refer **Appendix B and Appendix C**).

3.8.3 Confidentiality

Brink *et al.* (2008) define confidentiality as one of the ethical principles that prevent a health care provider from disclosing information about a patient to others without obtaining consent first, and that particular information may only be used in connection with the treatment or planning of health care (Brink *et al.*, 2012).

In this study, confidentiality was maintained by preventing publicising of the information in a way that rebels against the participants and the raw data were kept inaccessible to others and possible individuals are known to the respondents. Allocation and use of code names during data collection and reporting to protect the participants was applied. Their response information received was kept confidential.

3.8.4 Anonymity

Polit and Beck (2012) defined anonymity as the maximum safe way of safe guarding confidentiality of participants. It takes place when the researcher is unable to connect the participants to their questionnaire responses.

In this study, participants were kept anonymous by measures to keep participants information safe on my personal computer was implemented through the use of a pass word to keep the document protected. Concerning the storage of completed surveys, the university requires research data to be stored for five years before being destroyed.

To ensure confidentiality and anonymity of participants, code names were used during data collection and reporting.

3.9 SUMMARY

Chapter three described the research methods and procedures of the study. This included the design, the study setting, eligibility criteria, the population and sample described, data collection and analysis discussed, methods to ensure validity and reliability described and related to this study, ethical considerations and the pre-testing process discussed. The validation of the research instrument used in data collection was discussed.

The next chapter will discuss data analysis and the results of the study.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

This chapter describes nurse's perceptions of their role in the management of sedation in intensive care, with the intention of making recommendations for clinical practice and education of intensive care nurses. This was achieved within a descriptive, quantitative survey and cross-sectional design. The population (N=105) included nurses practicing in adult intensive care units at one major public hospital in Johannesburg. A sample size of 80 (n=80) respondents was obtained by means of purposive sampling. Data was collected by means of a data collection tool (**Appendix A**). Data were analysed by means of descriptive (frequencies and percentages) and comparative tests. Statistical tests included the Proportions test, univariate and multivariate logistic regressions and Chi-squared tests. Testing was done on the 0.05 ($p<0.05$) level of significance. Findings will be discussed on the scale, construct and study group level.

4.2 APPROACH TO DATA ANALYSIS

Descriptive statistics were used to present the demographic data of the nurse respondents. The demographics data included: age, gender, hours of work, and years of qualification as RN, years of experience in intensive care unit, current position, and post-registration qualification in intensive care nursing and academic qualifications. Measures of frequency distributions were used to summarise the questionnaire (**Section B and Section C**). Frequency distributions and tables were used to present these results. Percentages in these findings were taken to the nearest whole number.

In order to explore the data further, the overall summary of the demographic data (frequencies, means and standard deviations) as described above were used. The Proportions test and factor analysis were used to make an overall relation or significance between the themes on the themes on the questionnaire for the perceptions of the nurse's role in sedation (**Section B**) and perceptions of nurses in sedation management (**Section C**). Univariate and multiple logistic regressions were then computed to investigate factors

of effective management of sedation in the intensive care unit. The univariate logistic regression models were computed to investigate how each demographic factor contributed to the outcome, while the multivariate regression models were used to assess the collection effect of the demographic factors on the outcome. The Chi-square test was used to explore the association between the demographic data and nurse's perception of their role. Statistical significance was set at the level of $p<0.05$.

Statistical assistance was obtained from a statistician assigned to the postgraduate research office in the Faculty of Health Sciences, University of the Witwatersrand.

4.3 RESULTS AND DISCUSSION

4.3.1 Section A: Demographic Profile of Respondents

This section of the data collection instrument related to the respondent's demographic data, which comprised of eight (8) items. Items were age, gender, and hours of work, years qualified as an RN, years of experience in ICU, current position, post registration qualification, and professional qualifications, which were obtained from the respondents through a self-administered questionnaire. Results of this process are summarised in **Table 4.1.**

Table 4.1 Demographic profile obtained from the nurse respondents for the total sample

Item	Category	Frequency	Percentage
A1	Age		
	No response	1	1.3%
	<30 years	6	7.5%
	30 to 39 years	31	38.6%
	40 to 49 years	28	35.0%
	>50 years	14	17.5%
A2	Gender		
	Male	17	21.3%
	Female	63	78.8%
A3	Hours of work		
	Full-time	77	96.3%
	Part-time	3	3.7%
A4	Years qualified as RN		
	<1 year	1	1.3%
	1 to 5 years	26	**32.5%**
	6 to 10 years	20	25.0%
	>11 years	33	41.3%
A5	Years of ICU experience		
	<1 year	9	11.3%
	1 to 5 years	38	**47.5%**
	6 to 10 years	13	16.3%
	>11 years	20	25.0%
A6	Current position		
	Unit manager	5	6.3%
	Clinical instructor	4	5.0%
	Shift leader	28	35.0%
	ICU Nurse	43	**53.8%**
A7	Post registration qualification in ICU		
	No response	3	3.8%
	Yes	63	**78.8%**
	No	14	17.5%
A8	Professional qualification		
	No response	1	1.3%
	Certificate	3	3.8%
	Diploma	35	**43.8%**
	Degree	17	**21.3%**
	Postgraduate certificate	3	3.8%
	Postgraduate diploma	16	**20.0%**
	Master's degree	4	5.0%
	PhD	1	1.3%

Of the total sample (n=80), females accounted for 78.8% (n = 63) and 21.3% (n = 17) were males. 52.1% (n = 42) of the respondents were between the ages of 40 to more than 50

years, and 37 (n = 37; 46.1%) were in the less than 30 to 39 age categories. It can be extrapolated from these findings that females predominate in the sample. However, between age categories indicate opposite higher and lower frequencies in the 40 to more than 50 (>50) years and less than 30 (<30) years to 39 age categories, implying that in terms of age distributions it can be said that the population is slightly older in terms of age. **Table 4.1** displays these results.

An overwhelming 96.3% (n = 77) of the respondents were employed in the intensive care setting in a full-time capacity. Most 66.3% (n = 53) of the respondents had between 6 to more than eleven (>11) years of nursing experience, and 27 (33.8%) had less than five (<5) years of experience. In terms of ICU nursing experience, most 41.3% (n = 33) of the respondents had between 6 to more than eleven (>11) years of experience, and 58.8% (n = 47) had less than five (<5) years of experience. When comparing categories of less than five (<5) years of experience it can be extrapolated that nurses with less experience as an RN have more years of experience in ICU nursing (33.8% vs. 58.8%), while the opposite trends is observed in the more than six (>6) years of experience population group (66.3% vs. 41.3%). This cohort demonstrates that newly qualified professional nurses are entering or choosing intensive care nursing as a speciality (O'Kane, 2011). **Figure 4.1** displays these results.

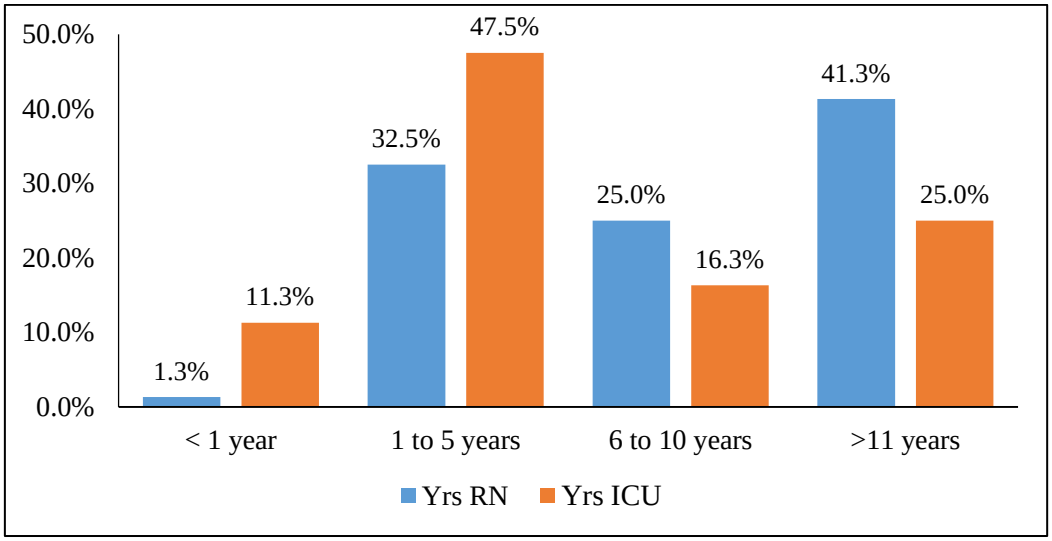


Figure 4.1 Comparison of years of experience as RN and years of experience in ICU

Most 53.8% (n = 43) of the respondents were primary bedside nurses, 28 (35.0%) and 5(6.3%) were shift leaders and nurse unit managers, respectively. Most 43.8% (n = 35) of the respondents held a diploma level qualification, and only 17 (21.3%) had a basic degree in nursing. Seventy-eight (78.8%, n = 63) percent of the respondents were intensive care qualified, and 14 (17.5%) were RNs but non-qualified in intensive care nursing in addition to their basic nursing qualification (whether degree or diploma) which indicates the majority of the participants held additional qualification, are ICU qualified.

Figure 4.2 presents these results.

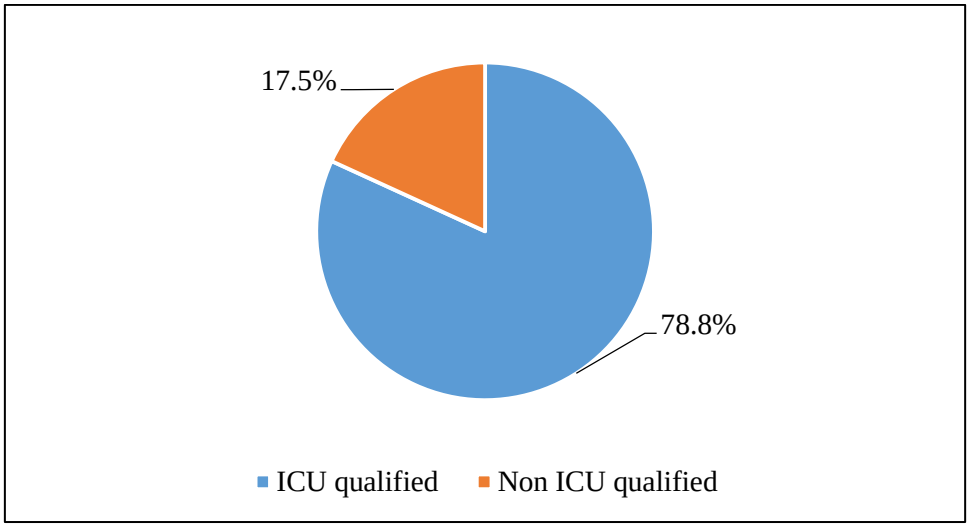


Figure 4.2 Post registration qualifications in intensive care nursing

4.3.2 Section B: Perceptions of Nurses Role in Sedation Management

Nurse's perceptions of their role in sedation management formed the next part of the questionnaire, which comprised of eight (8) questions (items B9 to B16). Items were combined to form coherent groups to facilitate discussion of the data. **Table 4.2** presents these results.

Table 4.2 Frequencies obtained from respondents for the perceptions of nurse role in sedation management

Item	Statement	Responses					
		Agree		Uncertain		Disagree	
		n	%	n	%	n	%
B9	"The nurse contributes to the plan regarding the target level of sedation for the patient for that day.	66	82.5%	4	5.0%	7	8.7%
B10	The target level of sedation is always individually assessed for each patient.	74	92.5%	2	2.5%	3	3.7%
B11	Communication between doctor and nurse regarding patients' daily plan/goals in relation to sedation is always clear.	58	72.5%	12	15.0%	9	11.3%
B12	Communication from nurse to nurse regarding patients' daily plan/goal in relation to sedation is always clear.	56	70.0%	10	12.5%	12	15.0%
B13	Sedation score should always be communicated from nurse to nurse during hand over report.	71	88.7%	3	3.7%	5	6.3%
B14	There are occasions when patient's level of sedation is more than clinically indicated i.e. over-sedated.	54	67.5%	10	12.5%	14	17.5%
B15	There are occasions where patient's level of sedation is less than clinically indicated i.e. under-sedated.	54	67.5%	6	7.5%	17	21.5%
B16	The nurse always considers the cost of the drugs when managing sedation"	23	18.7%	7	8.7%	49	61.3%

Out of the total sample (n = 80), most 92.5% (n = 74) of the respondents agreed with item B10 that states, "*The target level of sedation is always individually assessed for each patient*". 88.7% (n = 71) agreed with item B13 that asserts, "*Sedation score should always be communicated from nurse to nurse during handover reports.*" 82.5% (n = 66) agreed

with item B9 that states, "*The nurse contributes to the plan regarding the target level of sedation for the patient for that day*." Seventy-two point five (n = 58) percent agreed with item B11 that states, "*Communication between doctor and nurse regarding patients' daily plan/goals in relation to sedation is always clear.*" Seventy (n = 56) percent agreed with item B12 that asserts, "*Communication from nurse to nurse regarding the patients' daily/plan goal in relation to sedation is always clear.*" **Table 4.2** presents these results.

On the other hand, there was a high level of disagreement or rejection to the last three items. Most 61.3% (n = 49) of the respondents were in disagreement with item B16 that states, *"The nurse always considers the cost of the drugs when managing sedation*." Twenty-one point five percent (n = 17) were in disagreement with item B15 that states, "*There are occasions where patients level of sedation is less than clinically indicated i.e. under-sedated,*" and 17.5% (n = 14) disagreed with item B14 that states, "*There are occasions when patients level of sedation is more than clinically indicated i.e. over-sedated."* Table 4.2 presents these results.

4.3.3 Section C: Nurses Perceptions of the Management of Sedation

Nurse's perceptions of the management of sedation formed the final part of the questionnaire, which comprised thirteen (13) questions (C17 to C29). Items were combined to form coherent groups to facilitate discussion of the data.

Out of the total sample (n = 80), 51.3% (n = 41) of respondents indicated agreement with item C17 that states, "*Are you aware of a sedation policy/protocol in your workplace."* **Figure 4.3** displays these results.

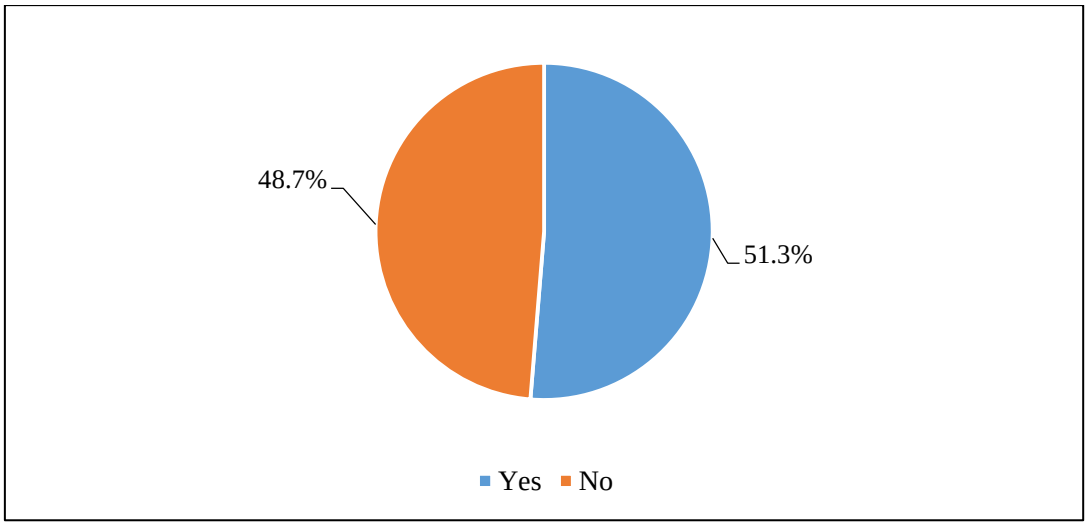


Figure 4.3 Awareness of sedation policy/protocol in workplace

Comments regarding respondents understanding of the sedation policy/protocol in the unit (item Q17) indicate how each ICU culture affects the data. Sometimes nurses work according to their individual education level and abilities:

> *"Senior nurses with loads of experience and or qualifications decide when to stop sedation."*

In contrast, nurses can be made to conform to the environment where they work:

> *"There is a strong medical model of care in the ICU where I work.*
> *Little support for nursing involvement …in fact doctors get angry when we are not following the protocols."*

Other units work together, to a point:

> *"Nursing autonomy is relatively high in our unit …but it depends on the experience of the nurse who is looking after that particular patient."*
> *"We all work together, but with the consultants having the last say …they have got the power to prescribe treatment."*

The next section of the data collection tool related to item C18 that enquired about the respondent's perception of the best measure of assessment of patient's level of sedation. The respondents were presented with four listed options.

The results revealed that most, 56.3% (n = 45) of the respondents were in agreement with item C18c that asserts, "*Both sedation score and nurse's judgment*", with contrast to, 17 (21.3%) and 12 (15.0%) respondents who agreed that "*nurses judgment of level of sedation*" (item C18b) and "*sedation scoring system*" (item 18a) respectively. **Figure 4.4** displays these results.

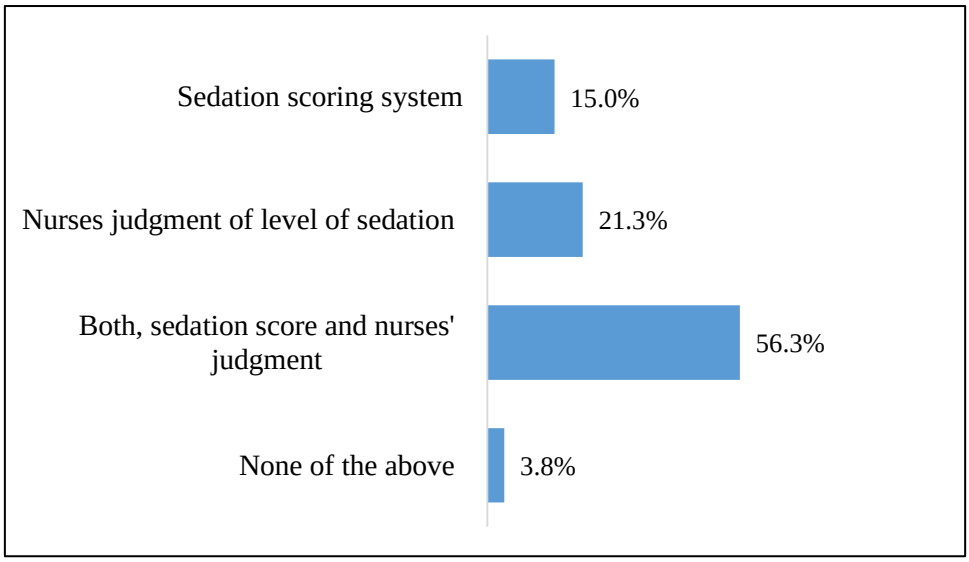


Figure 4.4 Best measure of assessment of patient's level of sedation

The respondent's perceptions of the ideal level of sedation for stable intubated patients are provided in **Table 4.3**.

Table 4.3 Ideal level of sedation for stable intubated patient during day and night time

Statement	Responses			
	Day		Night	
	n	%	n	%
"Patient awake most of the time i.e. aware but calm.	40	50.6%	20	25.0%
Patient roused by voice but remains calm.	11	13.9%	33	41.3%
Patient roused by movement or tracheal suction.	19	24.0%	14	17.6%
Patient aroused by painful stimuli, no response to tracheal suction.	3	3.8%	4	5.0%
Patient unarousable"	-	-	1	1.3%

In regard to the ideal level of sedation for a stable intubated patients (item C19), most 50.6% (n = 40) of the respondents agreed with item C19a during the day that states, "*Patient awake most of the time i.e. aware but calm"*, and 19 (24.0%) were in agreement with item C19c that states, "*Patient roused by movement or tracheal suction.*" **Table 4.3** displays these results.

While most 41.3% (n = 33) of the respondents agreed with item C19b during the night that states, *"Patient roused by voice but remains calm",* and 20 (25.0%) were in agreement with item C19a that states, "*Patient awake most of the time i.e. aware but calm*." **Table 4.3** displays these results.

Question C20 of the data collection tool (see **Appendix A**) enquired about nurse's confidence when assessing the patients need for an increase or decrease in sedation. Nurses level of confidence was ascertained during a visual analogue scale (VAS) that ranged from 1 (low level) to 10 (high level). Scale 1 to 4 were combined as not confident at all, scale 5 to 7 were rated as confident and scale 8 to 10 were rated as very confident according to the question paper.

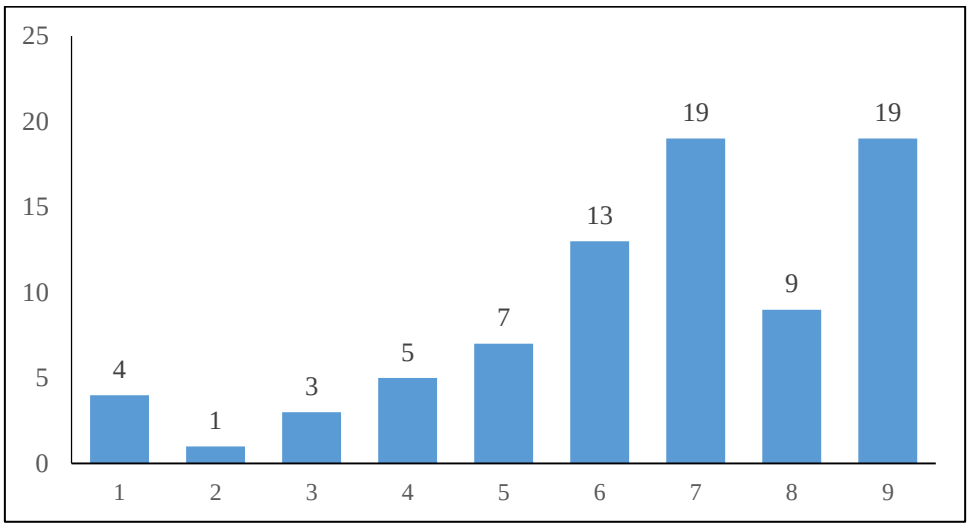


Figure 4.5 Nurses level of confidence for assessing patients need for sedation

Table 4.4 Frequencies obtained from the respondents for nurse perceptions of the management of sedation

Item	Statement	Responses					
		Agree		Neutral		Disagree	
		n	%	n	%	n	%
C21	"I will turn off the patient's sedation if I assess that the patient no longer requires it (without an order from the doctor).	58	72.5%	7	8.7%	8	10.0%
C22	I will restart sedation on a patient if I assess the patient requires it."	55	68.7%	9	11.3%	16	20.0%

Out of the total sample (n = 80), Most 72.5% (n = 58) of the respondents were in agreement with the priority item in C21 that states, *"I will turn off the patients sedation, if I assess that the patient no longer requires it* [without an order from the doctor]". Most 68.7% (n = 55) of the respondents agreed with item C22 that states, "*I will restart sedation on a patient if I assess the patient requires it*." **Table 4.4** displays these results.

On the other hand, some 20.0% (n = 16) of the respondents indicated a disagreement or rejection with item C22 that state*s, "I will restart sedation on a patient if I assess the patient requires it."* **Table 4.4** displays these results.

Table 4.5 Mean rank for nurse's management of situations with sedation

Item	Statement	Mean	SD
C25	"Patient is anxious or restless	1.73	0.78
C24	Patient at risk of unplanned self-extubation	1.80	0.86
C26	Patient and ventilator not synchronising	1.85	0.84
C23	Direct supervision of patient not possible due to 1:2 nurse-patient ratio.	2.40	1.14
C28	Perform nursing care effectively reduce interference during interventions e.g. turning, dressings change.	2.61	1.00
C27	No time to reassure an anxious/agitated patient due to the pressure of work."	2.90	0.95

Related to the management of situations with sedation (items C23 to C28), the results in mean ranked order are displayed in **Table 4.5**. Results showed that sedation was most frequently used when the patient is anxious or restless (M = 1.73, SD = 0.78).

Whereas, the results showed that sedation was least frequently used due to the pressure of work (M = 2.90, SD = 0.95).

Table 4.6 Mean ranked order for the goals of sedation from most important to least important

Item	Statement	Mean	SD
C29b	"Prevention of treatment interference e.g. unplanned self-extubation	2.80	2.35
C29d	Improve patient/ventilator synchrony	2.94	2.37
C29c	Enhanced comfort or pain management	3.49	2.25
C29e	Minimise sedation to expedite weaning from ventilator.	4.31	2.30
C29g	Reduce patient's anxiety, stress or agitation	4.42	2.20
C29h	Promote rest or sleep	4.78	2.24
C29a	Amnesia (reduce memory recall)	5.09	3.07
C29f	Decrease nurse's stress"	6.55	2.48

Related to the goals of sedation (item C29a to C29h), the results in mean ranked order from 1 = most important to 8 = least important are displayed in **Table 4.6**. "*Prevention of treatment interference e.g. unplanned self-extubation*" (item C29b) was identified as the highest priority overall (M = 2.80, SD = 2.35). Whereas, item C29f that states, "*Decrease nurses stress*" was identified as the least priority overall (M = 6.55, SD 2.48).

4.3.4 Comparative Statistics

4.3.4.1 Comparison of nurse's perception of their role in sedation management

To compare the perceptions of nurse's role in sedation management (see **Section B**), the Likert scale responses on questions (items B9 to B16) related to nurse's perceptions on

their role in sedation management were reduced into 2 quartiles i.e. agree vs. disagree. Proportions test were then computed to determine the statistical significance of the difference between proportions of nurses that agreed versus those that disagreed to perceptions of their role in sedation management. For this section of the analysis, the aim was to compare proportions of nurses that agreed to perceptions of their role in sedation management, hence all neural responses were dropped. Results of this process are summarised in **Table 4.7.**

Table 4.7 Comparison of nurses' perceptions of their role in sedation management

Statement	Agree n (%)	Disagree n (%)	p-value
"The nurse contributes to the plan regarding the target level of sedation for the patient for that day.	38(50.0%)	38(50.0%)	0.1919
The target level of sedation is always individually assessed for each patient.	50(64.1%)	28(35.9%)	0.0007*
Communication between doctors and nurse regarding patients' daily plan/goals about sedation is always clear.	59(86.7%)	9(13.3%)	0.0000*
Communication from nurse to nurse regarding patient's daily plan/goal in relation to sedation is always clear.	58(82.8%)	12(17.1%)	0.0000*
Sedation score should always be communicated from nurse to nurse during handover report.	50(64.9%)	27(35.0%)	0.0002*
There are occasions when patient's level of sedation is more than clinically indicated i.e. over-sedated.	56(80.0%)	14(20.0%)	0.0000*
There are situations where patient's level of sedation is less than clinically indicated i.e. under-sedated.	57(77.0%)	17(22.9%)	0.0000*
The nurse always considers the cost of the drug when managing sedation.	54(73.9%)	19(26.0%)	0.0000*
I will turn off the patient's sedation if I assess that the patient no longer requires it (without an order from the doctor).	58(79.4%)	15(20.5%)	0.0000*
I will restart sedation on the patient if I assess the patient requires it."	55(77.4%)	16(22.5%)	0.0000*

Key: *=statistical significance ($p<0.05$)

Table 4.7 presented these results. The results of the proportions test demonstrated that there were statistically ($p<0.05$) significant differences of nurses perceptions of their role

in sedation management, when comparing proportions of nurses that agreed to perceptions of their role in sedation management.

4.3.4.2 Factors affecting effective management of sedation in intensive care units

In this section, we investigate the effect of demographic factors on effective management of sedation in intensive care units based on the nurse's perception. The two outcomes for this section were *"nurse's perceptions on whether there were occasions when patients were over -sedated"* (item B14) and "*nurses perceptions on whether there were occasions when patients were under-sedated*" (item B15). Both outcomes were recorded into binary outcomes using factor analysis resulting in two outcomes i.e. 1 = agree, 2 = disagree.

Univariate and multivariate logistic regression were then computed to investigate factors affecting the effective management of sedation in intensive care units. The univariate logistic regression models were computed to investigate how each demographic factor contributed to the outcome while **multivariate logistic regression models** were computed to assess the collective effect of the demographic factors on the outcomes. The base category of comparison for each demographic factor was chosen based on the category with the highest proportion of nurses. Results of this process are summarised in **Tables 4.8 to 4.11**.

Table 4.8 Univariate analysis of factors associated with nurse's perception of patients over sedation

	OR 95% Confidence Interval	p-value
Age (base = 30 to 39 years)		
<30 years	0.7 (0.10 - 4.69)	0.713
40 to 49 years	3.68 (0.68 – 19.84)	0.130
>50 years	1.17 (0.25 – 5.50)	0.846
Gender (base = female)		
Male	1.30 (0.25 – 6.76)	0.752
Hours of work (base = full time)		
Part time	Omitted	
Years of experience as RN (base = 11+ years)		
<1 year	Omitted	
1 to 5 years	5.24 (0.56 – 48.65)	0.145
6 to 10 years	0.44 (0.12 – 1.69)	0.233
Years of experience in ICU (base = 2.5 years)		
< 1 year	0.89 (0.15 – 5.29)	0.145
6 to 10 years	Omitted	-
11 + years	0.44 (0.12 – 1.69)	0.233
Current position (base = ICU nurse)		
Unit manager	0.93 (0.09 – 10.10)	0.953
Shift leader	0.31 (0.04 – 2.53)	0.274
Clinical Instructor	3.47 (0.67 – 17.41)	0.140
Post registration qualification in ICU (base = yes)		
No	1.40 (0.27 – 7.25)	0.692
Professional qualification (base = diploma)		
Certificate	0.28(0.01 – 4.41)	0.337
Degree	0.58 (0.15 – 2.27)	0.431
Postgraduate certificate	0.24 (0.01 – 4.41)	0.337

Table 4.8 presented these results. The results of univariate analysis of factors associated with nurse's perceptions of patients under sedation demonstrated no statistically ($p>0.05$) significant differences in how the demographic factors contributed to this outcome.

Table 4.9 Multivariate analysis of factors associated with nurse's perception of patients over sedation

	OR 95% Confidence Interval	p-value
Age (base = 30 to 39 years)		
<30 years	0.00	0.996
40 to 49 years	22.30 (0.30 – 1667.53)	0.159
>50 years	51.71 (0.19 – 14039)	0.168
Gender (base = female)		
Male	0.81(0.01 – 46.69)	0.918
Hours of work (base = full time)		
Part time	Omitted	-
Years of experience as RN (base = 11+ years)		
<1 year	Omitted	-
1 to 5 years	1.28 (0.27 – 6.01)	0.753
6 to 10 years	0.26 (0.07 – 0.99)	0.048
Years of experience in ICU (base = 2.5 years)		
< 1 year	1.67 (0.30 – 9.42)	0.559
6 to 10 years	Omitted	-
11 + years	1.79 (0.48 – 6.69)	0.384
Current position (base = ICU nurse)		
Unit manager	1 (0.09 – 10.74)	1.000
Shift leader	1 (0.09 – 10.74)	1.000
Clinical Instructor	1.4 (0.42 – 4.69)	0.586
Post registration qualification in ICU (base = yes)		
No	1.19 (0.29 – 4.90)	0.806
Professional qualification (base = diploma)		
Certificate	0.67 (0.05 – 8.37)	0.753
Degree	1.08 (0.27 – 4.29)	0.901
Postgraduate diploma	1.83 (0.33 – 10.10)	0.486

Table 4.9 presented these results. The results of multivariate analysis of factors associated with nurse's perception of patients over-sedation demonstrated no statistically significant difference in how the demographic factors contributed to the outcome.

Table 4.10 Univariate analysis of factors associated with nurse's perception of patients under sedation

	OR 95% Confidence Interval	p-value
Age (base = 30 to 39 years)		
<30 years	0.80 (-1.53 – 3.12)	0.501
40 to 49 years	1.12 (-0.20 – 2.43)	0.096
>50 years	1.20 (- 0.48 – 2.89)	0.161
Gender (base = female)		
Male	2 (0.40 – 9.98)	0.398
Hours of work (base = full time)		
Part time	Omitted	-
Years of experience as RN (base = 11+ years)		
<1 year	Omitted	-
1 to 5 years	1.28 (0.27 – 6.01)	0.753
6 to 10 years	0.26 (0.07 – 0.99)	0.048*
Years of experience in ICU (base = 2.5 years)		
< 1 year	0.89 (0.15 – 5.29)	0.145
6 to 10 years	Omitted	-
11 + years	0.44 (0.12 – 1.69)	0.233
Current position (base = ICU nurse)		
Unit manager	0.93 (0.09 – 10.10)	0.953
Shift leader	0.31 (0.04 – 2.53)	0.274
Clinical Instructor	3.47 (0.67 – 17.41)	0.140
Post registration qualification in ICU (base = yes)		
No	1.40 (0.27 – 7.25)	0.692
Professional qualification (base = diploma)		
Certificate	0.28 (0.01 – 4.41)	0.337
Degree	0.58 (0.15 – 2.27)	0.431
Postgraduate certificate	0.24 (0.01 – 4.41)	0.337

Key: *= statistical significance ($p<0.05$)

Table 4.10 presented these results. The results of univariate analysis of factors associated with nurse's perception of patients under sedation demonstrated a statistical significance ($p<0.05$) difference with **years of experience from 6 to 10 years** ($p= 0.048$). These nurses are more likely to be cautious with sedation and give slightly less.

Table 4.11 Multivariate analysis of factors associated with nurse's perception of patients under sedation

	OR 95% Confidence Interval	p-value
Age (base = 30 to 39 years)		
<30 years	Omitted	-
40 to 49 years	6.85 (0.59 – 79.90)	0.125
>50 years	38.98 (0.99 – 1535.79)	0.051*
Gender (base = female)		
Male	11.82 (0.55 – 251.82)	0.114
Hours of work (base = full time)		
Part time	Omitted	-
Years of experience as RN (base = 11+ years)		
<1 year	Omitted	-
1 to 5 years	3.19 (0.06 – 180.40)	0.574
6 to 10 years	0.14 (0.000 – 7.34)	0.331
Years of experience in ICU (base = 2.5 years)		
< 1 year	7.55 (0.29 – 179.64)	0.225
6 to 10 years	Omitted	-
11 + years	2.22 (0.06 – 79.43)	0.662
Current position (base = ICU nurse)		
Unit manager	0.31 (0.01 – 16.28)	0.564
Shift leader	11.89 (0.06 – 2394.32)	0.360
Clinical Instructor	0.34 (0.03 – 4.02)	0.393
Post registration qualification in ICU (base = yes)		
No	5.11 (0.23 – 114.50)	0.303
Professional qualification (base = diploma)		
Certificate	0.54 (0.01 – 31.20)	0.768
Degree	8.42 (0.32 – 224.46)	0.901
Postgraduate certificate	1.06 (0.01 – 103.49)	0.979
Postgraduate diploma	15.60 (0.77 – 317.33)	0.074

Key: * = statistical significance ($p<0.05$)

Table 4.11 presented these results. The results of multivariate analysis of factors associated with **nurse's perception of patients under sedation demonstrated statistically ($p<0.05$) significant difference** in one demographic factor. It was in the age category of greater than 50 years (**M = 38.98, OR 0.99 – 1535.79, p = 0.051**) when tested against the base category of between 30 to 39 years. These results suggest **that older**

nurses (>50 years) are more likely to make a difference in affecting effective management in patient's under sedation than younger nurses (age 30 to 39 years) would.

4.3.4.3 Association between knowledge of sedation policy/protocol and nurses perceptions

To further explore the nurse's perceptions of their role in sedation management the researcher investigated the association between knowledge of sedation policy/protocol (see Section C) and nurse's perceptions of sedation management (see section B). The explanatory variables for this analysis were "*whether nurses were aware of sedation policy/protocol"* (item C17). The outcome variables for this analysis were "*nurses perceptions of whether there were occasions where patients were over-sedated*" (item B14) and "nurses perceptions on whether there were occasions where patients were under-sedated (item B15). Chi-squared tests were computed to investigate whether there was a significant difference in the proportions of nurses who agreed versus those that disagreed to over/under-sedation based on their knowledge of sedation policy/protocol. Results of this process are summarised in **Tables 4.12 and 4.13**.

Table 4.12 Association between knowledge of sedation policy/protocol and nurses perceptions on over-sedation

Statement	Disagree	Agree	p-value
Knowledge of sedation protocol			
Yes	5(35.71)	30(53.57)	
No	9(64.29)	26(46.43)	0.232

Table 4.12 presented these results. The results of the Chi-square test demonstrated no statistically ($p>0.05$) significant association between knowledge of sedation policy or protocol and nurses perceptions on over-sedation ($p=0.232$). These results suggest that there is no association between nurses who agreed to the knowledge of protocols and nurses perceptions affecting the effective management of over-sedation.

Table 4.13 Association between knowledge of sedation policy/protocol and nurses perceptions on under-sedation

Statement	Disagree	Agree	p-value
Knowledge of sedation protocol Yes No	 6(17.14) 11(28.21)	 29(82.86) 28(71.79)	 0.259

Table 4.13 presented these results. The results of the Chi-squared test demonstrated no statistically ($p>0.05$) significant association between knowledge of sedation policy or protocol and nurses perceptions on under-sedation ($p=0.259$). These results suggest that there is no association between nurses who agreed to the knowledge of protocols and nurses perceptions affecting the effective management of over-sedation.

4.4 DISCUSSION OF RESULTS

The purpose of this study was to explore nurse's perceptions of their role in managing sedation in intensive care units of a public sector hospital in Johannesburg. The intention of the study was to make recommendations for clinical practice and education of intensive care nurses.

The distribution of the sample revealed that 78.8% (n = 63) of the respondents were female, and 21.3% (n = 14) were male. These findings are consistent with the results of more recent locally published studies (Langley, Schmollgruber, Fulbrook, Albarran & Latour, 2013; Perrie, Schmollgruber, Bruce & Becker, 2014), which have consistently demonstrated intensive care nursing as a predominantly female profession.

Most 52.5% (n = 42) of the respondents were between the ages of 40 to more than 50 years, and 46.1% (n = 37) were in the categories between less than 30 to 39 years of age. These results are comparable to the studies of Langley et al. (2013) and Perrie *et al.* (2014). Most 66.3% (n = 53) of the respondents had more than 6 years of experience as a registered nurse. These results are slightly lower than 78% reported in the study of Langley *et al.* (2013). Most 78.8% of the respondents were intensive care qualified, and most

58.8% (n = 47) had less than 5 years of intensive care nursing experience. These results are slightly higher than the studies of Langley *et al.* (2013) and Perrie *et al.* (2014). These findings are not unexpected as there has been an increase locally in the education and training of intensive care nurses.

The largest group of nurses in this current study comprised primary bedside ICU nurses (53.8%, n = 43), the next large group were shift leaders (35.0%, n = 28), and only a marginal 6.3% (n = 5) number of the respondents were unit managers. These findings are comparable to the constitution of the sample in the Perrie *et al.* (20014) study. The distribution of the sample is consistent with similar studies in the United Kingdom (Walker & Gillen, 2006), United States of America (Guttormson *et al.,* 2010) and Norway (Randen & Bjork, 2010).

In this study, the next part of the questionnaire related to nurse's perceptions of their role in sedation management in the intensive care units.

Findings revealed a high percentage of the respondents in this study were in agreement with three priority items related to nurse's role in sedation management. 92.5% (n = 74) of respondents agreed with item B10 that states*, "The target level of sedation is always individually assessed for each patient*", 87.7% (n = 71) agreed with item B13 that asserts, *"Sedation score should always be communicated from nurse to nurse during handover report"* and 82.5% (n = 66) agree with item B9 that states, "*The nurse contributes to the plan regarding the target level of sedation for the patient for that day"*. This aspect was also investigated in one Irish study, where Walker and Gillen (2006) reported in their sample of 107 nurses that revealed frequency scores of 84%, 98% and 78% in items B10, B13 and B9, respectively. Similar results were also reported in the studies of Guttormson *et al.* (2010) and Randen and Bjork (2010).

In this current study, most 72.0% (n = 58) of the respondents agreed with item B11 that asserts, "*Communication between doctor and nurse regarding patients' daily plan/goals in relation to sedation is always clear",* and 70.0% (n = 56) agreed with item B12 that states, "*Communication from nurse to nurse regarding patient's daily plan/goal in relation to sedation is always clear*". This particular aspect was also investigated by Walker and Gillen (2006). Of those participants in Walker and Gillen (2006) study, 72% of their

participants agreed that communication was clear between nurses, and only 55% mentioned that communication was clear between nurses and doctors. While in yet another study, Guttormson *et al.* (2010) indicated that 60% of respondents agreed that sedation goals were clearly communicated between nurses and doctors. These results are comparable with previously published studies in Europe (Randen & Bjork, 2010; Samuelson *et al.,* 2003). Other findings in this study also revealed a moderate 67.5% (n = 54) percentage of the respondents respectively agreed with items B15 and B16 that states, "*There are occasions where patients level of sedation is more than clinically indicated i.e. over-sedated",* and *"There are occasions where patients level of sedation is less than clinically indicated i.e. under-sedated".* These results are comparable with the study of Walker and Gillen (2006), whereby 89% and 83% of nurse respondents reported that patients are over- or under- sedated in their intensive care units. The particular aspect was also investigated by Guttormson *et al.* (2010). Of participating nurses (n = 436) in the study of Guttormson *et al.* (2010), 52% agreed that patients were over-sedated when they are unable to follow commands, and 76.1% agreed that patients were under-sedated when they are spontaneously moving hands and feet or reaching for their ET tubes or intravenous lines. These results share similarity with previously published studies (Randen & Bjork, 2010; Samuelson *et al.,* 2003).

In the study, the final part of the questionnaire related to nursing respondents perception of the management of sedation.

In this study, most 51.3% (n = 41) of the respondents agreed positively with item C17 that states, *"Are you aware of a sedation policy or protocol in your workplace",* and 48.7% (n = 39) of the respondents disagreed. These results are higher than found in the data of a descriptive study by Egerod *et al.* (2006), whereby 25% and 10% of doctors and nurses working in Swedish intensive care units answered positively that sedation protocols were used in their workplace, respectively. However, results are lower than data from a survey of American critical care nurses, whereby 70% of respondents reported they were aware of sedation protocols used in their intensive care units (Guttormson *et al.,* 2010).

Most 56.3% (n = 45) of the respondents in this current study were in agreement that "*both the sedation score and nurses judgment*" was considered the best measure of assessment of the patients sedation level. This particular aspect was also investigated by Walker and

Gillen (2006). Of these participants in Walker and Gillen (2006) study, 90% of their participants agreed that nurse's judgment and sedation score were the best measure for sedation assessment. These results are comparable with previously published studies in Europe (Egerod *et al.*, 2006; Randen & Bjork, 2010; Samuelson *et al.*, 2003) and America (Guttormson *et al.*, 2010).

Findings in this current study revealed that the respondent's perception of the ideal level of sedation during the day time was less than the ideal level at night time. Most 50.6% (n = 40) of the respondents agreed with item C19a that states, *"Patient awake most of the time i.e. aware but calm"* as the ideal level of sedation during the day, and 41.3% (n = 33) agreed with item C19b that states, *"Patients roused by voice but remains calm" at night time"*. These results are similar but lower than found in the data from a descriptive study by Walker and Gillen (2006), whereby 82% and 81% of nurses working in Irish intensive care units indicated that during the day time patients should be awake but calm, and at night time it was acceptable for patients to be a little more sedated i.e. roused by voice, respectively.

When asked to rate their confidence level in assessing patient's level of sedation (item C20), most 58.7% (n = 47) of the respondents were in agreement that they had high confidence level (scoring 8 to 10 points), and 38.5% agreed that they had moderate confidence level (scoring 4 to 6 points). In this study, responses ranged from 3 to 10 with a mean of 7.45 (SD = 2.45; Median = 8.0 points). This issue was also investigated by Walker and Gillen (2006). These authors reported that the mean confidence score was 7.1 (SD = 1.94) with 51% of participating nurses scoring high confidence level. However, it must be noted that this current study has a variation in the participating nurse's responses of 2.45 in the standard deviation. No other studies to-date were found that asked nurses to self-rate their confidence level on a visual analogue scale from 1 to 10 when managing patient's sedation.

Many respondents in this current study were in agreement with item C21 that states, *"I will turn off the patients sedation, if I assess that the patient no longer requires it* [without an order from the doctor]", and 68.7% (n = 55) agreed with item C22 that asserts, "*I will restart sedation on a patient if I assess the patient requires it*". These results are higher than 40% and 48% indicated in a sample of Irish nurses (Walker & Gillen, 2006), and the

results of studies conducted in the United States of America (Guttormson *et al.,* 2010) and Sweden (*Samuelson et al.,* 2003).

When the respondents were asked about managing individual patient's sedation levels (items C23 to C28), the results in the mean ranked order showed that sedation was most frequently used when the "*patient is anxious or restless*" (M = 1.73, SD = 0.78). These results are contradictory, in an Irish descriptive study (Walker & Gillen, 2006) that reported the ranked mean score of 1.89 (SD = 0.62) that showed that sedation was most frequently used by 64% of nurses when "*the patient is at risk of unplanned self-extubation*". This particular aspect was also investigated by Guttormson *et al.* (2010). Of these participants in Guttormson *et al.* (2010) study, 76% of their participants agreed that sedation is most frequently used when "*patient and ventilator are not synchronizing*". These issues were also addressed in this current study, whereby the results showed that sedation was also used frequently in patient situations such as risk of unplanned extubation (M 1.80, SD = 0.78) and ventilator dyssynchrony (M = 1.85, SD = 0.84) in the second and third mean ranked order, respectively.

Further, the results of this current study showed that sedation was least frequently used when there is *"no time to reassure an anxious or agitated patient due to the pressure of work*" (M = 2.90, SD = 0.95). These findings are comparable with the studies of Walker and Gillen (2006), Egerod *et al.* (2006) and Samuelson *et al.* (2003).

Finally, the respondents were asked to rank in order of importance the goals of sedation (items C29a to C29h), from most important (1) to least important (8). Results showed that the first priority goal was "*the prevention of treatment interference e.g. unplanned self-extubation*" (M = 2.80, SD = 2.35). These results are comparable but slightly lower than the mean of 3.1 (SD = 1.79) reported in the study of Walker and Gillen (2006).

Further, the results of this current study showed that the least important goal of sedation was *"to decrease nurse's stress*" (M = 6.55, SD = 2.48). These findings are comparable but slightly lower than the mean of 7.4 (SD = 1.41) reported in the study of Walker and Gillen (2006).

In the next section, the results of respondent's practice characteristics and subscale scores are presented.

There was a statistically ($p<0.05$) significant difference in nurse's perceptions of patients under sedation in the age category >50 years (M = 38.98, OR 0.99-1535.79, p=0.051). These results suggest this group of nurses are more likely to make a difference in affecting effective management in patients under sedation.

There was no statistically ($p>0.05$) significant association between knowledge of sedation policy/protocol and nurses perceptions of over sedation ($p = 0.232$). These results suggest that there is no association between nurses who agreed to the knowledge of policy/protocols and nurses perceptions affecting the effective management of over-sedation.

There was no statistically ($p>0.05$) significant association between knowledge of sedation policy/protocol and nurses perceptions of under sedation ($p = 0.259$). These results suggest that there is no association between nurses who agreed to the knowledge of policy/protocols and nurses perceptions affecting the effective management of under sedation.

In this study, the open comments regarding the respondents understanding of the sedation policy/protocol revealed that individual education level and abilities, teamwork and inter-professional relationships (nurses and doctors) appears to affect nurses understanding.

4.5 SUMMARY

This chapter discussed descriptive and comparative statistical tests that were used to describe and analyse the data collected. The data and interpretation of findings supported by literature discussion were presented.

The following chapter will discuss the limitations of the study, summary of the research findings, conclusions and recommendations.

CHAPTER FIVE

SUMMARY OF STUDY, MAIN FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

5.1 INTRODUCTION

This concluding chapter presents a summary of the study, including a brief summary of the study methods, the main findings which emerged from the study as well as limitations. The main findings will be discussed in relation to the study objectives. Finally, recommendations for clinical nursing practice, nursing education and areas for further research are also presented, as well as the conclusions.

5.2 SUMMARY OF THE STUDY

5.2.1 Purpose of the Study

The purpose of this study was to explore nurses' perceptions of their role in managing sedation in intensive care units of a public sector hospital in Johannesburg, with the intention of making recommendations for clinical practice and education of intensive care nurses.

5.2.2 Objectives

The objectives of the study were to:

- Investigate nurses' perceptions of their role in sedation management in intensive care units.
- Describe nurses' perceptions of the management of sedation in intensive care units.
- Identify, the constraints that influence the effective management of sedation in intensive care units.

5.2.3 Methodology

Face and content validity of the research instrument was done by a panel of experts to ensure suitability of the data collection instrument for South Africa. Before commencement of the study, ethical clearance and permission to conduct the study was obtained from the relevant authorities and the university committee. A non-experimental, descriptive cross-sectional design was utilised to meet the objectives of the study. Following consultation with a statistician a sample of 80 (n = 80) participants was decided upon to constitute an adequate and representative sample size.

Data collection was conducted during May 2015 and January 2016. Following a second consultation with the statistician, descriptive statistics were used to analyse the data.

The Committee for Research on Human Subjects (Medical) of the Witwatersrand (protocol number M140831) (**Appendix D**) granted ethical clearance before commencement of the study. Permission to conduct the study was granted by the School of Therapeutics Postgraduate Committee (**Appendix F**) and the CEO of the Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) (**Appendix E**).

Five adult ICUs at one tertiary level institution were used to collect the data. A statistician was consulted prior to data collection and a sample size of 80 was decided to be acceptable. Statistical significance of the data was tested at the 0.5 (p=0.05) level.

To test the feasibility of the study, understanding of the information letter, informed consent and the questionnaire, pre-testing was conducted with five participants, who completed the self-administered questionnaire prior to commencement of the main study. The questionnaire used in the study was developed by Walker and Gillen (2006). The questionnaire comprised of 29 items with a combination of multiple responses which included dichotomous responses, a 5-point Likert Scale, 4-point Likert Scale and open ended responses.

To meet the study's objectives a quantitative, descriptive design was used. Descriptive statistics were used to analyse the data which was done in consultation with a statistician assigned to the Postgraduate Research Office in the Faculty of Health Sciences.

5.3 SUMMARY OF MAIN FINDINGS

The purpose of this study was to explore and describe nurse's perceptions of their role in managing sedation in the intensive care units of a public hospital in Johannesburg. The intention of the study was to make recommendations for clinical practice and education of intensive care nurses.

The distributions of the sample revealed 78.6% (n = 63) of the respondents were female, and 21.3% (n = 4) were male. Most 52.5% (n = 42) of the respondents were between the ages of 40 to >50 years, and 46.1% were in the categories between <30 to 39 years the findings confirm that nursing profession is ageing in South Africa. Most of the respondents had more than six years of experience as a registered nurse. 78.8% were intensive care qualified, and most 58.8% (n = 47) had less than 5 years of ICU nursing experience. The largest group of nurses comprised of primary bedside ICU nurses which implies there still a need for specialised nurses because of patient profiles in tertiary care hospital , the next large group were shift leaders (35.0%, n = 28) and only a marginal 6.3% (n = 5) were unit managers.

The **first objective** of the study was to investigate nurse's perceptions of their role in sedation management in the intensive care units.

Findings in this study demonstrated that a high percentage of agreement among nurses with three priority items related to perceptions of their role. These were item B10 that states, "*The target level of sedation is always individually assessed for each patient*", item B13 that asserts, "*Sedation scoring should always be communicated from nurse to nurse during handover report",* and item B9 that states, "*The nurse contributes to the plan regarding the target level of sedation for the patient for that day*".

In this study, a moderate percentage of agreement among nurses was demonstrated in two priority items related to collaborative and multidisciplinary team relationships. These were item B11 that states, "*Communication between doctor and nurse regarding patients' daily plan/goals in relation is always clear*" (72.5%, n = 58), nurses aware of their active role, interprofessional collaboration and communication and ability to assess and identify signs

of over-sedation. Item B12 that states, "*Communication from nurse to nurse regarding patient's daily plan/goal in relation to sedation is always clear"* (70.0%, n = 56).

Other findings also revealed the moderate percentage of agreement among nurses was demonstrated in two items related to individual nurse clinical judgment of patient's sedation levels. These were item B15 that asserts, "*There are occasions where patient's level of sedation is more than clinically indicated i.e. over-sedated*", and item B16 that asserts, "*There are occasions where patients level of sedation is more than clinically indicated i.e. under-sedated*." Lighter sedation has been a goal since from the 1990s aided by the implementation and usage of validated sedation scoring tools such as sedation protocols and guidelines and the rise in the awareness of these tools as it has evolved over the years, is still in progress (Egerod, Albarran, Ring, Blackwood, 2013). This is a positive thing we yet to see the results.

The **second objective** of the study was to describe nurse's perceptions of the management of sedation in the intensive care units.

Findings in this study revealed that most 51.3% (n = 41) nurses agreed positively with item C17 that states, "*Are you aware of a sedation policy or protocol in your workplace*", however, 56.3% (n = 45) agreed with item C18 that asserts, "*both, sedation score and nurse's judgment was considered the best measure of assessment of the patient's sedation level*." Nurses in cohort show signs of good clinical judgement when assessing for sedation.

In this study, the respondent's perception of the level of sedation during the day time was lighter than the ideal level of night time. This was evident in the following statement whereby, most 50.6% (n = 40) of the respondents agreed with item C19a that states, "*Patient awake most of the time i.e. awake but calm"* as the ideal level during the day, and 41.3% (n = 33) agreed with item C19b that states, "*Patients roused by voice but remains calm" at night time."* Which follows the definition of *"*Optimal" sedation states are proposed as those where the patient is calm, easily rousable; while ensuring the patient is not under or over sedated (Pun & Dunn, 2007).

When assessing nurse's level of confidence, most 58.7% (n = 47) of the respondents rated themselves with a high confidence level (scoring 8 to 10 points). In this study, responses ranged from 3 to 10 points with a mean of 7.45 (Median = 8.0 points). However, these results should be viewed with caution as it was noted that this current study has a variation in the participating nurse's response of 2.45 in the standard deviation.

The study demonstrated that there was a moderate percentage of agreement among the respondents in item C21 that states, *"I will turn off the patients sedation, if I assess that the patient no longer requires it (without an order from the doctor)"* (72.5%, n = 58) and item C22 that asserts, *"I will restart sedation on a patient if I assess the patient requires it*" (68.7%, n = 55). These results highlight inconsistencies among some nurse's practices and therefore, placing at an increased risk of under- and over-sedation however care is individualised with the aim of meeting optimal sedation for each individual patient.

Findings in this study revealed that the respondents perceptions of managing individual patient sedation levels in the mean ranked items from most frequently used was related to *"patient anxious or restless*", "*the patient is at risk of unplanned self-extubation*" and *"patient and ventilator not synchronizing",* whereas the least frequently used was related to *"No time to reassure an anxious or agitated patient due to pressure of work*". These findings highlight concerns for individual patient and safety needs.

Finally, the results from the ranked order of importance related to the goals of sedation revealed as most important *"the prevention of treatment interference e.g. unplanned self-extubation*" (M = 2.80, SD = 2.35), whereas the need "*to decrease nurses stress*" (M = 6.55, SD = 2.48) was the least important goal. These findings support nurses concern of individual patient comfort and safety needs.

The **third objective** of the study was to identify constraints that influence the effective management of sedation in the intensive care unit.

Findings in this study revealed a statistically ($p<0.05$) significantly difference in nurse's perceptions of patients under sedation particularly related to age >50 years (OR = 38.98, 95% CI = 0.99-1535.79, p = 0.051) and years of ICU nursing experience 6 to 10 years (OR = 0.26, 95% CI = 0.07-0.99, p = 0.048). These results suggest that individual nurses falling

within these categories are more likely to make a difference in affecting the effective management of patients under sedation.

There was no statistically ($p>0.05$) significant association between knowledge of sedation policy/protocol and nurses perceptions on over sedation ($p = 0.232$) and under sedation ($p = 0.259$). These results suggest nurses have acquired knowledge by their post registration training may find it difficult implementing that knowledge in the practice setting.

Finally, the analysis of open comments regarding the respondents understanding of the sedation policy/protocol revealed individual education level and abilities, teamwork and inter-professional relationships (nurse and doctors) appear to affect nurses understanding. Participants were lost as they were not part of the sample; they could not be part of the study as they were staff nurses. Some contestants were either on leave or maternity leave or school which at least they couldn't form part of the study.

5.4 LIMITATIONS OF THE STUDY

The researcher acknowledges the following limitations in this study.

- The study was done in one hospital: the public tertiary hospital in Gauteng and private hospitals were not included hence the findings cannot be generalised to all tertiary hospitals in South Africa.
- The study design was quantitative which limits the response of the participants to what the researcher wants to know through the design of the questionnaire which does not allow for liberation of decisions or answers or explanation from the participants.
- Reduction of data to numbers may result in loss information.
- The sample number used in the study was n=80 which is too small, the results of the study cannot be used to generalise to the study population or community as it is a small sample.

5.5 RECOMMENDATIONS ARISING FROM THE STUDY

The results of this study place emphasis on the findings revealed in international literature in the concept development of the roles of nurses in the management of sedation.

5.5.1 Clinical Practice

The implications for clinical nursing practice is based on the findings that influence the practice of sedation, to bring about an awareness on the importance of the topic and the use of sedation scoring tools that are beneficial for the effective management of sedation practice. This may assist nurses to become more independent practitioners in the management of sedation.

Consequently, the study findings promote the need for provision and development of a South African sedation guidelines and sedation protocols that are specific to patient's need to all the ICU's to improve practice as the results showed that most ICU's do not have sedation tools in the unit.

The results showed that sedation was most used when the patient was anxious or restless when there was no time to reassure the patient. A clear definition of the need for sedation and when it should be used is something that should be communicated continuously to avoid over-sedating patients.

Strengthening of the multi-disciplinary team approach for the management of sedation should be developed on evidence based sedation practice that allows goals of sedation to be clear to nurses and doctors for each patient so as to measure whether they are achieved.

Daily plan of care for each patient must include sedation target using provided sedation scoring systems in literature. Target sedation for the day for each patient should be linked to patient's respiratory requirements and haemodynamic stability.

5.5.2 Education

Education programs about sedation in ICU units for doctors and nurses should be in place to keep clinical practice up to date with the latest research and current knowledge.

The environment that is supportive of learning by providing learning materials on the topic of sedation must be available for nurses at the bedside.

Sedation scoring tools should form part of the ICU chart accessible for the nurses and must be introduced as part of orientation package for the new staff joining the ICU's.

5.5.3 Further Research

Development of more studies in the topic in South Africa is still a need for the country as not a lot is available in literature to improve clinical practice, a need for future research. This study involved nurses only perhaps a study an observational or qualitative study involving patients and doctors might even be more beneficial for future research.

5.6 CONCLUSION

In conclusion, this research study has described nurses' perceptions of sedation management to bring into light current practice on sedation of ICU patients with the intention of making sedation for ICU nurses clearer and the importance of the need for sedation in ICU. Effective sedation assessment and management for nurses is important as they are mostly the ones administering the sedation and are appointed as decision makers with regards to sedation of patients. Nurses also take up the role of advocating for patients in sedation practice. The results showed that there were occasions where patients were under-sedated or over-sedated in-spite of the high level of confidence in assessment for the need for sedation. The findings of the study emphasize a need for further education because of inconsistent practices among nurses in the ICU's.

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APPENDIX A

NURSES' PERCEPTIONS OF THEIR ROLE IN THE MANAGEMENT OF SEDATION IN THE INTENSIVE CARE UNITS OF A MAJOR PUBLIC SECTOR HOSPITAL IN JOHANNESBURG

DATA COLLECTION INSTRUMENT

The questionnaire will take approximately 5-10 minutes to complete. The questionnaire is divided in three sections with instructions throughout the questionnaire to help you. Your participation in this study is very important, as any issues identified from the questionnaire, will be addressed. Your participation in this study is much appreciated.

Section A – General. This section addresses questions about yourself and your background.

1. What is your age? (Please a tick in the appropriate box)
   ☐ <30 years
   ☐ 30- 39
   ☐ 40-49
   ☐ 50+ years

2. What is your gender**?**
   Male ☐ female ☐

3. What are your hours of work?
   Fulltime ☐ Part time ☐ Job share ☐

4. How many years are you qualified as a registered nurse?
   ☐ < 1 year
   ☐ 1- 5 years
   ☐ 6- 10 years
   ☐ 11+ years

5. How many years of intensive care experience do you have?
   ☐ <1 year
   ☐ 1-5 years
   ☐ 6-10 years
   ☐ 11+ years

6. What is your current grade?
   ☐ Unit manager
   ☐ Clinical instructor
   ☐ Shift leader
   ☐ ICU nurse

7. Have you, or are you currently undertaking, a post-registration qualification in Intensive Care nursing?
   Yes ☐ No ☐

8. In addition to your professional qualifications, which of the following academic qualifications have you attained? (*please tick the appropriate qualification(s) you have completed*)
   ☐ Certificate
   ☐ Diploma
   ☐ Degree
   ☐ Post Graduate Certificate
   ☐ Post Graduate Diploma
   ☐ Masters
   ☐ PhD
   ☐ Other (please specify) ____

Section B – sedation. This section addresses your perceptions of the nurses' role in sedation management

		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
9	The nurse contributes to the plan regarding the target level of sedation for the patient for that day	1	2	3	4	5
10	The target level of sedation is always individually assessed for each patient	1	2	3	4	5
11	Communication between doctor and nurse regarding patients' daily plan/goals in relation to sedation is always clear	1	2	3	4	5
12	Communication from nurse to nurse regarding patients' daily plan/goal in relation to sedation is always clear	1	2	3	4	5
13	Sedation score should always be communicated from nurse to nurse during handover	1	2	3	4	5
14	There are occasions when patient's level of sedation is more than clinically indicated i.e over-sedated.	1	2	3	4	5
15	There are occasions where patient's level of sedation is less than clinically indicated i.e under-sedated	1	2	3	4	5

16	The nurse always considers the cost of the drugs when managing sedation	1	2	3	4	5

Section C – sedation. This section addresses your perceptions of the management of sedation.

17. Are you aware of a sedation policy/ protocol in your workplace?

Yes ☐ No ☐

If yes, please briefly describe what you understand by the sedation policy/protocol in your workplace.

18. What do you think is the best measure of assessment of a patient's level of sedation? *(Please a tick at the appropriate box)*

☐ Sedation scoring tool

☐ Nurse's judgement of level of sedation

☐ Both sedation score and nurses' judgement

☐ None of the above

☐ Other (please specify)

19. What is the ideal level of sedation for a **stable** intubated patient during the day and night time? (*Please place one tick in the appropriate box for day and one tick for night)*

	Day	**Night**
Patient awake most of the time i.e aware but calm		
Patient roused by voice but remains calm		
Patient roused by movement or tracheal suction		
Patient roused by painful stimuli, no response to tracheal suction		
Patient unrousable		

20. On a scale from 1 to 10, how confident do you feel about assessing the patient's need for an increase or decrease in sedation? *(Please circle the appropriate number)*

1	2	3	4	5	6	7	8	9	10
Not confident at all				confident					Very confident

Listed below are statements about sedation. Please indicate your level of agreement/ disagreement by circling the appropriate number 1= strongly agree to 5 = strongly disagree.

		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
21.	I will turn off the patient's sedation, if I assess that the patient no longer requires it (without an order from the doctor)	1	2	3	4	5
22.	I will restart sedation on a patient if I assess the patient requires it	1	2	3	4	5

Please indicate how often you would alter the patient's sedation to help you manage the following situations *(please place a tick in the appropriate column).*

		Always	**Usually**	**Seldom**	**Never**
23.	Direct supervision of patient not possible due to 1:2 nurse: patient ratio				
24.	Patient at risk of unplanned self extubation				
25.	Patient is anxious or restless				
26.	Patient and ventilator not synchronising				
27.	No time to reassure an anxious/agitated patient due to the pressure of work				
28.	Perform nursing care effectively - reduce interference during interventions e.g. turning, dressing change				

29. The following list includes 8 possible **goals for sedation** in intensive care. Please rank in order of importance to **you**. Rate each goal from **1 =most** important to **8 = least** important *(please write the appropriate number in the right hand column; do not use the same score more than once).*

Amnesia (reduce memory recall)	
Prevention of treatment interference e.g. unplanned self-extubation.	
Enhanced comfort / pain management	
Improve patient/ ventilator synchrony	
Minimise sedation to expedite weaning from ventilator	
Decrease nurse's stress	
Reduce the patients anxiety/ stress / agitation	
Promote rest or sleep	

Thank you for taking the time and effort to complete this questionnaire. Your participation is much appreciated.

APPENDIX B

NURSES' PERCEPTIONS OF THEIR ROLE IN THE MANAGEMENT OF SEDATION IN THE INTENSIVE CARE UNITS OF A MAJOR PUBLIC SECTOR HOSPITAL IN JOHANNESBURG

PARTICIPANTS' INFORMATION LETTER

Dear Colleague,

My name is Noluvuyo Tshibha I am a student at the University of the Witwatersrand, in the Department of Nursing for the Master of Science degree in (intensive nursing) Nursing. I hope to conduct a research project and would therefore like to invite you to consent to my including you in my sample of nurses that I hope to study in the intensive care units.

The purpose of this study is to explore nurses' perceptions of their role in the management of sedation in the intensive care units of a major public sector hospital in the Johannesburg region.

I hereby invite you to please consider participating in a research study entitled *"Nurses' perceptions of their role in the management of sedation in the intensive care units of a major public sector hospital in Johannesburg"* Should you therefore agree to participate in this study you will be asked to sign a consent form to confirm your willingness to participate in the study. I will then ask you to rate 29 items independently on a predetermined questionnaire using a four-point Likert Scale. It will take you 5-10 minutes to complete the questionnaire.

Participation in the study is entirely voluntary. You may choose not to participate or withdraw from the study at any time, which will not affect the services you provide or your position in this institution. Anonymity and confidentiality will be ensured by using a code number instead of your real name and no personal information will be reported in the study so as to protect your identification. I appreciate that you will derive no direct benefit from participating in the study. However, I hope that the completed study will clarify the nursing role in management of sedation in the intensive care units. Results of the study will be given to you should you so wish.

The appropriate people and research committees of the University of the Witwatersrand, Gauteng Department of Health and Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) have approved the study and its procedures.

Thank you for taking time to read this information letter. Should you require any more information regarding the study or your rights, you are free to contact me in the Department of Nursing Education or on the following telephone number 0799210427.

Yours sincerely
Noluvuyo Tshibha
(MSc Nursing student)

APPENDIX C

NURSES' PERCEPTIONS OF THEIR ROLE IN THE MANAGEMENT OF SEDATION IN THE INTENSIVE CARE UNITS OF A MAJOR PUBLIC SECTOR HOSPITAL IN JOHANNESBURG

PARTICIPANT'S CONSENT FORM

I, _____(name) give permission to be included in the research study.

I have read with understanding the content of the information sheet and I have been given the opportunity to ask questions I might have regarding the procedure and my consent to my being included in the study.

Date _____ Signature _____

Witness _____

APPENDIX D

R14/49 Ms Noluvuyo Tshibha

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M140831

NAME: (Principal Investigator)	Ms Noluvuyo Tshibha
DEPARTMENT:	Nursing Education Charlotte Maxeke Johanesburg Academic Hospital
PROJECT TITLE:	Nurses' Perceptions of their Role in the Management of Sedation in the Intensive Care of a Major Public Sector Hospital in Johannesburg
DATE CONSIDERED:	29/08/2014
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Vivien Herbert and Shelly Schmollgruber
APPROVED BY:	Professor P Cleaton-Jones, Chairperson, HREC (Medical)
DATE OF APPROVAL:	25/02/2015

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 Secretary in Room 10004, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized 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 the application to the Committee. **I agree to submit a yearly progress report**.

Principal Investigator Signature Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX E

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

CHARLOTTE MAXEKE JOHANNESBURG ACADEMIC HOSPITAL

Enquiries:
Ms. G. Ngwenya
Office of the Nursing Director
Tell: (011): 488-4558
Fax: (011): 488-3786
12 March 2015

Ms. Noluvuyo Tshibha
Department of Nursing Education
Faculty of Health Sciences
University of Witwatersrand

Dear. Ms. Noluvuyo Tshibha

RE: "Intensive Care Nurses' Sedation Practices of Mechanically Ventilated Patients in the Intensive Care Units of a Major Public Sector Hospital in Johanneburg "

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

1. Charlotte Maxeke Johannesburg Academic hospital will not in anyway 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: 15/03/2015

Approved / not approved
Ms. G. Bogoshi
Chief Executive Officer
21/03/2015

RECEIVED REC
17 -03- 2015
SOUTH

APPENDIX F

APPROVAL OF POSTGRADUATE STUDIES

(Original document to be inserted on completion)

APPENDIX G

PERMISSION TO USE THE RESEARCH INSTRUMENT FROM THE DEVELOPER

From: Nikki Murray [mailto:nikkimwalker@hotmail.com]
Sent: 18 June 2014 15:04
To: schmoll@iafrica.com
Subject: Permission re. Research instrument

Dear Shelley

My colleague Patricia Gillen has passed me your request. I no longer have the email address as I have moved employers. Apologies for the inconvenience

Please see attached PDF of the questionnaire. Unfortunately, it's the best format available as I lost the original copy when I lost my hard drive on my old laptop! It also looks like there is a page missing but there isn't - just a typing error in the page numbering.

Please take this email as permission to use the questionnaire if you find it useful. I would off course be interested to see how your student's research progresses. Pass on my good wishes.

Nikki

From: Shelley Schmollgruber [mailto:schmoll@iafrica.com]
Sent: 09 June 2014 18:38
To: 'nikki.walker@royalhospitals.n-i.nhs.uk'
Cc: 'p.gillen@ulster.ac.uk'; shelley.schmollgruber@wits.ac.za
Subject: research interest
Importance: High

Dear Nikki and Patricia ,

My name is Shelley Schmollgruber. I am the postgraduate coordinator in the Department of Nursing Education of the University of the Witwatersrand in Johannesburg, South Africa. I am currently supervising a research study and my MSc student has expressed particular interest in your work entitled “Investigating nurses’ perceptions of their role in managing sedation in intensive care: An exploratory study. Intensive and Critical Care Nursing, 2006 vol. 22, pp. 338-345”.

On behalf of my student I would like to request your permission to use the instrument as we are conducting a similar study in our South African context. Would it be possible to send us a copy of the instrument along with your permission to use the instrument. If you are in agreement we can forward a copy of the proposal to you once our ethics committee has approved the study. We anticipate that the study will be completed by early 2015.

I am looking forward to your response.

Kind regards
Shelley Schmollgruber
Senior Lecturer Intensive and Critical Care Nursing
Department of Nursing Education
Faculty of Health Sciences
University of the Witwatersrand

APPENDIX H

Gill Smithies

Proofreading & Language Editing Services

59, Lewis Drive, Amanzimtoti, 4126, Kwazulu Natal

Cell: 071 352 5410 Email: moramist@vodamail.co.za

Work Certificate

To	Dr Shelley Schmollgruber
Address	Wits Dept of Nursing Education
Date	1/11/2017
Subject	Chapters 1 to 5 Nurses perceptions of their role in the management of sedation in the intensive care units of a major public sector hospital in Johannesburg by N. Tshibha.
Ref	SS/GS/22

I, Gill Smithies, certify that I have proofread,

Chapters 1 to 5: Nurses perceptions of their roles in the management of sedation in the intensive care units of a major public sector hospital in Gauteng by N. Tshibha.

to the standard as required by Wits Dept. of Nursing Education.

Gill Smithies

1/11/2017