DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

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A thesis submitted to the Faculty of Health Sciences, University of the Witwatersrand, in fulfilment of the requirements of the degree

of

Doctor of Philosophy.

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DECLARATION

I, Shelley Schmollgruber, declare that this thesis, which is being submitted for the degree of Doctor of Philosophy at the University of the Witwatersrand, Johannesburg, is my own work. It has not previously been submitted for any degree or examination at any other university.



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This 29th day of May, 2015

Committee for Research on Human Ethics (CRHS) number: MO40211

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ABSTRACT

Purpose: The aim of this study was to explore and describe the components of best nursing practice in the care of acutely ill patients in the intensive care setting and to use this information to propose standards of competency for nursing care. The purpose was to inform responsibility and accountability in the intensive care setting, thereby contributing to excellent quality nursing care and improved patient outcome.

Research method: The research method was structured in accordance with the process required to formulate nursing standards and comprised two phases, the developmental phase and the standards generation phase.

Data collection: Data were collected during the developmental phase through the use of quantitative and qualitative methods. The study design was exploratory, descriptive and standards generative. Data collection was conducted using steps. Step 1, involved exploring and describing the clinical profile of critically ill patients and requirements for nursing care in the intensive care unit (n=4). This was achieved by means of a prospective, longitudinal, quantitative study. Steps 2 to 3, involved exploring the competencies nurses require in the provision of patient care in the intensive care units, which was achieved by means of an in-depth qualitative study. Unstructured interviews were held with a group of specialist nurses (clinical nurses, educators and facilitators) to elicit competencies that critical care nurses required in the provision of care. In step 3, a focus group was used to elicit the opinions of other nurse practitioners in the intensive care units as to which competencies they required or felt are used in the intensive care unit. Standards were generated during the standards generation phase. Step 4, involved compiling a set of preliminary competencies based on evidence generated in steps 2 and 3. Step 5 involved triangulation of the data obtained in the study. This was done by means of a literature review. Step 6 involved the generation of concept standards based on the information obtained in steps 1, 2, 3, and 4. Step 7, involved the validation of construct standards by means of a workshop with experts. Data analysis included descriptive statistics, content analysis, identification of themes and inductive and deductive logic.

Conclusion: The conclusion included the recommendations of guidelines for the use of standards which was conducted in step 8.

Context of the study: The setting for the study was four intensive care units at a university-affiliated, public sector and tertiary level health care institution in Gauteng Province, South Africa.

ABBREVIATIONS

AACN	American Association of Critical Care Nurses
ACCCN	Australian College of Critical Care Nurses
APACHE	Acute Physiological, Age, Chronic Health Evaluation
BACCN	British Association of Critical Care Nurses
CACCN	Canadian Association of Critical Care Nurses
CCN	Critical Care Nurse
CCSSA	Critical Care Society of Southern Africa
EfCCNa	European Federation of Critical Care Nurses Associations
ETQA	Education and Training Quality Assurance
HEA	Higher Education Act
HEIs	Higher Education Institutions
HIV / AIDS	Human Immunodeficiency Virus Infection / Acquired Immunodeficiency Syndrome
ICN	International Council of Nurses
ICU	Intensive Care Unit (s)
MTS	Modernisation of Tertiary Services
NHA	National Health Act
NIH	National Institutes of Health
NQF	National Qualifications Framework
SANC	South African Nursing Council
SAPS II	Simplified Acute Physiological Score version II
SASA	South African Society of Anaesthesiologists
SAQA	South African Qualifications Authority
SGB	Standards Generating Body
TISS-28	Therapeutic Intervention Scoring System
WFCCN	World Federation of Critical Care Nurses
WHO	World Health Organization

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CHAPTER ONE

OVERVIEW OF THE STUDY

1.0 INTRODUCTION

This thesis intended to develop competency standards for Intensive Care nurses who care for critically ill patients in the Intensive Care Units (ICUs) of one university-affiliated, public sector and tertiary hospital in the Gauteng province in South Africa.

The term competence has been analysed from various perspectives, from those involving a theoretical framework, such as behaviourist, positivist or a modernistic viewpoint, to those explaining the term from a public perspective or in a political sense (Cowan, Norman and Coopamah, 2005). In other writings, competence has been described in relation to synonymous words "qualified", "proficiency", and/or "knowledge, skills and abilities" (Pijl-Zieber, Barton, Konkin, Owosoga and Caine, 2014). It also appears, in literature, that there is some confusion surrounding the term competence, measurement of the construct is complicated (Watson, Stimpson, Topping and Porock, 2002). Competence is a familiar term in nursing, implying one is able to function effectively and demonstrate a holistic perspective of a situation (Benner, 1984). Competence is the written statement which refers to the combination of knowledge, skills and attitudes of a person who performs at a predefined level and takes into consideration the broader practice implications and its effects on patients. Competency is defined as tasks undertaken correctly and skilfully (Pijl-Zieber et al. 2014). Competency has been defined as "the ability to perform the task with desirable outcomes under the varied circumstances of the real world" (Benner, 1982:304). Competence of a person is the ability to perform consistently in different circumstances applying their knowledge and skills to achieve high quality outcomes. With careful development of competency standards, behaviour statements could increase the reliability of its meaning (Parry, 1998). A nurse's competence is dependent on his/her knowledge, skills and attitude. An effective attitude is essential to successful performance.

The rationale for development of competency standards in Intensive Care nursing practice is motivated by introduction of an Outcomes Based Approach (OBE) education and training system through the National Qualifications Authority (SAQA) (Act No. 58 of

1995) based on the principles of the National Qualifications Authority (NQF) (Act No. 67 of 2008) and Higher Education Act (Act No. 61 of 1997) require that all nurses possess practice based competencies upon which educational outcomes can be measured and quality of performance be assessed. In compliance with this national requirement, the South African Nursing Council (SANC) require that professional nurses have the necessary knowledge, skills, attitudes and values that will enable them to render professional service.

This chapter presents an overview of the study. The problem statement, purpose of the study, research objectives and significance of the study will be described. The assumptions of the researcher will be discussed and conceptual definitions defined. A brief overview will be given of the research methodology, validity, reliability and trustworthiness of the study and ethical procedures adhered to. These will be discussed in greater detail in chapter three.

1.1 BACKGROUND OF THE STUDY

Advances in medicine and technology mean that increasing numbers of severely ill patients are surviving with a corresponding need for Intensive Care Nursing (World Health Organisation [WHO], 2003). These critically ill patients are nursed in an intensive care unit (ICU) where sophisticated equipment is available to enable frequent monitoring of vital signs, assisted ventilation, and when life-threatening crisis occur, rapid resuscitation measures (WHO, 2003).

The World Federation of Critical Care Nurses (WFCCN) defines Intensive Care nursing as "specialised nursing care of critically ill patients who have manifest or potential disturbance of vital organ functions" (WFCCN, 2005). For Elliott, Aitken and Chaboyer (2007), this means assisting, supporting and restoring the patient towards health, or to ease the patient's pain and to prepare them for a dignified death. Its goal and purpose is to establish a therapeutic relationship with patients and their families and to empower individuals' physical, psychological, sociological, cultural and spiritual capabilities by preventive, curative and rehabilitative interventions (Elliott et al. 2007).

The environment of Intensive Care is complex and highly technological, requiring these nurses to have a broad knowledge base and a high level of decision-making skills (De Beer, Brysiewicz and Bhengu, 2011). Intensive Care, coronary care, cardiothoracic, neurosurgery, trauma and emergency care, *to mention a few*, are all specialisation and sub-specialisation areas of "critical care", having the common element that patients admitted to these areas are in a health crisis that requires collaborative management of a multidisciplinary team (Bailey, 1996; De Beer et al. 2011). According to Scribante and Bhagwanjee (2007) and Pretorius and Klopper (2012) a total of 244 024 patients were admitted to the South African ICUs during 2002, of whom 63% (154 044) were in the private sector units and 37% (89 980) to public sectors.

The profile of Intensive Care nursing has changed since its inception in the late 1966. It became evident in the national audit conducted by the Critical Care Society of Southern Africa (CCSSA) that maintained 25.6% of all nurses working in South African ICUs are registered in the speciality, while the remaining nurses (76.4%) have little or no orientation to critical illness (Scribante, Schmollgruber and Nel, 2004). Studies conducted overseas have consistently reported the lack of appropriate nursing skills is associated with increased patient risk (Aitken, Clarke, Sloane, Sochalski and Silber, 2002; Dang, Johantgen, Pronovost, Jenckes and Bass, 2002; Whitman, Kim, Davidson, Wolf and Wang, 2002). In the United Kingdom, Ball and McElligott (2003) explored the contribution of nurses' lack of knowledge, exposure and experience on patient's inability to progress in the ICU setting. This phenomenon causes frustration and financial dissatisfaction to clinical leaders who struggle to provide a professional, well resources service and operational Intensive Care service.

In total there are approximately 4 719 Intensive Care and High care beds in the public and private sectors (Naidoo, Singh and Lalloo, 2013), that are staffed by 4 584 professional nurses (Scribante and Bhagwanjee, 2007). According to the South African Nursing Council (SANC), South Africa had 3 800 trained critical care nurses listed on the registers in 2003 and has decreased to 2 537 in 2008 (SANC, 2008). There is a huge shortage of trained nurses in both health sectors in South Africa. In addition, the number of trained Intensive Care nurses in the country decreased in the last 10 years from over 3 000 Intensive Care Nurses in 1996 to less than 2 500 in 2005 (SANC, 2008).

The current Intensive Care nursing practice has also witnessed significant changes in the injury profile and disease patterns of critically ill patients. It became evident in the clinical practice that there is an increase in acuity levels of hospitalised patients, high HIV/AIDS levels, trauma and violence related injuries, urban unemployment and large immigrant population was factors identified by the Department of Health (DoH) as factors influencing the complex acuity, morbidity and mortality profile in critical care (DoH, 2003). This view is consistent with the views of Mathivha (2002) who reported that patient admitted to the ICUs in South Africa were typically male (65%) and trauma (motor vehicle accidents, gunshots and stabbings) accounts for medical (sepsis, metabolic and overdose), infectious disease (tetanus, malaria and cholera), gynaecological (pre-eclampsia, HELLP syndrome, sepsis and postoperative) and post-surgical (elective surgery) respectively as 30%, 8%, 5%, 4%. Actual mortality rate for patients admitted to the ICUs in South Africa were 31.5%, with the predicted rate being 30% (Mathivha, 2002).

This provides some insight into the acuity profile of critically ill patients who are admitted to the South African ICUs. Providing care for this complex and delicate needs of these patients requires specific competencies built on a framework and a well-developed body of skills to recognise the unique and individualised health needs of the critically ill patients and their families in vulnerable circumstances (WFFCN, 2005). To this end, these nurses must be equipped with the expertise to make sound and rapid judgments within the Intensive Care environment and to recognise and deal with ethical issues inherent in this environment (WHO, 2003).

In addition, the focus of Intensive Care nursing has witnessed the shift from curative care to comprehensive, patient centred and holistic care. The emphasis in practice is to "get back to basics" to improve and prevent nurse associated errors, such as health related infection, injury, development of pressure ulcer and failure to rescue (Edwards et al. [2007], cited in Vollman, 2013). This shift in focus has influenced the approach in Intensive Care nursing education, where the focus point of quality of care now includes integrating evidence into the basics of nursing care.

There are also a number of "failure to rescue" and modifiable areas that can be improved upon. McKinley, Nagy, Stein-Parbury, Bramwell and Hudson (2002) and Rattray, Crocker, Jones and Connaghan (2010) revealed sources of high vulnerability for critically ill

patients included physical and emotional dependency, lack of information, and depersonalised care. Pain is cited as the most frequently occurring experience of ICU patients. Frederickson and Ringsberg (2007) and Cutler, Hayter and Ryan (2013) indicated by integrative and systematic review that experience of stress related to the body include stress reactions, deprivation, or control to technical equipment, procedures and loss of meaning. In Finland, Merilainen, Kyngas and Ala-Kokko (2013) reported that stress related to the room highlights the environment and the situation in which the patient finds him/herself. The ethical relations of professionals and separation of patients from their significant others constitute stress related to relationships (Frederickson and Ringsberg, 2007; Merilainen et al. 2013).

In South Africa, Perrie, Schmollgruber, Bruce and Becker (2014) recently reported that the knowledge level of Intensive Care trained and non-trained nurses in selected areas commonly guided by evidence based protocols was found to be lacking. The overall mean score obtained was 47.56% (SD 11.61). The Intensive Care trained participants obtained 50.11% (SD 11.96) and non-Intensive Care trained obtained 45.01% (SD 10.75). This difference, although small was statistically significant (p=0.0099). A poor relationship was found between level of knowledge and years of experience (Perrie et al. 2014). This finding may mean that Intensive Care trained nurses have obtained advanced knowledge, yet they have difficulty applying their knowledge in clinical practice.

In addition, there appears to be some confusion in the nursing literature about the relative position of competence and capability (Watson et al. 2002), with some placing competence above capability in terms of being a higher level of attainment and vice versa. In Australia, Gardner, Hase, Gardner, Dunn and Carryer (2007) applied the capability framework to nurse practitioners. These authors found nurses described elements of their practice involved as using competencies in novel and complex situations as well as the familiar (Gardner et al. 2007). This study suggests that both competence and capability need to be considered in understanding the complex role of the nurse practitioners who operate in an extended role of nursing practice situations.

The need to revise, upgrade or redesign the content of the curriculum to ensure compliance with primary health care approaches in post graduate education is stipulated in the Health Act (South Africa Act No. 61 of 2003: ch4 par:15.4.4.1a). Based on review of the White

Paper the following areas are identified for evaluation of Intensive Care nurses to contribute to nursing as a profession.

- Evaluating education and training for critical care nurses in terms of appropriateness, cost-effect, core competencies and standards for practice;
- Promoting a culture of caring within critical care nursing practice; and
- Creating a team of competent and skilled professionals who are life-long critical thinkers and flexible partners of the multi-disciplinary team.

Other demands that acted as motivation for the study were the challenges and the expanded expectations of different bodies related to higher education and the Nursing Education institutions namely:

- Legislation contained in the Higher Education Act No. 101 of 1997, as amended;
- The South African Nursing Council (SANC) which proposed the Draft Charter of Nursing Practice (SANC, 2004), a competency based framework for nursing practice; and
- The Forum of the University Deans in South Africa (FUNDISA) that provides direction for recognition and inclusion of differentiated practice roles are now under discussion in South Africa.

During the time these developments were occurring in South Africa, there was also substantial international debate around the concept of advanced practice with terms specialist, advanced and expert often used interchangeably. *What differentiates the practice of these nurses remains a perennial question?*

The competency standards framework adopted by the nursing profession in South Africa was premised on a broad notion of competence as a combination of skills, knowledge, attitudes, values and abilities that underpin effective performance (SANC, 2004). The Intensive Care nurse in South Africa is a professional registered nurse in terms of the Nursing Act No 33 of 2005 (RSA, 2005) and registered to practice Medical and Surgical Nursing in the Category of Critical Care - general according to the Regulation R212 (SANC, R212 of 1993, as amended) of the Nurses Act (Act No 33 of 2005: ch2 par.34). This additional qualification builds upon general nursing education and enables the Intensive Care nurse to work in a variety of settings within the hospital. To justify the

significance of the content of the educational and training programme and professional development of Intensive Care nurses in clinical practice, it was therefore essential to explore the competencies required by such nurses in order to care for critically ill patients in all the domains of clinical practice.

The study was conducted in a unique context within the specific hospital in Johannesburg in the Gauteng Province. The Gauteng province is the smallest of nine provinces in South Africa. As it is considered as the financial and economic hub of South Africa it has a natural attraction for people from other parts of South Africa and surrounding countries close to its border. The province has an estimated population of 10 million people, which is estimated by Statistics South Africa (STATS SA. 2009) as > 20.4% of the total South African population. The Gauteng Department of Health has three public sector tertiary hospitals positioned strategically across the province in order to provide care to a majority of populations. The hospitals together provide an estimated total of 5,100 specialised in-patient beds for the province.



Figure 1.1 Geographical map of the Gauteng Province, South Africa

(http://www.johannesburg.co.za/maps.htm)

1.2 PROBLEM STATEMENT

Current clinical practice indicates that Intensive Care nurses utilise a wide range of cognitive, psychomotor and affective skills and from these combine or synthesise a cohesive approach to patient care: key nursing attributes are proactive management, vigilance, coping with the unpredictable and emotional support (Ball and McElligott, 2003). Studies suggest that professional practice and reflective practice, enabling, clinical problem solving, team work and leadership are essential competency domains of critical care nursing practice (Dunn, Lawson, Robertson, Underwood, Clark, Valentine, Walker, Wilson-Row, Crowder and Herewane, 2000; Gill, Leslie, Grech and Latour, 2012). Nurses should not only possess knowledge and skills, but also be able to transform competencies into effective performance in new situations in order to cope with rapid changes in health care. Such knowledge and skills are usually embodied in the regulatory framework of a professional body.

South Africa distinguishes between two categories of nurses, namely professional and sub-professional categories (inclusive of enrolled nurses and enrolled nursing assistants) that are regulated by the South African Nursing Council (SANC). Training of professional nurses typically occurs at colleges and universities and involves a 4-year registration, which leads to registration in general, psychiatry, community, and midwifery. In addition, education and training of professional nurses occurs at post registration level. South Africa differentiates between five broad categories of post-registration nurses, namely child nursing, community nursing, medical and surgical (inclusive of critical care sub-categories: for example, Intensive Care, trauma and emergency, nephrology, and *many others*), midwifery and psychiatry. Critical care – in this instance Intensive Care nursing education is provided on two levels that is a post-registration diploma offered by nursing colleges, and universities and a postgraduate (master's) degree offered by universities. There is no separate scope of practice in South Africa for post-registration nurses.

The current regulatory framework for nursing in South Africa, does not adequately guide the practice of post registration – in this instance Intensive Care registered nurses and professional registered nurses working in the ICUs. This has implications for accountability and responsibility for nurses working in the ICUs who are required to make decisions independently of the critically ill patient data obtained. However, introduction of

the Outcomes Based Approach (OBE) system through the South African Qualifications Authority (SAQA) (Act No. 58 of 1995) based on the principles of the National Qualifications Framework (NQF) (Act No. 67 of 2008) and Higher Education Act (Act No. 61 of 1997) requires that all nurses possess practice based competencies on which educational outcomes can be measured and quality of performance be assessed. The purpose of this study was therefore to develop competency standards for Intensive Care nurses who care for critically ill patients in the Intensive Care units of a university-affiliated, public sector and tertiary hospital in the Gauteng province in South Africa.

1.3 RESEARCH QUESTIONS

As this study has not previously been investigated in any depth, particularly in South Africa and against the rationale for the study, the following research question emerged.

> **How do Intensive Care nurses describe the competencies they require or use in the provision of patient care, and are these congruent with the needs of the critically ill patients in the ICUs?**

In order to answer this question, the following questions need to be addressed:

- What is the clinical profile of critically ill patients admitted to the ICUs?
- Which competencies in the opinion of an expert group of Intensive Care nurses do Intensive Care nurses require for the provision of care?
- Do other Intensive Care nurses in the ICUs agree with the opinions of the expert group of Intensive Care nurses?
- Can a preliminary set of competencies be developed from the data obtained?
- What is the relevance of the developed set of competencies in the literature?
- Can competency standards in the care of critically ill patients be developed

1.4 AIM AND OBJECTIVES

The aim of this study was to develop competency standards for Intensive Care nurses who care for critically ill patients in the ICUs of a university-affiliated, public sector and tertiary level hospital in the Gauteng province in South Africa.

In order to meet this aim the following objectives were set:

- To explore and describe the clinical profile of critically ill patients admitted to the ICUs.
- To elicit from an expert group of Intensive Care nurses in the Intensive Care setting, the competencies Intensive Care nurses require in the provision of care for the critically ill patient.
- To elicit from other Intensive Care nurses in the ICUs their opinions regarding the competencies they require or use in the ICUs.
- To compile a preliminary set of competencies based on the data obtained.
- To triangulate the relevance of the developed set of competencies in national and international literature.
- To develop competency standards in the care of critically ill patients.
- To validate the competency standards in the care of critically ill patients.
- To recommend guidelines for the use of competency standards in the care of critically ill patients.

1.5 CENTRAL THEORETICAL STATEMENT

Insight into the needs of critically ill patients and the required competencies of Intensive Care nurses provides the basis for development of competency standards which will facilitate the care of critically ill patients in the ICUs.

1.6 SIGNIFICANCE OF THE STUDY

The South African education and training system, through its policy of outcomes based education and training has made competency a national priority. In compliance with this national requirement of producing competent learners, the South African Nursing Council (SANC) require that Intensive Care nurses have the necessary knowledge, skills, attitudes and values which will enable them to render efficient professional service.

The health care system demands competent nurse practitioners to ensure quality in health care. In light of competency being a national priority and a statutory demand, identification

of competencies is a necessary consideration to developing nurse-sensitive outcome measures.

The current study involves the diverse talents of academics, clinical practitioners and the professional society to work together to achieve the development of competency standards for Intensive Care nursing practice, thereby providing the basis for future collaboration between these groups.

1.7 PARADIGMATIC ASSUMPTIONS

Creswell (2009) stated that a paradigm is a worldview, meaning that it is a set of beliefs that guides all thoughts, actions and human behaviours. This allows us to make sense of and give meaning to the things of the world (Patton, 2002). All research needs to be placed in a paradigm as it guides the direction and subsequent phases of the study. The paradigmatic perspectives of this study include the meta-theoretical, theoretical and methodological assumptions, which are discussed in the following section.

1.7.1 Meta-theoretical Assumptions

Meta-theoretical assumptions are axiomatic statements not intended to be tested by the study. The meta-theoretical assumptions of nursing comprise the person, environment, health and nursing, particularly applied to the speciality of Intensive Care nursing.

1.7.1.1 Person

The person is viewed as a holistic being that comprises of a body, mind, and spirit. As a holistic being the whole person is more than the sum of individual constituent parts (Fitzpatrick & Whall, 1983:247). The person has the innate ability to make their own choices to determine their life's pathway. As an open system the person may choose to co-exist with others in their world. Together with others the person constructs and co-constructs the meaning of the existence in the world (Fitzpatrick & Whall, 1983:278). In this study, the Intensive Care nurse is an open system, continually changing in mutual process with the environment. Recipients of nursing action may be critically ill and include individuals, families and communities.

1.7.1.2 Environment

The environment of the person comprises an internal and external world. All people through their existence endeavour to maintain a balance between these two dimensions. An imbalance manifests itself as stress, which upsets the harmony of a person to contribute in meaningful ways to the existence of others (Fitzpatrick & Whall, 1983:226). In this study, the internal dimension is the nature of human responses to life threatening illness, whereas the external environment is the ICU, which is considered by all protagonists of its use as a highly complex, technologically focuses and at times alien world (Almerud et al. 2008; Pitacco, Silvestro & Drigo, 2001).

1.7.1.3 Health and Illness

Health and wellness is the ultimate goal of nursing. As nurses we strive to prevent illness, injury or complications through all our actions, interactions and treatments to all patients entrusted to caring in order to promote the wellness concept (Chinn and Kramer, 2004). For this study, wellness and illness are described on a continuum because the starting point for Intensive Care nursing is the life-threatening responses to critical illness and patients are discharged from the ICU to the general ward in the hospital to facilitate their recovery process (Pitacco et al. 2001).

1.7.1.4 Intensive Care nursing

Intensive Care nursing is a speciality branch of nursing. Caring for the whole person is the focus of the discipline of nursing, which sets the nurse uniquely apart from all other health care professionals (Chinn and Kramer, 2004). A nurse sees the health needs of a patient as the priority of caring. On recognition of such needs the nurse shifts attention away from self to focus all attention to addressing the delicate and individual needs of patients entrusted to our caring. For this study, Intensive Care nursing is concerned with human responses to life threatening and potentially life threatening problems. Such life-threatening responses require continuous in-depth assessment and intense therapeutic measures and interventions (McKinley, 2007). The roles of the Intensive Care nurse are essential to the multi-disciplinary team who are needed to provide their expertise when caring for patients and their relatives (Williams, 2005).

1.7.2 Theoretical Assumptions

Theoretical assumptions are inclusive of theories and concepts used as a point of departure in the study.

The theoretical assumptions for the study are selected from the Novice to Expert Skills Acquisition Model (Benner, 1984). The emphasis of this model is that the transition from novice to expert occurs as a result of experiential learning in the clinical practice setting. The process of skills development progresses through five levels of skills proficiency: novice, advanced beginner, competent, proficient and expert. Key aspects of this model are summarised according to Benner (1984) and Benner, Tanner and Chesla (1996) below:

- Novice has no prior experience in nursing. There is negligible understanding of theories and concepts being taught. They learn measurable nursing rules and procedures, but there is a lack of situational context to correlate theory to rules, which results in an inflexible approach to nursing.
- Advanced beginner has been exposed to marginal patient situations as a result of sufficient variety and complexity to progress to marginal accepted performance. As such, rules are no longer context free as they begin to see the bigger picture, but need support and mentoring.
- Competent practitioner is able to see the broader perspective, which is nursing in terms of long term goals. This nurse plans care based on priorities rather than stimulus based interventions. The competent nurse lacks speed and flexibility of a proficient nurse, but is able to cope and manage challenging contingencies.
- Proficient practitioners are able to perceive the entirety of the clinical situation. Their practice is guided by substantial practice experience, understanding of the key principles of nursing and basic nursing needs. Holistic understanding allows them to make clinical judgments without the need to consult learned rules or procedural guides.
- Expert practitioner possesses an intuitive grasp of clinical situations. They function with certainty, fluidity and flexibility. This is based on a significant amount of experiential learning.

The progression from novice to expert is incremental but not necessarily linear, as with growth and development stagnation can occur. “Competent” is seen as the critical juncture to development of expertise. According to Dreyfus and Dreyfus (1996) the level of expertise is not a characteristic of the individual, but rather the function of familiarity in combination with education (Dreyfus and Dreyfus [1996], cited in Hamric, Spross and Hanson, 2005).

Therefore, some nurses advance to expertise because they are sufficiently engaged in clinical practice.

1.7.2.1 Theoretical definitions

The definitions below indicate the way in which the following terms are used in the context of the study.

- Competencies

Competencies are broad composite statements from Intensive Care nursing practice, which describe the framework of skills, reflecting knowledge, attitudes and psychosocial elements (Bruce et al. 2011; Muller [1999], cited in Morolong and Chabeli, 2005). According to the World Health Organization (WHO), the term learning outcomes is used synonymously with competencies (WHO, 2003).

For this study, it includes behaviours which Intensive Care nurses themselves believe are important for providing safe, effective and ethical care.

- Critical/ Intensive Care Nursing

Critical care nursing involves caring for patients and families experiencing life threatening illness or injury. Although critical care nursing can be applied in any setting in the pre-hospital, or in the trauma unit, this term has been used interchangeably with Intensive Care nursing. Within this high technological environment, nurses are required to have a broad knowledge base, display higher levels of decision-making skills and demonstrate a high

regard for patients and families in vulnerable circumstances (Bucher and Melander, 1999). The same meaning is adopted in this study.

- Intensive Care Unit (ICU)

An Intensive Care unit (ICU) is a specifically staffed and equipped hospital unit. The management is dedicated to rescuing patients with life threatening illness, injuries or complications (Bersten and Soni, 2003:3).

In this study, the ICU is defined according to the guidelines of the South African Society of Anaesthesiology (SASA), which categorises ICUs into Level 1 to Level 3 (SASA, 2013). The tertiary public sector academic units are considered Level 3 ICUs (SASA, 2013). Four level 3 ICUs at the selected study site participated as the study related sub-sites. These are trauma ICU, cardiothoracic ICU, general ICU and Coronary Care Unit.

- Scope of Practice

Refer to the range of roles, functions, responsibilities and activities which a registered nurse is educated for, competent and authorised to perform (ICN, 2009).

In this study, the scope of practice is the professional, ethical, legal standards for nursing by the professional body (SANC, R2598 of 1984, *as amended*).

1.7.2.2 Operational definitions

The explanations below indicate the way in which the following terms are measured in the study.

- Clinical profile

This is a description of the needs of critically ill patients in ICU, which is defined by severity of illness and level of care (Bersten and Soni, 2003:7).

For this study, the level of illness severity is determined by measurement of the most marked abnormality of fifteen clinical variables using the Simplified Acute Physiological Score (SAPS) version II; whereas the level of provided care is the quantification of nursing activities as determined by the Simplified Therapeutic Intervention Scoring System (TISS-28), which assigns points (ranging from 1 to 8) to seven therapeutic activities with nursing requirements for care in the ICU.

- Critically ill patient

The critically ill patient is characterised by actual or potential life threatening health problems, which include the requirement for continuous observation and interventions in ICU to prevent complications.

For the purpose of this study, the critically ill patient is an adult patient admitted to one of the four Level 3 ICUs at the study site.

- Critical/ Intensive Care Nurse

A critical/ Intensive Care nurse is a clinical nurse who functions at an advanced level of patient care in a multidisciplinary nursing environment. She/he may be formally trained – a registered nurse with no formal qualification, or formally trained.

According to the South African Nursing Council (SANC), a critically trained nurse is a registered nurse who obtains an additional qualification in medical-surgical nursing; Advanced Medical and Surgical Nursing: Critical Care (R212 of 1985, as amended: 119:2) or equivalent alternative Intensive Care Nursing. A critical care nurse is one who has had training at a SANC (1985) approved learning facility (university or college) under R212 and informal training through orientation and in-service training.

For this study, the critical/ Intensive Care nurse is based on Benner's (1984) recognition of knowledge embedded in clinical practice. Referred to, as Intensive Care nurse and categorised as an *expert Intensive Care nurse* or *other Intensive Care nurse*.

- Clinical facilitation/facilitator

Facilitation is ‘to make something easy or easier’ (Oxford Dictionary, 2007:367). Clinical facilitation refers to the technique where one person makes things easier for others, with the purpose of co-creation of new knowledge through the process of critical reflection and dialogue between the learner and the facilitator (Harvey, 2000:578).

A clinical facilitator is a professional nurse that the nursing school or clinical setting employs for the purpose of clinical teaching. This role is supplementary to the teaching role of the professional nurse. According to Bruce et al. (2011), it is a goal orientated dynamic approach in which the learner works together with a facilitator or coach within an atmosphere of mutual respect and trust in order to achieve set goals. The same meaning is applied in this study.

- Mentor

The term mentor is defined as ‘an experienced and trusted advisor’; ‘an experienced person in and organization or education facility who trains and mentors new employees or students’ (Oxford Dictionary, 2007:647). A mentor in the general refers to a professional nurse who has experience in a given area of responsibility for helping someone with less experience to develop knowledge and skills as he/she learns new roles (Free Dictionary, 2007).

In this study, a mentor in the specialty/specialisation provides advanced level education to support graduated/qualified Intensive Care nurses, thus fostering pathways to clinical excellence and educating nurses on evidence-based best practice (CACCN, 2004:11). The same meaning is adopted for the study.

- Nurse Educator

A nurse educator is a nurse who teaches and prepares professional/registered nurses for entry into practice positions. They can also teach in various patient settings to provide continuing education to registered nurses (Free Dictionary, 2007). The focus of the

educator or facilitator in the concept of education is an activity initiated by individuals to effect changes in knowledge, skills, and attitudes of individuals, groups or communities.

A nurse educator is an individual registered under section 3 of the Nursing Act (No. 33 of 2005), they are required to hold in addition, a qualification in the area of specialisation, in this case Intensive Care nursing (R212 of 1993, *and amended*, 119:2).The same meaning is applied in this study.

- Competence

Competence is defined as a level of performance demonstrating effective application of knowledge, skills and judgment (ICN, 2009), and as the "overlap of knowledge, skills and clinical components of psychomotor skills and clinical problem solving in the realm of affective responses" (Dunn et al. 2000).

- Competency standards

Competency standards define a range of level of competencies and capabilities that are assumed to be achieved at these levels (Trinder, 2005); in a given set of circumstances, designated role or setting. These statements identify and define the criteria which influence the quality or competence of Intensive Care nursing and clarify what is an expected outcome.

According to the WHO (2003), they are a means of comparing the degree of excellence of one educational programme with that of others (SANC, 2004; WHO, 2003). The same meaning is adopted in this study.

1.7.3 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, which proposes that the dimensions of the research process follow step by step,

starting with the problem statement, objectives, paradigmatic perspective, considering ethical measures, research design and method up to the report writing and lastly publication of the results. The design is consistent with the principles proposed for standards generation by Muller (cited in Booyens, 1998:607-608; 636-637), and includes both, quantitative and qualitative methods (Polit and Beck, 2009).

The research process will result in knowledge generation, and the knowledge generated in the study will be applied to nursing practice in order to provide quality care for patients. The competency standards are written with a purpose of making explicit the expected standards for clinical practice which will inform on-going professional development and contribute to the on-going development of competency standards for the speciality.

To ensure rigor in the research, validity, reliability and measures of trustworthiness (Lincoln and Guba, 1989:241-242) are applied. The principles of logical reasoning and justification are adhered to. The research process presents an adequate scientific trail for replication and scientific scrutiny and evidence is given for judgments made. The whole process is approached with integrity and adherence to provide a valid, reliable and contextual data that can be used to bring about development in clinical practice.

1.8 RESEARCH METHODOLOGY

Research methodology is the overall strategy in the development of competency standards for Intensive Care nurses who care for critically ill patients in the ICUs of a university-affiliated, public sector and tertiary level hospital in the Gauteng province in South Africa, which is the aim of the study. In the following section an overview and the methods used in the study will be provided.

1.8.1 Research Design

The research design is standards generative, contextual, exploratory and descriptive. Within a standards generative design, both quantitative and qualitative methods are used to address the research questions. Each aspect of the design is discussed.

The study is contextual, as the researcher intended to use the sequence of events as they occurred in the setting of the study. The study setting was the ICUs at one university-affiliated, public sector hospital and tertiary/quaternary level institution in Gauteng Province, South Africa. There is an increasing demand for Intensive Care services as a result of aging and growing HIV/AIDS populations, high levels of unemployment rates, crime and violence. As this study has not been fully explored in the South African context, the study was not intended to produce broad generalisations of the topic under review.

The study is exploratory, as the researcher intended to develop insights into the topic under review by using critically ill patients and Intensive Care nurses points of view. The relationship between the two was explored in the literature and experience of Intensive Care nurses in order to arrive at the development of competency standards.

The study is descriptive, as the researcher intended to develop deeper insights into the topic under review by using both critically ill patients and Intensive Care nurses points of view. The full nature of relationships as they occurred will be described in detail, for better understanding, in order to be used for the development of competency standards.

A standards generative approach is one that describes the process required for development of standards. For this study, the standards generative approach was used to systematically structure the research design and methods with the process required for development of the competency standards. The process required two phases: Phase 1 involved the collection of empirical evidence to be used for the development of competency standards; Phase 2, involved the development of competency standards.

1.8.2 Research Methods

The process for the development of the standards comprised two phases, which for the study were further divided into eight steps: each of these steps articulates in accordance with the objectives of the study and are discussed below.

Phase 1 involves the point of departure in the collection of empirical data pertaining to the development of competency standards, which comprises three steps (steps 1 to 3). Step 1 involves collecting data pertaining to the clinical profile of patients in the ICUs by means

of a prospective study using record reviews conducted on patients in the ICUs. Step 2 involves collecting data for the competencies required that Intensive Care nurses require or use for the provision of care by means of an in-depth study using individual interviews with an expert group of Intensive Care nurses in the Intensive Care settings as the key informants. Step 3 involves verification of the competencies identified by the key informants using focus group discussions with other Intensive Care nurses working in the ICUs.

Phase 2 involves the development of competency standards, which comprises five steps (steps 4 to 8). Steps 4 and 5 involve identification and development of a preliminary set of competencies by matching data collected in steps 2 to 3. Step 6, involves the development of competency standards by integrating, synthesising and categorising data collected in steps 1 to 5. Step 7 involves validating the competency standards by using a national group of expert Intensive Care nurses in the field of the study. Step 8 involves recommending guidelines for use of the competency standards in the care of critically ill patients, thus concluding the study.

Table 1.1 provides a brief overview of the methodology of the study although the detail thereof will be described in Chapter Three.

Table 1.1 Overview of research design and methods

Research objectives	Data collection	Sample and population	Trustworthiness	Data analysis
Phase 1- Step 1 To explore and describe the clinical profile of patients admitted to the ICUs.	*Data collection* Prospective record review.	*Population* Adult patients admitted to the ICUs (n=4) *Sample* Simple random (n=135)	*Validity and reliability* Use of valid and reliable instruments	*Data analysis* Descriptive and inferential statistics
Phase 1- Step 2 To elicit from an expert group of Intensive Care nurses, the competencies nurses require in the provision of care	*Data collection* In-depth individual interviews	*Population* Specialist nurses in the ICUs (n=4) *Sample* Purposive sample	*Trustworthiness* Guba and Lincoln (1989; 241-242) criteria for trustworthiness	*Data analysis* Tesch's method for qualitative analysis (in Cresswell, 2003:190-195)
Phase 1- Step 3 To elicit the opinions from other Intensive Care nurses regarding the competencies they require or use in the ICUs	*Data collection* Focus group interviews	*Population* Intensive Care nurses in the ICUs (n=4) *Sample* Purposive sample	*Trustworthiness* Guba and Lincoln (1989; 241-242) criteria for trustworthiness	*Data analysis* Tesch's method for qualitative analysis (in Cresswell, 2003:190-195)
Phase 2- Step 4 To compile a preliminary set of competencies based on the data obtained.	*Data source* From individual and focus group interviews (steps 2 to 3)	*Population* Conclusion statements	*Trustworthiness* Guba and Lincoln (1989; 241-242) criteria for trustworthiness	*Data analysis* Pattern matching (Miles and Huberman, 1994)
Phase 2 – Step 5 To triangulate the relevance of developed set of competencies		*Population* National and international literature		*Data analysis* Content analysis
Phase 2 - Step 6 To develop competency standards in the care of critically ill patients	*Data collection* Data conclusions steps 1,2,3, 4 and 5	*Population* Conclusion statements *Sample* 100% sample	*Trustworthiness* Guba and Lincoln (1989; 241-242) criteria for trustworthiness	*Data analysis* Standards generation (Muller cited in Booyens,1998).
Phase 2- Step 7 To validate competency standards in the care of critically ill patients	*Data collection* Peer review	*Population* Nurse educators and clinical facilitators *Sample* Purposive sample	*Trustworthiness* Guba and Lincoln (1989; 241-242) criteria for trustworthiness	*Data analysis* Recommendations, modifications and omissions

1.9 VALIDITY, RELIABILITY AND TRUSTWORTHINESS

An overview of validity, reliability and trustworthiness applied is provided, although the details thereof are discussed in chapter three. Measures of validity, reliability and trustworthiness of the prospective record review, in-depth individual interviews and focus group discussions were ensured and described below.

The process for describing the clinical profile of critically ill patients was ensured in the prospective record review, as the data collection instrument was developed from literature and tested all major elements of the characteristics of critically ill patients. Content validity was ensured as the instrument was developed from established instruments developed and tested on patients in the adult ICUs. Simple random sampling was applied to obtain a broader representation of critically ill patients to enhance generalisations of the sample to the population. Reliability of the study was implemented by strict adherence to the data collection tool. A pilot study was undertaken to ensure validity of the study's procedures in the South African context.

Guba's (1985) model, as described in Lincoln and Guba (1989:241-242), for ensuring validity and trustworthiness of qualitative research was applied in the in-depth individual interviews and focus group discussion with Intensive Care nurses. The four main aspects of trustworthiness applied to this study were credibility (truth value), dependability (consistency), transferability (applicability) and confirmability (neutrality).

1.10 ETHICAL CONSIDERATIONS

An overview of the ethical considerations is provided, although the details thereof are discussed in chapter three. The institutions involved are the University of the Witwatersrand, the Gauteng Department of Health and the Charlotte Maxeke Johannesburg Academic Hospital (CMJAH). Written permission to conduct the study was obtained from the Post Graduate Committee of the Faculty of Health Sciences and the Committee for Research on Human Subjects (Medical) of the University of the Witwatersrand.

Participants' right to informed consent, confidentiality and anonymity were maintained. All the participants were fully informed of the research purpose, the nature of their

involvement, their right to withdraw from the study, if they so wished, without prejudice, by the researcher or clinical personnel. The researcher explained the full nature and purpose of the study to the participants in a language they could understand. All participants were required to indicate their willingness to participate in the study by signing the consent form: while provision was made for patient participants who could not write to thumbprint their approval.

Confidentiality was upheld as all interview schedules and checklists used for data collection were stored in a safe place. Anonymity was ensured by using code names rather than participants' real names during data collection and analysis. The same code name appeared on the interview schedule and checklists of each participant. The list of real names was later destroyed. Specific ethical considerations were addressed relating to the informed consent by proxy, structured observations and tape recording.

1.11 OUTLINE OF THE THESIS

The research was conducted in phases (refer to **Table 1.1**). The execution of the plan resulting in the following chapter layout:

Chapter One:	Overview of the study
Chapter Two:	Literature review
Chapter Three:	Research design and methods
Chapter Four:	Results: Clinical profile of patients
Chapter Five:	Findings and discussion: Individual interviews and literature control
Chapter Six:	Findings and discussion: Focus group interviews and literature control
Chapter Seven:	Matching patient needs and Intensive Care nurse competencies and development of competency standards
Chapter Eight:	Evaluation of the study, conclusions, limitations and recommendations.

1.12 SUMMARY

In this chapter an overview of the study was given, the background of the study, research rationale and questions were detailed. The researcher's assumptions were discussed and the research methodology described. Ethical considerations pertaining to the study were given.

In the next chapter, the literature review will be discussed in greater detail.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The literature review was undertaken to explore the studies that have been carried out to date on the topic under study both, overseas and locally, in order to establish what is known about the topic that may have relevance for South Africa. The chapter presents the discussion of the literature reviewed in relation to competencies for intensive care nurses care of critically ill patients in the intensive care units. The increasing interest in patient care may reflect nurse's desire for a more complete understanding of the measures that are a necessary consideration in relation to high quality, safe and efficient care.

In order to structure the discussion in a way that has meaning and relevance for the concepts of the study, it was necessary to divide the discussion into a number of sections. Therefore, the chapter begins with the history and development including a description of past and current practices, knowledge, skills and technology and current challenges, particularly in South Africa. Because intensive care nursing is provided within the framework of the health care system, it is also necessary in this chapter to review the context of the health care system, inclusive of legislation and related policies. Following this an overview of intensive care personnel is provided, including the medical staff and nursing personnel. Thereafter, the discussion turns to critically ill patients, particularly related to increasing acuity levels, comorbid illness, standard care and patient outcomes. Finally, the competencies needed included those required to manage acuity level, diversities, therapeutic interventions, inter- and intra-disciplinary collaboration, staffing mix, protocols, guidelines and evidence based practice, and knowledge, skills and competencies. Thereafter the author will conclude the chapter with a summary.

2.2 HISTORY AND DEVELOPMENT

Intensive care is the treatment, provided to the most critically ill injured and postoperative patients, requiring concentrated and specialised care within a discrete area in the hospital (Brilli, Spevetz, Branson, Campbell, Cohen, Dasta, Harvey, Kelley, Kelly, Rudis, Andre,

Stone, Teres and Weled, 2001). This care is usually provided by a multidisciplinary team of doctors and nurses and other health care personnel with special expertise in the care of critically ill patients. Critical care is a speciality branch of nursing that is concerned with human responses to manifest and potential life threatening problems (Williams, Chaboyer, Thornsteindottir, Fulbrook, Shelton, Chan & Wojner, 2001). These life threatening problems require close observation, intense measures and therapeutic interventions (McKinley, 2007), while at the same time offering comfort and support to family members (De Beer et al. 2011). Critical care is an encompassing area that applies to settings where patients with designated life threatening conditions are nursed. These include adult and paediatric ICUs, high dependency units (HDUs) and coronary care units (CCUs). Intensive Care and critical care are terms that are used interchangeably, although these differ in meaning. For example, critical care is considered in its broadest sense, incorporating sub-specialities, areas such as emergency care, coronary care, high dependency, cardiothoracic and general ICU (Elliott et al. 2007). This definition is not universally accepted – with the more narrow view of critical care encompassing ICU and coronary care also being in common use (Elliott et al. 2007). For the purpose of this study, I have chosen not to distinguish between the terms, and I will consider intensive care and critical care to be the care provided in separate units in the hospital known as the 'intensive care unit' (ICU). The main purpose of any ICU is to provide quality care for the critically ill patient who has a condition that is compatible with a recovery.

2.2.1 Intensive Care Past and Current

Intensive care is a common service known worldwide for the provision of care to some of the sickest patients. The idea of intensive care as a dedicated space in the hospital was first put forward by Florence Nightingale, who also happens to be the founder of modern nursing in the 19th century (Fairman, 1992; Weil and Tang, 2011). Technology and support have been pivotal to the development of Intensive Care (Crocker, 2005). The early part of the 20th century witnessed emergence of ICUs that aimed to compensate for vital organ system failure. For example, the poliomyelitis patient's need for support forced the application of manual ventilation through tracheostomy (Bertelson and Cronqvist, 2003) or by use of respirators known as "iron lungs" for saving lives in the USA and Denmark (Weil and Tang, 2011). Intensive Care was established by the late 1950s to early 1960s in South Africa (Brink and Cooper, 2005).

Further advancements for the ICUs came in the early 1960s as a result of developments in surgery, which also created the need for specialised postoperative recovery rooms (Robnett, 2006). At the same time, the parallel development and advancements in the field of cardiology also played an important role, for example cardiac monitors, alternating current (AC) defibrillators and electrocardiographs, which also gave rise to establishment of the coronary care units (Wiles and Daffurn, 2002) However, the realisation that those patients needing these technologies also required close monitoring, which could be better and more effectively provided for, by specialised personnel in a designated area of the hospital led to establishment of the ICUs worldwide, by the mid-1960s (Bersten and Soni, 2003). These medical and surgical units served to separate the most critically ill patients to locations where they could be nurses by staff trained in these areas.

The current era of ICU began in the middle part of the 20th century as a result of medical advancements and technological developments. Weil and Tang (2011) stated that it began with automated monitoring of vital signs and rapidly expanded to allow for additional and refined measurements of patient status. Respiratory and haemodynamic measurements were complemented by laboratory measurements of blood gases, blood chemistries and new measurements, including cardiac enzymes and blood lactate, initially in STAT laboratories and later current multi-parameter point-of-care analysers (Weil and Tang, 2011; Wiles and Daffurn, 2002). As a result, titrated therapy was in response to cardiorespiratory therapy and metabolic measurements that indicated life threat. According to Elliott et al. (2007) these later developments in renal, metabolic and neurological management led to the principles of Intensive Care that exist today.

Today, many highly specialised ICUs exist for different patient populations for example, neurological, neurosurgical, burns, trauma, cardiothoracic, coronary care, surgery or medical patients. The major public sector tertiary hospitals are also academic hospitals and have teaching commitments so they usually have many highly specialised ICUs. The last national audit published in 2007, showed that there were 4, 168 ICU and high care beds in South Africa (Bhagwanjee and Scribante, 2007). The description of the ICUs are referred in accordance with the South African Society of Anaesthesiology (SASA) set of guidelines, which has three categories (Categories 1 to 3) (SASA, 2013). Table 2.1 presents the categories of ICUs in South Africa.

Table 2.1 Categories of ICUs adapted from SASA Guidelines (SASA, 2013:S33)

Category	Description
Category 3: Tertiary intensive care unit facility	This category has the potential to provide the highest degree of patient care and the type of patient admitted to this unit may include: • multiple organ failure; • requiring multidisciplinary intervention; • requiring ventilation with second organ failure; • requiring haemodialysis with second organ failure; and • haemodynamically unstable patients.
Category 2: Specialised organ support unit	Patients requiring this category of ICU require slightly less than category 3 patients and may include: • require active system support; • have single-organ failure; • airway problems; and • conditions that require potent drug infusions.
Category 1: High care unit	Patients admitted to this category of ICU require intensive monitoring only, and include those who have: • fluid and electrolyte or metabolic disturbances; • drug overdose that does not require intermittent positive pressure ventilation; • neuromuscular weakness that does not require intermittent positive pressure ventilation; and • single organ dysfunction that does not require active support.

Category 3 units are found in university-affiliated, tertiary level hospitals, and are run on a closed unit principle (SASA, 2013:S33). Four level 3 ICUs at the selected study site participated as the study related sub-sites. This study was conducted within these environments.

Knowledge, skills and technology is discussed in the next section.

2.2.2 Knowledge, Skills and Technology

Fairman (1992) maintained that in order to cope with caring for unstable critically ill patients nurses strove to increase their knowledge base. They were acutely aware their basic nursing education had focused on the functional aspects of nursing work and they needed to understand what was happening with these patients. Nurses learnt on the job, often taught by ICU doctors, accumulating knowledge and skills previously only the domain of medicine.

The major technological innovations occurred in the ICUs during the early 1960s and late 1970s (Fairman, 1992; Weil & Tang, 2011; Wiles & Daffurn, 2002). This included ventilators, cardiac monitors, defibrillators, dialysers and more recently added intra-aortic balloon pumps and other cardiac assist devices, which motivated the need for additional skills. Post basic courses developed quite early in the United Kingdom (UK), *South Africa* and Australia (Ashworth, 1985; Elliott et al. 2007; Scribante, Schmollgruber & Nel, 2004), these were hospital based courses and varied from 6 months to 12 months in duration. Employment of nurses with assessment of clinical competence was a major issue for most ICUs in the UK, South Africa and Australia (Ashworth, 1985; Elliott et al. 2007; Scribante et al. 2004).

Differences soon appeared in nursing practices in the ICUs both locally and internationally as a result of hospital based courses. Elliott et al. (2007) attribute differences in hospital based courses to the specific content and narrow focus of cases in some hospitals. By the early 1990s these courses had shifted into the tertiary educational setting in Australia, North America, Sweden and many other countries (Dunn et al. 2000). In each case advancing nursing was seen by both educators and clinicians as an opportunity to move nursing beyond the traditional apprenticeship model (McLean, Monger and Lally, 2005).

Professional organisations were established in the early years to guide the development of intensive care nurses, for example the American Association of Critical Care Nurses (AACCN) was established in 1969 (Elliott et al. 2007; McKinley, 2007). The World Federation of Critical Care Nurses (WFCCN) was motivated for by 46 professional organisations and established in 2001 to represent the interests of critical (or intensive) care nurses, worldwide (Williams, Chaboyer, Thornsteindottir, Fulbrook, Shelton, Chan

and Wojner, 2001). In South Africa, the Southern African Critical Care Society (CCSSA) is one of the largest medical societies in the country and offers multidisciplinary leadership to doctors, nurses and other members of the specialist team (Scribante et al. 2004). Under the auspices of the CCSSA, South Africa has representation on the executive council of the WFCCN. Collectively these professional organisations play a major role in providing guidance for education, research and collaborative practice. Thus providing leadership for advancing the art and science of specialty nursing and promoting the wellbeing of patients and their families.

Despite this acknowledgement of intensive care in history and development, there are current challenges to nursing worldwide. This includes the changing disease profile of critically ill patients and a shortage of nursing resources. Each aspect will be discussed in greater detail.

2.2.3 Current Challenges for Intensive Care

A shortage of qualified trained Intensive Care nurses has led to a reliance on newly qualified, agency (not in full-time employment) and sub-professional nurses (enrolled practical nurses as opposed to registered nurses) in ICUs to maintain continuity of service delivery, worldwide. Scribante et al. (2004) reported that 25.6% of all nurses currently working in South African ICUs are registered in the specialty, whereas remaining (76.4%) nurses fail to have an orientation to critical illness. The category of enrolled practical nurse is being replaced by the three-year trained staff nurse for reasons of irrelevance to the current context of sicker patients than before (SANC, 2009). Many studies have consistently reported a lack of appropriate nursing skills is associated with an increased risk to patients (Aiken et al. 2002; Ball and McElligott, 2003; Dang et al. 2002; Perrie et al. 2014). Thus the ICUs are dependent on intensive care nurses knowledge and skills to safely deal with challenges of meeting the complex needs of critically ill patients with staff complements which do not have the requisite proportion of registered practitioners.

Forecasted global projections indicate that elderly patient utilisation of ICUs is likely to increase in the foreseeable future. This is attributed to increased medical knowledge and better understanding of longevity and chronic illness. Many studies in the USA reported that from 26% to 51% of patients in ICUs are elderly, and have an increased length of stay

and use of ICU resources and mortality (Garrouste-Orgeas, Timsit, Montuclard, Colvez, Gattolliat, Phillippart, Rigal, Misett and Carlet, 2006; Seferian and Afessa, 2006). Thus the presence of co-morbid illness is associated with an increased ICU length of stay and nursing resource utilisation, while patient outcome is unpredictable.

The HIV/AIDS pandemic is also having a profound impact on Intensive Care in South Africa. It is estimated that from 7 to 10 million infected persons are living with HIV in South Africa (Jooste and Jasper, 2012; De Beer et al. 2011). Studies suggest that these patients require prolonged stays in ICU, increasing the strain on services and further impacting on the limited resources and unpredictable outcomes (Affessa and Green, 2000; Bhagwanjee, Muchart, Jeena and Moodley, 1997). In addition to this problem, a recent national study of 222 health care facilities indicated that 16% of all health care workers were HIV positive themselves (Scribante and Bhagwanjee, 2007).

The unpredictability of trauma and violence related injuries in South Africa are also a burden to public sector hospitals. Trauma is rated the second most common cause of death, with violence related death as a central feature. One study (Bruce, Schmollgruber, Eales and Gassiep, 2003), reported 10% of all patients (n=1,619) seen in one level I emergency centre required resuscitation and admission to an ICU. In addition to this problem, the trauma admission places enormous strain on the ICU services; frequency distribution was shown to be higher at night and on weekends. Thus concerns are raised around this portion of patients especially during a shortage of ICU beds and the admission of seriously ill patients to general wards.

2.3 LEGISLATION AND RELATED POLICIES

Health care reforms are underway around the world. The World Health Organisation (WHO) stated that the trend is away from high cost in patient care in hospitals toward primary health care led services, based on the assumption that resources are finite and access to health care is a fundamental human right (WHO, 2003). In the western countries the emphasis is on life style changes (such as cardiovascular disease) and mental health, while in the developing world the emphasis in on burden of disease such as tuberculosis and HIV/AIDS. Even though the population health needs may vary between countries in the developed and developing world, the International Council of Nurses (ICN) is of an

opinion that nurses should take into account patient demographic changes, be evidence based, culturally sensitive and agree on competencies required to provide high quality care (ICN, 2001).

In South Africa, the context of nursing has been complicated by some significant legislation changes. For reform the government enacted a number of influential changes. While it is not possible to address every act in this thesis, the Acts and policies that were influential, because they impacted strongly on the context, will be outlined briefly.

- The Constitution of the Republic of South Africa (Act No. 108 of 1996) lays down the foundation for ensuring that all people are treated equally and that each person is afforded basic rights.
- Higher Education Act (Act No. 101 of 1997 as amended), a higher education institution is one that has been established or declared under the Act. According to the Act, Nursing colleges are not deemed to be Higher Education Institutions (HEIs), whereas universities are (Bruce, Klopper and Mellish, 2011).
- Higher Education Amendment Act (Act No. 39 of 2008) defines higher education as all the learning programmes leading to a qualification that meets the requirements of Higher Education Qualifications Framework (HEQF). The HEI's must be aligned with the provisions of the Council for Higher Education (CHE). The Council for Higher Education (CHE) is the quality control for higher education.
- National Health Act (Act No. 61 of 2003) was endorsed in 2004 with the stated aim of creating a uniform and egalitarian health system. It is underpinned by health imperatives laid down by the Constitution of South Africa (RSA, Act No. 108 of 1996) and the primary health care approach.
- Nursing Act (Act No. 33 of 2005) makes provisions for the South African Nursing Council as the statutory body for administering the Nurses Act and Nurses Regulations.
- White Paper on Transformation of Health (Department of Health, 1997) provides the framework for the transformation of health and provides a special emphasis on health care and the need for a comprehensive and integrated approach to health care delivery. The provisions made within this paper direct nursing practice and the responsibilities of health care workers.

2.3.1 Nursing Education Context

In South Africa, nursing education is regulated by the South African Nursing Council (SANC) in accordance with the Nursing Act (No. 33 of 2005) relating to nursing education institutions. The SANC acts as an accreditation and training quality assurance body (ETQA) for nursing education (SANC 2005:5). Nursing education institutions are approved or accredited by the SANC as nursing colleges (public or private) or as departments of schools or nursing education institutions (NEIs). As pointed out, the rationale for this study is motivated by the introduction of an Outcomes Based Approach to Education and Training system through the South African Qualifications Authority (SAQA) (Act No. 58 of 1995) based on the principles of the National Qualifications Authority (NQF) (Act No. 67 of 2008) and Higher Education Act (Act No. 60 of 1997) require that all nurses possess practice based competencies upon which educational outcomes can be measured and quality of performance be assessed.

In compliance with this national requirement, the SANC require that nurses have the necessary knowledge, skills, attitudes and values that will enable them to render professional service. Each nursing college or university develops their own curriculum according to the broad guidelines outlined by the regulation and teaching guidelines for submission to and approval by the SANC and the CHE through their respective universities (Bruce et al. 2011). For the nurse educators and curriculum planners and designers this requires a shift in thinking from the traditional educator directed content-based curricular. Bruce et al. (2011) highlighted that competency based education is an outcomes-based approach to design, implementation, assessment and evaluation of nursing education programmes. Anema (2009:3) defined competency based education as one in which "assessments ensure that graduates have the essential knowledge, skills and abilities and attitudes to enter the work force" (Anema [2009:3] cited in Pijl-Zieber et al. 2014). The essence then, of competency based education is that it focuses on the learner, performance and learning outcome in reaching specific objectives and curricular goals. Because competency based education straddles across both education and clinical practice, in the next section the professional regulation and health context will be discussed.

2.3.2 Professional Regulation

The South African Nursing Council (SANC) is the statutory body responsible for administering the Nurses Act (Republic of South Africa, Act No 33 of 2005) and the Nurses Regulations. Its primary responsibility is the safety of the South African public receiving professional care from the hands of nurses and midwives. It sets out the conditions for, and authorises registration and enrolment of nurses and midwives on the South African register. As the national registration body, it governs the practice of nurses and midwives and sets minimum standards for nursing education. The legislation directly impacts on the scope of practice (SANC, Regulation 2598 of 1984, as amended) of the three categories of nurses. The scope of practice is divided into professional practice, ethical practice, clinical practice and quality of practice. Each category of nurse is an independent practitioner responsible and accountable for her/his own area of practice in terms of competencies. For the professional nurse, it includes comprehensive nursing care, including patient care of an unstable and complicated patient. For the staff nurse it refers to basic nursing care to the stable and uncomplicated patient, and for the auxiliary (assistant) nurse it means elemental care (SANC, 2004).

In recognising the international trends the Nursing Council developed the Draft Charter of Nursing Practice in 2004 and proposed in Chapter 5 a competency framework for nursing practice (SANC, 2004). Its main purpose was to align the practice of nursing to changes in national health policy and the legislative framework (Bruce et al. 2011). South Africa does not have a scope of practice for the specialist and advanced practice nurse (Bruce et al. 2011; Searle, 2005). However, based on extensive earlier work done by the Standards Generation Body (SGB), the SANC proposed five qualification types, including a post graduate diploma enabling the practice as a specialist which is duly registered with the SAQA (Bruce et al. 2011). As pointed out, University departments offering undergraduate and postgraduate programs are accredited by both the SANC and HERC through their respective universities. The department of health context is discussed in the next section.

2.3.3 Department of Health Context

In South Africa, the National Health Act (RSA, Act Number 61 of 2003) was endorsed in 2004 with the stated aim of remedying past injustice created by an era of apartheid, by

creating a uniform and egalitarian health system. Some of the key legislative provisions require basic health care services to be available in public sector hospitals, that no South African may be refused emergency treatment and the development of new health governing structures to ensure compliance between national, provincial and district levels of health care. The legislature is underpinned by health imperatives laid down in the Constitution of South Africa (RSA, Act Number 108 of 1996).

As the National Health Act took more than 10 years to complete, a number of policy documents by the National Department of Health (DoH, 1997) preceded its introduction. Some of the key factors impinging on service provision were:

- A steady shift in emphasis of health care by the provincial department of health towards establishing the district level based on the primary health care approach.
- This shift in emphasis motivated a cut in funding coupled with a shift from curative based care and hospital restructuring, a decline in hospital services following budgetary constraints and exodus of health care professionals to the private sector and other countries (Ruff, 1997).
- The emphasis of enquiry in staffing requirements between provinces following the introduction of the Voluntary Severance Package by the public services commission, resulted in highly skilled personnel, including critical care nurses, taking the package, leaving unskilled staff in public sector hospitals (Ruff, 1997).
- The emphasis of standardisation of service conditions between provinces following the Central Bargaining Chamber (functionaries of the Department of Health) opting to remove the financial incentive for critical care nurses, this resulted in an exodus of many nurses to the private sector, exacerbating the existing crisis of critical care nurses in all provinces (Ruff, 1997).
- The emphasis on assurance of equity in public spending between provinces following the introduction of an agreed upon limited list of highly skilled services which could be divided up into the major conditions (e.g. open heart surgery, skilled management of infectious diseases and renal dialysis (Department of Health, 1997), which resulted in limitations in such services in some hospitals.

This led to the exodus of highly skilled and experienced Intensive Care nurses and exacerbated a crisis for Intensive Care nursing practice. As pointed out, the focus of the

Department of Health and its provincial department was on the establishment of district level of health care, emphasis on public sector restructuring process was delayed. In 2002, the Department of Health commissioned the Modernisation of Tertiary Services (MTS) Project underpinned by the National Health Act (RSA, Act Number 61 of 2003). Its aim was to develop an integrated and coordinated plan of specialised services provided by public sector hospitals. Although the MTS Strategic Framework Discussion Document by the Department of Health (2003) does not constitute the final plan or policy for specialised services within public sector hospitals, it does provide a précis of the challenges generated by focus group discussions, particularly intensive care specialists, public sector hospitals are faced with and will be incorporated into discussions throughout this study.

The Department of Health and its provincial structures determine the categories and number of nurses on the basis of the Human Resources for Health (HRH) Plan and Service Transformation Plans. Decisions regarding education and training need to meet HRH targets include and are applied to public sector NEIs – universities and colleges (Bruce, 2009). The need to revise, upgrade or redesign the content of the curriculum to ensure compliance with primary health care approaches in post graduate education is stipulated in the Health Act (South Africa Act No. 61 of 2003: ch 4 par 15.4.4.1a). Based on review of the White Paper the following areas are identified for evaluation of Intensive Care nursing to contribute to nursing as a profession.

- Evaluating education and training for critical care nurses, in terms of appropriateness, cost effect, core competencies and standards for practice;
- Promoting a culture of caring within critical care nursing practice; and
- Creating a team of competent and skilled practitioners who are life-long critical care thinkers and flexible partners of the multidisciplinary team.

The literature presented so far provides an understanding of legislation and related policies within the global context of health care, and the context of nursing education, professional regulation and health care in South Africa. In the next section the literature related to intensive care personnel is presented.

2.4 INTENSIVE CARE PERSONNEL

Intensive Care personnel include medical staff and nursing personnel as the main providers of care. The nurse in education and training and other categories of nurses are also described. Each aspect related to Intensive Care personnel is discussed in detail.

2.4.1 Medical Staff

In the past, the medical staff role varied with the type of ICU and hospital, from absolute control of patient management to consultation (NIH, 1983). This has changed as the current 'best practice' view supports requirements for a medical intensivist who is certified as a specialist for the care of critically ill patients. In this position, the intensivist assumes the function of director or consultant for the process of care. According to Brilli, Spevetz, Branson, Campbell, Cohen, Dasta, Harvey, Kelley, Kelly, Rudis, Andre, Stone, Teres and Weled (2001), this entails responsibility for coordinating management activities, such as triage, enforcement of collaboration with other team members, clinical administrative protocols and implementation of quality assurance programs.

There is a growing body of evidence to demonstrate the contribution that an intensivist makes to the outcomes for patients. Many studies consistently reported a reduction in mortality, morbidity, length of stay and resource utilisation when the role of an intensivist shifted to managing patients in ICUs (Carson, Stocking, Podsadecki, Christenson, Pohlman, MacRae, Jordan, Humphrey, Siegler and Hall, 1996; Ghorra, Reinert, Cioffi, Buczko and Simms, 1999; Multz, Chalfin, Samson, Dantzker, Fein, Steinberg, Niederman & Scharf, 1998). Studies also suggest that an improved outcome is consistently demonstrated despite higher patient APACHE II scores (Carson et al. 1996; Ghorra et al. 1999). In contrast, despite the overwhelming evidence to support intensivist staffing models, in the USA, it is estimated that only 10 % of adult ICU patients are managed by a dedicated intensivist-led multi-disciplinary team, in part due to shortages of medical specialists trained in intensive care (Fuchs, Berenholz and Dorman, 2005). These authors suggest alternative models of care such as medical specialists without formal training in intensive care may still be needed in ICUs, until the current number of intensivists matches the demand.

Additionally, the ICUs are also essential teaching areas. The curricula of a number of medical specialty programmes, such as medicine, surgery, anaesthesiology and paediatrics, and nursing speciality education and training require their candidates work in an accredited ICU in order that their training may be recognised (Higher Education Council [HEC], Act Number 61 of 1997; SAQA, Act Number 58 of 1995). Studies also show that specialist nurses derive benefit from working with an intensivist, in terms of knowledge and skills acquisition (Manthous, Amoteng-Adjepong, al-Kharrat, Jacob, Alnuaimat, Chatila & Hall, 1997; Topeli, Laghi and Tobin, 2005).

2.4.2 Nursing Personnel

Nurses are considered the key element in critical care as they provide continuity of care, whereas the physicians and other health care professionals come and go (National Institutes of Health (NIH) 1983). Elliott et al. (2007) stated that the role of the Intensive Care nurse as a specialist has changed as the discipline has developed. Brilli et al. (2001) indicated that, in the current 'best practice' view, this role is not limited to the traditional roles of a nurse as nursing practice focuses on several areas, such as unit manager (charge nurse), shift leader, clinical instructor (mentor) or researcher. Additionally, a number of overseas studies (Australia and United Kingdom) indicated that nurses have started to transform their roles in "outreach activities" (Endacott, Chaboyer, Edington and Thalib, 2009; Chellel, Higgs and Scholes, 2006) to make a unique contribution in health care. These emerging roles are based in response to patient need rather than limited by location in the hospital.

Intensive care nurses are informed by the fundamental nature of nursing and the characteristics of specialization. Nursing staffing patterns are keyed to the level of patient needs rather than fixed ratio (NIH, 1983). According to Hamric et al. (2005) the basic activities are said to take in the concept of holism, an orientation of the whole range of influences of a patient's life, and pursuit of health and illness. Intensive care nurses provide 24-hour care for a patient and their family to ensure safety, providing continuity of care and coordinating patient care and treatments. The characteristics of specialisation include responsibility for close monitoring of patients and the attached equipment, whereby they engage in the analysis of complex data based on anticipation of problems. In one study Bucknall (2000) reported on average decision making made by nurses observed during a

two hour period was 238. In this study, the most frequent decisions were associated with evaluation activities (51.4%), followed by communication and intervention decisions, respectively as 29.5% and 19.3%. Thus they engage in clinical decision making, execution and evaluation of interventions in order to minimize adverse events.

In another study, Wong, Gallegos, Weinger, Clack, Stagle and Anderson (2003) used a time and motion method to observe 10 Intensive Care nurses for 4 hours before and after installation of a sophisticated computer information system in USA hospital. The authors used 5 major categories of direct care, documentation, administration, housekeeping, and 69 sub-categories to group the Intensive Care nurses activities. Their findings indicated that Intensive Care nurses time documenting decreased by 30% after introduction, which meant more time spent on direct care activities.

Abbey, Chaboyer and Mitchell (2012), more recently used a time and motion method to observe the work activities of 10 Australian Intensive Care bedside nurses during the day shift. The authors coded the observed data according to direct and indirect patient activities or we unit or personally related. Their findings indicated the major work activity groups for Intensive Care nurses were direct care 40.5% of their time, indirect care 32.4% of their time, personal activity 21.9%, and all unit related activity 5.0%. Further, Intensive Care nurses undertook two activities simultaneously for 43% of the study timeframe. This study provides baseline evidence of what Intensive Care nurses undertake on a daily basis with only one quarter of their time not being spent on direct or indirect patient activities.

There is a growing body of evidence comprising large scale studies that emphasise the contribution made by intensive care nurses (Dang et al. 2002; Needleman, Buerhaus, Mattke, Stewart and Zelevinsky, 2002). For example Ball and McElligott (2003) described the key nursing attributes of patient-centred care as proactive management, vigilance, coping with the unpredictable and emotional support that made a difference towards patient outcomes.

2.4.3 Nurse in Education and Training

Globally, the declaration of Madrid, endorsed by the World Federation of Critical Care Nurses (WFCCN, 2005) provides a baseline for education and training for intensive care

nurses, and in addition, The World Health Organisation (WHO) has a competency based curriculum endorsed by the European Federation of Critical Care Nurses (WHO, 2003). In this regard, Elliott et al. (2007) put forward that formal education in conjunction with experiential learning, continuity of professional development, and reflective practice provides the knowledge, skills and attitudes essential to quality care practices, as articulated in the competency standards of Australia, Canada and UK. In a more recent study, Gill et al. (2012) conducted a review of the differences and similarities in the standards in the USA, Canada, UK, New Zealand and Australia. The common constructs identified in three of the five standards were: patient/family partnership and dignity, recognising own scope of practice and reflection, professional development (UK, New Zealand and Australia), planning of care (USA, UK and Australia), leadership and evidence based practice (USA, Canada and Australia). Common in two standards were ethical decision making (USA and Australia) and practice accountability (New Zealand and Australia). In one *only* of the standards (Australia), were the constructs functioning in accordance with legislative and common law and providing support for colleagues. These findings suggest the expected standards for Intensive Care nursing practice are fundamentally similar.

Within South Africa, intensive care nursing education and training is provided on two levels: as a post registration diploma and as a postgraduate (Master's) degree. Both of these training options are offered in public and private sector institutions. Entry requirements for potential intensive care nurses include a registration as a registered professional (basic) nurse with the South African Nursing Council (SANC) and a minimum of six months experience in an ICU as a recommendation. As pointed out, each nursing college or university develops their own curriculum according to the broad guidelines outlined by the regulation and teaching guidelines for submission to and approval by the SANC. Nurses educators are registered with the SANC, they are qualified in the clinical speciality and primarily responsible for the education and training components of the course. The duration of the course varies between one to two years, depending on whether the course is taken at post registration diploma or post-graduate degree. Nurses in education and training complete their clinical practice in a SANC approved public or private accredited intensive care units, under the supervision of specialist nurses throughout the duration of their course. Clinical rotations include general medical and surgical units, cardio-thoracic, trauma and neurosurgery units, and coronary

care, in selective facilities, renal dialysis, anaesthesiology, burns and paediatric intensive care are offered in addition to the generic clinical areas. Thus also making Intensive Care nursing broad based. Postgraduate students are also required to develop and conduct research under supervision in their selected specialty. On completion of the programme, candidates sit college or university-based examinations (theoretical and clinical) register the additional qualification on the national register of the SANC and the National Qualifications Framework (SAQA, 2000).

2.4.4 Other Nursing Categories

Traditionally, nursing teams in the ICUs comprised of intensive care nurses and students registered for a training program. However, a shortage of intensive care nurses, both in South Africa (Scribante et al. 2004) and other countries (Dunn, Wilson and Esterman, 2005; Robnett, 2006) have resulted in the placement of basic registered nurses working in ICU without formal training and sub-professional nurses, such as enrolled practical nurses to ensure continuity of care.

One study (Binnekade, Vroom, de Mol and De Haan, 2003) reported a significant decrease in the incidence of critical care nursing situations leading to unsafe practice and errors during the period in which the additional nurses were present. Providing additional nursing hours reduced the number of errors, even when these additional nurses were not ICU trained. This was most probably due to freeing up the intensive care nurses and allowing them to concentrate on the higher level, more risk-prone activities. By contrast, one study (Thorens, Kaelin, Jolliet and Chevrolet, 1995) reported rapidity of weaning of patients with chronic obstructive lung disease was inversely correlated with the quality and quantity of nursing personnel during a 6-year period in a medical ICU in Switzerland. Morrison, Beckman, Lurie, Carless and Gilles (2001) demonstrated nursing inexperience contributed to at least half of the 1,400 adverse events reported in the Australian survey of ICU outcomes.

Other studies suggest a reduction in the number of registered nurses in direct patient care associated with complications such as nosocomial infections (Hugonnet, Cheverolet and Pittet, 2007; Robert, Fridkin, Blumberg, Anderson, White, Ray, Chan and Jarvis, 2000) and increased risk of central line infections, pressure sore incidence, falls and use of

physical restraints (Whitman et al. 2002), medication errors, patient injuries and death (Aiken et al. 2002). Studies that reported displacement of intensive care nurses has not produced cost savings and has adverse effects on the quality of patient care (Donovon and Lewis [1997], in Clarke, Mackinnon, England, Burr, Fowler and Fairservice, 2000).

No studies were found in the South African context that evaluated the effects of the other nursing categories for the care of critically ill patients.

2.5 CRITICALLY ILL PATIENTS

This section provides an overview of research that has focused on critically ill patients. Included are studies that attempt to define or characterise the critically ill patient. The term critical illness, according to Bersten and Soni (2003), is thought of as a state involving failure of one or more vital organ system. This acute state may be associated with chronic organ impairment, Brilli et al. (2001) described the critically ill patient as "any patient who is at risk for decompensating or any patient who is physiologically unstable, requiring constant surveillance and minute-to-minute titration according to the disease process" (Brilli et al. 2001:2010). The term "critically ill" is used to define patients according to both the seriousness of their condition and the environment in which they are cared for, which provides staff and facilities over and above the general ward areas (WFCCN, 2007).

2.5.1 Increased Acuity

In the ICU context, acuity or severity of illness instruments measure the acuity of patients' clinical illness by recording the worst physiological score at a set time period (i.e. during the first 24 hours of an ICU admission or daily) and can be used to guide and evaluate treatment (Le Gall, 2005). The common instruments used with critical ill patients managed in the general ICU setting are the Acute Physiology and Chronic Health Evaluation (APACHE) (Knaus, Zimmerman, Wagner and Draper, 1981), and Simplified Acute Physiology Score (SAPS) (Le Gall, Loirat, Alperovitch et al. 1984). The SAPS II was one of the instruments used for data collection in this study.

In a European study, Jacob and Rothen (1997) reported an increase in category I patients, with a concomitant decline in category II and category III patients over a period of *15*

years. The authors explained the lower the category, the higher the acuity level and vice versa. This suggests an increasing acuity level is seen in patient's clinical illness over an extensive period of time. Similarly, an increasing acuity level was reported over a period of four years in an Italian study (Capuzzo, Valpondi, Sgarbi, Borolazzi, Pavoni, Candini, Gritti and Avisi, 2000).

In another Italian study, it was reported that 30.42% of the sample was considered high risk for complications with the majority (63.8%) in the unscheduled category (Iapichino, Gattioni, Radrissani, Simini, Bertolini, Feria, Mistraletti, Porta and Miranda, 2004). These authors defined 'high risk' as a length of stay greater than two days (>2 days) and SAPS II score greater than 32 points (>32 points). In this regard, a reduction in length of stay, when medically appropriate, is the primary goal of ICU care in order to improve the quality of care and reduce hospital costs.

In addition, two studies indicated that there is an increasing acuity and dependency of patients being cared for in general wards (Coad, Haines and Lawrence, 2002; Morrice and Simpson, 2007). Long term ward care prior to ICU admission is associated with an increased probability of increased acuity, long ICU stay and mortality rate (Alzola, Lynn, Wagner and Wu, 2000; Stricker, Rothen and Takala, 2003). In this regard, it confirms the Halpern et al (2004) findings, further suggesting there is an unprecedented need for ICU beds.

2.5.2 Co-morbid Illness

The patient population within ICU is constantly changing, with a worldwide increase in the number of people who live to old age. This has led to an increased population of elderly patients within Intensive Care, who have complex co-morbidities (Estenssoro, Canales, Saenz, Gonzalez, Aprea, Laffaire, Gola and Dubin, 2006; Seferian and Affessa, 2006). Two studies conducted overseas (America and France) reported 26% to 51% of patients currently in ICUs were elderly (Garrouste-Orgeas et al. 2006; Hennesy, Juzwishin, Noseworthy and Doig, 2005). An American study, also indicated that the presence of chronic illness, particularly cardiovascular conditions, significantly increases ICU utilisation and admission in elderly (> 65 years) patients as compared with younger (< 65 years) age groups (Seferian and Afessa, 2006). Further, these authors reported that age-

increased respiratory conditions accounted for the increasing proportion of admissions. By contrast, two-thirds of patients aged > 80 years referred to ICUs were denied admission, the commonly cited reasons being no bed availability, or being too well or too sick to benefit from ICU admission (Garrouste-Orgeas et al. 2006).

In South Africa, Bhagwanjee, Muchart, Jeena and Moodley (1997) demonstrated that a higher morbidity is associated with HIV positive patients than compared to HIV negative patients. Studies conducted in the USA have indicated that ICU utilisation rates range from 12% to 14%, with the most commonly cited reason for admission being respiratory failure (Afessa and Green, 2000; Nerasimhan, Posner, DePalo, Mayo and Rosen, 2004). It was shown in one study (United Kingdom), that there is also an emergence of non-HIV associated conditions, such as sepsis and sepsis-related disorders leading to progressive organ failure, which is also a positive predictor of poor patient outcome (Avidan, Jones and Pozniak, 2000).

2.5.3 Broad Care

Within the ICU context, the critically ill patient is classified according to one of three levels of care (Haupt, Bekes, Brilli, Carl, Gray, Jastremski, Naylor, Rudis, Spevetz, Wedel and Horst, 2003). This enables delivery of the broad care for the critically ill patient. Crocker (2007) explained that the care levels based on patient acuities more accurately represents the holistic needs of critical care patients. In the United Kingdom the levels of care as cited in Crocker (2007) are:

- Level 1: Patients at risk of their condition deteriorating, or those recently relocated from higher levels of care, whose needs can be met on an acute ward with additional advice and support from the critical care team;
- Level 2: Patients requiring more detailed observation or intervention requiring support for a single failing organ system or postoperative care and those “stepping down” from higher levels of care; and
- Level 3: Patients requiring advanced respiratory support alone or basic respiratory support together with support of at least two organ systems. This level includes all complex patients requiring support for multi-organ failure.

Other studies (Kisorio, Schmollgruber, Becker, 2008; Padilha, Souso, Kimura, Miyadahira, Cruz, Vattimo, Fusco, Campos, Mendes and Mayor, 2007) have demonstrated positive correlations between severity of illness and fluctuations in levels of care as represented in the therapeutic intervention scores, such as the Therapeutic Intervention Scoring System (TISS-28) (Miranda et al.1996). For example, it was estimated that an Intensive Care nurse is able to provide 46 TISS-28 points per shift, with a score of less than 10 (<10) signifying a ward patient; 10 to 19 a high dependency unit (HDU) patient, and more than 20 (>20) an HDU/ICU level (Miranda et al. 1996). Most studies report mean daily TISS-28 scores e.g. 23 (range 14 to 35) (Hamel, Davis, Teno, Knaus, Lynn et al. 1999), 36 (range 29 to 49) (Jones, Skirrow, Griffiths, Humpris, Ingelby et al. 2003) and 21 (range 12) (Rivera-Fernandez, Sanchez-Cruz, Abizanda-Campos and Vazquez-Mata, 2001). Such diversity in scores reflects a range of acuity of patients. Total ICU admission TISS scores are also occasionally reported (Bachman and Walter, 2001; Moran, Peisach, Solomon and Martin, 2004). The TISS-28 was one of the instruments used for data collection in this study.

2.5.4 Mortality, Morbidity, Length of Stay and Patient Outcomes

Prior research has identified the relationship between mortality, morbidity, length of stay and patient outcomes using the severity of illness scoring systems (Elliott et al. 2007). A study by Stricker et al. (2003) reported that ICU mortality rates are higher in the long term (> 7 days) compared to short term (< 7 days) patients, respectively 14.4 % and 7.2 % (Stricker et al. 2003). Another study (Laupland, Kirkpatrick and Kortbeek, 2006) demonstrated that prolonged ICU admissions have a higher illness severity and were nearly twice as likely to die, in the presence of shock and blood stream infection as compared to shorter ICU admissions. Further it was reported in the Stricker et al. (2003) study, that long-term patients are 'more sick' on admission, require prolonged support and intervention and consume a greater proportion of nursing workload compared to short term patients.

The type and severity of patients' illness may have a direct effect on length of ICU stay. Knaus, Draper, Wagner and Zimmerman (1986) reported that the characteristics of patients at the time of admission are also attributable to ICU length of stay and mortality. Similarly, Weisman (2000) reported that post-operative patients on the whole were less likely to have a prolonged ICU stay or to die during ICU admission. Moreover, emergency surgery

patients often have prolonged stays. Goldhill, McNarry, Hadjinastassiou and Tekkis (2004), reported that hospital length of stay > 15 days prior to ICU admission also had a significantly higher mortality rate when compared to patients who were in hospital for zero to three days.

In another study (Wong, Crofts, Gomez, McGuire and Byrick, 1995), it was observed certain medical diagnoses, such as neuromuscular weakness, pneumonia, multiple trauma and septic shock, are associated with long term (> 14 days) admission. The mortality rate of patients with HIV admitted for pulmonary disease was shown to be 67 %, compared to 20 % of patients admitted for non-pulmonary disorders. Mortality and length of stay in ICU increases with age (Seferian and Afessa, 2006) whereas patient outcome is directly related to the severity of illness; mortality and length of stay is increased in the elderly population with chronic illness (Garrouste-Orgeas et al. 2006).

The literature presented so far provides an understanding of increased acuity, co-morbid complexities of critically ill patients and how researchers have attempted to define, describe, capture and measure the broad care and the broader spectrum of care. The need for competencies is discussed in the next section.

2.6 THE NEED FOR COMPETENCIES

As pointed out, the competency framework adopted by the nursing profession in South Africa was premised on a broad notion of competence as a combination of skills, knowledge and attitudes, values and abilities that underpin effective performance in the nursing role and setting (SANC, 2004). In the literature, generic competencies are valid across different clinical contexts, whereas specific competencies are linked to specific areas of practice (ICN, 2009). Competencies needed for Intensive Care nursing include those required to manage acuity level, diversities, therapeutic interventions, inter- and intra-disciplinary collaboration, staffing mix, protocols, guidelines and evidence based practice and knowledge, skills and competencies. Each aspect will be discussed in detail.

2.6.1 Acuity

The term "acuity" refer to categorisation of patients according to an assessment based on their requirements for nursing care. In the ICU context, acuity or severity of illness instruments, such as the Acute Physiological, Age and Chronic Health Evaluation (APACHE) (Knaus, Zimmerman & Wagner, 1981), measure acuity level of the patient's critical illness by recording the worst physiological scores at a set period or a defined period of time. These provide information about individual patient's physiological derangements, which are placed into context of patient outcomes. Severity of illness scores are an important concept for nurses as they form the basis upon which care is organised and managed.

According to Searle (2005) assessment for the professional (registered) nurse included collecting, interpreting and checking information relevant to the patient's needs. Sources of data included: observations, physical examinations, nursing histories, medical records, family reports, records of other members of the health care team and reference when in doubt, with contrast, Erikson, Jones and Ditomasi (2013) stated linking assessment to knowing the person requires a more in-depth approach to care, nurses at the bedside need to have a systemised approach to data collection. A nursing assessment using an organised approach to data collection is a way to come to know the person's needs and generate a clinical judgment (Benner et al. 1996). It involves the collection and analysis and synthesis of disciplinary knowledge and other biomedical and behavioural knowledge data to arrive at a clear judgment (diagnosis). Advanced clinical assessment skills are essential for Intensive Care nurses so that the data collected are important to identify immediate and future needs of the patient and thereby facilitate development of a comprehensive care plan (Elliott et al. 2007).

2.6.2 Diversities

The dictionary definition for the term "diversities" refer to "the condition of having or being composed of different elements" and "inclusion of different types of patients (as people of races or culture)" in a group (Oxford Dictionary and Thesaurus, 2007).

Diversity in nursing is spurred most specifically by issues related to multiculturalism, gender and age, nursing also faces its next evolution as a clinical presence in the health care team. According to Erikson et al. (2013) these involve ideas such as promoting a workforce that reflects the population it serves; increasing diversity in nursing leadership to strengthen mentoring opportunities for minority nurses; enhancing and defining competencies needed to deliver the care required within a pluralistic society. This factor is brought about by the emphasis of health care from within a broader social context and based in cultural perspectives (Bucher and Melander, 1999).

Care at the bedside is challenged to keep pace with current and evolving reality. For McKinley (2007) being responsive to diversity is the sensitivity to recognise, appreciate and incorporate differences into the provision of care. The ICU environment requires nurses to provide care with confidence within a complex and dynamic environment with changes both precipitously and unpredictably (Evans, Bell, Sweeny, Morgan and Kelly, 2010). The concept of critically ill patient encompasses the family and/or significant others. This includes the ability to appropriately involve individuals as active participants in the process of care, to consistently provide relevant information about health care situation to individuals, to enable and support decision making in order to achieve safe and effective patient outcomes.

2.6.3 Therapeutic Interventions

An intervention is defined as "any treatment based upon clinical judgment and knowledge that a nurse performs to enhance nurse/patient outcomes (McKinley, 2007). Nursing interventions are activities that occur in response to clinical judgments (nursing diagnosis) identified by the nurse as requiring direct or indirect action.

Searle (2005) indicated for the professional nurse such interventions include fundamental physiological or psychological requirements which contribute to the well-being of a person, for example, the need for oxygen, nutrition, bodily excretion, movement, rest and sleep, personal hygiene, physiological safety and psychosocial well-being.

McKinley (2007) explained that therapeutic interventions include a constellation of nursing tasks ranging from simple to more complex tasks, which are combined together to bring

about nursing activities, and at the same time, monitoring the patients response to each task. With patient safety as the overriding goal (Elliott et al. 2007), there is a positive movement within the nursing profession, -in this instance Intensive Care nursing, to "get back to basics" or "fundamentals of care" (Vollman, 2009) to improve care and prevent nurse associated errors or harm as: hospital acquired infections, injury or falls, development of pressure sores and failure to rescue. Current clinical practice indicates high quality nursing care has moved beyond being regarded as a series of tasks to a position of holistic care, where patients are viewed as individuals with diverse and personal needs (Benner et al. 1996).

2.6.4 Inter- and Intra-Disciplinary Collaboration

Collaboration is an interpersonal relationship between and amongst colleagues sharing the same goal, power, authority and decision-making (Dougherty and Larson, 2010). It encompasses communication, coordination, problem solving strategies, shared process and professionalism; it involves making decisions, setting goals, assuming responsibility, working together cooperatively and communicating openly (Baggs and Schmitt, 1988: Dougherty and Larson, 2010).

A team is a group of people representing different disciplines (inter-disciplinary) or members of the same discipline (intra-disciplinary) working in a coordinated manner, aimed towards achieving the same goal (Brilli et al., 2001; Vazirani, Hays, Shapiro and Cowan, 2005) As a profession, nursing requires communication, coordination of care, problem solving, decision-making and information sharing for continuity of care, for instance during handover or change of management (Apker, Propp, Zahara, Ford and Hofmeister, 2006).

For McKinley (2007), collaboration entails working together in a way that promotes and encourages each person's contribution towards achieving realistic and optimal goals. Rose (2011) stated that nurses hold high the value of their professional autonomy in their ability to contribute to the joint decision making process. This can be achieved through interventions such as the use of check lists, protocols and guidelines to promote interdisciplinary collaboration as they reduce practice variability (Rose, 2011).

According to the Nurses Scope of Practice (SANC, 1984, *as amended*) delegation and supervision falls within the scope of the registered nurse, in the instance where a delegated task has been assigned to a person (enrolled nurse or nurse auxiliary) functioning beyond their scope of practice, the registered nurse carries ultimate responsibility (accountability) (Searle, 2005).

2.6.5 Skills Mix

Skill mix refers to the ratio of health care workers of varying levels of skill, training and experience within a clinical unit. The term skill mix is a concept of health care based on the drive towards cost effectiveness, quality of care and the clinical governance agenda. In intensive care, it also refers to the proportion of professional nurses possessing a formal specialist Intensive Care qualification (Elliott et al. 2007:20). The term skill mix is a concept of health care based on the drive towards cost effectiveness, quality of care and the clinical governance agenda. Task shifting is promoted by WHO (2007) as a tool for addressing the reality of health staff shortages. Task shifting involves the rational redistribution of tasks among members of the healthcare workforce (Bruce et al. 2012).

Crossan and Ferguson (2005) suggest on-going debates relating to substitution of health care workforce, changes in pay and career structures and focus of managers and politicians on 'value for money,' have heightened the need for effective skill mix management and for a sound evidence base to underpin management decisions. Spilsbury and Meyers (2004) reported that senior staff members are under pressure to provide evidence to promote the benefits of skilled nursing care and to make evidence based practice decisions on skill mix. Defloor, Van Hecke, Verhaeghe, Gobert, Darras and Grypdonck (2006) reported that function differentiation could lead to more time to fully develop nursing professionalism. This development is seen in countries where a range of new roles are emerging in response to the rapidly developing nature of nursing (Coombs, Chaboyer and Sole, 2007).

Grossman (2007) stated that leadership and empowerment strategies provide essential knowledge for nurses to become active participants and engage in policy and planning issues. Other studies suggest these leadership strategies are not limited to clinical situations but are requisite for direct patient care situations in advocating for patient safety, in supervisory roles and multidisciplinary engagements (Continho, 2011; Forneris and Peden

McAlpine, 2009), which can be achieved through the mentorship and role modelling of 'seasoned' nurses (Albarran and Whittle, 1997).

2.6.6 Protocols, Guidelines and Evidence-Based Practice

Evidence-based practice is a problem solving approach to clinical practice. It involves the conscientious use of current best evidence, along with clinical expertise and patient preferences and values in making decisions about patient care (DiCenso, Guyatt and Ciliska, 2005; Melnyn, Fineout-Overholt, Stillwell and Williamson, 2009; Sackett et al. 1996).

Clinical guidelines and care protocols are systematically developed based on evaluation of current direct best evidence (Hansen and Severinsson, 2009; Hewitt-Taylor, 2004). Thus there is an expectation in health care that the nurse's knowledge base remains current in order to make informed judgments to direct best practice.

Searle (2005) described two types of protocols: the nursing protocol is defined as approaches to nursing care which has been developed and tested by experienced nurses; on the other hand, a medical protocol specifies the procedures to be followed in giving a particular examination, in conducting research or a providing for a particular condition (Searle, 2005). From this discussion, it appears that the professional nurse provide care within the parameters of protocols as collaboratively developed.

For McKinley (2007) 'true' evidence based practice occurs when Intensive Care nurses engage in discussions and question sources of presenting evidence. Hansen and Severisson (2009) reported the nurse's ability to demonstrate a high degree of accountability for their judgements can be achieved through the process of self-reflection and on-going professional development (Aari, Suominen and Leino-Kilpi, 2008). Notwithstanding in the academic context, Intensive Care nurses are actively engaged in developing research and contributing new evidence for clinical practice through an acquisition of a higher degree.

2.6.7 Knowledge, Skills and Competencies

Knowledge, skills and competencies are concepts related to nursing education and training. Huggins (2004) defined knowledge as 'knowing and understanding' and skill as 'doing', and suggested that intensive care nurses use both knowledge and skills at the same time leading to difficulty in separating the two concepts. Fulbrook (2003) quoted Carper (1978) in stating that the knowledge that informs clinical practice must be drawn from many sources. Carper (1978) identified four patterns of knowing in nursing: empirics, the science of nursing; personal knowledge; and ethics, the moral component (Chinn & Kramer, 2008). Carper has been influential in the awareness of the diversity of nurse's knowledge. Skills in nursing practice have three domains: interpersonal, critical thinking and technical, and one study (Wysong & Driver, 2009) reported that patients hold high regard for interpersonal skills followed by critical thinking skills and technical skills, whereas nurses hold high critical thinking skills, followed by technical skills and interpersonal skills.

Alspach (1984) defined the goal of intensive care nursing education within a competency based program as "education that is directed at facilitating the acquisition of the knowledge, skills and attitudes that are required for competent practice" (in McKinley, 2007:91). These components include knowledge or cognitive skills, psychomotor or technical skills, interpersonal skills or attitudinal skills, and critical thinking ability. Benner, the Novice to Expert (1982:304), in her seminal work defined competency as "the ability to perform a task with desirable outcomes under the varied pressure of the real world". Learning from experience, which reflects that described by Benner (1984) takes place in every day contexts. In contrast, experiential knowledge constructs experience as "learning is a process by which knowledge is created through transformation of experience" (Usher & Solomon [1999] in Hancock & Durham, 2007:20). Thus it can be said that acquisition of knowledge alone is not the goal in learning but rather the purpose of applying that knowledge to practice in a competent fashion.

Parry (1998) defines competencies as clusters of related knowledge, attitudes and skills that influence key aspects and responsibilities of work, which is reflected in on-the-job performance. Bruce et al. (2011:176) quote Uys and Gwele (2005) and Wright (2006) in stating that "competency is a narrower term and entails an individual's performance in a particular work role to fulfil organisational or work setting requirements". These competencies can be measured against standards, and they can be enhanced by developmental activities (Cattini & Knowles, 1999; Dunn et al. 2000).

2.7 SUMMARY

The chapter explored the need for competency standards in the literature, both locally and internationally, and provided an understanding of the history and development of intensive care, as well as the health care legislation and related policies, intensive care personnel, the characteristics of critically ill patients and need for competencies.

The acuity level is characteristic of the critically ill patient. It can be measured objectively and expressed as severity of illness and as patient outcome. This forms the basis upon which care is organised and delivered. Nurses translate their clinical assessment into actions by making judgements to respond to patient vulnerabilities, risks or threats for the health and well-being of patients assigned to their care.

Diversity is related to differences in patient's families and multi-disciplinary team members. Nurses are expected to respond to diversity through their caring behaviours as this is a construct of nursing care. Changes in the health care system require that nurses also broaden their focus to include the concepts of health and wellness into their care regimen. The concept of caring for a critically ill patient includes the family and/ or significant other.

Therapeutic interventions require nurses to combine a constellation of nursing tasks varying in range from simple to more complicated tasks to bring about nursing care activities for direct care. Current practice indicates that high quality nursing care has moved beyond being regarded as a series of tasks to a position of holistic care where patients are viewed as individuals with diverse and personal needs.

Collaboration, this entails working together with others in a way that promotes and encourages the other person's contribution towards achieving realistic and optimal goals. Collaboration, credibility, compassion and coordination are communication skills sets of professional nurses. Nurses place high regard for autonomy in their ability to contribute to the joint decision making process.

Staffing skill mix, this is a concept of health care based on the continuity drive towards cost effectiveness, quality of care and clinical governance agenda. There is a need for

highly skilled nurses to become active participants and engage in policy and planning issues related to health care situations. Such, leadership strategies are also requisite for managing direct patient care situations by advocating for patient safety, in supervisory roles and multidisciplinary team engagements.

Protocols, guidelines and evidence based practice. These are concepts of health care to determine best practice, favoured in the drive to cost effective health care and on the clinical governance agenda. Evidence based practice occurs when nurses engage in discussions, question or query sources of presenting evidence. Nurses need to develop a high degree of accountability for their judgments, and this can be achieved through the process of self-reflection and development.

Knowledge, skills and competencies, such concepts are integral for nursing education and clinical practice. The knowledge that informs clinical practice is drawn from many sources, whereas the skills are derived from three domains: interpersonal, critical thinking and technical. It can be stated that competency in nursing is the ability to do the task with desirable outcomes under varied circumstances in the real world. In this view, learning occurs as experience in the everyday context of ICU. Experiential knowledge is created though the transformation of knowledge in the learning process. The goal of knowledge is not learning but rather through the purpose of applying that knowledge to practice in a competent fashion. Competencies refer to clusters of related knowledge, attitudes and skills that influence key aspects and responsibilities of work, which is reflected as on-the-job performance. These competencies can be measured against standards, which can be enhanced by developmental activities.

The following chapter will discuss the research methodology.

CHAPTER THREE

RESEARCH DESIGN AND RESEARCH METHODS

3.1 INTRODUCTION

This chapter describes the research methodology used during the course of the study. The research design was standards-generative, exploratory, descriptive and contextual. Both quantitative and qualitative methods were used to develop standards of competency in the care of critically ill patients in the ICUs of one university-affiliated, public sector hospital, tertiary/quaternary level institution in the Johannesburg region, Gauteng Province, South Africa. This chapter addresses the methods and procedures employed to accomplish the aim and objectives of the study.

3.2 AIM AND OBJECTIVES

For consistency purposes the aim and objectives of the study are repeated.

The aim of this study was to develop competency standards for Intensive Care nurses who care for critically ill patients in the ICUs of a university-affiliated, public sector and tertiary hospital in the Gauteng province in South Africa.

In order to meet this aim the following objectives were set:

- To explore and describe the clinical profile of patients admitted to the ICUs.
- To elicit from an expert group of Intensive Care nurses in the Intensive Care setting, the competencies Intensive Care nurses require in the provision of care for the critically ill patient.
- To elicit from other Intensive Care nurses in the ICUs their opinions regarding the competencies they require or use in the ICUs.
- To compile a preliminary set of competencies based on the data collected.
- To triangulate the relevance of the developed set of competencies in national and international literature.
- To develop standards of competency in the care of critically ill patients.

- To validate the standards of competency in the care of critically ill patients.
- To recommend guidelines for the use of standards of competency in the care of critically ill patients.

3.3 RESEARCH DESIGN

An overview of the research design and methods used in the study will be discussed.

3.3.1 Research Design

Research design refers to the researcher's overall plan for obtaining answers to the research questions and includes strategies and procedures that need to be implemented. The research design followed a standards-generative, contextual, exploratory and descriptive design; both quantitative and qualitative methods were used to address the research question. Each aspect of the research design is discussed in the following paragraphs.

3.3.1.1 Contextual

According to Babbie and Mouton (2011), the aim of contextual research is to describe and understand events occurring within the natural setting. Neuman (2006) stated that qualitative researchers emphasise the social context for understanding the participant's world. They hold that the meaning of a social action or statement depends on the context in which they appear.

This study was contextual in nature as it occurred in South Africa in one university-affiliated, public sector hospital and tertiary/quaternary level institution of the Department of Health, where the situation of critically ill patients and Intensive Care nurses in the adult ICUs was of immediate importance to the context of the study. The study was bound to the context of exploring the needs of critically ill patients and the required competencies of Intensive Care nurses; the aim being to develop standards of competency for nursing care, with the purpose of informing nurse responsibility and accountability in the Intensive Care setting, thereby contributing to excellent quality care and improved patient outcomes.

3.3.1.2 Exploratory

Exploratory refers to a design which explores the full phenomenon under study (Polit and Beck, 2008). Exploratory research is conducted to gain new insight, discover new ideas, or increase knowledge about a phenomenon. Exploratory researchers are creative, open minded and flexible as they adopt an investigative stance and explore all sources of information (Burns and Grove, 2009; Creswell, 2009). An exploratory design was most suitable for this study due to the fact little is known about the topic. No in-depth studies could be found on the topic particularly in South Africa. Given this fact, the researcher felt she had departed from a position of what is known to her as a nurse, clinical facilitator and educator in the field of study. In this study, an exploratory design was used to develop deeper insights into the viewpoints of critically ill patients and nurses in the ICUs. The relationship between the two was explored in the literature and experience of Intensive Care nurses themselves which led to the development of the competency standards.

3.3.1.3 Descriptive

Description, as a design, has as its main objective to observe, describe and document aspects of a situation or phenomenon as it naturally occurs (Polit and Beck, 2008). Descriptive research involves detailed portrayals of the participant's experiences, their feelings and meaning of their actions. Description develops from the data and context of the study. A descriptive design was most suitable for the study as the aim was not to establish causality but to describe the topic as it appears. In this study, a descriptive design was used to describe the needs of critically ill patients and the required competencies of Intensive Care nurses. The relationship between the two was explored to obtain a multi-faceted approach for description of the standards of competency.

3.3.1.4 Standards Generative

A standards generative approach was used to systematically structure the research design and methods with the principles required to develop standards by Muller (cited in Booyens, 1998:607-608;636-637; Muller et al. 2006:499-502). The process for standards development consists of development and quantification phases, that are modified to meet the requirements as described by Lynn (1986:382-385) for instrument development. The

development phase requires input from expert and "grassroot" level practitioners (Muller et al. 2006:499). The purpose is to determine what specialists in the various field of nursing regard as good practice. Both inductive and deductive approaches can be employed to achieve the latter and ensure ownership and trustworthiness of the standards. The quantification phase deal with the formal validation of the draft standards and the evaluation of the level of performance in nursing practice.

The above process of standard development was modified in the study. The quantification phase was omitted, as the researcher argued that following the principles of logical deduction and induction, credible and reasonable standards could also be formulated. Both inductive and deductive approaches were followed during this process. The process for the development of standards comprised two phases. Phase 1 was used as a point of departure for the study, which involved the collection of empirical data for the development of standards of competency. This was followed by the generation of standards of competency in Phase 2. The two phases were further divided into eight steps: each of these articulates in accordance with the objectives of the study.

Phase 1, comprised the collection of empirical data for development of standards of competency, which consisted of three steps (Steps 1 to 3).

- Step 1, involved collection data pertaining to the clinical profile of the critically ill patients admitted to the ICUs by means of a prospective record review conducted on the same patients.
- Step 2, involved collecting data pertaining to the competencies Intensive Care nurses require in the provision of care by means of an in-depth study using individual interviews with a group of expert Intensive Care nurses (nurse practitioners, educators and clinical facilitators), in the Intensive Care setting, as the key informants.
- Step 3, involved verification of the competencies which Intensive Care nurses require or use by means of an in-depth study using focus group discussions with other Intensive Care nurses in the ICUs.

Phase 2, comprised the generation of the standards of competency, which consisted of five steps (Steps 4 to 8).

- Step 4, involved identifying and developing a preliminary set of competencies by means of matching empirical data generated in steps 2 and 3.
- Step 5, involved triangulating the relevance of the developed set of competencies in the literature.
- Step 6, involved categorising, integrating and synthesising empirical data generated in steps 1,2,3,4 and 5 to develop standards of competency.
- Step 7, involved the validation of standards of competency by an independent group of expert Intensive Care nurses.
- Step 8, involved recommending guidelines for the use of the standards of competency in the care of critically ill patients, thus concluding the study.

Figure 3.1 provides an overview of the research design and methods of the study.

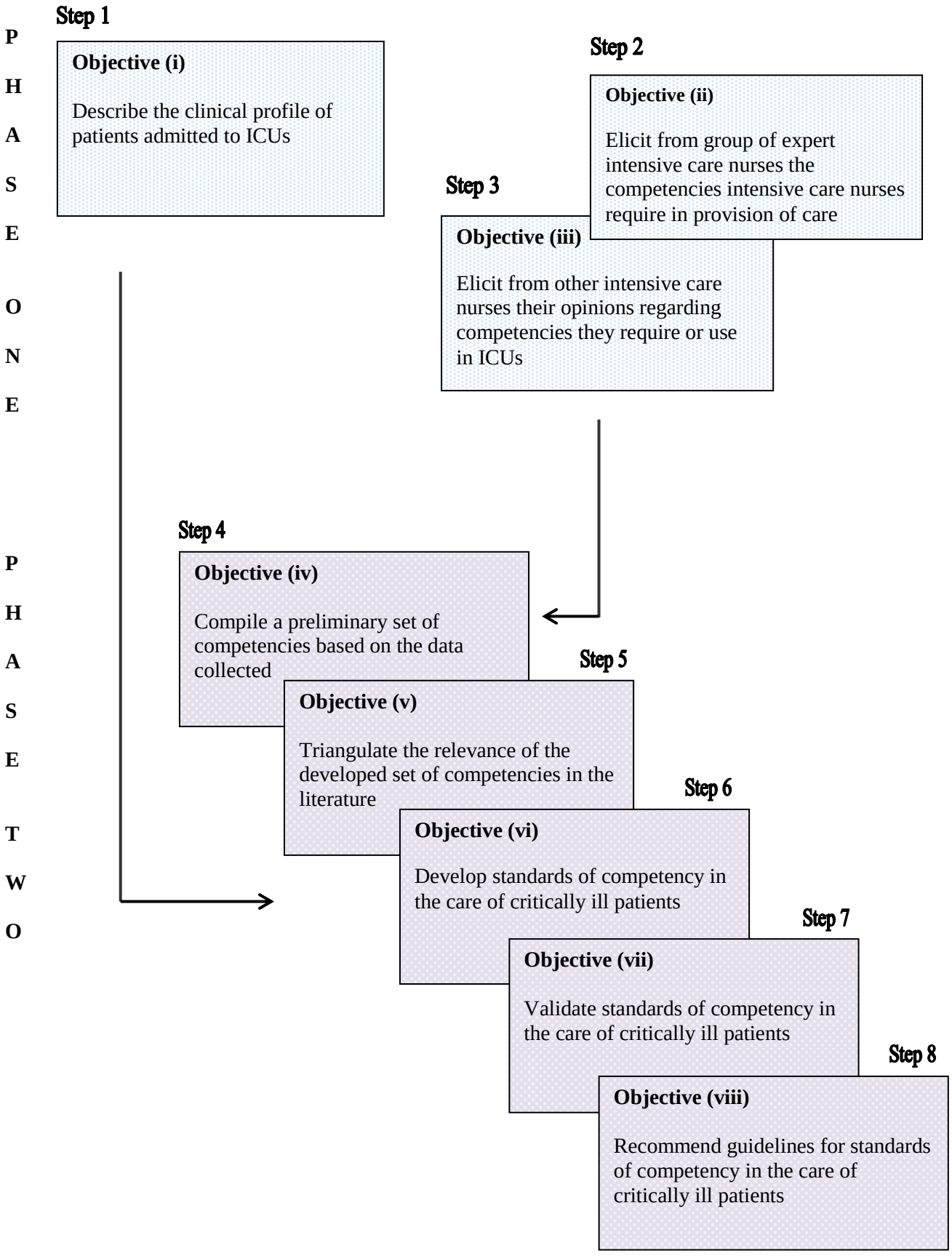


Figure 3.1 Overview of research design and methods

3.3.1.5 Quantitative

A quantitative study utilises a representative sample obtained by applying a probability sampling method (Polit and Beck, 2009). This enhances generalisation of the study findings to the target population. Reliable and valid data collection instruments are necessary to ensure credibility of study findings. A structured data collection method is preferable to unstructured methods, because it eliminates researcher and respondent biases (Burns and Grove, 2009). Quantitative research techniques enable the collection of numerical data, which is analysed statistically, to draw inferences about the universe.

In the quantitative part of the study, a record review was used to collect the data for the clinical profile of critically ill patients in the ICUs. By drawing on previous research, two original instruments, the Simplified Acute Physiological Score Version II (SAPS II) and the Simplified Therapeutic Intervention Score (TISS-28), which are described further in this chapter, respectively measured the level of illness and level of provided care on a randomly selected sample of patients who were admitted to the ICUs. Given the fact that these instruments are well known and used widely to provide measurements of critically ill patient's needs, they were well suited to provide generalisations of the health needs of critically ill patients.

3.3.1.6 Qualitative

A qualitative study explores the significance individuals or groups ascribe to a social situation or problem (Burns and Grove, 2009). Its purpose is to gain insights and understanding through discovery of meanings. As such, it does not intend to establish causality, but through an improved understanding of the whole and importance of rendering the complexity within a given situation (Burns and Grove, 2009). According to Denzin and Lincoln (2000:157), a qualitative study is a multi-perspective approach to examining social interaction, aimed at making sense of, interpreting, or reconstructing the interaction in terms of meanings which participants ascribe to it. Qualitative research is defined as an investigation of phenomena typically in an in-depth holistic manner, through the use of rich narrative materials using a flexible research design (Polit and Beck, 2009). For Chinn and Kramer (2004) and Benner (1984) insights achieved in this manner not only support the development of nursing knowledge but also guide nursing practice.

As noted in the problem statement and rationale for this study, little is known about the competencies that Intensive Care nurses require for the provision of care. A qualitative approach was indicated as no previous in-depth studies, particularly in South Africa, were found on the competencies Intensive Care nurses considered essential for critically ill patients. An in-depth study was used to explore the required competencies Intensive Care nurses needed using the view point of nurses, as the researcher felt this would provide deeper insight into the competencies required.

3.4 RESEARCH METHODS

Research methods are techniques used by researchers to structure, gather and analyse information relevant to the research question. The research methods therefore include the selection of the target population, sampling techniques (criteria for inclusions of participants), data collection and data analysis. As the study progressed in phases and steps, the objectives were used to provide consistency and order to the process.

3.4.1 Step 1: Clinical Profile of Critically ill Patients

The *first objective* was to explore and describe the clinical profile of patients in the ICUs, with the intention of using the findings for the needs of critically ill patients as evidence for development of standards of competency. Step 1 addressed the first objective in the study.

3.4.1.1 Population and sample

The population included all patients admitted to the ICUs of a university-affiliated, public sector hospital and tertiary/quaternary level institution in Gauteng Province, South Africa. The population included all patients who received care in the ICU. Critically ill patients who were readmitted to the ICUs were excluded on the basis that the study aimed to achieve broader representation of patients and re-admission is not a usual occurrence.

A preliminary, retrospective record review undertaken in March 2005 indicated approximately 405 critically ill patients were admitted to the ICUs during the period of 1.04.2004 to 30.6.2004. Thirty three per cent of these patients would be sampled until the

desired sample size was obtained; amounting to 135 patients per month. For this study, probability sampling was applied to select a random sample.

According to Polit and Beck (2008:347-348), the desired sample size is established at the desired number (n), the size of the population must be known or estimated (N), and then by dividing N by n, the sample width is established. The sampling interval is the standard distance between the elements chosen for the sample. In this study, a sample of 135 (n=135) participants would be sampled from a population of 405 (N=405), then the sampling interval was calculated as follows:

$$Kth = \frac{405}{135} = 3$$

Probability sampling was the most appropriate sampling method for this quantitative study. Participants were selected on the basis that they were all given an equal chance of being selected and secondly, met the inclusion criteria.

- Critically ill patients on admission to the ICUs, who were 18 years and older;
- Had an anticipated admission period of > 24 hours;
- Were in one of the four (4) selected ICUs.

The researcher used the admission register maintained in the ICUs of the university-affiliated, public sector and tertiary level hospital in Gauteng Province, South Africa as the sampling frame. The admission register of these ICUs consisted of identified critically ill patients, who were a heterogeneous aggregation of subjects from varying socio-demographic backgrounds. From the sampling frame the researcher then chose a *kth* element at random (onset of the study) and continued systematically to select every 3rd patient admitted to the ICUs during the study period until the desired sample size was obtained. These steps were followed to minimise the likelihood of selection bias.

Originally, a total of 135 (n=135) participants were selected for inclusion in the study, firstly on the basis of the preliminary record review and secondly, through consultation with a biomedical statistician from the Medical Research Council (MRC) of South Africa. However, one participant in the recovery period declined permission for their data to be included in the study and in adherence with the ethical requirements the data was

immediately withdrawn and destroyed, leaving a sample size of 134 (n=134) participants for data analysis.

3.4.1.2 Data collection methods and procedures

The study was described as prospective and longitudinal in nature. A structured record review collected the data over a period of time from the ICU charts of patients who had been admitted until discharge, or death occurred.

Data collection included recordings for severity of illness on admission and provided level of care measurements for monitoring progress throughout at regular intervals over a period of time in ICUs. The variables (age, gender, reason for admission, co-morbid illness, SAPS II score, TISS-28 score, mean total TISS-28 score, length of stay and outcomes) and their items were identified in literature prior to the onset of the study.

The regular intervals for measurements were based on previously published studies (Le Gall, Lemeshow and Saulnier, 1993; Miranda et al.1996; Muehler, Oishi, Specht, Rissner, Reinhart and Sakr, 2010). These measurements were set firstly within the first 24 hour period for severity of illness and secondly, after the period of 24 hours for provided level of care. This was followed by daily measurements for provided level of care, for example at regular intervals, set at 24 hours apart, until discharge or death of the patient in the ICUs. The data were obtained from the ICUs charts, medical and nursing notes, laboratory test results, admission and discharge records, thus the study was described as a record review.

The researcher conducted the data collection by means of one data collection tool, which comprised a checklist developed by the researcher and two established and valid instruments developed by international experts in the field of study (*Appendix A*).

- Data collection tool

One data collection tool was used which comprised three sections: section one, the checklist was built into the tool and patient data were completed by prospective record review; in sections two and three, patient data was completed on separate occasions respectively within 24 hours (i.e. day zero) after admission and after the period of 24 hours

(i.e. day one). Section three, data were further completed at regular intervals set at 24 hours apart, until discharge of the patient from the ICUs, or death occurred.

The development of the instrument was based on the New Simplified Acute Physiological Score (SAPS) version II and the Simplified Therapeutic Intervention Score (TISS-28), developed by Le Gall, Lemeshow and Saulnier (1993) and Miranda, De Rijk and Schaufeli (1996). As these studies were conducted overseas and emphasised being developed specifically for Intensive Care settings, the items were subjected to scrutiny by critical care medical and nursing domain experts in this study and found to be suitable for South Africa.

Section one of the data collection tool comprised 12 items designed to elicit patient data including age, gender, date of admission, reason for admission, SAPS II score on admission, presence of co-morbidity, TISS-28 score on admission, length of stay, Total TISS-28 score per patient stay and TISS-28 score per day. In this study, it was necessary to obtain admission and discharge dates in order to calculate length of stay in the ICUs (*Appendix A*).

Section two of the data collection tool comprised quantitative information on the measurement of severity of illness, using a list of 15 physiological items and each item was awarded between 0 to 26 points. The SAPS II score will be the worst value of the selected items during the first 24 hours of admission (i.e. day zero). A total SAPS II score was calculated by summing the scores of selected items which reflected the level of illness severity. The range of SAPS II score is from zero to 160 and the higher the score obtained, the greater the patients severity of illness and vice versa (*Appendix A*).

Section three of the data collection tool comprised quantitative information on the measurement of provided level of care, using a list of 28 therapeutic items and each item was awarded from one to eight points depending on the degree of nursing time and effort required. The total score ranges from zero to 70. A total TISS-28 score was calculated by summing the scores of the selected items, which reflected the provided level of care for the last 24 hour period. The higher the score, the more nursing time and effort required to care for the patient and vice versa (*Appendix A*).

- Validity and reliability of the instruments

As two existing instruments (SAPS II and TISS-28) were used for data collection in the study, validity and reliability of the instruments from past use in published studies is discussed. **Table 3.1** presents these findings.

Previous validity (criterion and cross validation) for SAPS II established by Le Gall and colleagues (1993) was 0.88 and 0.79 respectively. This was based on analysis of 12,977 records in the developmental set; a positive correlation was found between the developmental set (SAPS II) and the validation set (SAPS I) in both calibration (p=0.883 vs. 0.86) and discrimination (r=0.88 vs. 0.86) capabilities respectively. Furthermore, *concurrent validity*, undertaken on an independent sample by Moreno and Morais (1997), comparing the Acute Physiological and Chronic Health Evaluation (APACHE) version II and SAPS II, found discrimination, goodness of fit and calibration capabilities were higher for SAPS II than APACHE II (0.817 vs. 0.787; H 32.7 vs. 29.7; C 49.7 vs. 28.3) respectively. *Inter-rater reliability of SAPS II* was established by Livingston, MacKirdy, Howie, Jones and Norrie (2000) based on an analysis of 2nd rater records (10% of the sample), who found good intra-class reliability of the items on an independent sample.

Previous validity (cross validation) for TISS-28 established by Miranda and colleagues (1996) was 0.96. This was based on analysis of 10,000 records from databases of the Federation for Research on Intensive Care in Europe (FRICE) in the developmental set of TISS-28 and TISS-76 scores, where a positive correlation (r=0.96) was found between the TISS-28 and TISS-76 scores. Furthermore, *concurrent validity* undertaken on independent samples, (Moreno and Matos, 2000) re-calculated TISS-28 from an existing database and found a lower correlation (r=0.86), as did Lefering, Zart and Neugebauer (2001) who found a higher correlation. The latter authors attributed the difference to the homogeneity of the patients in their single centre study. *Inter-rater reliability of TISS-28* established by Moreno and Morais (1997) found the intra-class coefficient between TISS-28 and TISS-76 was similar (0.93) respectively.

Validity and reliability for the TISS-28 and SAPS II instruments for use in critically ill patients in South African ICUs has been established in a small study by Kisorio and colleagues (Kisorio, Schmollgruber and Becker, 2009).

Table 3.1 Established validity and reliability of instruments used in this study

Author	Setting and sample	Statistical tests and results
Le Gall, Lemeshow and Saulnier (1993)	Sample was drawn from 137 ICUs in 12 countries; A total of 13 152 medical and surgical patients randomly divided into developmental (65%) and validation (35%) samples.	*Criterion and cross validation* was found between developmental set (SAPS II) and validation set (SAPS I) in both calibration (p=0.883 vs 0.86) and discrimination capabilities (r=0.88 vs 0.86) respectively.
Moreno and Morais (1997)	Sample was drawn from 19 ICUs in Portugal; A total of 1094 patients were consecutively collected over a period of 4 months.	*Concurrent validity* found discrimination, goodness of fit and calibration capabilities were higher for SAPS II than APACHE II (0.817 vs 0.787; H 32.7 vs 29.7; C 49.7 vs 28.3), respectively.
Livingston, MacKirdy, Howie, Jones and Norrie (2000)	Sample was drawn from 22 general ICUs in Scotland; A total of 10,393 patients were included in the data analysis	Analysis of 2nd rater records (10% of sample) found a good *intra-class reliability* of items on an independent sample.
Miranda, de Rijk and Schauefli (1996)	Twenty two (n=22) adult medical, surgical and general Dutch ICUs; sample included total of 903 patients consecutively admitted to the ICUs.	*Cross validation* (r=0.96) was found between the TISS-28 and TISS-76 scores in the independent study and the developmental study (n=10,000; r=0.96) of TISS-28 and TISS-76 (Miranda, 1996).
Moreno and Matos (2000)	Sample was drawn from 19 ICUs in Portugal; total of 1094 patients consecutively collected over 4 months	*Concurrent validity* between TISS-28 and TISS-76 found a lower correlation (r=0.86).
Lefering, Zart and Neugebauer (2000)	Setting: 10 bedded ICU in a surgical university hospital in Germany; Total sample comprised 1,808 patients; 10 448 observation days; and Included abdominal, vascular and trauma patients.	*Concurrent validity* between TISS-28 and TISS-76 found a higher correlation (r=0.93).

- Pilot testing

The data collection tool was tested in a pilot study on ten (10) critically ill patients admitted to the ICUs at the selected institution. The institution was considered suitable for the pilot and main study because of its homogeneity and nature of the study design. Pilot testing of the instrument was one of the measures to ensure reliability of the study procedures. There were no problems encountered with the instrument during the pilot test. Data collected during the pilot test were edited, coded, categorised and filed for statistical analysis, but not included in the main study. No modifications were made to the data collection tool, thus the main study commenced.

- Data collection process

Upon receipt of approval from the University Human Research Ethics Committee (Medical), Provincial Health Directorate, the hospital chief executive, the director and nurse managers, data were collected in the adult ICUs during the period 1.04.2005 to 9.10.2005. (Refer to *Appendix Q* for the ethical clearance form and *Appendix U* for the hospital permission to conduct the study). Family members of critically ill patients who met the inclusion criteria were approached by the researcher and given verbal and written explanations about the study. If they expressed a desire for their loved ones to participate they were given an information letter and consent form to sign. Permission to use the data was obtained from the patient in the recovery period, for example in the ward after discharge from the. (Refer to *Appendix B* for the information letter, *Appendix C* for the consent form and *Appendix E* for the retrospective consent form).

3.4.1.3 Method of data analysis

Data analysis is the systematic organisation and synthesis of data and the testing of a research hypothesis using these data (Polit and Beck, 2008:751). This study employed descriptive and inferential statistics (Fisher's exact test, analysis of variances (ANOVA), the Bartlett's test, Bonferroni test and two-sample t-test with paired responses). Testing was set at the 0.05 ($p=<0.05$) level of significance. An overview of all data collected and analysed in the study is provided in **Table 3.2**.

Table 3.2 Data collected and analysed to determine clinical profile of patients

Main variables	Continuous variables	Categorical variables
Age	Age	
Gender		Gender
Reason for admission		Reason for admission
Co-morbid illness		Co-morbid illness
SAPS II score	SAPS II score	
TISS-28 score	TISS-28 Score	
Total TISS-28 score	Total TISS-28 score	
Mean total TISS-28 score	Mean Total TISS-28 score	
Length of stay	Length of stay	
Outcomes		Outcomes

Descriptive statistics were used to present the patient data: age, gender, reason for admission, co-morbid illness, SAPS II score, co-morbid illness, TISS-28 score and the total TISS-28 score per stay, Mean total TISS-28 score per day, length of stay in ICU and patient outcomes. STATA version 10 was the statistical programme used to analyse the data. Frequency distributions and cross tables were used to provide an overall coherent presentation and description of the patient data. Mean, median and standard deviations were used to summarise the above mentioned patient data.

Comparative data analysis was used to explore the nature of a relationship between two variables and the magnitude of that relationship (refer **Table 3.3**). Variables explored in the analysis were gender, reason for admission and co-morbid illness. Joint frequency distributions and contingency tables were used to provide an overall coherent presentation and description of selected variables: gender, reason for admission and co-morbid illness. Testing was done for the total sample (n=134) and by study groups in the four ICUs (n=4) (trauma, cardiothoracic, coronary care and general ICUs), in order to characterise the patient population groups between the ICUs. When testing for associations of interest between continuous and categorical variables, the one way analysis of variance (ANOVA) test was employed to determine multiple scores and significance of these scores (Glantz, 2012:41). However because the one way ANOVA assumes the study groups follow a normal distribution, the Bartlett's test was then used to verify whether the groups have

equal variances and the Bonferroni test made the adjustment and allowed comparisons to be made (Glantz, 2012:62).

Table 3.3 Comparisons between main variables pertaining to the clinical profile of ICU patients

Independent	Dependent
Intensive Care units	Age
Gender	SAPS II score on admission
Co-morbid illness	TISS-28 score on admission
Reason for admission	TISS-28 score on discharge
	Length of stay

When testing for associations of relationships between Total TISS-28 score and Mean Total TISS-28 score (refer **Table 3.4**) cumulative total TISS-28 scores were used in the analysis. A box and whisker plot was used for selected continuous data to handle many data points and to provide a visual representation of selected variables in order to detect distribution of spread and outliers. When testing for associations between paired responses for unequal groups, the two sample t-test was used to determine scores of selected variables and their significance (Glantz, 2012:62) The confidence interval was used to assign range of values for variables of interest, co-morbid illness and outcomes, so that the range had a specified probability of including the true value of selected variable. Confidence intervals are preferable to p-values, as they tell us about the possible effect sizes compatible with data (Glantz, 2012:125; Polit and Beck, 2009:415)

Table 3.4 Comparison of variables of interest pertaining to the TISS-28 score

Independent	Dependent
Gender	TISS-28 score items
Reason for admission	TISS-28 score categories
Co-morbid illness	

When testing for association of relationships for patient outcomes between TISS-28 score and SAPS II score (refer **Table 3.5**), a scatter-gram was plotted as a graphic representation

of the relationships of paired responses between selected variables and patient outcomes. The Fisher's exact test, which was considered the most appropriate non parametric test for analysing discrete data when the two independent samples are small (Glantz, 2012:87), was used to proportionate the relationship between selected variables and to assign the test statistic. Testing was done for the total TISS-28 scores and SAPS II scores on admission. Testing was done on scale, item and sub-item level in order to determine significance of scores.

Table 3.5 Comparison of variables of interest pertaining to patient outcomes

Variables of Interest	**Outcome**	
	Non Survival 0	**Survival 1**
Co-morbid illness	SAPS II score	SAPS II Score
SAPS II Score	SAPS II Score	SAPS II Score
SAPS II score items	SAPS II score items	SAPS II score items

The results of the survey are discussed in Chapter Four. After completion of this step, step 2 of the study commenced.

3.4.2 Step 2: In-depth Qualitative Study

Step 2 was to elicit, from an expert group of Intensive Care nurses (clinical nurses, educators and clinical facilitators), the competencies Intensive Care nurses require in provision of care, with the intention of using the findings as evidence for the required competencies of Intensive Care nurses for the development of standards of competency. Step 2 addressed the *second objective* of the study.

3.4.2.1 Population and sample

A non-probability sampling approach was used in this in-depth study. In a non-probability sampling method, the sampling elements are chosen from the population using non-random methods. In this study, non-probability sampling was used, namely purposive, judgemental

or theoretical sampling, where the researcher selects participants based on prior knowledge of participants' experience regarding the topic under study (Burns and Grove, 2009). The researcher chose Intensive Care nurses for the study's sample from the selected ICUs as they had experience in a wide range of critically ill situations and Intensive Care nursing.

Participants were first selected on the basis they were willing to share their views on the topic under study and secondly, they met the inclusion criteria. Inclusion criteria are summarised as:

- Registered holder of the additional clinical qualification in Intensive Care nursing or equivalent medical and surgical nursing in the subcategory of critical care;
- More than 10 years of clinical nursing practice;
- Working in full time employment in the ICUs.

These inclusion criteria were decided upon because in the ICUs, some Intensive Care nurses had much more experience than others. This decision was based on Benner's finding of knowledge embedded in clinical practice (Benner, 1984). Preference was given to certain participants on the basis of their positions and experience, as the researcher believed these nurses had more knowledge of the topic under study. All the participants were directly and indirectly involved in the care of critically ill patients in the ICUs, were involved in the clinical facilitation of Intensive Care nurses and had extensive experience in supervision, organisation and management. The decision regarding the sample size was based on the needs related to the purpose of the study. The number of individual interviews conducted depended on the saturation of information which was reached when themes and categories in the data become repetitive or redundant, such that no new information was collected (Polit and Beck, 2009).

3.4.2.2 Data collection

The data collection method used to obtain the information was an individual interview, which is an in-depth interview and constituted as a conversation with purpose. They are the most popular and commonly used method of data collection in qualitative studies. The major advantage is that questions are not scripted in advance, but are based on a list of topics which allow for flexibility and spontaneity (Britten and Fisher [1993], in Sim and

Wright, 2000). However they are criticised frequently for lacking objectivity (De Vos, Strydom, Fouche and Delport, 2011)).

- Managing the researcher role.

In qualitative studies the researcher serves as the instrument. This is founded on the principle of observer, note taker, interviewer and interpreter of the data collected (Creswell, 2009). The researcher is an educator, clinical facilitator and nurse practitioner in this field of study. The study site was affiliated to the university where the researcher is currently employed. The ICUs of the public sector hospital are well known and established academic sites. The field of study and level of expertise is limited in South Africa. The researcher chose participants who were known as experts in the field. The shared and common professional interests created a sense of trust which helped in the data collection. The role adopted was that of participant as an observer (Sim and Wright, 2000).

- Planning the question

Qualitative data were obtained through individual interviews by asking a broad central question which was:

> *Based on your experience and expertise, which competencies do you believe to be most essential for Intensive Care nurses to acquire for the provision of effective care of critically ill patients in your ICU?*

A brief overview of the aim of the research was given. Concluding comments were: *"Have we overlooked anything?"*

- Pilot testing

Pilot testing was done two weeks before actual data collection with the purpose of avoiding poor interviewing style, inappropriate interactions and to recognise pitfalls (De Vos et al. 2011). One participant was chosen to conduct pilot testing, in which the main question was piloted and some probing questions were utilised. The transcripts and audio-tape were critically evaluated with a colleague experienced in interviewing skills. The intention was

to ascertain if major changes were necessary for future interviews and should this be so, the data from the first initial interview would be discounted. A minimal amount of change was required, therefore the data were analysed as part of the study.

- Conducting interviews

Individual interviews were used to collect the data. Participants had been given an information letter, a biographical and consent form and audio-taping form. An appointment was made beforehand to conduct the individual interviews, with the participants choosing the venue and time most appropriate and suitable to them. The interviews were conducted in a private seminar room in close proximity to the respective ICUs. A notice stating that an interview was in session was placed outside the door to minimise noise which could detract and influence the interview. The objectives of the interview and significance of the study was explained. Participants were made aware that their contribution would be significant and relevant to the study. All participants would be protected from public disclosure. No hospital or person would be identified by name in the research report. All participants were reassured that there was no right or wrong answer to any question, but that their opinions were appreciated to provide insights into the competencies that Intensive Care nurses required. A non-threatening environment was ensured by welcoming participants in a friendly manner. After the participants had settled and were comfortable the following question was asked:

> *Based on your expertise and experience, which competencies do you believe to be most essential for Intensive Care nurses to acquire for provision of effective care of critically ill patients in your ICU?*

After the central question was asked participants were allowed to reflect on their thoughts before they were ready to proceed. Participants answered the question on how they had interpreted it and focused on the competencies they believed as most important in addressing the question. Participants were encouraged to speak freely at their own pace. Facial expressions and body language were used as cues to indicate whether participants wanted to verbalise, disagree, or were uncertain about any aspect of the discussion. Based on the cues given by participants, topics were introduced. The interview focused on the competencies Intensive Care nurses required in the opinion of highly skilled and vastly

experienced Intensive Care nurses, which also included some difficulties imposed by the clinical setting.

An informal conversation style was maintained throughout the interview. An attentive listening skill was enhanced by maintaining eye contact and note taking considered as necessary. Encouragement was sought by use of non-verbal techniques, such as head nods and eye contact, with minimal use of verbal responses such as *'yes'* and *'uh-huh'* and paraphrasing a statement or repetition by a synonym. Probes were used to obtain clarity by following up open-ended contributions, such as *'what'* or *'tell me more'*. Reflection was used to enhance reliability of data by asking, *'do I understand you correctly'.* Summarising the most important points was done at the end of the interview, and then participants were given the opportunity for final comments. The interviews lasted between one to one and a half hours.

3.4.2.3 Method of data analysis

The interviews were transcribed verbatim. Interview transcripts were analysed in adherence with the method proposed by Tesch (1990 in Creswell, 2009:185-190). According to Creswell this method provides a useful approach to systematically organise the data. The method included the following steps of data analysis:

- The transcriptions were divided into three columns. On the left hand side there was a column for noting concepts, the data was in the middle of the page and the right hand side was for the researcher's perceptions.
- The researcher read all the transcripts in order to get a sense of the whole idea communicated or the themes emerging.
- The most interesting, or shortest transcript was chosen and re-read.
- Words and sentences were used as units of analysis and as such were underlined as the researcher went repeatedly through the transcript.
- The underlined spoken words and sentences were then transferred to the left column as categories. Those perceptions that struck the researcher's mind were noted in the right column.
- The categories transferred onto the right-hand side were read in order to identify the main sub-categories as well as redundant categories.

- The underlined spoken words were transferred into a table highlighting the main categories, subcategories, as well further categories.
- These categories were finalised by revising the table and spoken words were then translated into scientific language. At this point the researcher had to keep in mind that further categorisation could still take place.

The rest of the transcripts, as well as the field notes, were then analysed in the same method.

- Immersion in the data

Data collection and data analysis occurred simultaneously with interviews, transcriptions and writing. Data collection and data analysis is described as an iterative process. In this approach, the researcher moves backwards and forwards between the data collection and data analysis, rather than collecting and analysing the data in sequence. According to Sim and Wright (2000), this prolonged period of 'immersion' is important in order for the researcher to detect subtle meanings which lie between the data.

Immersion in the data refers to the first phase of qualitative analysis, whereby a researcher invests sufficient time reading and re-reading the notes, transcripts, recalling observations and inserting field notes into the text (Polit and Beck, 2009). New insights were exposed to critical appraisal and a conscious effort was made to search for disconfirming, converging, diverging, similarity and different instances in the data.

- Codes, categories and themes

Transcribed interviews were analysed one at a time for content. Creating categories was the first step in the analytical pathway. At its most simple level, this is a way of summarising the data by identifying similarities and differences between them. Tentative categories were identified and subjected to revision and adjustment through further interrogation of new data derived from other sources. The literature refers to this as a constant comparative method, primarily identified with grounded theory research but extensively used in qualitative studies to ensure a systematic measured means of analysing data (Sim and Wright, 2000).

An index card system was created for each category identified in this way. The title for each category was written on the top of the card and cross referenced with the transcript on which it occurred. Similarly, the transcript was cross-referenced with the matching index card. As new categories were identified new cards were created, when further examples were encountered cross references were entered on the existing cards. Creating this system was useful when it came to moving between huge piles of information created by the transcriptions and interviews.

The tentative themes which emerged from each transcript were displayed on large sheets of paper together with the accompanying participant's code and justifying statements. In this process new themes and categories were added and other themes were refined and included into single categories.

In order to gain a broader perspective of the information which allowed for comparisons to be made between participants, information matrices were used by arranging categories and themes into tables which allowed for displaying the information. Themes were printed onto big sheets and participants' responses onto cards. Points of similarities and divergence of experiences and opinions of participants were sought with regard to age, gender, qualification, education, clinical experience, respective sub-speciality and professional role. Cards were pasted under the appropriate themes and different viewpoints of participants were compared and contrasted by looking at the transcripts of the initial individual interviews and then the focus group discussion. Similarly, points and similarities between the individual Intensive Care nurses and other nurse participants were also considered.

- Independent co-coding

An experienced qualitative researcher was requested to conduct independent co-coding. The same transcripts and field notes were sent to the independent co-coder, with a letter stating the objectives of the study, a description of the data collection methods, including the single open-ended question for participants' and a description of the technique of data analysis. After completion of co-coding, a meeting was organised between the co-coder and the researcher for a discussion where both compared their analysed results in order to reach consensus. The categories and subcategories agreed upon were then finalised into a

table format which comprised the findings of the study, then served as the basis for the discussion.

The results of the individual interviews are discussed in Chapter Five. The de-contextualised results were re-contextualised through a literature control. After completion of this, step 3 of the study commenced.

3.4.3 Step 3: In-depth Qualitative Study

Step 3 involved a verification process to elicit the opinions of other Intensive Care nurses in the Intensive Care setting for the competencies they require or use in the ICUs, with the intention of using the findings as evidence for the required competencies for the development of standards of competency. Step 3 addressed the *third objective* in the study.

3.4.3.1 Population and sample

Purposive sampling was used for selection of ten participants for the focus group discussion. Participants were selected firstly on the basis that they were willing to share their views on the topic under study and secondly, met the inclusion criteria which was:

- Registered holder of an additional clinical qualification in critical care nursing or equivalent medical and surgical nursing in the subcategory of critical care;
- More than six months of clinical nursing practice as an Intensive Care nurse;
- Working in full time employment in the ICUs.

These Intensive Care nurses who participated were directly involved in patient care and had knowledge and experience of the topic under study. Some were also involved in the supervision, organisation and management of Intensive Care nurses in the ICUs.

- Method of selection

Letters were hand delivered to the ICUs. Each participant received information explaining the relevant aspects of this study and included the purpose, method, objectives and potential risks, benefits and significance of participation. Participants who met the

selection criteria were given reassurance that their anonymity and confidentiality would be maintained and that they had the option of withdrawing from the study at any time. Written voluntary consent was obtained, without any coercion or undue influence and without any remuneration.

3.4.3.2 Data collection

Focus groups, which are facilitated conversations, were used to collect the data. A unique difference between focus groups and other groups is that the goal is not to reach consensus, provide suggestions or make decisions on a course of action, but to purposefully determine the perceptions, feelings and thoughts of participants (Krueger & Casey, 2009). People are the product of their environment and are influenced by other people. People may need to listen to opinions and perceptions of others and themselves to create awareness about their own abilities and strategies (Krueger & Casey, 2009).

Focus groups are typically composed of six to ten participants, but can range between four and twelve (Krueger & Casey, 2009). Experienced nurses were asked to give their opinions on the competencies they required or used in the ICUs. Participants had been given an information letter, a biographical and consent form and audio-taping form. An appointment was made beforehand to conduct the focus group interview. The focus groups were conducted in a private seminar room in the hospital. A non-threatening environment was assured by welcoming the participants, explaining seating arrangements and introducing participants to one another and reiterating measures to enhance anonymity and confidentiality. Consent had been obtained for audio-taping as well as verbatim recording. Participants were reassured that only the researcher would have access to the transcriptions. Participants' names were changed to codes so that no person would be identifiable from the raw data.

The focus group was conducted after the individual interviews. The questions were more broadly structured from the emerging topics, in the initial interviews, that the specialist group of nurses had identified as essential for Intensive Care nurses to acquire for the provision of care. The researcher identified the competencies and printed them onto small index cards which were used to ask questions of the focus group participants.

New questions from other sources were introduced one at a time. These opportunities were also used to obtain clarity on some points of divergence and convergence, or divergence noted by particularly lively debate. Facial expressions and body language were used as cues as to whether the person wanted to verbalise, disagree, or was uncertain about any aspect. Probes were used to obtain clarity by following up open-ended contributions, such as *'what?'* or *'tell me more'.* Reflection was used to enhance reliability of data by asking, *'do I understand you correctly'*. Encouragement was sought by use of non-verbal techniques, such as head nods and eye contact, with minimal use of verbal responses, such as *'yes'* and *'uh-huh,'* paraphrasing a statement or repetition by a synonym.

Field notes were taken as an important data collection technique. Non-verbal gestures made by the participants, as well as their interactions, were jotted down in conjunction with verbal responses. Other information pertinent to the study was also recorded, such as two way conversations held between two participants at any specific time during the interview. A final summary of the main points was made at the end and participants were given an opportunity for final comments or questions. The discussion lasted slightly less than two hours.

3.4.3.3 Method of data analysis

The interviews were transcribed verbatim. Data were analysed in adherence with the method proposed by Tesch (1990 in Creswell, 2009:185-190). The process followed the same procedures as described in the aforementioned section (refer section 3.4.2.3 of Chapter Three).

The results of the focus group interviews are discussed in Chapter Six. The de-contextualised results were re-contextualised through a literature control. After completion of this step, step 4 of the study commenced.

3.4.4 Steps 4 to 5: Preliminary Set of Competencies

Step 4 involved compiling a preliminary set of competencies from evidence generated in steps 2 to 3. This was followed by step 5, involved verifying the relevance of the

developed set competencies by means of data triangulation in national and international literature. Step 4 addressed the *fourth objective in* the study and step 5 addressed *fifth objective*.

A preliminary list was compiled from evidence generated in steps 2 to 3 and subjected to interrogation with Intensive Care nurses in the field and verified in the literature. The results of the developed set of competencies are discussed in chapter six. After completion of this step, step 6 of the study commenced.

3.4.5 Steps 6 to 7: Development of Competency Standards

Step 6 involved categorising, integrating and synthesizing concepts to develop standards of competency from evidence generated in steps 1,2,3,4 and 5. This was followed by step 7, which involved verifying the standard of competency. Step 6 addressed the *sixth objective* in the study and step 7 addressed the *seventh objective*.

3.4.5.1 Logical reasoning

Logical reasoning is the mental processing of ideas to solve problems (Polit and Beck, 2009). In logical reasoning, the whole is broken up into smaller parts. In this study the smaller parts included: the clinical profile of critically ill patients (step 1), required competencies of Intensive Care nurses (steps 2 to 3) and developed set of preliminary competencies (step 4). The whole is broken down into smaller parts so that relationships can be determined and an understanding of the whole can be achieved. Two types of logical reasoning were applied in the development of standards of competency: inductive and deductive reasoning (Chinn and Kramer, 2004).

Inductive reasoning involves a process of observing multiple smaller parts and then grouping observations into a larger whole (Chinn and Kramer, 2004). An example of inductive reasoning applied in this study was the grouping of all conclusions drawn from step 1 to step 4. This inductive reasoning process occurred during the integration and synthesis of the development of standards of competency.

Deductive reasoning involved the development of predictions from the integration and synthesis of conclusions (Chinn and Kramer, 2008), which were drawn from step 1 to step 3. An example of deductive reasoning applied in this study, is the development of recommendations from the integrated and synthesised conclusions drawn from steps 1 to 3.

3.4.5.2 Integration and synthesising evidence

Evidence obtained in the conclusions from steps 1 to 5 were integrated and synthesised. Integration and synthesis involved clustering from all the sources to form a new and complete picture by means of inductive reasoning. Similar conclusions from steps 1 to 3 were clustered together. Further, conclusions were divided into three main categories including, conclusions related to professional practice, care and management, professional enhancement.

Conclusions related to Intensive Care nursing practice were further organised to form the sequence of events occurring during the provision of care of the critically ill patient, commencing with the professional practice, care and management and professional enhancement. An audit trail of the synthesis and integration provided in steps 1 to 5 is provided in Chapter Seven.

3.4.5.3 Verification of standards of competency

Four evaluators were purposively selected by virtue of expertise in education, clinical facilitation and their status as active members of professional bodies or societies in the field of study. They were contacted either telephonically or in person to request their participation. Written agreement to participate in the study was obtained (*Appendix L*). The criteria, the guidelines for verification (*Appendix K*) and a description of the standards of competency were accompanying documents to enable competency standards evaluation.

The following criteria (AGREE Research Trust, 2009:7) were presented to the panel of experts:

- Scope and purpose with reference to the overall aim of competency standards, the specific health questions and the target population;

- Stakeholder involvement focused on the extent to which the competency standards were developed by appropriate stakeholders and representative of their views;
- Rigour, considered the process used to gather and synthesise the evidence, the methods to formulate recommendations and to update them;
- Clarity, which determined whether the formulation of standards was clear and unambiguous;
- Applicability considered the practical implications value and or affordability of the standards of competency;
- Editorial independence, determined whether formulation of the recommendations was unduly biased with competing interests.

The verifiers were asked to rate the competency standards based on 23 key items organised into six domains (AGREE Research Trust, 2009; available at http://www,agreetrust.org cited 2012.05.27). These were scope and purpose (items 1 to 3), stakeholder involvement (items 4 to 6), rigour of development (items 7 to 14), clarity of presentation (items 15 to 17), applicability (items 18 to 21) and editorial independence (items 22 to 23). Each item is rated on a 7-point scale (1-strongly disagree to 7-strongly agree). In addition, the verifiers were asked, on completion of the rating, to provide an overall assessment of the quality of the competency standards and to indicate whether they would recommend the use of the competency standards in clinical practice.

The results of validation of competency standards are discussed in Chapter Eight, thus concluding the study.

3.5 VALIDITY, RELIABILITY AND TRUSTWORTHINESS

The measures of validity, reliability and trustworthiness, as applied in the study, are described below.

3.5.1 Validity and Reliability

The traditional criteria for validity and reliability are supported by the positivist or scientific paradigm in quantitative research. According to De Vos et al. (2011) validity

refers to accuracy of the instrument measurements, whereas reliability is the stability or consistency between tests of measurements. The following measures were applied to ensure validity and reliability in the study:

- *Content validity* was ensured. The data collection tool was formulated from established instruments developed and tested on patients in the adult ICUs. The instruments were amongst those more commonly used internationally and known in current literature to provide the necessary information for patients needs in the adult ICUs. The validity of the instruments was established in published studies.
- *Probability sampling* was used to obtain a broader representation of the characteristics of critical illness in the sample, thereby providing an opportunity to enhance generalisation of the sample to the population.
- *Validity* of the study was maintained by ensuring consistency in data collection. This was in strict adherence to the data collection tool according to guidelines of the developers (Le Gall et al. 1996; Miranda et al. 1996). A pilot study was undertaken to ensure reliability of the study procedures in the South African context.

The afore-mentioned measures of validity and reliability applied to the prospective, longitudinal record review.

3.5.2 Measures of Trustworthiness

Measures of trustworthiness are fundamental aspects of rigour of qualitative studies. Trustworthiness is a concept adopted by Guba and Lincoln (1985) to explain what the qualitative researchers refer to as the validity and reliability of the study. Krefting (1991) argues that measures of trustworthiness are relevant as it ensures rigour without compromising the relevance of the study. According to Lincoln and Guba (1989:241-242) the four aspects of trustworthiness comprise credibility, dependability, transferability and confirmability.

3.5.2.1 Credibility

Credibility refers to confidence in the truth of data and is also defined as an alternative to internal validity. According to De Vos et al. (2011) the goal of credibility is to determine

whether the participants were accurately identified and described. Polit and Beck (2008) state that prolonged engagement, persistent observations, external checks, member checking, researcher credibility and data triangulation are measures which ensure the likelihood of producing credible results.

In this study credibility was ensured by the researcher spending enough time with the participants to learn about their environments and to build rapport, thus establishing a trusting relationship. The researcher conducted more than one interview by going back to verify whether the information provided by the participant was understood correctly.

Lincoln and Guba (1985) refer to this criterion as truth value, because Intensive Care nurses were allowed to relate their opinions regarding the competencies they required or used for giving effective care to critically ill patients in Intensive Care settings. The researcher also ensured the truth value of the study by writing field notes that were the researcher's own observations of these participants in the context of the situation. These included what, when, where and how of the circumstances. Theoretical notes included the researcher's inferences and associations of what was observed from one interview to another. The researcher is familiar with the Intensive Care setting as she has been working in such an environment for the past 25 years.

3.5.2.2 Dependability

De Vos et al. (2011) stated that dependability is an alternative to reliability, in which the researcher has to account for changing conditions in the phenomenon under study. The dependability of data refers to the stability of data over time and conditions. There can be no credibility without dependability. According to Polit and Beck (2008), the dependability of a study can be assured by conducting another study of the same nature at a different time.

For this study, the researcher explained to the participants that they were the experts in the field, that there was no right or wrong answers but their opinions were valued *(Appendix M).* This was an attempt to avoid a threat to consistency. An independent coder was used to assist in verifying the themes derived from the interviews. The involvement also eliminated lack of consistency. Participants were required to sign the consent form to

participate in the study, so that their willingness was confirmed. To eliminate the potential threat of social pressure, the researcher was the only person who conducted the interviews. A pilot study was conducted and discussed with the supervisor to establish correctness of the interviewing technique and if it conformed to the necessary requirements with all participants.

3.5.2.3 Transferability

The term transferability is concerned with outcomes of specific research. Guba and Lincoln (1985) support providing sufficient descriptive data, or that a dense, thick, description can be used by another researcher to judge whether to conduct a similar study in a similar context (Guba and Lincoln, 1985). Whilst Krefting (1991) argues that generalisation is not applicable to qualitative research as it takes place in the natural setting with few controlling variables, Lincoln and Guba (1989) shifted the responsibility of the data from the researcher to that of the individual, wishing to fit the findings to another situation or applying the method to another setting.

This study used contextual, exploratory and descriptive means in order to develop standards of competency in the care of critically ill patients in the ICUs of a university-affiliated, public sector, tertiary level hospital in Gauteng Province, South Africa. As such the study was not intended to produce broad generalisations (refer Chapters One, Three, Five and Seven). A purposive sample was used. The sampling was criterion based and inclusion criteria were set by the researcher. A detailed description of the design and methods, literature control, transcribed interviews and field notes were provided, in order to allow others to assess how transferable the findings are (Krefting, 1991).

3.5.2.4 Confirmability

Confirmability refers to objectivity of the data. It guarantees that the findings, conclusions and recommendations are supported in the data and there is an internal agreement between the researcher's interpretation and the actual evidence. Lincoln and Guba (1989) describe this criterion of neutrality whereby the bias of the researcher should be avoided in the procedures and findings. According to De Vos et al. (2011), it is important to ask whether the findings can be confirmed by another person to ensure confirmability. For Polit and

Beck (2008) congruency may be between two or more independent people. Confirmability is obtained by using triangulation of data sources, supporting or challenging the findings by means of a literature control.

In this study, information was verified by using individual interviews, focus group discussions and literature control. Data were tape recorded and field notes were made to record the thoughts, feelings and reactions of the researcher. Field notes were written immediately after each interview. The researcher made available all documents required for auditing, including raw data *(Appendix N and Appendix O),* field notes *(Appendix P)* as well as the analysed documents.

Measures applied for ensuring trustworthiness are presented in **table 3.6.**

Table 3.6 Measures applied for ensuring trustworthiness

Strategy	**Criteria**	**Application**
Credibility (truth value)	Prolonged engagement	The researcher worked for many hours with the participants to establish trusting relationships
	Reflexivity	Field notes were taken immediately and subjected to analysis
	Member checking	During interview summarisation, repeating, and paraphrasing of participants' words was done. Follow up interviews were done with some participants to ensure credibility of results.
	Interview technique	Researcher trained on research methods and interviewing skills.
Dependability (consistency)	Step wise replication	Co-coder involved in independent data analysis.
	Thick description	Detailed description of methodology, peer checking by colleagues and supervision by experts.
	Peer evaluation	Independent checking by colleagues and supervision by experts.
Transferability (applicability)	Nominated sample	The sampling method was purposive, criterion based and inclusion criteria set by researcher
	Thick description	Through description of research methodology and literature control.
Confirmability (neutrality)	Triangulation of data methods and data sources	Information was verified through interviews with other participants and literature control
	Reflexivity	Field notes taken and subject to data analysis

The aforementioned measures of trustworthiness applied to the individual interviews and focus group discussions.

3.6 ETHICAL CONSIDERATIONS

Ethical considerations are discussed under the following headings: permission to conduct research, informed consent and measures to ensure confidentiality and anonymity.

3.6.1 Permission to Conduct Research

Permission to conduct research was obtained from the Director of Gauteng Department of Health (*Appendix U*), the Post Graduate Committee of the Faculty of Health Sciences and the Committee for Research Ethics on Human Subjects (Medical) of the University of the Witwatersrand (*Appendix Q*), the Chief Executive Officer of the Charlotte Maxeke Johannesburg Academic Hospital (*Appendix R*), verbal permission was also obtained from the ICU Director/consultant, nursing services manager and nurse unit manager of the respective ICU.

3.6.2 Informed Consent

Given the nature of critical illness and treatments in the ICUs (Bigatello, George and Hurford, 2003), the family members of patients were given an information letter on their behalf (*Appendix B*). Family members were given time to deliberate and after they had indicated their willingness to participate, were given a consent form (*Appendix C*). Patient participants were asked for permission to use the data obtained by the study in the recovery period, for example after discharge from the ICU and in a hospital ward. The patients consent was preceded by the same attention to the ethical requirements. All participants signed the consent form (*Appendix E*). However, in the event of the patient's death in the ICU, the family member's consent was re-negotiated verbally and taken as acceptable, unless stated otherwise.

The nurses working in the ICUs were invited to participate in the individual and focus group interviews in order to discuss their point of view of the competencies they considered as essential for effective care of patients in the ICU (*Appendix G*). Permission was obtained and all the participants signed the consent (*Appendix I*) and audio-tape form (*Appendix J*).

3.6.3 Anonymity and Confidentiality

All participants were assured in writing of the confidential nature of the study. No names or identifying characteristics were mentioned in the research and care was taken to ensure participants were not identifiable. One participant requested their data not to be included in the study, which was done and destroyed in their presence. Participants were assured of their right to withdraw from the study at any time without prejudice. Data were kept under lock and key at all times, to be destroyed after the *thesis has been completed*. Data from the study will be used for the purpose of this study, and as such, raw data will be kept locked up and placed with the research supervisor for five years after which it will be destroyed (shredded). Analysed data will be saved in computer files which are protected with a password known only to the researcher.

3.7 SUMMARY

This chapter provided a detailed discussion of the research design and methods of the study, inclusive of population, sample and sampling method, data collection and data analysis procedures that were followed. Measures of validity, reliability and trustworthiness are discussed. Ethical considerations were addressed.

In the next chapter, the results of the clinical profile will be addressed.

CHAPTER FOUR

RESULTS AND DISCUSSION: CLINICAL PROFILE OF PATIENTS

4.1 INTRODUCTION

This chapter describes the clinical profile of patients in the ICUs, with the intention of using the findings for the health needs of patients, as evidence for development of the standards of competency. This was achieved within an exploratory, descriptive, contextual and quantitative design. The population included all patients admitted to the ICUs at a university-affiliated, public sector and tertiary level hospital in the Gauteng province in South Africa. A sample size of 134 (n=134) patients was obtained by means of systematic random sampling. Data were collected by means of a data collection tool (*Appendix A*). Data were analysed by means of descriptive and inferential statistics. Statistical tests included two sample t-tests, analysis of variances (ANOVA), Bartlett's test for equivalence, Bonferroni correction test and Fisher's exact test. Testing was done at the 0.05 ($p<0.05$) level of significance and insured a power of at least 95 % accuracy on findings. Findings will be discussed on scale, construct, and study group and item level. This chapter discusses descriptive and inferential statistics employed to analyse, present and describe the research findings.

4.2 APPROACH TO DATA ANALYSIS

Descriptive statistics were used to present the interpretation of the clinical data of the patients: gender, age, reason for admission, co-morbid illness, severity of illness and the level of provided care, length of stay and outcomes. Frequency distributions and cross tables were used to provide an overall coherent picture of the data. Measures of central tendency (mean and median) and variance (standard deviation) were used to summarize the data. The above-mentioned clinical data were then further explored by using bivariate analysis. Joint frequency distributions and contingency tables were applied to display the concept of associations between selected variables, and followed by inferential testing to determine statistically significant associations.

When comparing for one factor of interest, **a one-way analysis of variance** (ANOVA) was applied to test for equal means across groups and equivalence of means within groups, respectively. Because the ANOVA test assumes that variances are equal across the sample, the **Bartlett's test** was used to verify that assumption, and the correction was made by the **Bonferroni test** to assure the overall confidence coefficient was maintained. However, when testing for two factors of interest, a two sample student t-test was applied to test the mean scores, for example as applied in the categories of co-morbid illness.

When using large volumes of data, for example the serial measurements of TISS-28 scores a box and whisker plot was used to visually present the data to convey location and variation information in the data. The **Fisher's exact test** was applied to determine whether groups of selected variables differed in the proportion with which they fall into the selected categorical classifications, such as the scores derived from the TISS-28 measurements and reason for admission. In this case, both p-values ($p<0.05$) and confidence intervals (CI) were calculated. Testing was done on item, category and sub-item level to further explore the data.

When using the scores derived from patient outcomes, two groups were created by depicting survival and non-survival of participants as the outcomes measure. A **two sample t-test** was then applied to determine statistical significance of the mean scores between these groups. In this case a confidence interval was used to assign the range of values for the variables of interest so that the range has a specific probability of including the true selected value. Further testing was undertaken by using pooled results of selected variables, such as TISS-28 and SAPS II scores on admission. A scatter gram was plotted as a graphic representation of the relationship of paired responses between selected variables and categories of patient outcomes. The **Fisher's exact test** was used to proportionate relationships between the variables and to assign the test statistic. Testing was applied at item and sub-item level in order to determine where statistically significant differences might lie in the mean scores.

4.3 AGE

Item 1.1 of the data collection tool related to age. The ages of critically ill patients were grouped into categories for analysis.

The mean age of patients admitted to the ICUs was 48.2 years for the total sample (n=134). The age range of all patients admitted to ICUs was from 20 to 82 years. Thirty-two (23.9%) patients were older than 64 years, whereas a close majority (45.5%) of all patients were between the ages of 20 to 44 years.

Analysis between ICUs indicated that mean age of patients admitted to the cardio-thoracic ICU was higher (60.3 years), as compared to a lower (35.4 years) mean age of patients admitted to the trauma ICU. Fifty percent (n=11) of all patients admitted to the cardio-thoracic ICU were older than 64 years as compared to more than two-thirds 78.6 % (n=22) of all patients admitted to the trauma ICU who were younger than 44 years and more than half 55.2% (n=16) of patients admitted to the coronary care ICU were between the ages of 45 to 64 years. Results of this process are summarised in **table 4.1.**

Table 4.1 Comparison of Age between the ICUs (n=134)

	Trauma (n=28)	Cardio-thoracic (n=22)	Coronary care (n=29)	General (n=55)
Age (mean, SD)	**35.4 (11.3)**	**60.3 (14.5)**	56.4 (13.8)	45.5 (18.4)
20 – 44 years	**22 (78.6%)**	5 (22.7%)	5 (17.2%)	30 (54.5%)
45 – 64 years	5 (17.8%)	6 (27.3%)	**16 (55.2%)**	14 (25.5%)
65 – 82 years	1 (3.6%)	**11 (50.0%)**	8 (27.6%)	11 (20.0%)
Range (years)	20 – 67	**32 – 78**	25 – 80	**25 – 82**

4.3.1 Comparison of Age between ICUs

Multiple comparisons between the ICUs in terms of the difference in mean scores for age was statistically significantly (p=0.000) different for patient population groups in three (trauma, cardio-thoracic and general) of the four ICUs (**refer table 4.2**). However there

was no statistically significant difference (p=1.000) between the mean scores between cardio-thoracic and coronary care ICUs (**refer table 4.3**), implying that in terms of their age these patient population groups are more likely to be similar.

Table 4.2 Comparison of Age between the ICUs

Unit	Age
Trauma	35.39
Cardio-thoracic	60.27
Coronary Care	56.37
General	45.49
Difference between ICUs	3380.92
Difference within units	242.104

(ANOVA **p=0.000**; Bartlett's test **p=0.032**)

Table 4.3 Comparison of Age within the ICUs

	Trauma	Cardio-thoracic	General
Cardio-thoracic	24.88 (p=0.000)		
Coronary Care	20.99 (p=0.000)	**-3.89 (p=1.000)**	
General	10.99 (p=0.036)	- 14.78 (p=0.002)	-10.88 (0.017)

(Bonferroni Test)

4.3.2 Conclusions Derived from Age

The following conclusions were drawn related to age of patients admitted to the ICUs:

- The majority (54.5%; n=73) of patients admitted to the ICUs were under the age of 48.2 years.
- An analysis between sub-specialty ICUs (n=4) indicated that groups of cardiothoracic and coronary care patients were older (45 to 82 years), in contrast to the groups of trauma and general ICU participants who were younger (20 to 44 years).

4.4 GENDER

Item 1.2 of the data collection instrument related to the gender of critically ill patients. The gender of critically ill patients was grouped into categories (refer **table 4.4**) for analysis.

Table 4.4 Comparison of Gender between ICUs (n=134)

	Trauma (n=28)	Cardio-thoracic (n=22)	Coronary care (n=29)	General (n=55)
Gender (%)				
Males	**21 (75.0%)**	15 (68.2%)	**24 (82.8%)**	25 (45.4%)
Females	**7 (25.0%)**	7 (31.8%)	**5 (17.2%)**	**30 (54.6%)**

Males accounted for 63.4% and females 36.6% of the total sample. Analysis between ICUs indicated higher percentage of males in three (trauma, cardio-thoracic and coronary care) of the four ICUs, whereas general ICU had a lower 45.4% (n=25) percentage of males. A higher 54.5% (n=36) percentage of females admitted to the general ICU as compared to a lower percentage of females in the other three (trauma, cardio-thoracic and coronary care) ICUs.

4.4.1 Comparison for Gender by Age

Table 4.5 Comparison of gender by Age between the ICUs

Gender	Age
Males	47.70 (17.02)
Females	48.99 (18.93)
Difference	1.25

(Two sample t-test p=0.694)

Table 4.5 shows the comparisons of the total sample (n=134) for gender by total mean age scores. However, these results indicated that there is no statistically significant (p=0.694) relationship between females and males total mean age scores, implying that females (48.99) do not have a statistically significantly higher mean age score than males (47.70).

4.4.2 Conclusions Derived from Gender

The following conclusions were drawn related to gender of patients admitted to the ICUs:

- Male patients predominate in the total sample (n=134) and within three (coronary care, cardiothoracic and trauma) of the four ICUs, implying that the opposite trend was noted in the general ICU.
- Analysis between the study groups, indicated a higher male to female ratio (4.8:1) in coronary care, as compared with slightly lower (3:1 and 2.1:1) male to female ratio in trauma and cardiothoracic patient populations, respectively, with contrast opposite higher (54.4% and lower (45.6%) female and male distributions, were noted implying that female patients predominate in the general ICU patient population.

4.5 REASON FOR ADMISSION

Item 1.3 of the data collection tool related to the reason for admission to the Intensive Care units. The reason for admission of the critically ill patient was grouped into categories (refer **table 4.6**) for analysis.

Table 4.6 Comparison of reason for admission between ICUs

	Trauma (n=28)	Cardio-thoracic (n=22)	Coronary care (n=29)	General (n=55)
Reason for Admission				
Medical	1 (3.6%)	1 (4.5%)	**28 (96.6%)**	**24 (43.6%)**
Scheduled surgery	-	**13 (59.1%)**	1 (3.4%)	**20 (36.4%)**
Unscheduled surgery	**27 (96.4%)**	8 (36.4%)	-	**11 (20.0%)**

Of the total sample (n=134), the reason for admission of patients was higher (59.7%; n=80) for surgery, and 40.3% (n=54) were medical cases. Of all surgical patients, unscheduled surgery was higher (34.3%; n=46) than scheduled surgery, which was 25.4% (n=34).

Analysis between ICUs indicated one (general) of the four ICUs admitted patients in all three categories as compared with predominance for specialisation in the other three (trauma, cardio-thoracic and coronary care) ICUs. Further, the majority (59.7%; n=80), of all patients admitted for surgery were direct admissions (either from casualty department or operating room), as compared to a lower 38.8% (n=52) who were admitted to ICU from general hospital wards. Of all the ICUs, the reason for admission was higher in categories of unscheduled surgery, scheduled surgery and medical. Of all the ICUs, the main reason for admission was noted to be higher by speciality predominance as indicated in trauma, cardiothoracic and coronary care ICUs respectively; in the categories of unscheduled surgery 96.4% (n=27), scheduled surgery 59.1% (n=13) and medical cases 96.6% (n=28), as compared to a case mix in the general ICU. Of all the patients, the reason for admission was lower < 3.6% in the categories of medical and scheduled surgery in three (trauma, cardiothoracic and coronary care) of the four ICUs, the chart review indicated that these patients were admitted due to a limited ICU bed availability in the admitting unit. The results of this process are summarized in **table 4.6**.

4.5.1 Conclusions Derived from Reason for Admission

The following conclusions were drawn for the reason for admission of patients to ICUs:

- The majority (59.7%) of the patient's reason for admission to ICUs was surgical and 40.3 % were medical cases.
- Analysis between ICUs indicated that trauma ICU had a slightly higher (96.4%; n=27) case load in unscheduled surgery as compared with a slightly higher (59.1%; n=13) scheduled surgical case load in the cardiothoracic population group, whereas the coronary care unit had a slightly higher (96.6%; n=28) load in medical cases as compared with a lower 43.6% (n=24) medical cases in general ICU.

4.6 CO-MORBID ILLNESS

Item 1.5 of the data collection tool related to co-morbid illness. The co-morbid illnesses of critically ill patients were grouped into categories (refer **table 4.7**) for analysis.

Table 4.7 Comparisons of co-morbid illness between the ICUs

	Trauma (n=28)	Cardio-thoracic (n=22)	Coronary care (n=29)	General (n=55)
Co-morbid illness Present	**6 (21.4%)**	15 (68.2%)	**23 (79.3%)**	**36 (65.4%)**

Co-morbid illness was verified as present in a majority (59.7%; n=80) of patients as compared to a lower 40.3% (n=54) absence of co-morbid illness in the total sample. Analysis between the ICUs indicated a higher (79.3%; n=73) percentage of patients in coronary care had established presence for co-morbid illness as compared to a lower 21.4% (n=6) percentage of patients in the trauma ICU. The majority (52.5%; n=42) of all patients with established presence of co-morbid illness were in the trauma and general ICUs, as compared with a slightly lower 47.5% (n=38) in the cardio-thoracic and coronary care ICUs. Results of this process are summarized in **table 4.7**.

Presence of co-morbid illness was divided into four categories according to their matched number of patient's co-morbid conditions. These categories were used according to a study by Seferian and Afessa (2006:2113) as it guides in detecting the effects of prevalence of chronic illness on ICU utilisation. Of the total sample (n=134), thirty-six patients (45.0%) presented with two, three and four co-morbid conditions as compared to forty-four patients (53.7%) who had only one co-morbid illness. Findings also indicated a close majority 44.1% (n=19) of single co-morbid illness were verified as hypertension. Findings are displayed in **figure 4.1**.

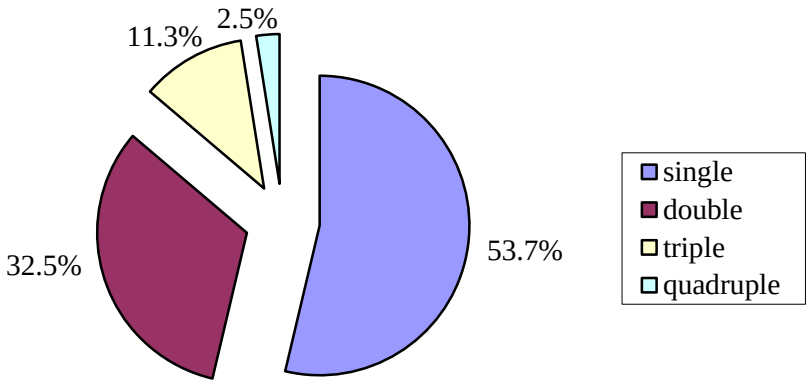


Figure 4.1 Frequency distribution of pre-existent co-morbid illness

4.6.1 Conclusions Derived from Co-morbid Illness

The following conclusions were drawn related to co-morbid illness of patients admitted to the ICUs:

- The majority (59.7%; n=80) of patients had a pre-existent co-morbid illness, verified majority (53.7%; n=43) as single and followed by double 32.5% (n=26), triple 11.3% (n=9) and quadruple 2.5% (n=2) chronic illness, and this carries an increased risk of poor patient outcomes and readmissions for Intensive Care services
- A close majority (44.1%; n=19) of single chronic illness cases were verified as hypertension, and suggested in literature to be associated with frequent ICU readmissions.
- Analysis between study groups indicated a higher 79.3% (n=23) incidence of co-morbid illness in coronary care cases, as compared with lower 21.4% (n=6) in the trauma population group, whereas more than half (>50.0%) of the patients in the general and cardiothoracic population groups exhibited co-morbid illness.

4.7 SEVERITY OF CRITICAL ILLNESS

Item 1.6 of the data collection tool related to level of severity of critical illness. The level of severity of illness of critically ill patients was determined by the SAPS II score (refer **table 4.8**).

4.7.1 SAPS II Score

Severity of critical illness as indicated by the SAPS II score on admission was 34.83 (SD 13.30) for the total sample (n=134), and the range was 71 points. An analysis between ICUs revealed the trauma patients as having a higher 42.75 (SD 11.69) total mean SAPS II score and followed by a lower 34.72 (SD 12.53), 32.54 (SD 12.70) and 29.13 (SD 13.32) indicated in the general, cardiothoracic and coronary care patient groups, respectively.

In order to characterise the sample of patients between the ICUs, a further analysis for variances of SAPS II score indicated trauma patients had higher SAPS II scores observed in males and presence of co-morbid illness, respectively as 44.67 (SD 10.40) and 46.83 (SD 13.99). Similarly, cardiothoracic cases had higher 33.47 (SD 14.55) and 37.25 (SD 12.65) indicated in males and presence of co-morbid illness, and the general patient group also indicated higher scores in males 35.44 (SD 12.67), the presence of co-morbid illness 34.25 (SD 12.39). In addition medical 41.58 (SD 12.12) patient population groups, and contrasted by the coronary care group that only indicated higher scores 34.00 (SD 4.42) for female patients. Single cases were not included in the analysis. Results are summarized in **table 4.8**.

Table 4.8 Comparison of SAPS II Score between ICUs by gender, co-morbid illness and reason for admission

	Trauma (n=28)	Cardio-thoracic (n=22)	Coronary care (n=29)	General (n=55)
Severity of Illness				
SAPS II Score	**42.75 (11.69)**	32.54 (12.70)	**29.13 (13.32)**	34.72 (12.53)
Gender				
Male	**44.67 (10.40)**	**33.47 (14.55)**	**28.12 (14.37)**	**35.44 (12.67)**
Female	37.00 (14.25)	30.57 (8.02)	34.00 (4.42)	34.13 (12.59)
Co-morbidity				
Present	**46.83 (13.99)**	35.40 (13.96)	29.13 (14.05)	**34.25 (12.39)**
Absent	41.64 (11.09)	26.42 (6.77)	29.16 (11.23)	35.63 (13.10)
Reason for Admission				
Medical	63.00 #	48.00 #	29.60 (13.32)	**41.58 (12.12)**
Scheduled surgery	-	28.46 (11.68)	16.00 #	27.30 (9.37)
Unscheduled surgery	42.0 (11.21)	**37.25 (12.65)**	-	33.27 (10.87)

Key: #=single cases

4.7.2 Comparison for SAPS II total score by Co-morbid illness

Multivariate comparisons between the ICUs in terms of the difference (2.37) in mean scores for SAPS II score for co-morbid illness yielded not statistically significantly ($p>0.05$) differences for co-morbid illness (refer **table 4.9**). In other words, in terms of absent co-morbid illness the mean scores were not statistically significantly higher (36.51) than the mean scores of present co-morbid illness (33.93), implying that there is no difference.

Table 4.9 Comparison of SAPS II by co-morbidity

Co-morbidity	SAPS II score
Present	33.93
Absent	36.51
Difference	2.37

(ANOVA F=0.309; Bartlett's test p=0.399; Bonferroni test p=0.309)

4.7.3 SAPS II Predicted Morality Risk

Section two of the data collection tool related to measurements of SAPS II scores (*Appendix A*). The predicted mortality risk was calculated electronically using the SAPS II (New Simplified Acute Physiology Score) calculator (accessed 2012.3.14: http:www.sfar.org/scores2/saps2.html). These predicted mortality risk scores were divided into four groups according to their matched predicted mortality risk scores. These categories were used according to a study by Miranda et al. (1996:67) as it guides in detecting different predicted mortality risk patterns for comparison of specific diagnostic groups of ICU patients

Of the total sample (n=134), the SAPS II predicted mortality risk was 20.30 %. Findings for predicted mortality risk indicated a higher number of patients was observed in the SAPS II score categories from 20 to 39 (n=71) and 40 to 59 (n=43) points predicted mortality risk was respectively 53.0% and 32.2%. This was compared to lower number of patients in the SAPS II score categories from 0 to 19 (n=15) and 60 to 80 (n=5) points for predicted mortality risk was 11.2% and 36.0% respectively. Findings are displayed in **figure 4.2**.

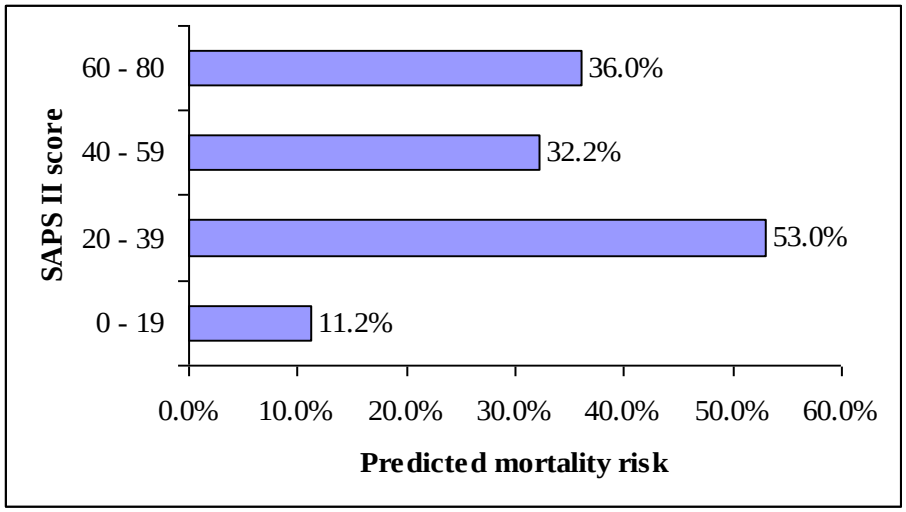


Figure 4.2 SAPS II Score predicted mortality risk for the total sample

4.7.4 Actual ICU Mortality Rate

The observed mortality rate for the ICU admission period of the total sample (n=134) was 20.0% (n=23). **Table 4.10** provides an overview of comparison of patient outcomes between the different ICUs.

Table 4.10 Comparison of patient outcomes between ICUs

	Trauma (n=28)	Cardiothoracic (n=22)	Coronary care (n=29)	General (n=55)
Patient Outcome (%)				
ICU survival	23 (82.14%)	18 (81.82%)	24 (82.75%)	42 (76.36%)
ICU non-survival	5 (17.86%)	4 (18.18%)	**5 (17.25%)**	**13 (23.64%)**

An analysis between ICUs indicated a slightly higher 23.64% (n=13) frequency responses in category of non-survival observed in the general ICU cases, as compared to a lower 17.25% (n=5) indicated in coronary care patient population group. Results are summarized in **table 4.10**.

4.7.5 Conclusions Derived from Severity of Illness

The following conclusions were drawn related to severity of illness of patients admitted to the ICUs:

- The severity of illness as determined by total mean SAPS II score for the sample (n=134) was 34.83 (SD 13.30), and range was 9 to 80 points.
- Trauma cases had the highest 42.75 (SD 11.69) SAPS II score, by contrast coronary care cases had the lowest 29.13 (SD 13.32) scores.
- A higher variation in SAPS II score was observed for patients with pre-existent co-morbid illness in three of the four sub-speciality ICUs, by contrast, the case mix in the general ICU had a higher SAPS II scores for absence of co-morbid illness
- SAPS II score predicted mortality risk was 20.3%, and the actual ICU mortality rate was 20.0% (n=27).

4.8 LEVEL OF PROVIDED CARE

Item 1.7 of the data collection tool related to level of provided care. The level of provided care of critically ill patients was determined by the TISS-28 score on admission (refer to **table 4.11**).

4.8.1 TISS-28 Score on Admission

Mean TISS-28 score on admission was 29.23 (SD 8.06) for the total sample (n=134), and ranged from 11 to 58 points. An analysis between the ICUs indicated cardiothoracic patients having a slightly higher 34.81 (SD 5.27) mean TISS-28 score, and followed by trauma and general patient population groups, respectively as 31.07 (SD 4.76) and 30.03 (SD 7.33), contrasted with lower 21.68 (SD 8.56) mean score in the coronary care patient group.

In order to characterize the sample of patients between the ICUs, further analysis of the data indicated that trauma cases had higher TISS-28 scores observed in the male population and an absence of co-morbid illness, respectively as 31.62 (SD 5.15) and 31.23 (SD 5.18) and similarly, the cardiothoracic group indicated higher scores for males 35.23

(SD 6.20), presence of co-morbid illness 35.33 (SD 6.24) and in addition, unscheduled surgery category 37.25 (SD 3.53). The general patient group indicated a higher score for males 30.28 (SD 7.48) and an absence of co-morbid illness 31.79 (SD 8.32) and unscheduled surgery 34.90 (SD 7.42). Single cases were not included in the analysis. Results are summarized in **table 4.11**.

Table 4.11 Comparison of TISS-28 Scores between the ICUs for age, gender, co-morbid illness and reason for admission

	Trauma (n=28)	Cardio-thoracic (n=22)	Coronary care (n=29)	General (n=55)
TISS-28 score				
on admission	31.07 (4.78)	34.81 (5.27)	21.68 (8.56)	30.03 (7.33)
Gender				
Male	**31.62 (5.15)**	**35.23 (6.20)**	21.58 (8.85)	**30.28 (7.48)**
Female	29.43 (3.21)	33.28 (1.98)	22.20 (7.98)	29.83 (7.33)
Co-morbidity				
Present	30.50 (3.21)	**35.33 (6.24)**	22.26 (8.89)	29.11 (6.70)
Absent	**31.23 (5.18)**	33.71 (2.14)	19.50 (7.50)	**31.79 (8.32)**
Reason for Admission				
Medical	34.00#	35.00#	21.32 (8.48)	29.50 (6.98)
Scheduled surgery	-	33.50 (5.92)	32.00#	28.00 (6.83)
Un-scheduled surgery	30.96 (4.84)	**37.25 (3.53)**	-	**34.90 (7.42)**

Key: #=single cases

4.8.2 Comparison for TISS-28 score by Co-morbid illness

Multivariate comparisons between the ICUs in terms of the difference (64.42) in mean scores for TISS-28 scores on admission for co-morbid illness yielded no statistically

significant difference (p>0.0381) for co-morbid illness. In other words, in terms of absent co-morbid illness the mean scores were not statistically significantly higher (30.46) than the mean scores of present co-morbid illness (28.38), implying that the patient groups between ICUs were similar in terms of this characteristic. Results are summarised in **table 4.12**.

Table 4.12: Comparison of TISS-28 on admission by co-morbidity

Co-morbidity	TISS-28 score
Present	28.38
Absent	30.46
Difference between units	138.87
Difference within units	64.42

(ANOVA p=0.144; Bartlett's test p=0.381; Bonferroni test p=0.144)

4.8.3 Total TISS-28 Scores: Per Patient Stay

Item 1.11 of the data collection tool related to level of provided care. The level of provided care of critically ill patients was determined by the Total TISS-28 score per patient stay (refer to **table 4.13**).

Table 4.13 Comparison of Total TISS-28 score per patient stay between ICUs

	Trauma (n=28)	Cardiothoracic (n=22)	Coronary care (n=29)	General (n=55)
Total TISS-28 score Range	23.0 to 697.0 (674.0)	20.0 to 605.0 (585.0)	11.0 to 39.3 (28.3)	**11 to 3009 (2998.0)**

Of the total sample (n=134), the daily follow up of patients yielded a total of 1066 TISS-28 score measurements for analysis. The mean cumulative **total TISS-28 score per patient stay** per ICU was 207.54 with a standard deviation of 360.34, and ranged from 11 to 3009

points. Analysis between the ICUs indicated that on average the range for total TISS-28 score was highest (2998.0) in the general patient population, when compared with a lower 28.3 score range in the coronary care patient group. Results of this process are summarised in **table 4.13**.

4.8.4 Mean TISS-28 Score per Patient per Day

Item 1.12 of the data collection tool related to level of provided care. The level of provided care of critically ill patients was determined by the Mean TISS-28 score per patient per day in ICU. Section three of the data collection tool related to serial measurements of TISS-28 scores (*Appendix A*).

Data were analysed to display the Mean TISS-28 score per patient per day. Findings indicated that the Mean TISS-28 score per patient per day was 26.94 (SD 7.52) for the total sample (n=134). Data were then explored to determine the evolution of Mean TISS-28 scores over number of days in ICU. Based on the analysis of 1066 TISS-28 data entries obtained from a sample of 134 patients during the ICU admission period. A box and whisper plot was used to handle the many data values. A pattern was noted in the Mean TISS-28 scores that reflected a visual display that indicated data were widespread and outliers (top and bottom) were observed. In particular, days of interest were day 2, days 5 to 8 that reflected gradual ups and downs and day 15 appeared pretty similar. Findings are displayed in **figure 4.3**.

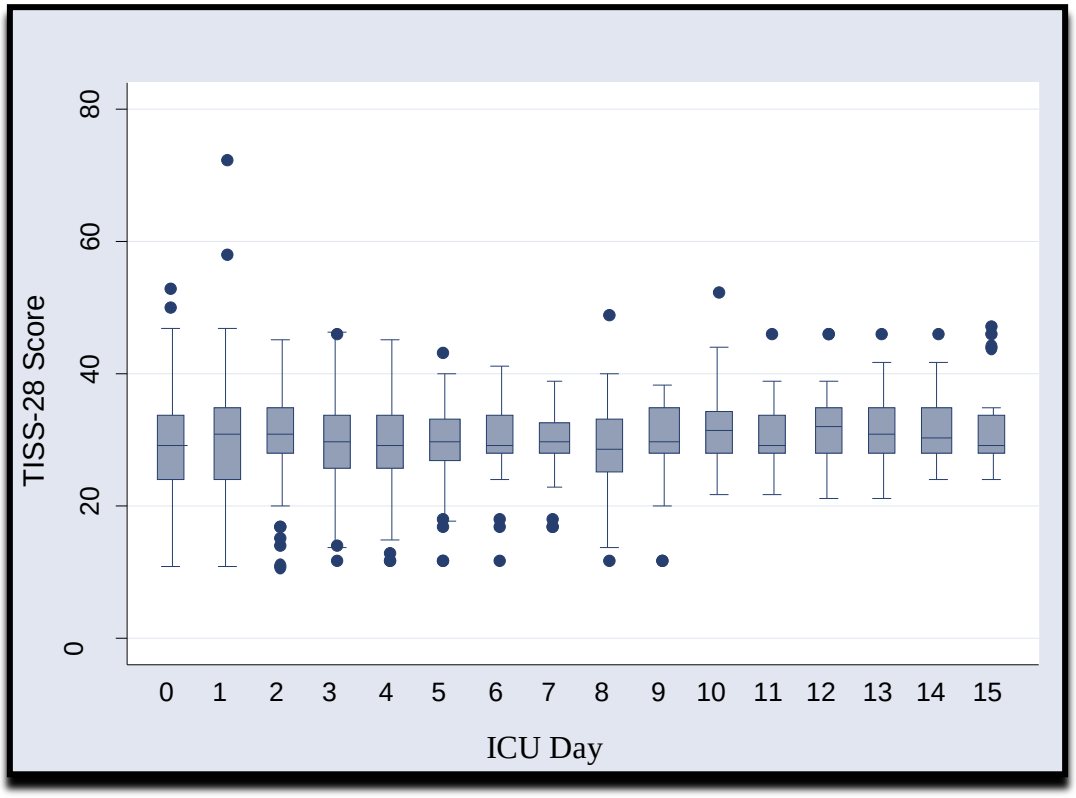


Figure 4.3 Summary of Mean TISS-28 scores by ICU days for the total sample (n=134)

4.8.5 Comparison of TISS-28 score by Reason for Admission

Table 4.14 Summary of TISS-28 score items by reason for admission for total sample (n=134)

TISS-28 item	Reason for Admission			Fisher's Exact Test p -value
	Medical (n=54)	Scheduled Surgery (n=34)	Unscheduled Surgery (n=46)	
Basic Activities				
Standard Monitoring	100.00%	100.00%	100.00%	-
Laboratory investigations	94.44%	100.00%	100.00%	0.117
Single medication	98.15%	100.00%	93.48%	0.299
Multiple medications	96.30%	100.00%	93.48%	0.368
Routine dressing changes	92.59%	97.06%	91.30%	0.623
Frequent dressing changes	1.85%	2.94%	6.52%	0.528
Care of Drains	3.70%	41.18%	56.52%	0.000*
Cardiovascular Support				
Single vasoactive medication	27.78%	38.24%	8.70%	0.004*
Multiple vasoactive medications	16.67%	20.59%	28.26%	0.371
Intravenous fluid replacement	7.41%	14.71%	32.61%	0.005*
Peripheral arterial catheter	57.41%	97.06%	97.83%	0.000*
LAP,PAC,CO monitoring	0.00%	0.00%	2.17%	0.597
Central venous line	59.26%	100.00%	100.00%	0.000*
Cardiopulmonary resuscitation	3.70%	-	-	0.340
Ventilatory Support				
Mechanical ventilation	38.89%	70.59%	97.83%	0.000*
Supplemental support	44.44%	29.41%	4.35%	0.000*
Care of artificial airways	40.74%	67.65%	91.30%	0.000*
Treatment of improving lung function	42.59%	73.53%	82.61%	0.000*
Renal Support				
Hemofiltration techniques	5.56%	5.88%	2.17%	0.660
Quantitative urine output	94.44%	97.03%	97.83%	0.849
Active diuresis	16.67%	17.65%	4.35%	0.087
Neurological Support				
Measurement of intracranial pressure	-	-	2.17%	0.597
Metabolic Support				
Treatment for complicated metabolic acidosis / alkalosis	11.11%	-	-	0.009*
Intravenous hyperalimentation	-	-	-	-
Enteral feeding	29.63%	11.76%	26.09%	0.143
Specific interventions				
Single interventions in the ICU	20.37%	5.88%	43.48%	0.000*
Multiple interventions in the ICU	3.70%	-	-	0.340
Specific interventions outside the ICU	25.93 %	8.82 %	13.04%	0.087

Key: *= statistical significance

Findings indicated that all ICU patients received standard monitoring (100.0%), and nearly all had single or multiple medication (>93.0%), routine dressing changes (>91.0%),

frequent urine monitoring (>94.0%), however only scheduled surgery and unscheduled surgery patients had frequent laboratory monitoring (100.0%), central venous line (100.0%) and greater requirements for ventilatory support (>70.5%). Whereas, medical patients had a greater need for specific interventions outside the ICU (25.03%) than scheduled surgery (8.82%) and unscheduled surgery (13.04%) patients. By contrast unscheduled surgery patients have a greater need for interventions in the ICU (43.48%) than medical (20.37%) and scheduled surgery (5.88%) patients. Requirements for care of artificial airways were higher (91.3%) for patients in unscheduled surgery categories, when compared with 67.65% and 40.74% in scheduled surgery and medical patients, respectively. Results are summarized in **table 4.14**.

Data were then analysed to determine whether the differences in the TISS-28 scores on admission were statistically significant by reason for admission. A Fisher's exact test was employed to proportionate the data by categories (medical, scheduled surgery and unscheduled surgery) in order to provide the test statistic. Findings indicated that of the 28 TISS-28 items, eleven items were statistically significant ($p<0.05$). Included in the TISS-28 categories were one item in the category of basic activities, four items in the category of cardiovascular support, five items in ventilatory support, one item in metabolic support and specific interventions categories, respectively. No significant differences were observed in the remaining TISS-28 categories (renal and neurological). Results are summarised in **table 4.14**.

4.8.6 Comparison for TISS-28 Score by Selected Therapeutic Categories

Data were further analysed to determine where the statistically significant difference might lie in the TISS-28 score therapeutic items by selected variables derived from TISS-28 category. Testing was done for co-morbid illness, ICU and reason for admission.

4.8.6.1 Co-morbid illness

Table 4.15 provides a summary of statistical tests for co-morbid illness on day 0 by selected TISS-28 categories (basic support, cardiovascular support, ventilatory support and special investigations).

Table 4.15 Summary of statistical tests for co-morbid illness on day 0 by selected TISS-28 categories (basic support, cardiovascular support, ventilatory support and special investigations)

TISS-28 Therapeutic intervention groups	**Co-morbid illness**						**Two sample t-test**
	Present			**Absent**			
	Mean	**SD**	**CI**	**Mean**	**SD**	**CI**	
Basic support	10.68	1.50	10.35-11.02	**11.05**	1.49	10.64 -11.46	0.166
Cardiovascular	8.36	4.90	7.26-9.45	**8.55**	4.02	7.26-7.45	0.811
Ventilatory	4.58	2.61	4.00-5.19	**6.07**	1.94	5.54-6.60	0.005*
Investigations	1.49	2.21	0.99-1.98	**1.94**	2.34	1.30-2.58	0.255

Key: * = statistical significance

Findings indicated that of the four selected TISS-28 categories, **only one was statistically significant (p=0.005; CI 5.5.54-6.60) different for co-morbid illness.** Results indicated for ventilatory support indicated that mean scores for absence of co-morbid illness was higher (6.07) than the score for presence of co-morbid illness (4.58), implying that absence of co-morbid illness for ventilatory support is statistically different from presence of co-morbid illness. Results of this process are summarized in **table 4.15**.

4.8.6.2 Intensive Care unit (ICU) and reason for admission

Table 4.16 Summary of TISS-28 items on day 0 basic items, cardiovascular, ventilatory support, and special investigations between ICUs and reason for admission

Variables	**TISS-28 items**			
	Basic items (1 to 7)	Cardiovascular (8 to 12)	Ventilatory (15 to 18)	Investigations (26 to 28)
Intensive Care units				
Trauma	11.071	9.071	6.678	1.500
Cardiothoracic	12.363	11.090	6.545	1.409
Coronary care	9.758	4.034	2.068	2.896
General	10.672	9.381	5.563	1.211
Difference between units	88.02	259.13	129.13	19.05
Difference within units	213.37	15.27	3.25	4.85
ANOVA test	F=0.000	F=0.000	F=0.000	F=0.000
Bartlett's test	**p=0.032***	p=0.159	**p=0.000***	p=0.186
Reason for admission				
Medical	9.925	6.259	3.666	2.092
Scheduled surgery	11.235	9.882	5.529	0.617
Unscheduled surgery	**11.608**	**9.934**	**6.717**	**1.956**
Difference between units	38.81	215.16	118.27	25.54
Difference within units	1.72	17.81	4.38	4.86
ANOVA test	F=0.000	F=0.000	F=0.000	F=0.006
Bartlett's test	**p=0.000***	p=0.351	**p=0.000***	**p=0.022***

Key: * = statistical significance

Multivariate comparisons between the ICUs in terms of the difference in mean scores for four selected TISS-28 categories (basic items, cardiovascular support, ventilatory support

and special investigations) **between the ICUs indicated that only two (basic items and ventilatory support) TISS-28 categories were statistically significantly different as p< 0.0032 and p<0.000, respectively**. In other words, in terms of the difference (80.02) between ICU patient population groups, there is a statistically significant difference in the mean scores for basic and ventilatory requirements between patient population groups, implying that these population groups are more likely to be different in terms of these characteristics. Results are summarised in **table 4.16**.

Multivariate comparisons for **reason for admission** in terms of the difference in mean scores for four selected TISS-28 categories (basic items, cardiovascular support, ventilatory support and special investigations) indicated that **only three (basic items, ventilatory support and special investigations) TISS-28 categories for reason for admission were statistically significantly different as p=0.000 and p=0.000, p=0.0022, respectively**. In other words, in terms of the difference between the mean scores for reason for admission, there is a statistically significant difference in the mean scores for basic items, ventilatory requirements and special investigations for reason for admission, implying that these population groups are more likely to be different in terms of these characteristics. Results are summarised in **table 4.16.**

Table 4.17 Summary of selected TISS-28 items on admission within the ICUs

Variables	Intensive Care Units					
	Trauma		Cardiothoracic		Coronary care	
	Mean	p-value	Mean	p-value	Mean	p-value
Basic activities						
Cardiothoracic	1.292	0.003*				
Coronary care	-1.312	0.001*	-2.605	0.000*		
General	-0.398	**1.000**	-1.690	0.014*	0.914	0.014*
Cardiovascular						
Cardiothoracic	2.019	0.432				
Coronary care	-5.036	0.000*	-7.056	0.000*		
General	0.310	**1.000**	-1.709	**0.512**	5.347	0.000*
Ventilatory						
Cardiothoracic	-0.244	**1.000**				
Coronary care	-4.609	0.000*	-4.385	0.000*		
General	-1.114	0.052*	-0.890	**0.314**	3.494	0.000*
Special Investigations						
Cardiothoracic	- 0.090	**1.000**				
Coronary care	1.396	**0.109**	1.487	**0.110**		
General	-0.281	**1.000**	-0.190	**1.000**	-1.678	**0.007**

Key: * = statistical significance (Bonferroni test)

Data were then analysed to determine whether the differences indicated by the Bartlett's test was statistically significant in selected TISS-28 categories. Findings yielded in terms of basic activities, the means scores are not equal in the groups of cardiothoracic and coronary care, implying that they are different. However, the mean scores were found to be equal in general and trauma patients, implying that these are similar. In the category of cardiovascular support, findings indicated that the mean scores are not equal within coronary care and trauma, general and cardiothoracic groups, implying that they are different. However, the mean scores were equal in trauma, general and cardiothoracic groups, implying that these are similar. In the category of ventilatory support, findings indicated the mean scores are not equal in cardiothoracic and general groups, implying that they are different. However, the mean scores are equal in trauma, cardiothoracic and

general groups. In the category of special investigations the mean scores are equal within all groups, implying that these are similar. Results of this process are summarised in **table 4.17**.

Table 4.18 Comparison of TISS-28 score by reason for admission

Variables	Reason for Admission			
	Medical		Scheduled Surgery	
	Mean	p-value	Mean	p-value
Basic activities				
Scheduled surgery	1.309	0.000*		
Unscheduled surgery	1.682	0.000*	0.000	0.629
Cardiovascular				
Scheduled surgery	3.623	0.000*		
Unscheduled surgery	3.675	0.000*	0.0524	1.000
Ventilatory support				
Scheduled surgery	1.862	0.000*		
Unscheduled surgery	3.050	0.000*	1.187	0.040
Special investigations				
Scheduled surgery	-1.474	0.008		
Unscheduled surgery	-0.136	1.000	1.338	0.025

Key: * = statistical significance (Bonferroni test)

Data were analysed to determine whether the difference indicated by the Bartlett's test was statistically significant in selected TISS-28 categories. In the category of basic activities, cardiovascular support and ventilatory support, the mean scores are not equal in the groups of scheduled and unscheduled surgery, implying that they are different. However, the mean scores are equal in medical and scheduled surgery implying that these are similar. Findings of this process are summarised in **table 4.18**.

4.8.7 Shift in TISS-28 Score from Admission to Discharge

Mean TISS-28 score on discharge was 25.09 (SD 8.17) for the total sample (n=134). This was observed as only differences of 4.14 points from the admission TISS-28 score 29.23 (SD 8.06) to the discharge TISS-28 score 25.09 (SD 8.17) (refer **table 4.19**). Analysis between ICUs, indicated that a greater shift (-7.31 points) was observed in the cardiothoracic cases, as compared with similar but smaller shifts from – 3.35 and – 3.54 points indicated in trauma and general case loads, respectively.

Table 4.19 Summary of the shift in TISS-28 Score from admission to discharge by TISS-28 score categories

Intensive Care unit	**TISS-28 score on admission**				**TISS-28 score on discharge**		
	n	Mean	SD	Range	Mean	SD	Range
Trauma	28	31.07	4.78	23 to 44	**-3.35**	4.99	-11 to 9
Cardiothoracic	22	34.81	5.27	26 to 47	**-7.31**	6.54	-23 to 9
Coronary care	29	21.68	8.56	13 to 50	-4.48	5.13	-18 to 9
General	55	30.03	7.33	11 to 53	-3.54	8.63	-23 to 18
Total sample	134	**29.23**	8.06	-	**25.09**	8.17	-

TISS-28 scores were divided into four groups according to their matched TISS-28 scores. These categories were used according to a study by Miranda et al. (1996:67) as it guides in detecting different time spending patterns by nurses during the care of ICU patient. Of the total sample (n=134), the majority of patient participants (63.4%; n=85) had from 20 to 35 TISS-28 score points on admission, followed by 20.9% (n=28) and 15.7% (n=21) between 35 to 60 and 0 to 20 points, respectively. Furthermore, the majority (64.9%; n=85) of patient participants had from 20 to 35 score points on discharge, followed by 24.6% (n=33) and 10.4% (n=10) between 0 to 20 and 35 to 60 points. Findings are displayed in **figure 4. 4**.

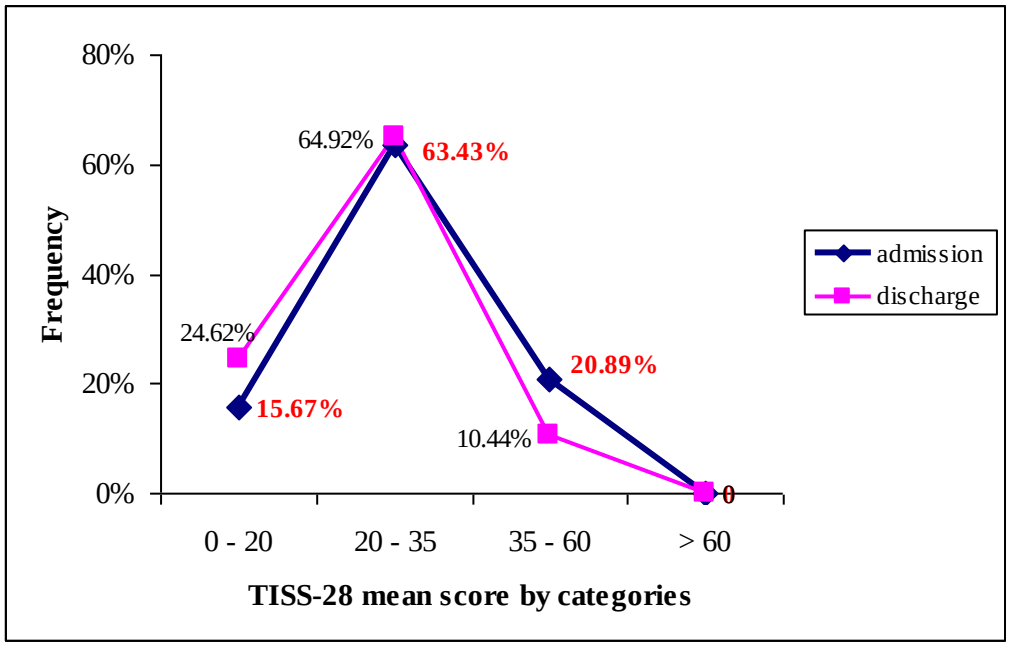


Figure 4.4 Distribution of the TISS-28 score from admission to discharge by categories

4.8.8 Conclusions Derived from TISS-28 Score

The following conclusions were drawn related to level of provided care of patients admitted to the ICUs:

- Of the total sample TISS-28 score on admission was 29.23 (SD 8.06) and ranged from 11 to 58 points
- Analysis between ICUs indicated a slightly higher 34.81 (SD 5.27) total TISS-28 score indicated in cardiothoracic cases, with contrast a slightly lower 21.68 (SD 8.56) total TISS-28 score was indicated in coronary care cases
- Total mean TISS-28 scores are correlated for gender, co-morbid illness and reason for admission in three (cardiothoracic, coronary care and general) of four ICUs, with contrast this is not so in trauma cases
- Fluctuations in TISS-28 scores by the number of days in ICU were noted as increased for day 2, days 5 to 8 and day 15. A similar trend was also observed in the spread of TISS-28 scores by days in ICU and outliers (top and bottom) were consistently noted in the data spread
- Of the total TISS-28 items, eleven items were statistically significantly ($p<0.001$) different by reason for admission. Included were basic activities (one item),

cardiovascular activities (four items), ventilatory support (five items) and metabolic support and specific investigations (one item), respectively.

- Co-morbid illness was statistically significant ($p<0.001$) for ventilatory support, implying that the mean scores between absence and presence of co-morbid illness were different.
- Intensive Care units were statistically significant ($p<0.001$) for ventilatory support, implying that the mean scores were not equal within the categories (cardiothoracic, trauma, coronary care and general) of the population groups.
- Reason for admission was statistically significant ($p<0.001$) for basic items, ventilatory support and special investigations, implying that the mean scores were not equal within the categories (medical, scheduled surgery and unscheduled surgery) of the population group.

4.9 LENGTH OF STAY

Item 1.9 of the data collection instrument related to length of ICU stay (refer to **table 4.20)**. The length of ICU stay of the critically ill patients was derived from differences between admission and discharge dates, items 1.4 and 1.8 of the data collection tool respectively.

Table 4.20 Comparison of length of stay between ICUs for gender, co-morbid illness and reason for admission

	Trauma (n=28)	Cardio-thoracic (n=22)	Coronary care (n=29)	General (n=55)
Length of stay				
Days	8.46 (7.95)	6.27 (5.56)	2.79 (3.86)	8.54 (17.01)
Gender				
Male	**9.28 (8.06)**	6.00 (5.26)	2.79 (4.01)	**12.56 (23.69)**
Female	6.00 (7.64)	**6.86 (6.57**)	2.80 (3.49)	5.20 (7.01)
Co-morbidity				
Present	5.67 (6.77)	**7.07 (5.15)**	**3.00 (4.23)**	7.88 (18.36)
Absent	**9.23 (8.22)**	4.57 (6.45)	2.00 (2.00)	**9.78 (14.49)**
Reason for Admission				
Medical	1.00 #	13.00 #	2.85 (3.92)	**11.58 (21.89)**
Scheduled surgery	-	**6.46 (6.39)**	1.00 #	4.25 (6.28)
Un-scheduled surgery	8.74 (7.97)	5.12 (3.83)	-	**9.72 (18.06)**

Key: # = single cases

The mean length of stay was 6.91 days (SD 11.99) for the total sample (n=134), the range was 107 days and varied from 1 to 108 days.

Analysis between the ICUs observed the general patient group having a slightly higher (8.54; SD 17.01) mean score for length of stay, and followed by trauma, cardiothoracic and coronary care patient populations as 8.46 (SD 7.95), 6.27 (SD 5.56) and 2.79 (SD 3.86), respectively. In order to characterise the sample between the ICUs, further analysis of the data revealed that trauma patients had higher scores for length of stay in the male population, with the presence of co-morbid illness and unscheduled surgery, indicated as 9.28 (SD 8.06), 9.23 (SD 8.22) and 8.74 (SD 7.97) respectively. Similarly, the general patients displayed the same pattern, where higher scores for the male distribution (12.56; SD 23.69), absence of co-morbid illness (9.78; SD 14.49) and unscheduled surgery (9.72; SD 18.06) were noted, and in addition, the medical category for reason for admission (11.58; SD 21.89), whereas cardiothoracic cases displayed opposite trends for higher scores in the female distribution and in addition, scheduled surgery, indicated as 6.86 (SD 6.57) and 6.46 (6.39), respectively. Whereas the coronary care patient group only displayed higher (3.00; SD 4.23) scores for presence of co-morbid illness. Single cases were not included in this analysis. Results of this process are summarized in **table 4.20**.

Length of stay was divided into four groups according to their matched scores. These categories were used according to current literature (Stricker, Rothen and Takala, 2003; Laupland, Kirkpatrick and Korbeek, 2006) as they guide in detecting different length of stay patterns of the ICU patients in relation to severity of illness. Of the total sample (n=134), the majority 71.6% (n=96) frequency responses indicated for length of stay was in the < 7 days category, contrasting with only 6.0% (n=8) in the category > 3 weeks. Findings are displayed in **figure 4.5.**

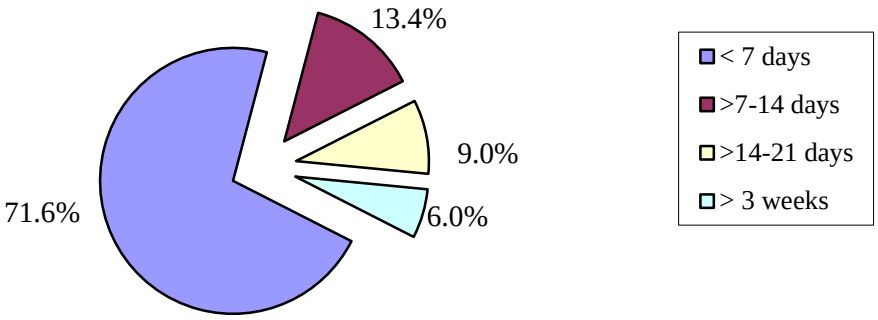


Figure 4.5 Length of stay by category for the total sample (n=134)

4.9.1 Conclusions Drawn for Length of Stay

The following conclusions related to length of stay of patients admitted to the ICUs were drawn:

- Mean length of stay was 6.91 (SD 11.99) and range was 1 to 108 days for the total sample (n=134)
- Analysis between ICUs indicated a slightly higher (8.54 and 8.46) length of stay indicated in trauma and general patient groups. By contrast, a shorter 2.79 length of stay days was noted in the coronary care cases
- Majority (71.6%) of all cases admission period to ICUs length of stay was less than 7 days, which is considered as a short stay category. By contrast, only 6.0% of patients had a prolonged (>3 weeks) length of stay, implying that there is predominance for rapid turnover of patients in these ICUs
- Length of stay is positively correlated by case mix characteristics for gender, co-morbid illness and reason for admission.

4.10 PATIENT OUTCOME

Item 1.10 of the data collection related to outcomes. The outcomes of the critically ill patient were grouped into categories of survival and non-survival for analysis (refer **table 4.21**). These categories are universally included for assessments of patient outcome in critical illness (Bersten and Soni, 2003:12; Moreno and Matos, 2000:159).

Data were analysed to determine whether the difference in patient outcomes by SAPS II score were statistically significant. Mean scores, p-values and confidence intervals were calculated by using a two sample t-test. Findings indicated that there is no statistically significant difference for SAPS II score between non-survival and survival (p=0.073; CI -0.41 – 9.11). In other words, non-survivors (11.42) do not have a statistically significantly higher mean SAPS II score than survivors (7.08), implying that in terms of outcome these population groups are more likely to be similar. Results of this process are summarized in **table 4.21**

Table 4.21 Summary of statistics for SAPS II score by patient outcome categories (non-survival and survival)

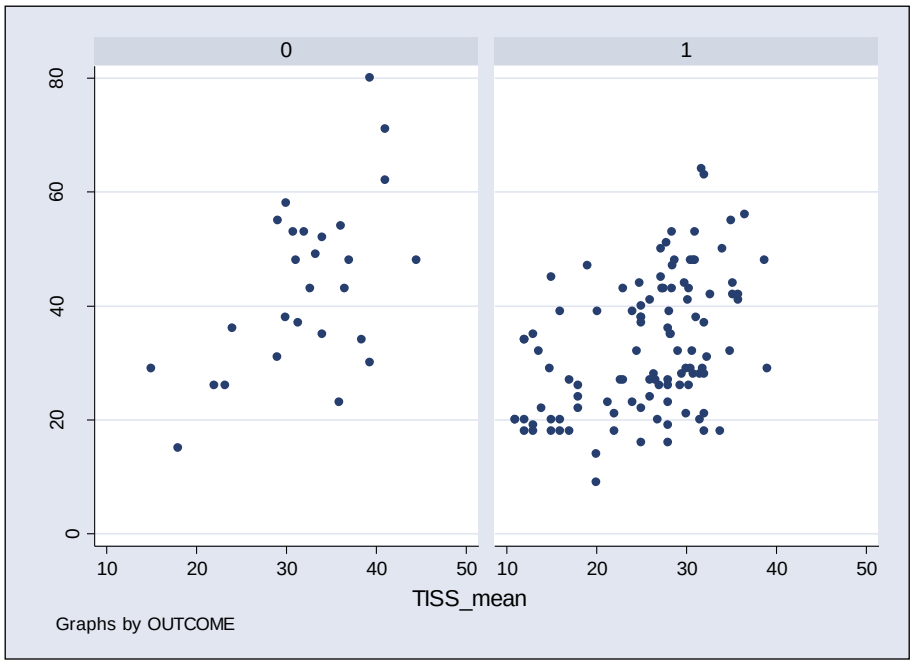
Patient Outcome	**SAPS II score**			
	n (a)	**Mean**	**SD**	**95% CI**
Non-survival (0)	27	**11.42**	12.50	6.48 – 16.37
Survival (1)	107	7.08	10.82	5.00 – 9.15
Combined	134	7.95	11.27	6.03 – 9.88
Difference		**4.34**	2.40	- 0.41 – 9.11

(two sample t-test; p=0.073)

4.10.1 Relationships between SAPS II score and TISS-28 score

Further exploration of the data was undertaken by using pooled results of the total mean SAPS II score and TISS-28 score measurements obtained on admission of patients to the ICUs. In this process a scatter-plot was used to reveal a relationship between these two variables. Such relationships manifest themselves by any non-random structure in the plot.

Findings indicated that both scatter plots resemble an increase in SAPS II score with increasing TISS-28 mean scores. Statistically, a regression plot can be fitted to quantify this increase and also a regression line showing the increase in SAPS II for even unit increase in TISS-28 values which also gives p-values for that relationship. SAPS II and TISS-28 were statistically significantly correlated (r=0.46; p=0.000), implying that patients with high SAPS II scores tend to have higher TISS-28 scores. Findings are displayed in **figure 4.6.**



Key= 0=non-survival; 1=survival

Figure 4.6 Comparison SAPS II score and TISS-28 on admission between survivors and non-survivors

4.10.1.1 Relationships for SAPS II score items

When determining the difference for mean total outcome scores between survivors and non-survivors, total SAPS II scores were used and a Fishers Exact Test was employed to proportionate the differences in the mean scores between the study groups. **Table 4.22** provides an overview of the results.

Table 4.22 Comparison of SAPS II score items between survivors and non-survivors

SAPS II item		ICU Survivors (n=107)	ICU Non Survivors (n=27)	Difference in Mean scores	Fisher's exact test p- value
Q1	Age in years	5.85 (5.98)	7.63 (6.38)	1.779	0.175
Q2	Systolic blood pressure	1.87 (2.48)	1.81 (2.11)	0.196	0.902
Q3	Heart rate b/min	2.45 (3.02)	3.33 (2.40)	0.875	0.165
Q4	Temperature	0.667 (0.48)	0.81 (0.38)	0.152	0.136
Q5	Ventilation PaO_2 / FiO_2 ratio	4.57 (3.77)	7.33 (3.59)	2.763	0.001 *
Q6	Urine Output	0.99 (2.71)	1.55 (3.14)	0.565	0.351
Q7	Serum urea	0.87 (2.11)	3.11 (3.73)	2.233	0.006 *
Q8	White Blood Cell Count	0.50 (2.08)	0.66 (1.27)	0.162	0.611
Q9	Serum Potassium	0.80 (0.39)	0.77 (0.42)	0.031	0.744
Q10	Serum Sodium	0.15 (0.66)	0.18 (0.96)	0.026	0.894
Q11	Serum Bicarbonate	0.81 (1.91)	1.22 (2.08)	0.409	0.331
Q12	Serum Bilirubin	2.21 (3.82)	2.96 (4.12)	0.748	0.373
Q13	Glasgow Coma Scale	5.45 (9.65)	6.44 (10.36)	0.996	0.638
Q14	Chronic Disease	0.88 (3.71)	0.63 (3.27)	0.258	0.742
Q15	Type of admission	4.93 (3.27)	5.48 (2.80)	0.547	0.427

Key = * statistically significant

Findings indicated for this study, of the fifteen SAPS II score items for patient outcome, only two items (13.33%) were statistically significantly ($p<0.05$) different. Included were ventilation PaO_2 / FiO_2 ratio (item Q5) and serum urea (item Q7). In other words in terms of these items, survivors and non survivors are not likely to have the same SAPS II scores. No significant differences were observed in the remaining SAPS II score items. It can be extrapolated from these findings that inadequacy of ventilation oxygenation and impairment of renal function indicated poor patient outcomes. Results of this process are summarised in **table 4.22.**

4.10.1.2 Relationships for SAPS II score sub-items

Data were then analysed to determine where the difference might lie in the total mean SAPS II scores between survivor and non-survivor population groups. The approach was like the latter, however this time the Fishers Exact test was employed to proportionate significance for total mean SAPS II scores by sub-items.

Table 4.23 Comparison of SAPS II score sub-item scores on admission

SAPS II item			Outcome		Fisher's Exact test p-value
			Non-survivors (n=27)	Survivors (n=107)	
Q5	PaO_2 / FiO_2 ratio	0	14.81%	37.38%	0.001 *
		6	25.93%	37.38%	
		9	37.04%	22.43%	
		11	22.22%	2.80%	
Q7	Serum Urea	0	55.56%	85.05%	0.000 *
		6	33.33%	14.95%	
		10	11.11%	-	
Q8	WBC count	0	77.78%	91.59%	0.033 *
		3	22.22%	5.61%	
		12	-	2.80%	

Key: *=statistical significance

Findings indicated that of the 15 SAPS II items, only three variables were statistically significantly ($p<0.05$) different at the sub-level item scores. Included were ventilation PaO_2 / FiO_2 ratio (item Q5), serum urea (item Q7) and white blood cell count (item Q8). In other words these sub-items reflected a pattern of opposite higher and lower scores at sub-item level between non-survival and survival population groups, respectively. Results of this process are summarized in **table 4.23**

4.10.2 Conclusions Derived from Patient Outcome

The following conclusions were drawn related to outcomes of patients admitted to the ICUs:

- SAPS II and TISS-28 scores on admission are positively correlated in survivors and non-survivors, however no statistical significant difference ($p=0.073$) in the mean scores for co-morbid illness was shown between population groups
- Of the total 15 SAPS II items, two items were statistically significant ($p<0.001$). These included PaO_2 /FiO_2 ratio (item Q5) and serum urea (item Q7)
- Of the total 15 SAPS II items, three sub-item scores were statistically significant ($p<0.001$). These included opposite higher and lower sub-item scores in PaO2 / FiO_2 ratio (item Q5), serum urea (item Q7) and white cell count (item Q8).

4.11 DISCUSSION OF FINDINGS

The purpose of this part of the study was to explore and describe the clinical profile of patients admitted to the Intensive Care units at a university-affiliated, public sector and tertiary level hospital in the Gauteng province in South Africa.

In this study, the mean age of patients was 48.2 years (SD 17.72), the ranges for age were from 20 to 82 years. However, analysis between ICUs indicated opposite higher and lower frequencies in the 20 to 44 and 45 to 65 age categories, implying that the majority of patients admitted to the trauma and general ICUs were younger as compared to an older population in the coronary care ICU. Whereas patients in the cardio-thoracic ICU had a higher older population in the 65 to 82-age category, both coronary care and cardio-thoracic ICUs had over 70 % of all patients between the ages of 45 to 82 years. In this study, findings indicated a **younger age distribution** than similar studies in Europe and

the USA, where Iapichino, Gattioni, Radrizzani, Simini, Bertolini, Feria, Mistraletti, Porta and Miranda (2004) and Zimmerman, Kramer, McNair and Malila (2006) indicated the mean age of their sample was 59.1 and 61.7 years respectively. However, a younger age distribution is **within keeping of similar studies in developing countries** such as Tunisia and Saudi Arabia, where Nouira, Belghith, Elastrous, Jaafoura, Ellouzi, Boujdaria, Gahbiche, Bouchoucha and Abroug (1998) and Arabi, Venkatesh, Haddad, Goraj, Al-Shimemen and Al-Malik (2001) reported the mean age of their sample was 45.8 to 48.3 years and 49.1 years respectively.

Related to gender distribution, males accounted for 64.4% (n=85) and females 36.6% (n=49) of the total sample (n=134), and ratio of male to female patients was 1.73:1. However, analysis between ICUs indicated a higher male to female ratio in three (trauma, cardio-thoracic and coronary care) ICUs, which was 3:1, 2.1:1 and 4.8:1 respectively, whereas lower (0.8:1) male to female ratio was indicated in the general ICU. In this study, gender distribution **trends are consistent** with similar studies conducted overseas (Saudi Arabia, Germany and Scotland), which was respectively 62.4% (Arabi et al. 2001), 56.9% (Markgraf, Deutschinoff, Pientka and Scholten, 2000) and 56.8% (Livingston, Mackirdy, Howie, Jones and Norrie, 2000). However, findings in this study indicated a **higher female distribution in the general ICU** than one study in Tunisia, where Nouira et al. (1998) reported males accounted for 55.9% in one ICU in their study, implying females accounted for 44.1%. **No other studies to-date was found** that indicated a higher female to male ratio in the ICUs.

Related to reason for admission, a higher 59.7% (n=80) percentage of patients was admitted for surgery and 40.3% (n=54) were medical cases. Of all surgical patients, unscheduled surgery was higher (34.3%; n=46) than scheduled surgery, which was 25.4% (n=34). In this study, reason for admission distribution for **surgery and medical categories was similar** to studies conducted overseas where Capuzzo, Valpondi, Sgarbi, Bortolazzi, Pavoni, Gilli, Candini, Gritti and Alvisi (2000) indicated a **higher surgery than medical (81.3% v 18.7%) relationship** in an Italian study, conversely Zimmerman et al. (2006) reported a higher medical than surgery (69.4% v 30.6%) relationship in a multi-centre study in the USA. In this study, the reason for admission in **unscheduled surgery was higher** than similar studies conducted in the USA**,** where Rosenberg, Zimmerman, Alzola, Draper and Knaus (2000) reported in a multi-centre study 6.5% of

patients were admitted for unscheduled surgery, **whereas lower than a study conducted in Tunisia** where Nouira et al. (1998) indicated 63.0% of patients in their study. In this study, the reason for admission in the **scheduled surgery category was lower** than similar studies conducted in Italy and Tunisia where Capuzzo et al. (2000) and Nouira et al. (1998) respectively reported 54.5% and 1.7% to 11.0% in their studies, whereas lower than similar studies conducted in the USA and Scotland where Rosenberg et al. (2000) and Livingston et al. (2000) reported 23.7% and 21.3% respectively.

Related to co-morbid illness, the majority (59.7%; n=80) patients for the total sample (n=134), were positive for pre-existent co-morbid illness, and thirty six (45.0%) presented with two, three and four co-morbid conditions as compared to forty-four (53.5%) who had one co-morbid condition. Further, the majority (44.1%; n=19) of single co-morbid illness were verified as hypertension. Findings in this study related to presence of co-morbid illness are **consistent with trends of similar studies** conducted overseas (Europe and Saudi Arabia), where Muehler, Oishi, Specht, Rissner, Reinhart and Sakr (2010) reported the incidence of chronic illness in their study, particularly for hypertension as 46.7%, while Arabi et al. (2001) reported 32.0% of their sample had one or more chronic illness, **this was lower than an Australian study** where Williams, Ho, Finn, Knuiman and Webb (2010) indicated co-morbidities of 18.6% in their Australian study. However, the finding for this study that **hypertension (44.1%; n=19) was the single most frequent co-morbid illness was lower than** the study by Muehler et al. (2010), and **similar to one South African study** (Hanekom, Coetzee and Faure, 2006) conducted in the Western Cape that reported hypertension as the most frequent co-morbid illness found in their sample (42.0%) and 21.0% of patients were positive for HIV.

Related to severity of illness, the mean SAPS II score was 34.83 (SD 13.30) points for patients admission to ICU, and the range was 71 points for the total sample (n=134). Of the total sample (n=134), trauma patients had a higher (42.75; SD 11.69) total mean SAPS II score and followed by a lower 34.72 (SD 12.53), 32.54 (SD 12.70) and 29.13 (SD 13.32) indicated in the general, cardiothoracic and coronary care patient groups, respectively. Further, the SAPS II score predicted mortality rate was 20.03% for the total sample (n=134), and actual ICU mortality rate was (20.0%; n=23), implying that predictions made by the SAPS II scores for the total sample (n=134) were accurate. Findings in this study related to the SAPS II scores are **consistent with trends of similar studies** conducted

overseas (Europe and Asia). However, findings in this study indicated **slightly higher** (34.83; SD 13.30) total mean SAPS II distribution than similar overseas studies, where Katsaragakis, Papadimitripoulos, Antonakis, Stregiopoulos, Konstadoulakis and Androulakis (2000) and Metnitz, Vesely, Valentin, Popow, Hiesmayr, Krenn and Stelzer (1999) reported a total mean SAPS II score of 25.7 and 33.1, respectively in their study samples. Findings in this study **are lower than one similar study** conducted in China**,** where Kwok, Chen Chau, Le Low and Thompson (2005) reported a total mean SAPS II score of 41.5 and a standard deviation of 21.3. In this study, the finding that the total mean SAPS II score **was higher (42.75; SD 11.69) in the trauma patient group**, was higher than one similar study conducted overseas, whereby Nogueira, Cardosa De Sousa and Domingues (2009) reported a total mean SAPS II score of 34.20 (SD 17.52) in their sample.

Related to level of provided care, the mean TISS-28 score was 29.23 (SD 8.06) points on admission to ICU, and ranged from 11 to 58 points for the total sample (n=134). Of the total mean TISS-28 scores, cardiothoracic patients had a higher TISS-28 score (34.81; SD 5.27), as compared with trauma and general patients, respectively 31.07 (SD 4.76) and 30.03 (SD 7.33), as compared to a lower 21.68 (SD 8.56) in coronary care patient groups. However, based on a total of 1066 TISS-28 measurements, the mean cumulative TISS-28 score per patient stay per ICU was 207.54 (SD 360.34), and the mean total TISS-28 score per patient day was 26.94 (SD 7.52). A pattern was noted on display of total TISS-28 scores that reflected gradual ups and downs on day 2, day 5, day 8 and day 15. All patients received standard monitoring (100.0%) and nearly all had single or multiple medication (>93.0%), routine dressing changes (>91.0%) and frequent monitoring (>94.0%). Of the 28 TISS-28 items **eleven** items were statistically significant ($p<0.05$), included were **one** item in the category of basic activities, **four** items in the category of cardiovascular support**, five** items in ventilatory support and **one** item in specific interventions. Of the four selected variables, co-morbid illness yielded statistical significance ($p=0.005$; CI 5.54 – 6.60) for ventilatory support. Similarly, of the four selected variables, the differences between ICUs indicated statistical significance ($p<0.05$) for basic items and ventilatory support, respectively as $p<0.032$ and $p<0.001$, whereas reason for admission showed statistical significance ($p<0.05$) for three (basic items, ventilatory support and special investigations). In this study, the mean TISS-28 score distribution **trends are consistent with similar studies** conducted overseas e.g. Muehler et al. (2010) and Kwok et al. (2005).

Findings related to level of provided care for this study are **slightly lower than one study conducted in Germany,** where Muehler et al. (2010) reported the mean TISS-28 score of their sample was observed as highest (SD 47.7) in patients who underwent cardiothoracic surgery. Findings for this study are slightly higher than one study conducted in Brazil (Padilha, Cardoso Sousa, Kimura, Monteiro da Cruz, Vattimo, Fusco, de Campos, Mendes and Mayor, 2007), where the authors reported the mean TISS-28 score of 23 and range of 14 to 32 points, similarly Kwok et al. (2005) reported in their study the mean TISS-28 score was 28.4 points and ranged from 14 to 48. Findings for this study are **similar for mean TISS-28 score per patient per day** than one European study, where Metnitz et al. (1999) reported a total mean score per patient per day was 30.6 points (range 24.3 to 38.7) in their sample. The finding in this study, that the **TISS-28 score gradually moved up and down is supported in part** by the Muelher et al. (2010) study, whereby the authors reported a gradual increase in TISS-28 score in trauma and gastrointestinal patients, and opposite trend was noted, where both TISS-28 scores declined after two weeks of admission in cardiothoracic and neurosurgical patients.

Related to length of stay, the mean length of stay for the total sample (n=134) was 6.91 (SD 11.99), and ranged from 1 to 108 days. Further, the majority 71.6% (n=96) frequency responses indicated length of stay was in the < 7 days category, by contrast, only 6.0% (n=8) were in the category > 3 weeks. Findings in this study are **consistent with distribution trends in similar studies conducted overseas**, (Saudi Arabia and Brazil), where Arabi et al. (2001) and Padilha et al. (2007) reported the mean length of stay for their samples as 6.58 and 7.7 days, respectively. However, **the findings for length of stay for this study are longer than similar studies conducted in Europe and the USA,** where Seferian and Afessa (2006) reported the mean length of stay in their study as 2.9 days. Similarly Sakr, Marques, Mortsch, Gonsalves, Hekmat, Kabisch, Kohl and Reinhart (2010) observed the median range for length of stay as 1 to 3 days in their sample.

Related to patient outcomes for the difference between survivor and non-survivor population groups; the correlation between SAPS II and TISS-28 scores were statistically significant ($r=0.46$; $p=0.000$). Of the total SAPS II score items, only two were statistically significantly ($p<0.05$) different. Included were ventilation PaO_2/FiO_2 ratio and serum urea, respectively item Q5 and Q7. Of the 15 SAPS II items, only three scores were statistically significantly ($p<0.05$) different at the sub-level item scores. Included were ventilation

PaO_2 /FiO_2 ratio (item 1.5), serum urea (item 7) and white blood cell count (item 8). These sub-items reflected a pattern of opposite higher and lower scores at sub-item level between non survival and survival population groups, respectively. Findings in this study are **consistent with the distribution trends in similar studies** conducted overseas (Europe and China), where Kwok et al. (2005) and Metnitz et al. (1999) reported that the correlation between TISS-28 and SAPS II demonstrated a significant and positive result. The findings for this study that **SAPS II score and TISS-28 score were statistically correlated (r=0.46' p=0.000) is consistent with the findings of one study** by Muehler et al. (2010). However, **the finding for this study that there was no statistical significance in the mean SAPS II score for co-morbid illness is contrary** to the finding of one study (Estenssoro, Reina, Canales, Saenz, Gonzalez, Aprea, Gola and Dubin, 2006) that reported higher APACHE II (21 vs. 18) for non-survivors than survivors in their sample.

Of the total sample (n=134) a slightly higher (41.04%; n=55) percentage of patients were admitted to the general ICUs, followed by 21.04% (n=29), 20.30% (n=28) and 16.42% (n=22) indicated in coronary care, trauma and cardiothoracic ICUs, respectively.

4.12 CONCLUSIONS FOR THE NEEDS OF PATIENTS

Conclusions for the results regarding the health needs of patients admitted to the ICUs drawn from the clinical profile:

- The mean age of patients was 48.2 years (SD 17.72), the range of ages were from 20 to 82 years. Related to age distribution, the majority (>50%) of patients admitted to the trauma and general ICUs were younger (20 to 44 years) as compared to over two thirds (>70.0%) of older patients (45 to 65 years) in the coronary care and cardiothoracic unit.

- Males accounted for 64.4% (n=85) and females 36.6% (n=49) of the total sample. Related to gender distribution, findings indictated a higher male to female ratio in three ICUs, which were 3:1, 2.1:1 and 4.8:1 respectively, whereas lower (0.8:1) male to female ratio was indicated in the general ICU.

- Related to reason for ICU admission, a higher (59.7%; n=80) percentage of patients were admitted for surgery and 40.3% (n=54) were medical cases. Of all surgical patients unscheduled surgery was higher 34.3% (n=46) than scheduled surgery, which was 25.4% (n=34).

- The majority (59.7%; n=80) patients of the total sample were positive for pre-existent co-morbid illness, and thirty six (45.0%) presented with two, three and four co-morbid conditions as compared to forty four (53.5%) with one co-morbid condition. Further, a close majority 44.1% (n=19) of single co-morbid illness were verified as hypertension.

- Related to severity of illness, the SAPS II score was 34.83 (SD 13.30) points for patient admission, and the range was 71 points for the total sample. Trauma patients had a higher 42.75 (SD 11.69) total mean SAPS II score and followed by a lower 34.72 (SD 12.53), 32.54 (SD 12.70) and 29.13 (SD 13.32) indicated in the general, cardiothoracic and coronary care patient groups, respectively.

- The predicted SAPS II mortality rate was 20.03% for the total sample (n=134), and actual mortality rate was 20.0% (n=23), implying that predictions made by the SAPS II score for the total sample were accurate.

- Related to level of provided care, the mean TISS-28 score was 29.23 (SD 8.06) points on admission to ICU, and ranged from 11 to 58 points for the total sample (n=134). Of the total mean TISS-28 scores, cardiothoracic patients had a higher TISS-28 score (34.81; SD 5.27), as compared with trauma and general patients, respectively 31.07 (SD 4.76) and 30.03 (SD 7.33). Of the 28 TISS-28 items eleven items were statistically significant ($p<0.05$), included were one item in the category of basic activities, four items in the category of cardiovascular support, five items in ventilatory support and one item in specific interventions.

- Of the four selected variables, co-morbid illness yielded statistical significance ($p=0.005$; CI 5.54 – 6.60) for ventilatory support. Similary of the four items, the difference between ICUs indicated statistical signifiance ($p<0.05$) for basic items

and ventilatory support, respectively as $p<0.032$ and $p<0.001$, whereas reason for admission showed statisical significance ($p<0.05$) for three (basic items, ventilatory support and special investigations).

- The mean length of stay for the total sample was 6.91 (SD 11.99), and ranged from 1 to 108 days. Further, the majority (71.06; n=96) frequency responses indicated length of stay was in the < 7 days category, by contrast, only 6.0% (n=8) were in the category > 3 weeks.

- Related to patient outcomes for the difference between survivor and non-survivor population groups, the correlation between SAPS II and TISS-28 scores were statistically significant (r=0.46; p=0.000). Of the 15 SAPS II score items, only two were statistically significantly ($p<0.05$) different. Included were ventilation PaO_2/FiO_2 ratio and serum urea, by contrast, only three scores were statistically signifiantly ($p<0.05$) different at the sub-item scores. Included were ventilation PaO_2/FiO_2 ratio, serum urea and white blood cell count. These sub-items reflected a pattern of opposite higher and lower scores at sub-item level between non survival and survival population groups, respectively.

4.13 SUMMARY

The conclusions derived in chapter four were used as evidence together with the opinions of professional nurses in the ICUs on the competencies required by Intensive Care nurses (refer chapter five) for the development of a preliminary set of competencies based on data obtained. Findings and discussion pertaining to Step 2 of the research design and research method are provided in the next chapter.

CHAPTER FIVE

FINDINGS AND DISCUSSION: INDIVIDUAL INTERVIEWS AND LITERATURE CONTROL

5.1 INTRODUCTION

This chapter discusses the competencies required of Intensive Care nurses, according to professional nurses in the field, with the intention of using the findings as evidence for the development of competency standards. This was achieved through an exploration, descriptive, contextual and qualitative design using individual interviews (n=8). The study population included Intensive Care nurses (N=61) working in the ICUs. Themes and sub-themes are presented, discussed and integrated with literature. The discussion of themes and sub-themes is substantiated by verbatim quotes from transcripts and field notes. Reference to existing literature is made throughout the discussion to substantiate the research findings within the context of the body of scientific knowledge. Tesch's (1990, in Cresswell, 2009:185-190) method of qualitative data analysis was followed as described in chapter three in order to develop a sense of the whole.

5.2 DESCRIPTION OF SAMPLE

A purposive sample of eight Intensive Care nurses (n=8) participated in the interviews, representing Intensive Care nurses in full time employment at the selected institution as described in chapter three.

Criteria for selection were summarized as follows:

- Registered holder of an additional qualification in Intensive Care nursing or equivalent medical surgical nursing in the sub-category of critical care;
- More than *10 years* of clinical nursing practice; and
- Working in full time employment in the ICUs.

These Intensive Care nurses had vast clinical experience (average 19.3 years). All had functioned as mentors in clinical practice; four held more than one additional qualification

in specialisation practice; three held higher degrees and two held formal teaching positions. All the interviews were conducted in English; however, for all but two of the nurses interviewed, English was not their first language. All the nurses interviewed were female.

5.3 DATA COLLECTION AND ANALYSIS

The interviews were conducted in a private room in close proximity to the respective ICU. A notice stating that an interview was in session was placed outside the door to minimize noise, which could distract them from the interviews and influence the interview data. Privacy was thus ensured. The following question was used to direct the interview:

> *Based on your expertise and experience, which competencies do you believe to be most essential for Intensive Care nurses to acquire for the provision of effective care of critically ill patients in your ICU?*

After the central question was asked participants were allowed to reflect on their thoughts before they were ready to proceed. An informal conversational style was maintained throughout the interview. An attentive listening skill was enhanced by maintaining eye contact and the taking of notes. Strategies used to encourage participation included non-verbal techniques, such as head nods and eye contact, and use of verbal responses, such as *'yes'* and *'uh-huh'* and paraphrasing a statement or repetition using a synonym. Probes such as, *'what'* or *'tell me more'* were used to obtain clarity. Reflection was used to enhance reliability of the data by asking, *'do I understand you correctly'*. Summarizing the most important points was done at the end of the interview. Participants were given the opportunity for final comments. The interviews lasted between one to one- and a half hours. A relaxed atmosphere was maintained as refreshments were taken into the room.

Individual interviews were audio taped and transcribed verbatim. Data analysis followed the method described by Tesch (1990, in Creswell, 2009:185-190). Themes and sub-themes were identified as described in chapter three. Initial data analysis happened simultaneously during the interviews. Participants emphasized the competencies required of Intensive Care nurses through detailed explanations of clinical practice and also highlighted some difficulties experienced in the practice setting. The findings of the individual interviews with Intensive Care nurses are detailed in the thematic discussions.

5.4 DISCUSSION OF THEMES EMERGING FROM INTERVIEWS

Transcription data were analysed in adherence with the method proposed by Tesch (1990 in Creswell, 2009:185-190), resulting initially in five broad themes and twenty-six sub-themes.

"Putting it all together" emerged in the data of the interviews with individual Intensive Care nurses as the essential competency that Intensive Care nurses required for the provision of effective care for critically ill patients in the ICUs. *"Putting it all together"* was described as holistic and integrated nursing care, comprising four themes and twelve sub-themes (**Table 5.1**).

Each of these themes is discussed along with the associated sub-themes. Quotes from the interviews are used to illustrate the findings, but are also intended to allow the reader to arbitrate for themselves something of the nature of the responses which form the data and to evaluate the credibility of the findings and conclusions of the study.

Exemplars from transcripts are individually cited. The researcher elected to include excerpts which had been verified by at least three (3) participants and in, doing so, selected one statement which best illustrated the point under discussion.

When quotes are given, they are followed by the codes N, these letters indicate the remark made by the Intensive Care nurse (N) in the individual interviews. The number following the letter indicates the code number of the participant for example N8 means the eighth Intensive Care nurse interviewed gave that particular statement.

Table 5.1 provides an overview of the themes and sub-themes from the interviews with individual Intensive Care nurses.

Table 5.1: Themes and sub-themes from the data with individual nurse participants

THEME	**SUB-THEME**
5.4.1 Foundational care practices	5.4.1.1 Experience in use of technology
	5.4.1.2 Highly skilled in basic nursing care
	5.4.1.3 Following protocol, use of evidence-based practice
	5.4.1.4 Guided by the scope of practice
5.4.2 Critical thinking in decision making	5.4.2.1 Knowledge of the discipline
	5.4.2.2 Self-knowledge is essential in safe practice
5.4.3 Emotional competencies	5.4.3.1 Collegial relationship with the doctor
	5.4.3.2 Open team communication
	5.4.3.3 Offering support for nursing team
	5.4.3.4 Offering support for family of ICU patient
5.4.4 Transcending obstacles to growth and development	5.4.5.1 Obstacles to growth and development
	5.4.5.2 Enablers for growth and development

5.4.1 THEME ONE: FOUNDATIONAL CARE PRACTICES

Foundational care practices refer to those habitual or customary actions, which are central to or basic for a particular situation or context – in this instance Intensive Care nursing (Free Dictionary, 2009).

The foundational care practices are acquired through specialisation as an Intensive Care nurse. The participants understood competence as to have a "know that" and "know how" that equipped them to be ready to perform and act independently. Most tasks or actions are related to acute medico-technical interventions and the Intensive Care nurse performing them were referred to as requiring extended roles. Experience in use of technology, being highly skilled in basic nursing care, following protocols, use of evidence-based practice and guided by the scope of practice are terms used by the participants as competencies need to support the foundational care practices in Intensive Care nursing.

5.4.1.1 Experience in use of technology

Technology encompasses all the machinery, tools, knowledge and skills required for the provision of Intensive Care.

In this study, it was noted that technologies provide a useful means to monitor and treat patients, but were not considered as helpful when used as a substitute for observations by a nurse. This suggests knowledge and understanding of technology is needed by Intensive Care nurses when working with these technologies.

Wilkin and Slevin (2004) and Little (2000) indicate that technological competence is a necessary foundation to the development of clinical practice in the execution of, and for safe practice (Henneman, Gawlinski and Guiliano, 2012). The literature suggests technology can render care invisible when the central focus is machine-orientated in a busy ICU (Almerud et al. 2008).

Participants in this study cautioned that unilateral reliance on technology without the other measures of observation may not be ideal in the care of the patient. This was what they said:

> *"…it is vital to know technology but I also think technology must not be the most important thing …"*
>
> *(N1; N7; N2)*

Experience in the use of Intensive Care technology is also important so that technology can function alongside the provision of patient care. Benner (1984) claims that experienced practitioners demonstrate seamless integration of technology into every day caring practice, whereas McGrath (2008) and Little (2000) suggest that novice nurses tend to focus deliberately on technology. This can lead to loss of judgement and harm to a patient by reducing nursing to a series of tasks and detracting from holistic and individualised care.

Intensive care nurses felt that to know about technology is vital to detect equipment failure. Intensive Care is highly technological but nurses must be competent in their ability to

distinguish between a physiological condition that may be a patient problem or an equipment failure. Their views are illustrated in the following excerpts:

> *"It is important to detect equipment failure …"*
>
> *(N1; N2; N8; N5)*

> *"The conventional methods like nurse's observations are still important"*
>
> *(N1; N2; N7)*

Almerud et al. (2008) emphasise the importance of caring professionals to being able to harmonise an understanding of the patient as a person with objective signs by prioritising patient needs for care. In the literature this connection is referred to as balancing sophisticated technology with comprehensive care (Kongsuwan and Locsin, 2011; Wikstrom and Wilkin, 2004). Participants agreed:

> *'…even when we are so busy …we must never forget the patient lying there is also a human being …he needs you to spend time with them"*
>
> *(N7)*

> *"…the patient is on a ventilator he can't talk so he is frightened and anxious about what is happening to him …explain to him why be can't talk …"*
>
> *(N6)*

From the above excerpts, it is clear that spending time and communicating with the patient was considered as prioritising care. Thus prioritising care is of paramount importance and described in terms of time management and implementing patient care, which is the foundation of technological competence.

Kongsuwan and Locsin (2011), Almerud et al. (2008) and Wikstrom, Cederborg and Johanson in 2007 acknowledge the equal importance of both humanistic and technological aspects of the role of Intensive Care nurses as not only integral but also essential.

The participants expressed the view that *"keeping a safe environment"* is a part of technological competence. They related this to the safety of the physical environment and

knowing about technology which is the foundation of Intensive Care. This principle is upheld in the regulatory framework of the nursing profession (SANC, R2598 of 1984, *as amended*). Pre-emptive measures in anticipation of potential patient problems, such as life threatening situations, can be enhanced by ensuring that emergency back-up equipment is readily available in the event of equipment failure or accidental removal of the endotracheal tube.

> *"The environment must be safe for the patient …free of injury for the patient and yourself"*
>
> *(N2; N6)*

> *"…competence is ensuring that emergency equipment suction, ambubag are all in good working form"*
>
> *(N1; N2; N6; N7)*

In a review Couchman et al. (2007) attested that patient safety, patient and equipment assessment and patient comfort underpin nursing care of patients in the Intensive Care setting. This view is supported by Coyer, Wheeler, Wetzig and Couchman (2007). Benner, Tanner and Chesla (1996) also concur, stating that caring is primary when the things that matter most are placed into perspective.

Keeping a safe environment plays an important role in "*minimising medico-legal risks"*. Several participants felt that the ability to minimise medico-legal risk is achieved through the expertise of nurse when working with these technologies. It is known that technology can cause sensory overstimulation, stress and ultimately psychological harm to patients (Coyer et al. 2007).

> *"…nurse's expertise is the ability to minimise complications and medico-legal risks"*
>
> *(N1; N2; N6)*

Human errors, mechanical faults and increased stress in Intensive Care settings appear to come from inadequate education (Kiekkas, Karga, Poulopoulou, Karpouhtsi, Papadoulas and Koutsojannis, 2006). This implies that knowledge of technology acquired through

education is crucial for the prevention of human errors, mechanical faults and increased stress in Intensive Care nursing.

Similarly, Binnekade, Vroom, de Mol and de Haan (2003) and De Neef, Bos and Tol (2009) acknowledged Intensive Care nurses' role in minimizing medico-legal hazards and complications in the Intensive Care setting. The checking of surrounding equipment is integral to Intensive Care nurses' role for ensuring patients' safety in Intensive Care. Literature refers to this as surveillance (Henneman et al. 2012).

Several participants maintained that doctors are dependent on their knowledge and experience with the equipment. These nurses can ensure that standardised procedures are followed correctly at the bedside when assisting doctors with diagnostic procedures, such as pulmonary artery catheter insertion.

> *"...I can say the doctors become so dependent on you because of your knowledge ...you have experience with the equipment"*
>
> *(N2; N5; N4)*

Some of the other participants agreed.

> *"...most of the doctors working in our unit's don't know how to work a ventilator or work an infusion pump ...so they rely on you to do the settings and make all the changes ..."*
>
> *(N3)*

> *"...during therapeutic diagnostic procedures ...the doctor depends on you to assemble equipment needed"*
>
> *(N2;N4)*

This finding is consistent with the findings of Scribante, Muller and Lipman (1996). In their study they found that experienced nurses offer valuable advice when assisting doctors with therapeutic and diagnostic procedures in ICUs.

In addition, several participants said that an extended repertoire of physical skills will enhance the assessment made by a nurse. They mentioned how important assessment was to report patient condition changes using a systematic, orderly and structured approach. They indicated how significant it was to assess the patient's condition continuously. Assessment could also be seen as an intervention done for the patient, for evaluation or for an update. The views of the participants are expressed below:

> *"…the nurse will assess her patient systematically whereas the doctor may only focus on the urine output or the eyes only"*
>
> *(N5; N6)*

> *"…as nurses we should become more involved in decisions like pulled out care on patients"*
>
> *(N2)*

> *"I think that your critical thinking skills comes in things that are not every day in ICU …you need knowledge to back it …getting your environment set up, doing your own physical assessment for a patient first quite important"*
>
> *(N6)*

Eliott et al. (2007) claim that good assessment skills are essential for the Intensive Care nurse as the data that are collected are important to identify the immediate and future needs of the patient and thereby facilitates the development of a comprehensive care plan.

Authors concur that assessment by a nurse enables the detection of actual and potential problems needing the nurse's immediate attention (Coyer et al. 2007), and a full assessment provides the nurse with a 'bigger perspective' of what is happening with the patient (Tanner, 2006).

Lesa and Dixon (2007), Coombs and Moorse (2002) and West (2006) reported that advanced nurses are extending their repertoire of physical skills to include those once considered the domain of doctors. These authors agreed that good physical assessment skills enable nurses to recognise subtle changes in their patients that would otherwise go unnoticed.

Assessment may be seen as gathering data of a patient and using information to make decisions about care or intervention required. Enhanced assessment skills are essential for the Intensive Care nurse as the data are important to identify immediate and future needs of the patient and to facilitate the development of a comprehensive care plan.

5.4.1.2 Highly skilled in basic nursing care

Basic care skills include those required for suctioning, personal hygiene and prevention of catheter-related interference, such as infections.

The participants felt being "highly skilled in basic nursing care" is a part of the manual or procedural skills competencies in Intensive Care nursing. Being "highly skilled" means being capable of working efficiently, such a person can usually supervise the work of others who are skilled in the same type of work.

The manual or procedural skills are described by participants as either basic or highly skilled. In order to demonstrate manual skills competencies the Intensive Care nurse should be highly skilled in basic nursing skills that is foundational to all other skills in Intensive Care.

While suctioning is a basic skill in both a general ward and in an ICU, suctioning was viewed as one example where an intensive care nurse can be considered efficient and highly skilled. This procedure is known to be difficult to perform in life-threatening and mechanically ventilated patient's situation as it is associated with serious complications or harm to patient, such as accidental or unintentional removal of the endotracheal tube (Bouza, Garcia, Diaz, Segovia and Rodrigues, 2007). In the event of a nurse lacking competence in the basic suctioning, the likelihood of harm is even greater in an ICU context.

> *"…should be skilful of how to suction a patient"*
>
> (N1; N2; N6)

Other basic skills are related to maintenance of personal hygiene, taking care of pressure parts and mouth care, including ensuring the patient is comfortable and pain-free.

Maintaining personal hygiene can become problematic in unstable patient's situation; the participants maintained they would do baseline observations and monitor the vital signs for safe care throughout the procedure. The following quotes illustrate their views:

> *"Competence in maintaining personal hygiene, mouth care, doing dressings, bathing a patient ...very important"*
>
> (N7. N1, N2)

> *"...personal hygiene is essential for any nurse to do ...even when your patient is unstable ...get a baseline, do simple things first like a dressing or washing him ...you can monitor his responses while doing"*
>
> (N6)

This finding is similar, to those in a study conducted by Burger, Parker, Cason, Hauck, Kaetzel, O'Nan and While (2010) who observed that highly skilled nurses focus on a task in hand, while maintaining an holistic view of the patient. Providing individualised care and monitoring patient responses under changing circumstances demonstrates being highly skilled in basic nursing care that is foundational to all other skills in Intensive Care.

Aari, Suominen and Leino-Kilpi (2008) confirmed that planning and integrating basic care interventions into the care of the patient is a part of clinical competence for Intensive Care nursing.

Maintenance of the central lines was recognised as the responsibility of the registered Intensive Care nurses, including monitoring site insertion and prevention of infections when laboratory investigations are required, such as frequent blood sampling.

> *"putting in lines is a doctor's responsibility but to maintain them is what the ICU nurse does ..."*
>
> (N6; N2; N1)

Bouza et al. (2000) also reported that prevention of interference related to indwelling devices is the sole responsibility of the Intensive Care nurse. This is a basic skill that has to be accompanied by the safe care of patients in ICU. This knowledge is a key to preventing

infections associated with central lines (Couchman et al. 2007; Labeau, Veerecke, Vandijck, Claes and Blot, 2009).

5.4.1.3 Following protocols, use of evidence-based practice

Protocols generally refer to official procedures or a system of rules that govern one's decisions and actions. In the context of Intensive Care nursing, protocols enable Intensive Care nurses to consider and put evidence into practice. They provide a framework for guiding nursing actions or for working in a multidisciplinary team. Such care or work is thus protocol-based.

While the Intensive Care nurse has relative autonomy utilizing advanced knowledge and skills, several participants agreed that nursing practice in ICU is protocol based. The judicious deviation from these protocols was viewed as an advanced skill they possess. However, as an independent practitioner the registered Intensive Care nurse has the authority to deviate from the protocol following personal judgement in response to changing patient situations. Hewitt-Taylor (2004) agrees that protocols dictate the recommended care for common conditions, and protocols are intended to facilitate but do not replace the clinical decision making (Considine and Good [2004] in Hewitt-Taylor, 2004:49). This participant agrees with Hewitt-Taylor:

> *"there are protocols we follow …"*
>
> (N2; N4; N6)

> *"…there may rise some circumstances that cause you to deviate from the protocols …the cognitive functioning must allow you to make important judgement"*
>
> (N4; N6)

It appears that participants viewed following a protocol as foundational for safe functioning in ICU. However, deviating from the protocol and making personal judgment demonstrates high level functioning of an Intensive Care nurse being highly skilled. Clinical judgment has to be backed-up by evidence. Participant's said even simple procedures have to be evidence-based:

"…even for dressing our lines the policy is based on research"

(N2)

"…it is constant protocols we use …like feeding patients, ventilator changes and even the drugs we use in ICU … even when it comes to drugs like inotropes, vasopressors, potassium replacements and IV fluids …"

(N5 ;N7; N8)

Protocols in Intensive Care cannot be ignored. Participants were cautious in following protocols without confirming with best practice evidence in Intensive Care; this was considered as being scientific in the delivery of care.

"We cannot do things just because someone has instructed so …they must be researched"

(N3; N2; N8)

Protocols, practice guidelines and evidence are inextricably linked. Collectively they infer evidence-based practice (EBP).

Intensive Care nurses agreed that the use of evidence-based practice recommendations is a guide for the foundational care practices. Evidence-based practice is the incorporation of the best research evidence, clinical expertise and patient values into patient care decision making (DiCenso, Guyatt and Ciliska, 2005). It combines the wisdom derived from a variety of credible resources such as protocols and policies, developed by professional and governmental groups (Carr, 2005).

Participants confirmed that a basic skill such as a wound dressing for a patient should be supported by research evidence. Following the evidence-based guidelines was considered a key to deliverance of quality care in Intensive Care. Inclusion of evidence-based practice in basic care is viewed in literature as conscientious and judicious use of the current best evidence when making decisions about the care of individual patients (Sackett, Rosenberg, Gray and Hayes, 1996).

Attending ward rounds, updates and conferences were regarded as important for knowledge development. A review by Aari et al. (2008) supported by Hewitt-Taylor (2004) cited that clinical guidelines help nurses to provide evidence-based care. Participants felt that, in order to ensure best practice, it is imperative they keep abreast of new developments.

> *"The individuals must keep themselves updated …we are in an academic hospital; it is fairly easy because there are academic ward rounds …reference is made to the latest research"*
>
> (N1; N6; N8)

Informed decisions and interpretation need knowledge and skills. These can be obtained through reading current studies and questioning others in the academic ward rounds. Participants also felt that, in order to ensure best practice, it is imperative that they also keep abreast of new technological developments.

> *"they need to have knowledge and skills to understand what it is they are doing …understanding the ventilator and to make interpretations"*
>
> (N1; N3; N6; N8)

From the above discussion it is clear that evidence that is based on current research ensures best practice. The Intensive Care nurse must exercise judgment in the application of new knowledge when making interpretations.

5.4.1.4 Guided by the Scope of Practice

A number of participants cited that following the SANC's scope of practice as a means of ensuring excellence in clinical practice is essential even though they have been equipped with extra skills and knowledge. The scope of practice determines what every nurse can do. According to the professional regulatory body, the scope of practice is the ethical and legal standard for the nursing profession (SANC, R2598 of 1984, as amended). This provides the essential parameters for therapeutic activities that can be carried out by a registered nurse.

"...whatever you are doing is according to your scope of practice ...even giving oxygen"

(N2; N4; N6; N8)

Intensive care is a specialist area of care provided by the Intensive Care nurse in collaboration with the specialist Intensive Care doctor who determines the medical treatment and active therapeutic interventions. The Intensive Care nurse as a partner in this care can make independent decisions in many instances. This is upheld based on an assumption that independent decisions leading to actions are undertaken through professional accountability and not as a result of obeying doctor's orders (SANC, R387 of 1985, as amended). Confirmed by participants:

"The ICU environment is guided by the doctor ...I think that the ICU nurse should not be dependent on the doctor to make a decision"

(N6; N8; N4)

"...we also have trauma protocols and sometimes we deviate from them ...as long as you can motivate your actions"

(N4)

It appears that role distinction in this partnership has to be cautiously blended by professional boundaries and skills maturity.

"There are tasks for doctors and those for nurses ...the ICU nurses should be skilful in both tasks"

(N2; N6; N8)

Many authors caution that an overemphasis on technical interventions can result in nurses neglecting their own responsibilities becoming medical functionaries (Briggs, 1996; Woodrow, 1997). Bowler and Mallik (1998) warn the profession as this could lead to becoming doctor's assistants. This will lead to loss of basic nursing care and harm for patients.

> *"nurse's must stick to nursing tasks which are our suctioning of patients, trachea cares …doctors tasks are not done to convenience the doctors"*
>
> (N2)

Benner (1984) in her seminal work entitled "Acquisition from Novice to Expert", alluded to those situations that required nurse's role expansion directly acknowledging those situations in which nurses were required to act in the absence of a doctor.

> *"putting in central lines is good to advocate for the patient …but not when general patient care is neglected"*
>
> (N6; N4; N8)

Even though the Intensive Care nurse can perform in an expanded role, even beyond his/her scope of practice, these must not put the patient at risk of being neglected in the administration of basic nursing care. This makes the scope of practice foundational in that it is in everything you do, routinely.

5.4.2 Theme Two: Critical Thinking <u>in</u> Decision Making

Chase (2004:45) defines critical thinking as "reflective thinking in that one questions one's own thinking process to determine if all possible avenues have been explored and conclusions are based on evidence". The ability to prioritise care is central to Intensive Care nursing. This involves having the skills to synthesize, analyse and apply information gained from a variety of sources and determine appropriate nursing actions.

This theme attempts to capture critical thinking <u>in</u> decision making. Knowledge of the discipline and self-knowledge are the deciding factors when options of treatment are being evaluated. When analysing data, analytical and interpretive thinking skills are used to problem solve. This theme is supported by two sub-themes, namely, knowledge of the discipline and self-knowledge in safe practice.

5.4.2.1 Knowledge of the discipline

The participants felt that cognitive competence is a key factor in decision-making. Simmons, Lanuza, Fonteyn, Hicks and Holm (2003:71) defined cognitive competence, "as a recursive process that involves both inductive and deductive cognitive skills to simultaneously gather and evaluate assessment data".

In this study, participants mentioned that Intensive Care nurses need to implement and use their theoretical knowledge when gathering and analysing patient data and identifying possible interventions and appropriate nursing care. Participants expressed data gathering and analysis as core competencies they usually use while in the Intensive Care unit.

> *"There is a need to know the ICU environment ...knowledge of the procedures being done there"*
>
> (N3; N5)

> *"Knowledge comes from basic ICU training ...but the knowledge must extend beyond the basics ...decision to extubate lies with the doctor ...the nurse must be able to evaluate that decision"*
>
> (N1; N4)

Knowing the ICU environment and the procedures used in the care of patients is foundational to the Intensive Care trained nurse. This knowledge has to be extended beyond that which is considered as foundational. This implies knowledge beyond following protocols. It is this extended knowledge that informs decision-making, interpretations and independent actions and facilitates the evaluation of decision making made by other members of the multidisciplinary team.

In addition, to gathering data and analysis, participants maintained the Intensive Care nurse must have the ability to make a diagnosis. They described their sequenced actions in response to noticing the presence of abnormal vital signs in a patient's situation. This can be enhanced through knowing the normal physiological and laboratory values.

"Importantly she must be able to make a diagnosis when things are going out of range ...she must know normal values and all the data relevant to cardiovascular respiratory system ..."

(N3; N5)

Also they use additional diagnostic tests to understand the data they have. After that they would be analysing and interpreting their findings to manage the patient accordingly, which could mean notifying the doctor for assistance, or to prepare to take care of an emergency situation, should the need arise.

"She should be able to make a prior diagnosis of blood gases before she actually tells the doctor ...and will prepare to tube [intubate] the patient"

(N5; N3)

One participant said:

"...integration of the data is crucial for the ICU nurse to finding the reason why ...I think this is going the distance or the extra mile as an ICU nurse"

(N6)

Participants maintained critical thinking skills are needed by nurses after gathering data and analysing the patient's condition. Critical thinking is an important time-based and prioritization. Nurses should critically think using the information at hand and based on that make a decision on the appropriateness of the intervention for the patient which leads to decision making.

"You need your critical thinking skills to make a diagnosis ...to me experience and knowledge are critical to make a decision"

(N1; N4)

Through decision making Intensive Care nurses were able to manage different patient's condition through critical thought and making the correct decisions for that patient.

This finding is consistent with the clinical decision making process described by Gillespie and Peterson (2009) and supported by Tanner (2006).

Lindberg (2006) observed the "ability to take action" and the "ability to perceive the situation correctly" as two of the five different ways that Intensive Care nurses understand competence.

In the literature, Hancock and Durham (2007) reported that translation of knowledge into action requires many fundamental types of knowledge: theoretical knowledge, practice knowledge, personal knowledge, ethics and moral component of nursing. Fulbrook agreed with this attention (2003). Thus the knowledge that informs clinical practice is drawn from many sources.

Other studies (Bucknall, 2000; Currey, Botti and Browne (2003) reported that decision making complexity in Intensive Care nursing is related to the astute technological assessment and knowledge of the nurse, was one of the deciding factors when options of treatment and care were being evaluated.

In this study, it appears that the combination of both, theoretical and experiential knowledge facilitates independent decision-making:

> *"A good knowledge of physiology enables nurses to know the pathophysiology and to understand the action of drugs, blocking and enhancing"*
>
> *(N2; N7)*

> *"Superb knowledge of pathophysiology helps you to understand what happened after giving a drug to a patient …you can almost work it out for yourself"*
>
> *(N2; N5)*

> *"Nurses must know they cannot rely on the doctor being there for them"*
>
> (N4)

A good knowledge of physiology was viewed as giving the Intensive Care nurse autonomy to make treatment decisions. But a superb knowledge of pathophysiology allowed them to

decide when to titrate or even withhold treatment for a patient using an EBP protocol in the absence of a doctor.

Scribante et al. (1996) claimed that nurses need to know how the treatment or medication is going to act in a critically ill patient because the action might differ from the less ill patient. Pirrett (2007) observed Intensive Care nurses ability to envisage the physiological effects of the intended action providing rationale for their decisions.

5.4.2.2 Self-knowledge is essential to safe practice

Self-knowledge is a term used to describe the information that one draws upon when applying critical thinking in decision making (Free Dictionary, 2009). Self-knowledge includes an awareness and consciousness of the self when simultaneously gathering and evaluating assessment data for a critically ill patient.

The participants viewed being safe practitioners as knowing themselves. Knowing their own boundaries of practice included personal knowing of limitations and strengths, acts and omissions and scope of practice. This, they maintained, constituted reflection in safe practice. This is known to be a professional competence. Appraisal of self is viewed as a giving the Intensive Care nurse the opportunity to identify areas for improvement.

> *"Competence is knowing you are a safe practitioner ...knowing your own scope of practice ...knowing your own acts and omissions"*
>
> *(N2; N5; N6)*

> *"Being able to know your own boundaries within which you practice ...you need to know your own limitations and own strengths because not all of us are equal at certain things"*
>
> (N2; N8)

The ability of the Intensive Care nurse to reflect on their own practice is an advanced practice and it confirms the differentiation that appears to be developing from novice, advanced and expert nurse in this research.

Along with the requirements for self-knowledge and critical thinking in decision making, the participants felt that safe practice is maintained through Intensive Care nurses experience.

> *"Knowledge comes from experience ...you should not have a trial and error, there is a lot to learn in ICU"*
>
> *(N2; N6)*

> *"Experience gives nurses to have a better idea than the doctors about what is happening with the patient ...she should be able to share with him or make an independent decision"*
>
> (N1; N6)

From this discussion it appears that, knowledge from experience gives the Intensive Care nurse creative ideas to solve problems, which enables them to impart information or make judgements to inform actions within a multidisciplinary setting. The ability to manage [intubate] an airway is an emergency situation is critical for the Intensive Care nurse to maintain.

> *"It is critical in ICU for the nurse to know how to intubate ...this is one skill I think is essential for the nurse to have"*
>
> (N4)

These findings are similar to Benner, Tanner and Chesla's (1996) description of a developing sense of agency and advanced professional practice.

5.4.3 Theme Three: Emotional Competencies

Emotional competencies refer to one's abilities to release one's own feelings, an ease around others, and an ability to successfully lead and express (Free Dictionary, 2009), with contrast, emotional intelligence refers to the ability to be able to identify, express, understand and regulate emotions either negatively or positively, in one self and others (Mathews, Zeidner and Roberts [2004], cited in Towell, Nel and Muller, 2013).

In this study, emotional competencies include the ability to establish and maintain relationships with nurses and other members of the multidisciplinary team. This relationship is a partnership characterised by collaboration, open team communication, mutual respect and cooperation.

Benner et al. (1996) describe this connection of multidisciplinary team members as 'emotional attunement'.

Four sub-themes support the emotional competencies, namely collegial relationships, open team communication, offering psychological support to nursing team, and offering emotional support to family of ICU patient.

These attributes are developed through education, experience and continuing development. It is acknowledged by the participants that not all Intensive Care nurses are able to develop these attributes.

5.4.3.1 Collegial relationships with the doctor

The participants viewed working relationships with the doctors as essential to the delivery of care in the ICU. Intensive Care nurses have a role to play in monitoring vital signs of patients and manipulating treatments. The participants stated they felt this gave them a right to question treatment decisions taken for a patient. This suggested the nurse is advocating for a patient entrusted to her care.

> *"ICU nurses have an important role to play ...I feel that I have a right to query even medical treatment of a patient"*
>
> (N2; N4; N6)

Participants felt that senior doctors considered the viewpoint of experienced or senior nurses positively, as they were happy to refer their juniors to them if they had certain problems. This suggested experienced Intensive Care nurses instilled confidence in their abilities and earned the trust of the doctors.

"...senior doctors would say to their juniors ...if you had a problem ask the sisters"

(N1; N2; N6)

Collaboration in the working relationship of doctors and nurses is an integral part of collegiality. Participants maintained that nurses and doctors make different contributions to patient care and they needed to work together to achieve a good outcome for patients.

"...we need to work collaboratively with the doctors"

(N1; N6; N7)

Aari et al. (2008) confirmed that collaboration is a part of the Intensive Care nurse's professional competence. This includes those interventions performed by the nurse and other health care team members, such as the doctor, with a mutual goal of achieving the most effective outcomes for patients.

Caring for a critically ill patient is provided through collaboration and good interpersonal relationships between nurses and doctors based on mutual respect. This is essential to achieve a good outcome for patients.

"...a good interpersonal relationship between you and the doctor is essential to achieve ...and respect one another"

(N2; N5)

Participants viewed collegial relationships as the platform that facilitates health care team to engage easily in discussion. Collegial relationships are viewed in the literature as being important to achieve a good outcome for patients (McKinley, 2007) and essential for sharing of information and decision making (Baggs and Schmitt, 1997; Lingard, Espin, Evans and Hawryluck, 2004).

5.4.3.2 Open team communication

Communication is a combination of verbal and non-verbal behaviours integrated for the purpose of exchanging information, in the context of Intensive Care nursing, it is displayed

as open communication among nurses and nurses and doctors (Arnold and Boggs, 2011:523).

Participants viewed the maintenance of open team communication as a guide in making correct decisions to enhance cooperation among nurses. This was because expertise is enhanced when information is shared amongst team members.

> *"... cooperation among nurses will lead to correct decisions ... expertise is shared"*
>
> *(N2; N6)*

The finding of the need for cooperation between nurses in decision-making is supported in three studies (Currie et al. 2003; Hoffman, Aitken and Duffield, 2009; Manias and Street, 2001). It is good communication that is helpful for decision making.

> *"Communicating information about the patient, condition, observations and progress to another nurse is very important ..."*
>
> *(N1, N4, N6. N7)*

Nurse participants felt that communication in the traditional handover practices between nurses were good practice. They felt that this provided the platform for exchange of patient information to another nurse provider thereby ensuring continuity of care.

Written communication is a key to keeping of records as records are a valid account of patient events. They are legal documents. This principle is upheld in the professional regulation of nursing (SANC, R2598 of 1984, as amended).

> *"Keeping accurate records is very important ... written report are legal"*
>
> *(N2; N6; N1)*

Participants viewed indirect communication among team members as unhelpful to achieve a good patient outcome. Some participants cited situations where they felt doctors failed to communicate directly with them.

"Communication is important …it is not so helpful when a doctor just comes and writes on the ICU chart and not say so to the person looking after the patient"

(N3; N5)

Thomas, Sexton, Robert and Helmreich (2003) report different views might be held between nurses and doctors about teamwork. This increases the likelihood of breakdown in communication. Manoljovitch and DeCicco (2007) observed failure to communicate between doctors and nurses as a predictor of adverse events and serious errors in the Intensive Care setting, this is supported by Stein-Parbury and Liaschenko (2007).

Baggs and Schmitt in 1997 identified knowledge as an antecedent factor for collaboration. In this study participants confirmed that an adequate level of knowledge and experience is the key to good teamwork.

"…we are not assertive enough because our knowledge base is not adequate …"

(N5)

"I am able to assert myself in a subtle way … I always refer to literature"

(N1; N6; N7)

Courage to assert oneself may help in the maintenance of patient safety. Being assertive is having the courage to stand up to voice an opinion about a decision taken by another without fear of reprisal or intimidation. Nurses in the ICUs have a custodial role with doctors and a negotiated role as patient advocates according to the Nurses Scope of Practice (SANC, R2598 of 1984, as amended). This makes the ability to negotiate for the correct treatment options for patients a critical attribute in delivering safe care in ICU.

"Nurses must be able to tell the doctor what to do … standing there leaving the patient to crash is not good"

(N2; N5; N1)

Some participants felt that experienced Intensive Care nurses had more knowledge about critical illness situations than a lesser-experienced doctor. This suggested that doctors could learn from experienced nurses when they assert themselves professionally.

"... Doctor may not know one thing; after a number of years in ICU the sister may well know"

(N1; N6)

Working with doctors in the Intensive Care units also meant working with a medical hierarchy of professors, consultants, senior doctors, registrars and medical officers. Some participants felt that senior nurses were undervalued by some team members for their input, but appreciated the way senior doctors socialised their juniors to respect nurses.

"...after he has phoned the consultant he was told ... you will listen to the nurses because they have been working long in ICU"

(N2; N1; N7)

This affirmation from senior doctors can be enhanced and earned through nurses displaying helpfulness and being respectful.

"... When I pick up a mistake by the doctor ... I must respectfully draw his attention to it and not just carry out the prescription"

(N2)

Knowledge is a key to picking up mistakes in care decisions as well as confronting others when corrective measures are necessary in protecting patients' safety. The nurse's ability to think critically and analytically helps to inform judgements about patient situations.

"...Competent nurses earn the respect of the doctors ..."

(N2; N6; N7)

"I think it is essential in a critical care environment like ICU to be able to assimilate, analyse and make an independent decision ... not to totally depend on the doctor to intervene"

(N5; N4; N6)

This finding is similar to those in a study conducted by Burger et al. (2010) who observed highly skilled nurses tend to prevent stressful situations by employing pre-emptive strategies to avoid them.

Intensive Care nurses should be competent to work under pressure. The Intensive Care environment is a stressful place, especially when dealing with emotions of other team members, and one participant is of the view that a level of emotional maturity is necessary to help the Intensive Care nurse to cope with different people in the team.

> *"In an environment like ICU lots of* [stressful] *emotions result in the team ... the nurse must be able to be* ***emotionally mature*** *to cope with all the different emotions"*
>
> *(N5; N6; N4)*

Participants felt that Intensive Care nurses have a role to play in coordinating activities of other team members. In particular, it was noted that the team falls apart when nurses lose their tempers.

> *"I think when the nurse cannot* ***maintain her cool*** *the team falls apart ...she has a huge role to play in the ICU environment"*
>
> *(N5; N4)*

In this excerpt it is noted that *"maintain her cool"* is an informal phrase, which means to maintain (or inability to maintain) a calm and controlled attitude (Free Dictionary, 2009). Nurses working in the Intensive Care units have a role to coordinate the activities of other team members according to the Nurses Scope of Practice (SANC, R2598 of 1984, as amended). In an environment like the ICU, an experienced Intensive Care nurse must take up a **leading professional role** to direct and guide the activities of other team members. The views of some of the participants are expressed below:

> *"There they were administering those drugs.... I had to quickly step in there to tell them you can't do that…they didn't even know what they were doing"*
>
> *(N5)*

"...we are also developing untrained ICU nurses to get to a level where we want to see them ...looking after a critically ill patient on CVVHD"

(N3; N5)

"The shift leader must supervise the others ..."

(N3)

The coordinating role relates to the ability of the Intensive Care nurse to lead and direct others in a supportive and constructive manner. These attributes are developed through experience, continuing education and acceptance of responsibility.

5.4.3.3 Offering support to nursing team

Several participants explained during interviews that there are stressors for nurses working in the Intensive Care units. This included a shortage of nurses, budget restructuring and outbursts or disagreements among team members. Participants mentioned that:

"Nursing critically ill patients is stressful ...the charge nurse who supports and mentors her team is vital"

(N5; N6)

The ability to offer psychological support for the nursing team is vital, the participants maintained that Intensive Care Nurses would cope better knowing they were supported. This suggests that nurses working in Intensive Care are in need of stress debriefing to help them cope better.

"... if nurses know that they are adequately supported they will be able to manage stress"

(N5; N7; N6)

As early as in 1972, Hay and Oken and Poncet, Toullic, Papazian, Kentish-Barnes, Timsit, Pochard, Chevret, Schlemmer and Azoulay (2007) acknowledged the psychological burdens of Intensive Care nursing and need for support. Areas for improvement include

conflict prevention, participation in Intensive Care research groups, and better management of end-of-life care.

The Intensive Care nurse must support doctors, nurses and family members/ significant others of sick patients.

5.4.3.4 Offering support to family of ICU patient

The ability to provide emotional support for family of ICU patients is a fundamental part of the process of care in ICU. Offering family members crisis counselling is the form of emotional support.

> *"...Family is important ... they got a fright when a patient is in ICU"*
>
> *(N7; N1; N6)*

Two studies (Leske, 2003; McAdam and Puntillo, 2009) support family responses of anxiety, stress, and depressions when a loved one is admitted to ICU. Families are confronted with life and death issues, role reversal, financial concerns, added responsibility and uncertainty. The integration of the family and creation of family centred approach to care are important to holistic nursing care.

The participants maintained that family need to be supported. This suggested that the family of a critically ill patient should be aware that nurses are willing to support them.

> *"... the family forms an integral part in the process of care ... they need to be supported"*
>
> *(N6; N7; N8)*

Wilkin and Slevin (2004) and O'Connell and Landers (2008) reported that care of the family is an integral part of the process of care in ICUs. The family must be constantly informed about the care and progress of the patients to meet their needs and expectations.

"... Giving support to the family is integral to care ... they need to be kept informed about the happenings in order to call a pastor or [prepare for] *rituals"*

(N2; N1)

"...inform the family all the way about the condition"

(N1; N6)

Leske (2002) identified the categorical needs for family members as information, proximity to the family member, support and comfort. Hupcey (1999) and Pryzby (2005) reported that nurses are inconsistent in meeting family needs because of differing opinions as to what families valued most.

Two studies (Kosco and Warren, 2000; Yin-King, Lee and Lau, 2003) reported that nurses rated support and comfort needs as decidedly higher, whereas family members valued information especially from the same nurse, proximity and assurance through offering hope.

Caring for patients to the end of life is a competence that Intensive Care nurses need to have. The Intensive Care nurse will explain the events of the dying process so that the family have full understanding of what is happening to their loved one. The participants maintained that a nurse continues to care for the patient to the very end. Included in providing this care, a nurse will ensure appropriate comfort measures are applied for a dying patient and advocate for *"adequate pain relief from the Intensive Care team" (N7).*

"... the competent nurse cares for a patient up to the end, long after [the tubes have been] pulled out"

(N1; N6)

The participants stated that caring for family forms a fundamental part of the process of care. Further, it was suggested that nurses played a major role in caring for the family of dying patients, whilst they also provided continuity of care and advocacy for the individual needs of the dying patient.

5.4.4 Theme Four: Transcending Obstacles to Growth and Development

Growing and developing as a professional is important in the process of becoming an effective and efficient Intensive Care nurse.

Transcending obstacles to professional growth and development was a common theme in the data gathered from the individual interviews with nurses. A discussion about obstacles for professional growth and development support this theme.

The participants identified obstacles for knowledge as cost of studies, lack of interest and commitment, complacency and culture as main factors. Enablers for development of knowledge and professional growth were personal development and development of others.

5.4.4.1 Obstacles to growth and development

Participants revealed that there are some obstacles which militate against enhancing their knowledge. Amongst obstacles to knowledge and growth, participants cited the cost of studies as well as travelling to libraries as main factors.

> *"there are enormous social problems that drain one's energy at home and preventing one from applying one's self or get knowledge"*
>
> *(N1; N6;N7)*

> *"costs involved in furthering education … studying may take a chunk out of the family income particularly as a lot of nurses are breadwinners"*
>
> *(N1; N6)*

> *"it is costly to stay* very updated *…coming to the library on a Saturday, cost of petrol and making copies of research journals"*
>
> *(N1)*

Two world surveys, Williams, Chaboyer, Alberto, Thorsteindottir, Schmollgruber, Fulbrook, Chan and Bost (2007) and Williams, Bost, Chaboyer, Fulbrook, Alberto,

Thorsteindosttir, Schmollgruber and Chan in 2012, reported that nurses have difficulty extending their education due to financial factors. The lack of formal learning opportunities is said to impact on nurses' confidence, motivation and capability, which ultimately will affect delivery of patient care and professional growth and development.

Some of the participants mentioned a lack of interest in one's job as another obstacle to growth. Participants observed that some colleagues displayed a lack of interest by coming and going to work without any interest of new developments. Some participants felt that some of the nurses failed to show an interest in what is happening in their workplace from the day they were qualified.

> *"lack of interest and commitment is another obstacle to acquiring knowledge ...people do the job just to get paid and go home"*
>
> *(N1; N2; N4; N6; N7)*

> *"...some people **failed to develop** after they qualified and yet they were good students"*
>
> *(N1; N6)*

One study (Huggins, 2004) identified individual internal factors such as 'interest' 'relevance of skill' and 'finances' as factors which affects the extent and development of learning.

Participants viewed **complacency** by top management as an obstacle to growth.

> *"I think because no-one is held accountable for what they do ...they get away with no knowledge ..."*
>
> *(N1; N4; N6)*
>
> *"the hospital does not get sued for what they do ...things get brushed under the carpet; so why spend money and energy acquiring knowledge when you can bumble along without it"*
>
> *(N1; N6)*

Lack of disciplinary procedures when a problem occurs plays an important role and can lead to sub-standard care. The literature suggests that the investigation of failures, re-evaluating how disciplinary procedures instituted enhanced communication and how feedback involving those involved in 'hands on care' facilitated the development of a safety culture (Currie and Watterson [2007] in Richardson and Storr, 2010).

The black African culture was seen as a barrier to growth by some of the participants due to the patriarchal structure where males still have the upper hand and the male doctors (the majority of whom belong to ethnic groups other than black) are still seen as the masters. This is apparently, more evident in some female black nurses.

In this setting, the culture of some nurses was viewed as an invisible barrier to growth. Some of the participants cited culture as an invisible barrier to growth and development especially to some black nurses.

Some of the participants had this to say:

> *"…the black nurses obedience to males or/and white masters is carried over …they are over obedient to the doctors to the detriment of their patients"*
>
> *(N2; N6; N7)*

> *"…black nurses of the past were exceptional individuals but …"*
>
> *(N2; N6)*

> *"…I think we failed to mentor black nurses …I blame us as well as the doctors for the slide in service"*
>
> *(N2)*

Studies in other countries have also reported medical dominance and consequent nurse subservience in the Intensive Care settings. While cultural constraints were cited as being the key to attitudes of some black nurses in this study, literature seems to confirm that this dominance of doctors in ICU settings is widespread.

As noted in Martin-Rodriguez, Beaulieu and D'Armour (2005) and Lockward-Wood (2000), these power-relationship disparities were related to imbalances of knowledge, lack of education, gender imbalances and negative professional image held by both groups.

Evans, Bell, Sweeney, Morgan and Kelly (2010) and McKinley (2007) refer to this as "power imbalances" which have consequences in an environment such as Intensive Care settings where nurses are expected to display high levels of autonomy in patient care.

5.4.4.2 Enabler's for growth and development

In dealing with this widespread gender imbalance and lack of autonomy, these participants confirmed the need for **mentoring in ICU**. The mentor should be someone who the Intensive Care nurse can trust, support, and show him or herself professionally.

> *"A competent ICU nurse should be able to be trusted …able to relay information to others and willing to involve them in the care …and be supportive"*
>
> *(N6; FGN7)*

In addition to being trusted, the participants said the mentor should be an encourager to motivate others to recognise learning opportunities.

> *"…the competent ICU nurse must be able to encourage others …saying you can learn a lot from the doctors ward round"*
>
> *(N3)*

Many participants spoke about the role of the preceptor not only with regard to the socialisation of new students but also for the development of the whole unit.

> *"The preceptor is there to develop the whole unit and has a very important role to play with regard the socialisation of the new students"*
>
> *(N3; N4; N5)*

Experienced Intensive Care nurses were viewed as people who can mentor the novice nurse coming into Intensive Care units for the first time. This they can do by relaying information, supporting and encouraging novice or newly qualified nurses in Intensive Care units. Literature refers to this as authentic mentoring (Giallonardo, Wong and Iwasiw, 2010).

Within an African cultural context, groups of people in a community are both independent and interdependent. Tjale and De Villiers (2004:211) proposed that benefits are derived for mentor and novice "where a mentor gains confidence though a process of reflection and self-discovery of knowledge they already possess, while a novice acquires new knowledge".

Nurse participants maintained that role models were needed to guide them on expanding their knowledge base beyond their level of scope of practice.

> *"I almost feel that from a practical point of view we need role models, experienced people who are doing the right thing …"*
>
> *(N2; N3; N6)*

Some participants mentioned that Intensive Care Nurses make independent decisions frequently when a doctor is not available. Thus they need to maintain current knowledge of the latest developments in treatment modalities.

> *In certain circumstances she must be able to act independently where the doctor may not be around or the doctor may not know what to do"*
>
> *(N5;N4;N7)*

It is also acknowledged that Intensive Care is changing as a result of evidence-based medicine and patient conditions. Intensive Care nursing is responsive to these changes and nurses need to keep abreast of these developments.

> *"Things are changing in ICU …nursing is dynamic …there is a need to keep abreast of these changes"*
>
> *(N4;N6;N7)*

Intensive Care is a world of change as are the diseases as well as nursing. Participants were of the opinion that they needed mentors as a guide to making independent decisions and acquiring new knowledge.

5.4 CONCLUSIONS DRAWN FROM INTERVIEW THEMES

Conclusions for the findings regarding Intensive Care nurse competencies drawn from interview themes and sub-themes, are as follows:

- Putting it all together is the essential competency for Intensive Care nurses who provide care for critically ill patients in the Intensive Care units. Putting it all together is described as holistic and integrated nursing care.

- Technological competence and high efficiency in basic nursing skills form the foundation of Intensive Care. Evidence based practice and the Scope of Practice serve as a guiding framework for foundational care practices by Intensive Care nurses.

- Knowledge of the discipline and self-knowledge in safe practice informs the application of critical thinking in decision-making, interpretations and independent actions by the Intensive Care nurse and facilitates simultaneous assessment of data from patients and evaluation of decisions made by other members of the multi-disciplinary team.

- Working relationships among nurses and nurses and doctors is a partnership characterised by collaboration, open team communication, mutual respect and cooperation, which form the basis for emotional competencies in Intensive Care nursing.

- Growing and developing as a professional is an important part of becoming an effective and efficient Intensive Care nurse. Transcending obstacles to professional growth can be facilitated by creating informal learning opportunities through mentorships.

5.5 SUMMARY

The conclusions derived from chapter five were used as evidence together with the opinions of other professional nurses in the ICUs on the competencies required by

Intensive Care nurses (refer Chapter six) for the development of a preliminary set of competencies based on data obtained. Findings and discussion pertaining to Step 3 of the research design and research method are provided in the next chapter.

CHAPTER SIX

FINDINGS AND DISCUSSION: FOCUS GROUP INTERVIEW AND LITERATURE CONTROL

6.1 INTRODUCTION

In this chapter, the results obtained from the focus group interviews with Intensive Care nurses will be presented in order to describe the required or used competencies of Intensive Care nurses, within the intention of using the findings as evidence for the development of competency standards. This was achieved through an exploration, description, contextual and qualitative design using one focus group interview (n=9) and two sessions. The study population included Intensive Care nurses (N=61) working in the ICUs. Themes and sub-themes are presented, discussed and integrated with literature. The discussion of themes and sub-themes is substantiated by verbatim quotes from transcripts and field notes. Reference to existing literature is made throughout the discussion to substantiate the research findings within the context of the body of scientific knowledge. Tesch's (1990, in Creswell, 2009:185-190) method of qualitative data analysis was followed as described in chapter three in order to develop a sense of the whole.

6.2 DESCRIPTION OF THE SAMPLE

A purposive sample of nine Intensive Care nurses (n=9) participated in the focus group interview. All participants were approached and invited to participate. Participants were selected based on the following:

- Registered holder of the additional qualification in Intensive Care nursing or equivalent medical and surgical nursing in the sub-category of critical care;
- More than *two years* of clinical nursing practice;
- Working in full time employment in the ICUs.

These Intensive Care nurses had, on average, 5.3 years of clinical experience (range 2 to 10 years) and all had functioned as registered nurses in clinical practice. Five held senior positions, three had worked as shift leaders and two held junior positions. Only one

participant had an additional qualification in specialisation practice. All the interviews were conducted in English even though English was not their first language. Most of the nurses interviewed were female, only two of the participants interviewed were male.

6.3 DATA COLLECTION AND ANALYSIS

The focus group interview was conducted after the individual interviews with Intensive Care nurses were audio-taped and transcribed in accordance with the method proposed by Tesch (1990, in Creswell, 2009:185-190). The questions used to direct the focus group interview were **more broadly structured** from the **emerging topics identified** by Intensive Care nurses in the **individual interviews**. The interview was conducted in **two sessions in** a private area in the hospital and each lasted for two hours, with a relaxed atmosphere maintained throughout. Permission was obtained to have the conversation audio-taped. The opening question followed introductory comments used to thank the participants for their time, diffuse tension and to assure them their opinion was valued. The question posed to the participants was:

> *Based on your experience and expertise, which competencies do you believe to be most essential for Intensive Care nurses to acquire for the provision of effective care of critically ill patients in your ICU?*

The interview guide was used to probe the issues identified by Intensive Care nurses in the individual interviews *(Appendix F)*. After participants' opinions, experiences and suggestions were thoroughly discussed, the interview guide was used to probe for issues not mentioned in the discussion.

Initially, participants found it difficult to discuss the competencies they thought they possessed or required. Direct questioning was used to lead them into the practice situation, thereafter they were allowed to share their beliefs and experiences. More detailed explanations were sought by re-introduction of notes taken during the discussion particularly related to points of concurrence and lively discussion. Participants focused on the competencies they thought they required and used in the clinical setting and detailed explanations were employed. The audiotaped conversation was transcribed, field notes inserted and data analysed.

6.4 THEMES AND SUB-THEMES EXTRAPOLATED FROM THE INTENSIVE CARE NURSE INTERVIEWS

Transcription data were analysed in adherence with the method proposed by Tesch (1990 in Creswell, 2009:185-190), resulting in four broad themes and twelve sub-themes as described in Chapter Five.

Comparing the responses from the individual interviews and focus group discussion, revealed common similarities in identifying the competencies required and used by other Intensive Care nurses.

In order to avoid repetition in the writing, **themes and sub-themes from the Intensive Care nurse interviews** are included in the discussion of the focus group interviews (Table 6.1). The **reason for this, was because** the purpose of the focus group interview was **to seek verification from other Intensive Care nurses** working in the Intensive Care setting that the competencies identified by those in the individual interviews were required or used in the care of critically ill patients in the ICUs as described in Chapter Three.

Each of these extrapolated themes is discussed along with the associated sub-themes. Quotes from the focus group discussion are used to illustrate the findings, but are also intended to allow the reader to arbitrate for themselves something of the nature of the responses, which form the data to evaluate the credibility of the findings and conclusion of the study.

Exemplars from transcriptions are individually cited. The researcher elected to include excerpts which had been verified by at least three (3) participants and, in doing so selected one statement which best illustrated the point under discussion.

When quotes are given, they are followed by the codes FG, indicate which indicates the remark was made by the Intensive Care nurse (N) in the focus group discussion. The number following the letter indicates the code number of the participant, for example FGN9 means the ninth Intensive Care nurse in the discussion gave that particular statement.

Table 6.1: Themes and sub-themes from the data with individual nurse participants

THEME	**SUB-THEME**
6.4.1 Foundational care practices	6.4.1.1 Use of technology
	6.4.1.2 Highly skilled in basic nursing care
	6.4.1.3 Following protocols
	6.4.1.4 Scope of Practice
6.4.2 Critical thinking in decision making	6.4.2.1 Knowledge of the discipline
	6.4.2.2 Self-knowledge in safe practice
6. 4.3 Emotional competencies	6.4.3.1 Open Communication
	6.4.3.2 Respect
	6.4.3.3 Support of family members
6.4.4 Transcending obstacles to growth and development	6.4.4.1 Enablers for growth and development

6.4.1 Foundational Care Practices

6.4.1.1 Experience in use of technology

A synergistic view of the participants reflected that experience in the use of technology was important. The views ranged from technologies were important but not more important than the care of patients. They felt people tend to overemphasise technology and general things about patient care are often forgotten. They also felt it was important for nurses to know how to grasp technical aspects when there was equipment failure, as stated:

> *"I know the technology is important in ICU…but I don't think it is so important."*
>
> (FGN1, FGN9)

> *"I find people tend to overemphasise and forget those general things …like a normal blood pressure."*
>
> *(FGN7)*

> *"…it is important to know how to calibrate a machine …it is important to know how to troubleshoot equipment …and make changes correctly."*
>
> (FGN6)

Along with experience in use of technology and technological competence, the senior nurse participants verbalised that safety of the patient was most important. They also felt technology complicated care and made it more difficult for less experienced nurses, as expressed by:

> *"…you can't just come and turn a nob [setting] …you must have knowledge to do that …it is part of keeping the patient safe."*
>
> *(FGN1)*

> *"I just feel don't touch if you don't know rather ask someone if you are unsure."*
>
> *(FGN9)*

> *"…technology complicates care …it is not easy to turn a ventilated patient with a tube in if you don't know how to* [do it]."
>
> (FGN1)

To sum this up, the view held by the participants reflected that technology was important but not the most important thing for a nurse to do. They exercised caution about the tendency to overemphasise technology. Safety of the patient was important and knowledge of technology provided the nurse with the "know how" required for caring for a ventilated patient.

6.4.1.2 Highly skilled in basic nursing care

A synergistic view of the participants reflected that physical care was important. The views ranged from doing basic care and other care such as providing comfort and talking to patients. They said a nurse's assessment provided a plan for the management of the total care needs for a patient. They felt it was far broader in ICU and that a caring disposition be displayed before implementation of actions. They also believed that other care was

important such as ventilator care, sedation and comfort cares and recently a lot of end of life care. They stated basic care included talking to patients when they worked with technology, as they felt it helped meet emotional needs.

> *"Basic care is all those basic things like physical care …our assessments tell us what we do to care for patients …like the patient's needs and just that we do."*
>
> (FGN7)

> *"I think it is much broader in ICU …you have got to be a caring person to do care …you have got to be that before you do actions."*
>
> (FGN9; FGN5)

> *"…they must do care for the patient all those things like hygiene, suctioning, pressure part care, mouth care."*
>
> (FGN3)

> *"…there are other cares like we do nutrition, ventilator care, sedation and comfort cares …we also do end of life care …we are doing a lot of that now these days."*
>
> (FGN1)

In addition to the elements for physical care, some of the more experienced participants verbalised that emotional needs of patients was important. They said patients were frightened and anxious as this was an unknown situation and were unable to communicate because they were intubated. They also felt that many nurses were not comfortable talking to patients, which added to patient's anxiety and frustration. The view of the participants is expressed below:

> *"The patient can't talk so he is frightened and he is anxious about what is happening to him."*
>
> (FGN1)

"If you don't talk to him he is not going to know that there was a tube there blocking the vocal chords."

(FGN3)

"You know so many nurses don't talk to patients …a patient told me that they thought we weren't listening …that made him more anxious and frustrated."

(FGN1; FGN2; FGN9)

Along with the emotional needs of the patients, participants verbalised that family were important. They said including the family was vital and an integral part of holistic nursing care and that family were provided with support. This was in contrast to some of the participants, who felt family presence at the bedside created problems for the nurse, particularly when the doctors were busy. This suggested that these nurses were divided in their responses.

"…including family in the care is important …we understand the role family has in the patient's life ….to include the family is holistic."

(FGN1)

"I don't have the time to be bothered with family issues and problems …there is too much to do."

(FGN7)

"…the family just think they can come anytime …just when it suits them …the doctor's get angry at me …they don't want them there when they are busy."

(FGN5; FGN8)

To conclude, the view of the participants was that basic care was physical and psychological care, which included other care such as nutrition, ventilation care, sedation and comfort care. End of life care was also provided by nurses. A caring disposition displayed by nurses was considered of importance before implementation of actions. Also, communication was said to be important as they felt this was an unfamiliar situation for the

patient brought about by the presence of technology. Nurses were divided in their responses for inclusion of family in the process of care.

6.4.1.3 Following protocol, use of evidence-based practice

The synergistic view of the participants was that protocols are followed in the ICU setting. These were considered to be medically prescribed prescriptions, meant for nurses to follow. They felt this was the way doctors operated in ICU settings because they are not always with the patients. Nurses are expected to follow protocols when administering treatments as it is all laid down in the protocol, for example how to mix drugs, what rate to use and when to adjust the dosages. The view of the participants is expressed below:

> *"...protocols our doctors give us ...we are expected follow when it comes to our drugs ...it is all laid down in the file or on the ICU chart."*
>
> (FGN7)

> *"We follow protocols ...this is the way we operate in ICU."*
>
> (FGN6)

When the other participants were asked about circumstances under which they would deviate from the protocol. It appears the nurses generally felt the doctors prescribed the protocols, because they were medically prescribed instructions and they were expected to adhere to them.

> *"...it suppose it can be but it is not often our doctors deviate ...it can't be because it is all written down there ...it is according to the standard."*
>
> (FGN9)

From the above discussion it appears these Intensive Care nurses may not be so familiar with the term evidence-based protocols. When the researcher clarified and explained what the term meant, they reiterated they followed protocols in the management of the treatment and drug regimes. If they encountered a problem they would call their senior, or even a doctor to come and review the case management expressed by:

"…what the doctor prescribes we follow …even if it means following a protocol."

(FGN3)

"…doctors will get very angry if we don't follow the protocol …because that is what we are meant to do."

(FGN5)

"I think if we run into problems you can always find a doctor in our unit …we can even call our senior or shift leader to come and help."

(FGN6)

To sum up, the view of the participants was that protocols are followed in the management of drugs and treatment regimes. They appear to lack knowledge about how the EBP protocols work because they see these as medical prescriptions intended for nurses to follow.

6.4.1.4 Guided by Scope of Practice

The synergistic view of the participants was that the scope of practice was important. The views of participants ranged from expressions of responsibilities, autonomy and accountability for care. They felt the scope of practice guided the responsibilities of a nurse and included the emergency management procedures for critically ill patients. They also felt that the ICU environment was guided by the doctor and that the Intensive Care nurse was autonomous and capable of making clinical judgments for a patient, independent of a doctor's instruction. This was expressed as:

"…what you do must be according to your scope of practice …even managing an emergency …"

(FGN7; FGN1; FGN9)

"The ICU environment is guided by the doctor …a nurse can make an independent decision."

(FGN1)

> *"…even when a doctor comes and issues an instruction …I can make my own decision whether I carry that out or not …as long as I can motivate."*
>
> (FGN7)

While this is not the case, two participants in the group believed Intensive Care nurses held a separate scope of practice.

> *"ICU nurses have a different scope of practice …because we can do things other nurses can't do …"*
>
> (FGN3; FGN5)

To conclude, the view of the participants was that the scope of practice was identified as an important component for clinical competency. The ICU environment is guided by the doctor, but nurses were considered autonomous practitioners and capable of making judgments, willing to take responsibility for independent judgments, acts, omissions and actions.

6.4.2 Critical Thinking in Decision Making

6.4.2.1 Knowledge of discipline

The synergistic view of the participants reflected that nurses use their critical thinking skills when faced with a new problem. The view is critical thinking helps them identify critical incidents which may need immediate attention. They felt this included situations they may be unfamiliar with handling, but were still accountable for everything they do on a patient.

> *"…critical thinking will be used to solve problems, like if you have a new problem you are not so familiar with…"*
>
> (FGN7)

They explained a sequence of actions after applying the critical thinking skills to a patient situation. This is what one participant said:

> *"If you have an arrest …you would be thinking what you should be doing …it may be the patient has a respiratory problem because the stats is low on the monitor …maybe it's hypoxia …so you can increase the oxygen …if that does not improve, then you can change your ventilation settings and if that still does not work you can call a doctor."*
>
> (FGN2)

Another added:

> *"I think in that situation …it is doing and thinking at the same time …it helps because you are still accountable for whatever you do for a patient."*
>
> (FGN1)

To conclude, the view of the participants is that critical thinking is used when faced with a new and unfamiliar situation. They felt that critical thought is linked to accountability of a nurse, because they may have to account for everything they have done for a patient.

6.4.2.2 Self-knowledge is essential for safe practice

When asked for their views of being safe practitioners in the Intensive Care setting, the participants' view was that it was through knowing your scope of practice and acts and omissions. They felt this included their responsibilities as nurses to ensure the patient's environment was safe. They also included the nurse's measures to ensure safe medication administration. This is what they said:

> *"Knowing the scope of practice of a nurse …knowing that the patients environment is safe."*
>
> (FGN3)

> *"You cannot just give a drug and disappear …you must stay and observe how the patient reacts to what you have given them."*
>
> (FGN7; FGN8)

To sum up, the view of the participants is that safe practice is a professional competence. They felt this is linked to knowing the legislation governing nursing practice and the Nurse's Scope of Practice.

6.4.3 Emotive Competencies

6.4.3.1 Communication

The synergistic view of the participants reflected that nurses maintained open communication. The views were that cooperation was maintained amongst nurses and that doctors failed to maintain direct communication with them. They felt that accurate written documents were maintained according to legal requirements. The views of the participants are reflected below:

> *"...if I find I don't understand something ...like an ECG or blood gas I will go to my senior to help me ...she will know."*
>
> (FGN3)

> *"...often they* [doctors] *will just come and write something on the chart and not tell you ...maybe they told the shift leader I don't' know."*
>
> (FGN4; FGN5)

> *"...you always keep good records ...it is in your scope of practice they [authorities] will come and check up on you."*
>
> (FGN6)

Along with the elements of cooperation, some participants were divided in their responses. They said they found some senior nurses were incorrect in the advice that was given and they were left to carry the responsibility when confronted by the doctor. The more senior and experienced participants felt they were viewed as old fashioned, because they were checking up on the patient and that junior nurses were more resistant to these practices as they felt they were registered Intensive Care nurses. This suggested there was a **generation gap** amongst nurses. The views of the participants are expressed below:

"I find that cooperation amongst nurses doesn't happen anymore ...they tell me I am old fashion ...they know what they are doing because they were taught these things in training ...now who am I coming to check up on them."

(FGN1)

"They tell you to do things ...they think they know ...then it is wrong ... where are they now when the doctor shouts me ... not around to tell the doctor they told me to do so ..."

(FGN8)

In addition, to the requirements for communication, participants also verbalised that assertiveness of nurses was important. However, they said nurses generally lacked knowledge to assert themselves as many of them were junior and found ward rounds too intimidating to say something to the doctor. They said:

"...they tell me ward rounds are too intense ...they don't understand what the doctor tells them to do ...they are too nervous to say something ..."

(FGN9)

"I won't say anything ...I am too junior ...it is intimidating to say something ...when there are so many people there ..."

(FGN3)

"...I will stand there just like a fly on the wall and not move or say anything ..."

(FGN 5)

To sum up, the views of the participants were similar to the views of the individual nurses, but the degree of variance was felt by some participants for doctor's failure to maintain direct communication with less experienced nurses. Some un-cooperation amongst nurses was felt, particularly between junior and senior nurses. Nurse's inability to assert themselves was generally related to insecurity to say something to a doctor for fear of reprisal or intimidation.

Along with communication, participant's verbalised that respect was also an important factor for establishing good interpersonal relationships between nurses and doctors. They felt some of the doctors were not always forthcoming in providing information about new drugs they were expected to administer.

> *"…nurses should be updated on new drugs they are expected to administer …"*
>
> (FGN5; FGN6)

The agreement amongst the participants was that nurses are the natural advocates for the patient and they needed to know what was being prescribed was correct for the patient. This is upheld in terms of the Nurse's Scope of Practice.

6.4.2 Offering support for nursing team

Along with communication and respect, participants verbalised the need for support for the nursing team. They said if nurses are supported by their colleagues they cope better with stress. This meant that ICU nurses are taking additional strain, brought about by a shortage of experienced nurses coupled with cost constraints and rising patient acuities. They felt the unit manager who supported and mentored her team was vital for helping nurses to cope with stress in the ICU environment.

> *"…we know if we had a problem we can go to our senior* [unit manager] *she will help us to sort out that problem"*
>
> (FGN3; FGN4; FGN7)

> *"Just the other day I had to tell the doctor the nurse is 100% correct …it is in her scope of practice …but he would not listen to the nurses until I stepped in …"*
>
> (FGN1; FGN9)

To conclude, the view of these participants is that they demonstrated confidence in the leadership skills offered to them by their seniors. The participants expressed that they trusted the judgment and support provided to them by their seniors.

6.4.4 Transcending obstacles for growth and development

6.4.4.1 Enablers for growth and development

The synergistic view of the participants was that they gained knowledge from their peers. They felt their peers helped them to learn how to put things into practice. They conceded that not all their peers were good role models. However they sought out and chose to work with those who were approachable and willing to teach them. This is what they said:

> *"We are learning all the time …not necessarily changing things but just becoming better at doing things in ICU."*
>
> (FGN2)

> *"The competent ICU nurse can be trusted and willing to share information with others …and be supportive."*
>
> (FGN1)

> *"We learn from our seniors like our shift leaders …they would show you how to do ...or not do things."*
>
> (FGN5; FGN3)

In turn, some of the participants also stated that when they were confident to do something they would share this information with their colleagues. This was because they were supported to learn these things and now they wanted to share it with others to help them grow and develop their skills.

> "I think because we were supported to learn things …now we support others in learning the same things."
>
> (FGN3)

> "…we grow and become experts through the support of others …isn't that so."
>
> (FGN9)

The view of the participants was that they learned to apply knowledge through the support and guidance of their peers, seniors and shift leaders. They felt as they gained confidence in their knowledge they were able to function independently safely and in turn, they were able to impart knowledge to their colleagues to help them grow and develop.

6.4 CONCLUSIONS DRAWN FROM FOCUS GROUP THEMES

Conclusions for the findings regarding Intensive Care nurse competencies drawn from the extrapolated themes and sub-themes are as follows:

- Comparing responses from both groups of Intensive Care nurses (individual and focus group interviews) reveals common similarities in identifying the competencies required by Intensive Care nurses.
- They agreed on importance of foundational care practices. Some differences were noted between the groups in that focus group participants considered high efficiency in basic nursing care to be **broader in the care elements** and **less than those in evidence-based practice** described in the individual interviews.
- They agreed on the importance of critical thinking in decision making, including application of knowledge and self-knowledge in safe practice.
- Participants agreed on factors in emotional competencies related to communication and offering support for nurses. Some differences were noted in **collegial relationships, cooperation and coordination roles between nurses,** as described in the individual interviews.
- They agreed on transcending obstacles to growth and development. However, elements of enablers for growth and development, such as peer support for learning, were emphasised through the focus group discussion.

6.5 SUMMARY

The conclusions derived from Chapter Six were used together with required competencies of the individual Intensive Care nurses (chapter five) and the profile of critically ill patients in the ICUs for the development of a preliminary set of competencies based on the data obtained. The results and discussion pertaining to development of a preliminary set of

competencies in step four of the research design and research methods are provided in the next chapter to add to the needs of critically ill patients in the ICUs.

CHAPTER SEVEN

MATCHING PATIENT NEEDS AND REQUIRED COMPETENCIES AND DEVELOPMENT OF COMPETENCY STANDARDS

7.1 INTRODUCTION

In this chapter the competency standards for Intensive Care nurses, who care for critically ill patients in a university-affiliated public sector and tertiary level hospital in Gauteng Province, South Africa, are developed. The basis for the competency standards are the findings of this study, intuitive insights of the researcher and other sources from the literature. A criterion suggested by the AGREE Research Trust (2009) is proposed to evaluate the data.

7.2 PROCESS FOR DEVELOPMENT OF COMPETENCY STANDARDS

The development of the competency standards is presented as follows: logical reasoning is applied in the application; an overview is drawn from step 1 to step 3; integration of synthesis of conclusions drawn from steps 1 to 3 including development of relational statements within the competency standards. Inductive and deductive logical reasoning were applied to the development of a preliminary set of competencies. Polit and Beck (2008) and Chinn and Kramer (2008) describe logistical reasoning as the mental processing of ideas to solve problems; the whole is broken down into smaller parts. The smaller parts included steps 1 to 3. In the development of the competency standards two types of logical reasoning were applied, inductive and deductive reasoning.

Inductive reasoning involves the process of observing multiple smaller parts and then grouping these together to form a larger part (Chinn and Kramer, 2008). An example of inductive reasoning was the grouping of conclusions drawn from steps 1 to 3. The inductive phase occurred during the integration and synthesis phase of the development of competency standards.

Deductive reasoning involves the development of predictions from the integration and synthesis of the conclusions drawn from steps 1 to 3. An example of deductive reasoning applied in this study is the recommendations from an integrated and synthesised conclusion drawn from step 1 to step 3.

The overview of conclusions drawn from steps 1 to 3 follows:

Step 1: The *first objective* was to explore and describe the clinical profile of patients admitted to the ICUs.

- The average age of patients admitted to ICUs was 48.2 years (SD 17.72), ranging from 20 to 82 years. Males accounted for 64.4% (n=85) and females 36.6% (n=49) of the total sample (n=134). In this study, a higher (59.7%) percentage of the patients were admitted for surgical procedures with 40.3% being medical cases. Of all surgical patients, unscheduled surgery was higher (34.3%) than scheduled surgery, which was 25.4%.

- The majority (59.7%) of patients of the total sample were positive for pre-existent co-morbid illness, whilst 36 (45.0%) presented for two, three or four co-morbid illness conditions, compared to 44 (53.5%) who had one co-morbid illness condition. Further, the majority (44.1%) of single co-morbid illness were **verified as hypertension**.

- The mean SAPS II score was 34.83 (SD 13.30) points for patients admitted to ICU and the range was 71 points for the total sample. Of the total sample, **trauma patients had a higher (42.75; SD 11.69)** total **mean SAPS II score** followed by a lower score indicated in general, cardiothoracic and coronary care patient groups, respectively 34.72 (12.53), 32.54 (SD 12.70) and 29.13 (SD 13.32). The ICU mortality rate was 20.0% (n=23) for the total sample (n=134), whilst SAPS II predicted mortality rate was 20.03% for the total sample.

- The mean TISS-28 score was 29.23 (SD 8.06) points on admission to ICU, and ranged from 11 to 58 points for the total sample (n=134). Of the total mean TISS-

28 scores, **cardiothoracic patients had a higher TISS-28 score (34.81; SD 5.27)** compared with trauma and general patient groups, respectively 31.07 (SD 4.76) and 30.03 (SD 7.33).

- Based on 1,066 TISS-28 measurements, the mean TISS-28 cumulative score per patient per stay in ICU was 207.54 (SD 360.34) and the mean total TISS-28 score per patient day was 26.94 (SD 7.52). A pattern was noted on display of total TISS-28 scores, which reflected **gradual fluctuations on days two, five, eight and 15**. All patients received **standard monitoring (100%)** and nearly all had **single or multiple medication (>93.0%),** routine **dressing changes (>91.0%)** and **frequent urine output monitoring** (>94%). Of the 28 TISS=28 items **11 items were significant** ($p<0.05$), including one in the category of basic activities, four items in the category of cardiovascular support, five in ventilatory support and one in specific interventions.

- The average length of stay of patients in ICU was 6.91 (SD 11.99), ranging from one to 108 days. Further, majority 71.6% (n=96) of frequency responses indicated **length of stay** was in the **less than seven days** category, in contrast to only 6.0% which indicated length of stay was in the category of more than three weeks.

- For the difference between survivor and non-survivor population groups, the **correlation between SAPS II and TISS-28 scores** were **statistically significant** ($r=0.46$; $p=0.000$). Of the total SAPS II score items, only two were statistically significantly different ($p<0.05$). Included were **ventilation PaO_2/FiO_2** ratio and **serum urea**, respectively item Q5 and Q7. Of the 15 SAPS II items, only three were statistically significant ($p<0.05$) different at the sub-item scores. Included were ventilation **PaO_2/FiO_2** ratio (item 1.5) and **serum urea** (item Q7) and white blood cell count (item Q8). These sub-items reflected a pattern of **opposite higher and lower scores** at **sub-item level** between non-survival and survival population groups, respectively.

Step 2: The *second objective* was to elicit from an expert group of Intensive Care nurses the competencies Intensive Care nurses required for the provision of care.

- Putting it all together is the essential competency for Intensive Care nurses who provide care for critically ill patients in the Intensive Care units. Putting it all together is described as holistic and integrated nursing care.

- Technological competence and high efficiency in basic nursing skills form the foundation for Intensive Care. Evidence based practice and Scope of Practice serve as the guiding framework for foundational care practices by Intensive Care nurses.

- Knowledge of the discipline and self-knowledge in safe practice informs the application of critical thinking in decision-making, interpretations and independent actions by the Intensive Care nurse and facilitates simultaneous assessment of data from patients and evaluation of decisions made by other members of the multi-disciplinary team.

- Working relationships between patient/families, nurses and nurses and doctors is a partnership characterised by collaboration, open team communication, mutual respect and cooperation, which form the basis for emotional competencies in Intensive Care nursing.

- Growing and developing as a professional is an important part of becoming an effective and efficient Intensive Care nurse. Transcending obstacles to professional growth can be facilitated by creating informal learning opportunities through mentorships.

Step 3: The *third objective* was to elicit from other Intensive Care nurses in the Intensive Care setting for the competencies they required or used in the ICUs.

- Comparing responses from both groups of Intensive Care nurses (individual interviews and focus group interviews) reveals common similarities in identifying the competencies required and used by Intensive Care nurses.

- They agreed on importance of foundational care practices. Some differences were noted between the groups in that focus group participants considered high

efficiency nursing care to be **broader in care elements** and **less than** those in **evidence-based practice** described in the individual interviews.

- They agreed on importance of critical thinking in decision making, including application of knowledge and self-knowledge in safe practice.

- Also participants agreed on importance of factors in emotional competencies related to communication and offering support for nurses. Some differences were noted in **collegial relationships**, **communication**, **cooperation** and **coordination role between nurses** than that described in the individual interviews.

- They agreed on importance of factors for transcending obstacles to growth and development. However, elements of enablers for growth and development such as **peer support for learning** were emphasised through the focus group discussion.

7.3 DEVELOPMENT OF A PRELIMINARY SET OF COMPETENCIES

Steps 4 to 5: The *fourth objective* was to compile a preliminary list of competencies from the data collected in steps 2 and 3, and followed by *the fifth objective,* which was to verify the significance of the developed list of competencies in the literature.

7.3.1 Definitions for Competence and Competency

Competence is a poorly defined term generally. In the health professions competence is used to describe the knowledge that enables a person to perform activities in a consistent and safe manner. It is the major determinant of performance.

In operative terms there is a general agreement that competence in nursing reflects the following:

- Knowledge, understanding and judgment;
- A range of skills cognitive, technical or psychomotor and interpersonal, and
- A range of personal attributes and attitudes.

(ICN, 2009:6)

The International Council of Nursing (ICN, 2009) defines competence as a level of performance demonstrating the effective application of knowledge, skills and judgment. This is this definition that is used as underpinning for the ICN Framework of competencies for the Nurse Specialist (ICN, 2009).

In the literature, the ability to perform to predefined standards is gained through education and training, experience and mentors. Parry (1998) defined "competencies" as the applied skills and knowledge that enable people to do their work. These are descriptive behaviour statements that are observable and allow for measurement of competence. Competencies are useful to describe the activities that can be carried out by a professional when carry out a specific job.

7.3.2 Process for Development and Verification

International literature reviews and data gathered from focus group and individual interviews (steps 2 and 3 of the study) formed the basis for the development of a list of competencies. The process for development of a set of competencies was undertaken in two parts (**steps 4 and 5** of the study). First, content analysis was performed according to Miles and Huberman (1994) as described in chapter three. Emerging themes were identified separately by the researcher and a colleague (specialist nurse in the field) and discussed until consensus (refer **table 7.1**).

Then, then they were organised in categories based on ICN Framework of Competencies for the Nurse Specialist (ICN, 2009). According to the framework the roles of nurses can be described in **three different domains**: the first is the **professional, ethical and legal practice** domain, the second is **care provision** and **management** and the third domain consists of **professional, personal** and **quality development** (see **Figure 7.1**).

Then resulting list of competencies were taken back to the Intensive Care nurse participants in a consensus seeking process.

The preliminary list of competencies drawn from the data obtained is presented in **table 7.1**.

Table 7.1 Preliminary set of competencies based on data obtained in the study (steps 2 to 3)

THEME I: FOUNDATIONAL CARE PRACTICES	**THEME 3: EMOTIONAL COMPETENCIES**
Experience in use of technology (refer 5.4.1.1, p.139)	*Collegial relationship with doctor (refer 5.4.3.1; p.156)*
Know technology (p.139)	Be patient advocate in MDT (p.156)
Conduct own set of observations (p.140)	Engage in treatment decisions (p.156)
Keep environment safe (p. 141)	Work collaboratively with doctors (p.157)
recognise risk and minimise complications (p.141)	Keep good interpersonal relationships (p. 157)
Assess patient systematically (p. 143)	Respect the other's opinion (p. 157)
Do own physical examination (p.143)	*Maintain open team communication (refer 5.4.3.2; p. 158)*
Highly skilled basic nursing care (refer 5.4.1.2; p.144)	Cooperate with others to make correct decisions (p. 158)
Know how to perform procedures (p.144)	Communicate critical information to others (p. 158)
Know how to maintain comfort/pain (p.144)	Keep accurate records (p. 158)
Monitor responses at same time (p. 145)	*Ability to support nursing team (refer 5.4.3.3; p. 162)*
Following protocols using EBP (refer 5.4.1.3; p.146)	Delegate tasks to others (p. 161)
Know how to use EBP protocol (p. 146)	Offer supervision and teach others (p. 163)
Maintain knowledge development (p. 148)	Give guidance, support and feedback (p. 162)
Exercise judgment when making decisions (p.148)	Manage and anticipate conflict situations (p. 162)
Apply caution when using new knowledge (p.148)	*Ability to offer support for family (refer 5.4.3.4; p.163)*
Guided by Scope of Practice (refer 5.4.1.4 p.149)	Offer crisis counselling to family (p. 163)
Be responsible for own tasks and actions (p.149)	Teach family about ICU environment (p. 163)
Collaborate and partner with doctor (p. 149)	Give them information to their level of satisfaction (p. 164)
Make autonomous decisions (p.149)	Give them access and encourage them to visit (p. 164)
Be accountable for own actions (p.149)	Respect cultural and religious beliefs (p. 165)
THEME 2: CRITICAL THINKING IN DECISION MAKING	Give special care if the patient receiving palliative care (p. 164)
Knowledge of discipline (refer 5.4.2.1; p.151)	Advocate for individual needs of patient (p. 165)
Apply knowledge (p. 151)	**THEME 4: TRANSCEND OBSTACLES TO GROW & DEVELOP**
Gather data and analysis (p. 152)	*Develop self and others (refer 5.4.4.2; p. 168)*
Integrate information to prioritise patient needs (p. 151)	Be a role model and gain trust of others (p. 168)
Relate findings to patient situation (p. 153)	Mentor others to improve their standard of care (p.168)
Manage life threatening/non-life threatening situations (p. 152)	Consistently demonstrate high quality care (p. 168)
Evaluate responses adequately (p. 151)	Seek out and identify good role models (p. 169)
Self-knowledge is essential for safe practice (refer 5.4.2.2; p.154)	Develop a sense of life-long learning (p. 169)
Know nursing acts and omissions (p. 154)	Motivate others to seek out learning opportunities (p. 168)
Reflecting on own practice performance (p. 154)	Teach and support new students (p. 169)
Keep learning in the workplace to improve practice (p. 155)	

An overview of the revised ICN competencies framework is presented in **figure 7.2**.

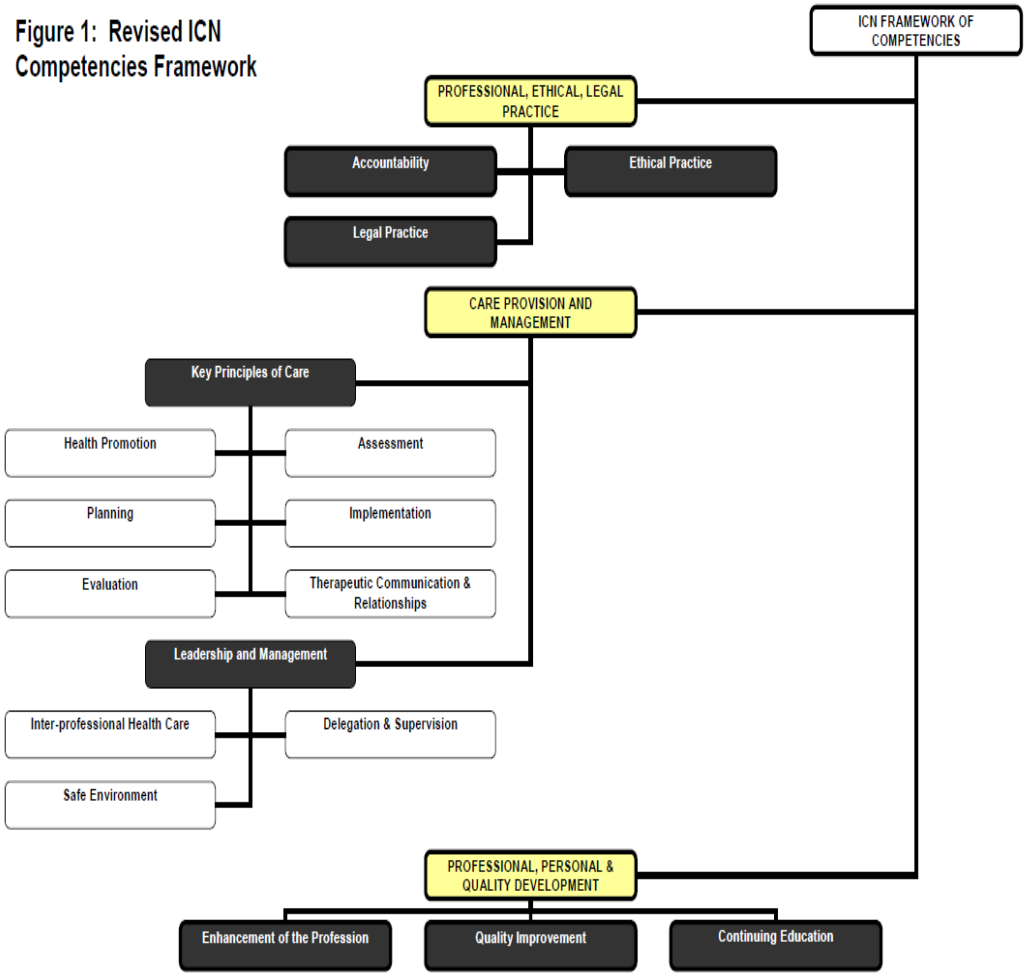


Figure 7.2 Revised International Council of Nurses competencies framework (ICN, 2009:8)

7.4 THE COMPETENCY STANDARDS FOR INTENSIVE CARE NURSES' CARE OF A CRITICALLY ILL PATIENT IN THE INTENSIVE CARE UNITS

The competency standards for intensive care nurses care of critically ill patients is intended to be implemented and applied in conjunction with the following:

- The National Nursing Act (RSA, No 33 of 2005)
- The Regulation and Guidelines Related to the Clinical Nursing Science Course Leading to an Additional Qualification (SANC, R212 of 1993, as amended)

- The Regulations Relating to the Scope of Practice of Persons who are Registered or Enrolled under the Nursing Act, 1978 (SANC, R 2598 of 1984, as amended)
- The South African Nursing Council Rules setting out the Acts or Omissions in respect of which the Council May Take Disciplinary Steps (SANC, R387 of 194, as amended).

The competency standards, for intensive care nurses care of a critically ill patient in the intensive care units, make recommendations informing professional practice, care and management and professional, personal and quality development.

The competency standards are written with the purpose of informing Intensive care nursing practice, however the input and involvement of the multi-disciplinary team are fully acknowledged and encouraged in their involvement in the competency standards for intensive care nurses care of critically ill patients in the intensive care units, as the process of development competency standards is a dynamic one and will need to be updated as new evidence becomes available.

All registered intensive care nurses working in the intensive care units are in a position to implement the competency standards in the provision of care for a critically ill patient. It is expected that intensive care registered nurses will provide their care of the critically ill patient and family or significant other within their scope of practice. Intensive care nurses are encouraged to seek consultation from the multidisciplinary team in all instances where the care needs of a patient and family, or significant other, surpasses the individual intensive care nurses ability to function independently.

7.5.1 Intensive Care Nursing Professional, Legal and Ethical Practice

The competencies are structured according to ICN framework of competencies for intensive care nurses who provide care for a critically ill patient. The sequence commences with the recommendations related to the first category *professional, legal and ethical practice.*

The nurse is expected to function within the parameters of the professional therapeutic activities (the Scope of Practice) which can be carried out by a registered nurse. The nurse

must demonstrate accountability for added responsibility undertaken as an intensive care nurse.

The nurse is expected to take responsibility for additional functions beyond her scope of practice and be accountable for independent decisions.

Competency 1
Acts accountably and takes responsibility for independent decisions

Independent decisions leading to actions are undertaken through professional accountability and not as a result of obeying the doctor's orders (SANC, R395 of 1985 as amended).

Criteria:

- Accepts responsibility for consequence of own acts and omissions.
- Takes full responsibility for accurate intervention prescribed by other members of the team.
- Seeks referral when appropriate.
- Clarifies unclear instructions with the doctors.
- Makes informed judgments within level of competence and scope of practice.

Competency 2
Demonstrates ethical sensitivity and upholds ethical practice

Demonstrating ethical sensitivity is upheld in the professions code of ethics and code of conduct (SANC, 2004) and recommended in intensive care (Aari, Sumominen & Leino-Kilpi, 2008).

Criteria:

- Complies with professions code of ethics and code of conduct.
- Demonstrates awareness of ethical issues in nursing by engaging in discussions with multidisciplinary team.
- Identifies instances of unprofessional conduct.

- Responds appropriately to unprofessional behaviour.

Competency 3
Function according to the scope of practice and level of competence

The scope of practice is the professional, ethical and legal framework outlining the duties and responsibilities of the registered nurse (SANC, 2004) and recommended in intensive care (Scribante, Muller & Lipman, 1996).

Criteria:

- Knowing own scope of practice and legal requirements of the nursing profession.
- Protects the rights of patients and their family.
- Demonstrates knowledge of the rights of vulnerable patients.
- Recognises the patients' right to full informed consent.
- Acts to provide a therapeutic environment conducive of well-being for the patient.
- Respects the rights of patients.
- Acts in a sensitive and non-judgmental manner when engaging with patients and their family members.

7.5.2 Intensive Care Nursing Care and Management

The sequence commences with the recommendations related to the *second category* care and management for Intensive care nursing.

To provide effective care for a critically ill patient, the intensive care nurse is required to demonstrate the application of specialised knowledge and skills when implementing nursing interventions.

Competency 4
Maintain an environment that is safe to promote the well-being of a patient.

Keeping the physical and psychosocial environment safe includes the ability to identify abnormal situations and also activities to promote safety, security and comfort for the well-being of a patient and their family members.

Keeping the environment safe, particularly related to assessment of the patient and equipment is recommended in intensive care (Couchman, Wetzig, Coyer & Wheeler, 2007).

Criteria:

- Ability to assess the respiratory system to ensure adequacy of oxygenation and patency of an artificial airway for a patient.
- Ability to observe the patient continuously or frequently to detect subtle changes in the patient situation.
- Ability to conduct a systematic physical assessment to identify actual or potential problems for the patient.
- Ability to minimise medico-legal risks and complications for example by the use of appropriate alarm settings.
- Ability to ensure medication infusions are being administered correctly and according to the prescribed or standardised drug regime.

Clinical decision making is based on advanced theoretical knowledge and experiential learning. When assessing and managing patient responses to various situations, the intensive care nurse uses critical thinking to problem solve, management of emergency situations is part of problem resolution.

The **ability to assess, manage and integrate** multiple sources of data forms a major part of the function of an intensive care nurse.

Competency 5
Manages multiple sources of data when making judgments

Clinical decision making and management of emergency situations is supported in the evidence of intensive care (Aari, Sumominen & Leino-Kilpi, 2008).

Criteria:

- Gather information from many sources including the patient's history, talking to family, the ICU charts, laboratory data
- Use additional information obtained from the nurses assessment
- Analyse the information by using interpretive skills to establish a nursing diagnosis
- Evaluate the effectiveness of that decision in relation to the pathophysiology of the patient situation

Ability to identify problems includes the resolution of the problem and this is supported in the scope of practice as the **ability to make a nursing diagnosis** (Searle, 2005).

Competency 6
Manages responses required for multiple sources of data

Criteria:

- Manage an emergency situation
- Seek assistance from a doctor or another senior professional nurse
- Prepares for emergency intervention while waiting for medical assistance
- Evaluates the effectiveness of that nursing intervention
- Re-asses and re-organise the plan of care for the patient

Technological devices are useful in the care and support of the critically ill patient. The intensive care nurse is required to use and manage additional technological devices in the delivery of care.

Competency 7
Manages additional technological resources in patient care

Technological competence is essential for development of the foundational care practice, and is supported in intensive care (Little, 2000).

Criteria:

- In-depth knowledge of a wide array of technological devices used in the care of critically ill patients including ventilators, infusion pumps and other assist devices.
- To obtain patient data pertaining to equipment settings and functioning.
- To use patient data in conjunction with other measures of nurses assessment when making adjustment to settings.
- The ability to trouble-shoot equipment failure or errors. This can be achieved by taking a manual blood pressure reading to verify the technological data.
- To ensure emergency back-up equipment is available at the bedside such as an ambubag and suctioning devices in the event of equipment failure or accidental extubation.

Competency 8
Manages evidence-based protocols and drug regimes

Protocol-based and standardised care is viewed as a mechanism for supporting the expansion and extension of the nursing roles as it supports autonomous practice and is supported in intensive care (Rycroft-Malone, Fontenia, Bick & Seers, 2008).

Criteria:

- In-depth knowledge of the nurse's role in the management and implementation of evidence-based treatment programmes.
- Keep updated for the introduction of new evidence in the existing treatment protocols. This can be achieved by engaging in ward round discussions.
- In-depth-knowledge of physiological actions, side effect and interactions of standardised drug regimes.

The nurse is required to establish and maintain a **therapeutic relationship** with the patient and their family members in order to promote the well-being and healing of the patient.

Competency 9
Manages care of a patient and their family members

Maintaining the comfort measures for a patient including positioning, hygiene interventions such as eye care, mouth care and washing, management of stressors, pain and sedation management is recommended in intensive care (Coyer, Wheeler, Wetzig & Couchman, 2008).

Criteria:

- Ability to assess the patients' level of consciousness.
- Ability to discriminate the conditions related to anxiety, delirium and pain
- The ability to assess, plan and implement the patient and family needs for nursing care.
- To ensure hygiene measures for a patient are maintained, including oral care, dressings and bathing.
- To ensure correct alignment of body positioning in the unconscious patient.
- To ensure adequacy of pain control measures for a patient.
- To communicate information about the progress of the patient situation to the family.
- To encourage the presence of family members at the bedside.
- To ensure adequate comfort measures are maintained for the dying patient.
- To advocate for adequate pain control for the dying patient.

The ability to maintain partnerships with other health care providers is based on collaboration, respect and good interpersonal relationships. Attributes of leadership skills are developed through education and extensive experience in the workplace.

Competency 10
Maintains collaborative activities with others to achieve a good outcome

Collaborative practice amongst doctors and nurses and nurses and nurses as members of the multidisciplinary team is essential to achieve a good patient outcome and is supported in intensive care (Aari, Sumominen & Leino-Kilpi, 2008).

Criteria:

- Recognises and respects the roles of members of the multidisciplinary team.
- Works in partnership with doctors to communicate the plan of care.
- Communicates information effectively with other members of the team.
- Initiates and maintains open communication with all members of the team.

Competency 11

Establishes and maintains collaborative relationships with colleagues

Criteria:

- Fosters a collegial relationship with other nurses.
- Respects the level of expertise of other nurses in the team.
- Provides support for novice nurses experiencing difficulty in the team.
- Identifies and responds to situations where assistance is needed.
- Demonstrates the ability to work as a shift leader.
- Initiates and maintains open communication with team members.
- Participates in the orientation of new staff members.
- Discusses clinical judgments and assessment findings with doctor.
- Ensures decision making involves all members of the team.

Competency 12

Creates a supportive environment for colleagues

Creating an environment for colleagues is supported in the role of the intensive care nurse for caring for the well-being of staff or overcoming low morale, conflict and challenging patient situations (Gill, Leslie, Grech & Latour, 2012).

Criteria:

- Supports the activities of other less experienced members of the team.
- Monitors staff morale and acts to improve morale when it is low.
- Initiates counselling when it is needed.
- Implements strategies to overcome conflict amongst team members.

- Provides appropriate support for colleagues when faced with difficult and tense situations.

7.5.1.3 Category Three: Professional, Personal and Quality Development

The Intensive Care nurse is expected to demonstrate leadership in management and education roles. This includes the ability to act as a positive role model for other nurses, to motivate and support them in their achievement of professional growth and development. The organisation in the intensive care setting must support leadership for the achievement of excellence of nurses.

Empowerment of nurses is supported in the literature and used as evidence in intensive care (Aari et al. 2008; Bradbury-Jones, Sambrook & Irvine, 2007).

Nurses are expected to fulfil the code of conduct requirements for the profession. This includes offering support, mentoring and guidance for the support of other nurses and colleagues.

Competency 13
Provides support for development of other nurses

This principle is upheld in the professional code of conduct and code of ethics (SANC, 2004); providing leadership is supported in intensive care (Continho, 2010).

Criteria:

- Be a role model that instils confidence in others
- Assist nurses to cope with stress and conflict situations
- Provide feedback in a manner that reflects a positive image of nursing
- Influence positive role model behaviours and support safe decision making
- Act as a mentor to help, manage and support development of nurses.

Competency 14 Reflects on own practice and conduct self-appraisal

Improving areas of own practice leads to development of professionalism and expertise and this is supported in intensive care (Benner, Tanner & Chesla, 1996).

Criteria:

- Conduct regular self-appraisal to identify areas for development.
- Reflect in nurses' scope of practice and acts and omissions helps them to identify areas for improvement.
- Keeping reading, engaging in discussions with doctors and critique of current research helps them to reflect and develop their own practice.
- Nurses need to develop their practice by conducting their own research studies.

Competency 15 Undertakes activities to maintain self-development

The ability to undertake on-going self-development is related to the development of expertise and supported in the work of Benner, Tanner and Chesla (1996) in the achievement of professional excellence.

Criteria:

- Maintains continuing professional development by attending updates
- Attends local, national and international conferences
- Conducts and participates in research activities
- Undertakes additional education development

7.6 PROCESS FOR VALIDATION OF COMPETENCY STANDARDS

Step 7: To *seventh objective* was to validate the competency standards for the care of critically ill patients.

Determining the extent to which the competency standards satisfy external criteria and meet certain standards makes the judgment for evaluation. Evaluation of competency

standards allows the reader to draw conclusions about their validity. The criterion according to the AGREE Research Trust (2009) was used. The purpose of verifying the competency standards was to verify the quality, to refine and further develop them and to ensure content validity.

The validation of competency standards consisted of 23 key items organised into six domains. Each item is rated on a 7-point scale where 1 connoted strongly disagree and 7, strongly agree according to the validation criteria (AGREE Research Trust, 2009). The domain scores were calculated by summing the scores of all individual items in a domain and by standardising the total as a percentage. In addition, in one section of the overall assessment for verifiers were asked to comment whether they would strongly recommend, recommend with modifications, would not recommend the competency standards or were uncertain. The overall assessment was used to judge the quality of competency standards. Feedback, recommendations, criticisms and suggestions were analysed, incorporated and presented in tabular format.

7.7 SUMMARY

This chapter comprised the development of the competency standards for intensive care nurses who care for critically ill patients. Evaluation criteria for the competency standards were also explicated. Chapter eight will conclude the study reflecting on the findings, the limitations and suggest recommendations for future research, education and practice.

CHAPTER EIGHT

VALIDATION OF THE COMPETENCY STANDARDS, EVALUATION OF THE STUDY AND RECOMMENDATIONS

8.1 INTRODUCTION

This chapter presents the validation of the competency standards, evaluation of the study and recommendations. The purpose of verifying the competency standards was to verify the quality, to refine and further develop them and to ensure content validity. The process for verification was described in chapter seven.

8.2 SELECTION OF EXPERT PANEL FOR VERIFICATION

Four independent evaluators were purposively selected by virtue of expertise in education, clinical facilitation and their status as active members of professional bodies or societies in the field of study. An overview of the profile of the evaluators is provided.

- Assessor 1 holds a PhD qualification and is involved in the education and training of intensive and Intensive Care nurses within the university setting. This participant was purposively selected because of extensive experience in the higher education setting.
- Assessor 2 is a senior nursing services manager in the Intensive Care setting of a university-affiliated public sector hospital which shares similarities with the setting used in this study. This participant was purposively selected because of extensive experience in organisational leadership and involvement in policy development for the Intensive Care setting.
- Assessor 3 holds a diploma in Intensive Care nursing and is involved in the clinical facilitation of education and training of Intensive Care nurses in the college setting. This participant was purposively selected because of extensive experience and expertise in the clinical facilitation of Intensive Care nursing programmes.
- Assessor 4 is a highly experienced nurse researcher who also holds a higher degree (Master's) in Intensive Care nursing. This participant was purposively selected because of extensive experience in the use of research methodologies in the field of study.

All participants were contacted telephonically or in person to invite their participation. Written agreement to participate in the study was obtained (*Annexure L*). The criteria, the guidelines for verification (*Annexure K*) and a description of the competency standards were accompanying documents to enable competency standards evaluation.

8.3 VERIFICATION OF THE COMPETENCY STANDARDS

The Agree II instrument consists of 23 key items organised into six domains followed by two overall assessment rating items. Each domain captures a unique dimension of guideline quality. These are scope and purpose, stakeholder involvement, rigour of development, clarity of presentation, applicability and editorial independence. According to the authors the domains are independent and should not be aggregated into a single quality score (AGREE Research Trust, 2009). A quality score was calculated for each of the six AGREE II domains.

8.3.1 Domain One: Scope and Purpose

In accordance with the AGREE Research Trust (2009), scope and purpose is concerned with the overall aim of the guidelines, the specific health questions and the target population (items 1 to 3).

Table 8.1 Appraiser scores for scope and purpose

	Item 1	Item 2	Item 3	Total
Appraiser 1	5	6	6	17
Appraiser 2	6	6	7	19
Appraiser 3	5	6	4	15
Appraiser 4	5	5	6	16
Total	21	23	23	67

Maximum possible score = 7 (strongly agree) x 3 items x 4 appraisers = 84
Minimum possible score = 1 (strongly disagree) x 4 (appraisers) = 12
The scales domain score will be:

(Obtained score – Minimum possible score)

(Maximum possible score – Minimum possible score)

(67-12) (84-12) x 100 = 55/72 x 100 = 0.763 x 100 = **76.3%**

Comments:

- description of patient population be included in the standards

8.3.2 Domain Two: Stakeholder Involvement

Stakeholder involvement focuses on the extent to which the competency standards was developed by the appropriate stakeholders and represents the views of its intended users. The stakeholder involvement is represented by items four to six (AGREE Research Trust, 2009).

Table 8.2 Appraiser scores for stakeholder involvement

	Item 3	Item 4	Item 5	Total
Appraiser 1	7	7	7	21
Appraiser 2	6	5	6	17
Appraiser 3	5	5	4	14
Appraiser 4	6	6	5	17
Total	24	23	22	69

Maximum possible score = 7 (strongly agree) x 3 items x 4 appraisers = 84

Minimum possible score = 1 (strongly disagree) x 4 (appraisers) = 12

The scales domain score will be:

(Obtained score – Minimum possible score)

(Maximum possible score – Minimum possible score)

(69-12) (86-12) x 100 = 57/72 x 100 = 0.791 x 100 = **79.1%**

Comments:

- it is not clear at what level the standards apply i.e. newly qualified or experienced nurse

8.3.3 Domain Three: Rigour of Development

Rigour of development relates to the process used to gather and synthesise the evidence, the methods to formulate the recommendation and to update these. Rigour of development is represented by items 7 to 14 (AGREE Research Trust, 2009).

Table 8.3 Appraiser scores for rigour of development

Appraiser	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total
Appraiser 1	7	6	6	6	6	7	6	6	50
Appraiser 2	7	7	5	6	6	7	7	7	52
Appraiser 3	6	7	6	5	5	6	5	5	45
Appraiser 4	6	7	7	5	5	7	6	7	50
Total	26	27	24	22	22	27	24	25	197

Maximum possible score = 7 (strongly agree) x 8 items x 4 appraisers = 224

Minimum possible score = 1 (strongly disagree) x 4 (appraisers) = 12

The scales domain score will be:

$$\frac{\text{(Obtained score – Minimum possible score)}}{\text{(Maximum possible score – Minimum possible score)}}$$

(197-12) (224-12) x 100 = 185/212 x 100 = 0.872 x 100 = **87.26%**

Comments:

- standards are supported by evidence in literature
- recommendations are supported by stakeholders views
- is this specific or can it be generalised
- time scale be indicated for updating

8.3.4 Domain Four: Clarity of Presentation

Clarity of presentation deals with the language, structure and format of the standards. Clarity of presentation is represented by items 15 to 17 (AGREE Research Trust, 2009).

Table 8.4 Appraiser scores for clarity of presentation

	Item 15	Item 16	Item 17	Total
Appraiser 1	6	6	6	18
Appraiser 2	7	5	6	18
Appraiser 3	7	7	7	21
Appraiser 4	6	6	7	19
Total	26	24	26	76

Maximum possible score = 7 (strongly agree) x 3 items x 4 appraisers = 84

Minimum possible score = 1 (strongly disagree) x 4 (appraisers) = 12

The scales domain score will be:

$$\frac{\text{(Obtained score – Minimum possible score)}}{\text{(Maximum possible score – Minimum possible score)}}$$

(76-12) (84-12) x 100 = 64/72 x 100 = 0.888 x 100 = **88.0%**

Comments:

- recommendations are clear
- language is simple and understandable

8.3.5 Domain Five: Applicability

Applicability pertains to the *likely barriers and facilitators to implementation*, strategies to improve uptake and resource implications of applying the competency standards. Applicability is represented by items 18 to 21 (AGREE Research Trust, 2009).

Table 8.5 Appraiser scores for applicability

Appraiser	Item 18	Item 19	Item 20	Item 21	Total
Appraiser 1	6	7	6	5	24
Appraiser 2	6	6	5	6	23
Appraiser 3	7	6	7	7	27
Appraiser 4	5	6	5	6	22
Total	24	25	23	24	96

Maximum possible score = 7 (strongly agree) x 4 items x 4 appraisers = 112

Minimum possible score = 1 (strongly disagree) x 4 (appraisers) = 12

The scales domain score will be:

$$\frac{\text{(Obtained score – Minimum possible score)}}{\text{(Maximum possible score – Minimum possible score)}}$$

(96-12) (112-12) x 100 = 84/100 x 100 = 0.841 x 100 = **84.0%**

Comments:

- additional material be provided for use by organisational management

8.3.6 Domain Six: Editorial independence

Editorial independence is concerned with the formulation of recommendations not being unduly biased with competing interests. Editorial independence is represented by items 22 to 23 (AGREE Research Trust, 2009).

Table 8.6 Appraiser scores for editorial independence

Appraiser	Item 22	Item 23	Total
Appraiser 1	7	7	14
Appraiser 2	7	7	14
Appraiser 3	6	7	13
Appraiser 4	7	6	13
Total	27	27	54

Maximum possible score = 7 (strongly agree) x 2 items x 4 appraisers = 56

Minimum possible score = 1 (strongly disagree) x 4 (appraisers) = 12

The scales domain score will be:

$$\frac{\text{(Obtained score – Minimum possible score)}}{\text{(Maximum possible score – Minimum possible score)}}$$

(54-12) (56-12) x 100 = 42/44 x 100 = 0.954 x 100 = **95.4%**

8.3.7 Overall Guideline Assessment

Overall assessment includes the rating of the overall quality of the competency standards and whether the guideline would be implemented for use in practice.

Table 7.7 Appraiser scores for overall rating

Appraiser	Total rating
Appraiser 1	6
Appraiser 2	7
Appraiser 3	5
Appraiser 4	6
Total	24

Maximum possible score = 7 (strongly agree) x 1 items x 4 appraisers = 28

Minimum possible score = 1 (strongly disagree) x 4 (appraisers) = 12

The scales domain score will be:

$$\frac{\text{(Obtained score – Minimum possible score)}}{\text{(Maximum possible score – Minimum possible score)}}$$

(24-12) (28-12) x 100 = 12/16 x 100 = 0.750 x 100 = **75.0%**

Three appraisers recommended the use of the competency standards with modification, whereas one appraiser recommended the standards without reservation.

8.4 EVALUATION OF THE STUDY

The evaluation of the study is presented in the form of a review of the chapters in the study.

An overview of the study was provided in **Chapter One**. The overview served as an introduction to the background of the study, research rationale and questions were detailed. Congruently from the problem statement, the purpose of the study was described and addressed through the study objectives. The aim of the study was to develop competency standards for Intensive Care nurses caring for critically ill patients in the Intensive Care units of a university-affiliated, public sector and tertiary level hospital in Gauteng Province, South Africa. Objectives were followed by the rationale and assumptions supported by the researcher. These assumptions are meta-theoretical, theoretical and methodological. An outline of the study design and research method concluded Chapter One.

The literature reviewed in relation to the need for competency standards was discussed in detail in **Chapter Two** and provided an understanding of the history and development of Intensive Care, as well as health care legislation and related policies, Intensive Care personnel and the characteristics of critically ill patients. The competencies needed by Intensive Care nurses include those required to manage acuity level, diversities, therapeutic interventions, inter- and intra-disciplinary collaboration, staffing mix, protocols, guidelines and evidence-based practice and knowledge, skills and competencies.

The research design and research methods were discussed in detail in **Chapter Three** and included discussion pertaining to data collection, population, sample and sampling method and the pilot study. It also included data analysis methods and procedures for presentation of results as well as the measures applied to ensure validity and reliability and ethical considerations.

A standards generative approach was used to systematically structure the research design and methods with the process required to develop standards (Muller et al. 2005). The process for development of competency standards comprised two phases. Phase 1 was used as the point of departure for the study, which involved the collection of empirical data for

the development of competency standards. This was followed by the generation of competency standards in Phase 2. Consequently, the two phases of the study were further divided into six steps: each of these steps articulates in accordance with the objectives of the study (refer **Figure 8.1**).

Figure 8.1 provides an overview of the research design and methods.

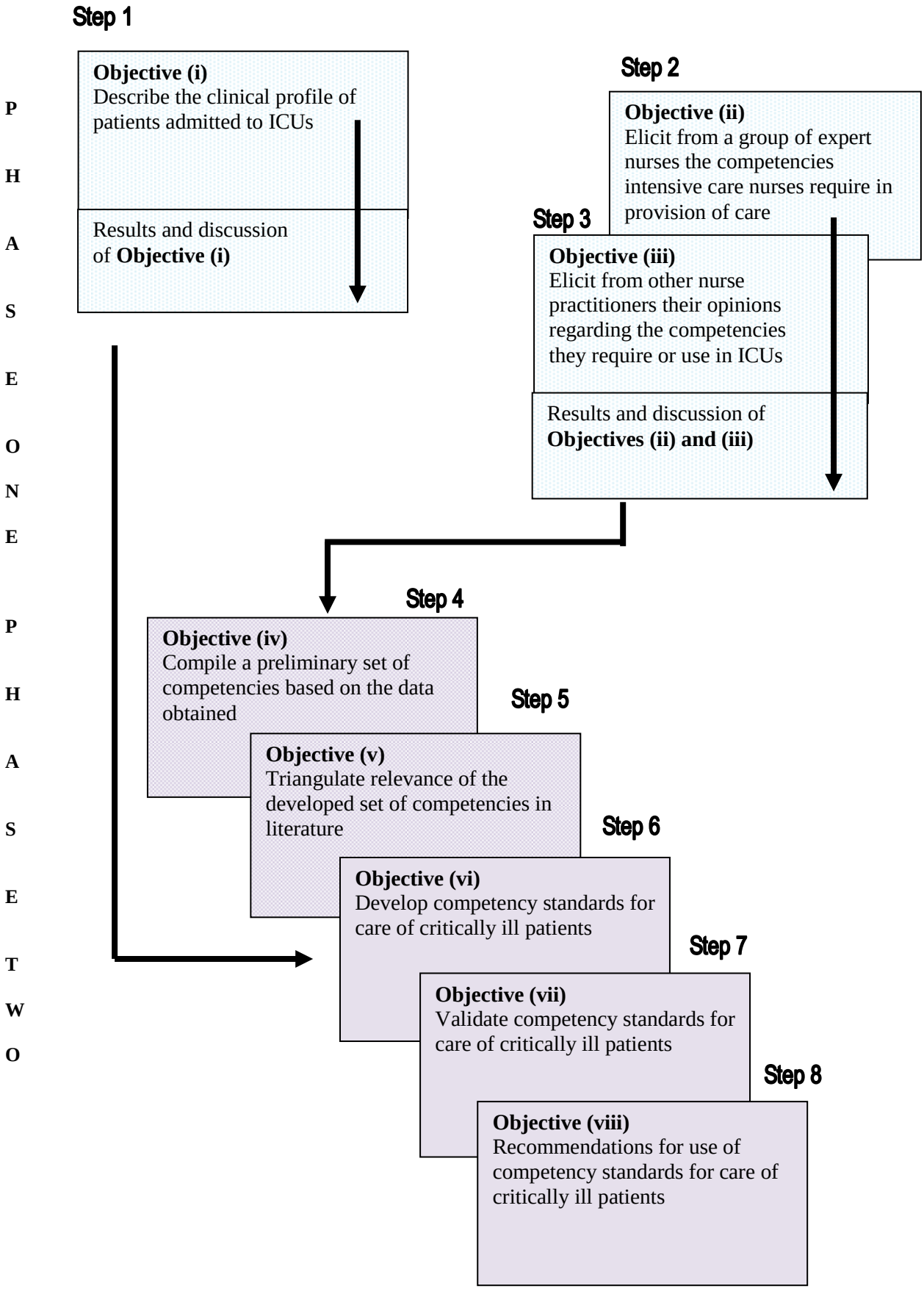


Figure 8.1 Overview of research design and methods

Phase 1, comprised the collection of empirical data for development of the competency standards, which consisted of three steps (Steps 1 to 3). Step 1, involved collecting data pertaining to the clinical profile of the critically ill patients in the Intensive Care units by means of a prospective study using a record review conducted on patients in the Intensive Care units. Step 2, involved collecting data pertaining to the competencies Intensive Care nurses require for the provision of care by means of an in-depth study using individual interviews with nurses in the Intensive Care units, as the key informants. Step 3 involved verifying the competencies Intensive Care nurses require or use in the Intensive Care units by means of an in-depth study using focus group discussions with other nurse practitioners in the Intensive Care units.

Phase 2, comprised the generation of competency standards, which consisted of three steps (Steps 4 to 6). Step 4, involved compiling a preliminary of competencies from evidence generated in steps 2 to 3. Step 5 involved triangulation of the relevance of the developed set of competencies in literature. Step 6 involved categorising, integrating and synthesising the concepts to develop competency standards. Step 7, involved the validation of the competency standards by an independent group of expert nurses.

The evaluation of the study was achieved in relation to achievement of the objectives.

The first objective was to explore and **describe the clinical profile** of critically ill patients admitted to the Intensive Care units. The results and discussion of the first objective are presented in **Chapter Four** which related to step 1 in the research design and research methods. This was achieved within an exploratory, descriptive, contextual and quantitative design. The population included all patients admitted to four Intensive Care units at a university-affiliated, public sector and tertiary level hospital in Gauteng province, South Africa. A sample size of 134 (n=134) patients was obtained by random sampling. Data were collected by means of a data collection tool (refer Annexure A) and analysed by means of descriptive and inferential statistics. Statistical tests included two-sample t-tests, analysis of variances (ANOVA), Bartlett's test for equivalence, Bonferroni's correction test and Fisher's exact test. Testing was done at the 0.05 level of significance and ensured a power of at least 95% accuracy on findings. The results of the first objective are presented as follows:

- The average age of patients admitted to ICUs was 48.2 years (SD 17.72) and ranged from 20 to 82 years. Males accounted for 64.4% (n=85) and females 36.6% (n=49) of the total sample (n=134), with the ratio of male to female to female patients being 1.73:1:1.

- **Related to the reason for admission**, a higher (59.7%; n=80) percentage of patients were admitted for surgery and 40.3% were medical cases. Of all surgical patients unscheduled surgery was higher (34.3%; n=46) than scheduled surgery, which was 25.4% (n=34).

- The majority (59.7%; n=80) of patients for the total sample (n=134) were positive for pre-existent **co-morbid illness** and 36 (45.0%) presented with two, three or four co-morbid illness conditions compared to 44 (53.5%) who had one co-morbid illness condition. Further, the majority (44.1%; n=19) of single co-morbid illness was verified as hypertension.

- **Related to severity of illness**, the mean SAPS II score was 34.83 (SD 13.30) points for patients admitted to ICUs and the range was 71 patients for the total sample (n=134). Further, the SAPS II score predicted mortality rate was 20.03% for the total sample (n=134), whilst the actual ICU mortality rate was 20.0% (n=23).

- **Related to level of provided care**, the mean TISS-28 score was 29.23 (SD 8.06) points on admission to ICU and ranged from 11 to 58 points for the total sample (n=134). Based on a total of 1,066 TISS-28 measurements, the mean cumulative TISS-28 score per patient per stay per ICU was 207.54 (SD 360.34) and the mean Total TISS-28 score was 26.94 (SD 7.52). A pattern was noted on display of total TISS-28 scores which reflected gradual up and downs on days two, five, eight and 15.

- **All patients received** standard monitoring (100.0%) and nearly all had single or multiple medication (>93.0%), routine dressing changes (>91.0%) and frequent monitoring (>94.0%). Of the 28 TISS-28 items, **11 items were significant** ($p<0.05$), which included one item in the category of basic activities, four items in

the category of cardiovascular support, five items in ventilatory support and one item in specific interventions.

- Of the **four selected variables,** co-morbid illness yielded statistical significance (p=0.05; CI 5.54 – 6.60) for ventilatory support. Similarly of the four variables the differences between ICUs was statistically significant (p<0.05) for basic items and ventilatory support, respectively as p<0.032 and p<0.001, whereas reason for admission showed statistical significance (p<0.05) for three basic ventilatory support and special investigations.

- **Related to length of stay**, the mean length of stay for the total sample (n=134) was 6.91 (SD 11.99) and ranged from one to 108 days. Further the majority (71.6%; n=96) of frequency responses indicated length of stay was in the < **seven days category**, with contrast only 6.0% (n=8) indicating length of stay was in the category of > three weeks.

- **Related to patient outcomes**, for the differences between survivors and non-survivor population groups, the correlation between SAPS II and TISS-28 scores were statistically significant (r=0.46; p=0.000). Of the total SAPS II score items, only two were statistically significantly (p<0.05) different. Included were ventilation PaO2/FiO2 ratio and serum urea, respectively items Q5 and Q7. Of the 15 SAPS II items, only three were statistically significant (p<0.05) different at the sub-level item scores. Included were ventilation PaO2/FiO2 ratio (item 1.5), serum urea (item Q7) and white blood cell count (item Q8). These items reflected a pattern of opposite higher and lower scores at sub-item levels between non survival and survival population groups, respectively.

The second objective was to elicit from an expert group of Intensive Care nurses the **competencies Intensive Care nurses required** for provision of care. The results and discussion of the second objective were presented in **Chapter Five**. The second objective sought to elicit the opinion of a group of specialists (nurse practitioners, educators and clinical facilitators) as the *key informants* for the competencies required by Intensive Care nurses for provision of care. This was achieved through an in-depth qualitative study using interviews conducted with eight individual Intensive Care nurse participants. The sample

size was not predetermined and the individual interviews continued until saturation. Themes and sub-themes are presented, discussed and integrated with literature. The discussion of themes and sub-themes is substantiated by verbatim quotes from transcripts and field notes. Individual interviews were audio-taped and transcribed in accordance with the method proposed by Tesch (1990 in Creswell, 185-190). Findings of the second objective are presented below:

- The Intensive Care registered nurse is required to demonstrate **integration of advanced knowledge and skills** when implementing nursing interventions. This includes patient assessment, safety of patient care, medication administration and documentation.

- The **use of evidence-based practice** is based on recommendations from current research to ensure best practice. The Intensive Care nurse engages in multi-disciplinary discussions, scrutinises research findings and **exercises judgment** in the application of new knowledge when making interpretations.

- The Intensive Care nurse is expected to **function within** the essential **parameters for professional therapeutic activities** (the **scope of practice**) which can be carried out by a registered nurse. The nurse must demonstrate accountability for added responsibilities undertaken as an Intensive Care nurse.

- When assessing and managing patient responses to various conditions, the Intensive Care nurse uses **critical thinking to problem solve**. This is **integral to good decision making** and includes the activities of organising and analysing information, recognising patterns and gathering data to support conclusions drawn.

- The Intensive Care nurse is expected to **engage in reflection** to ensure continuous professional development. This includes self-appraisal for areas of improvement.

- The Intensive Care nurse is expected to **work together** with other members of the multidisciplinary team. The ability to establish good professional relationships is based on open communication, respect and trust. The ability to **coordinate and**

lead the activities of team members under tense situations is **guided by professional maturity**.

- The Intensive Care nurse is required to establish a **professional therapeutic relationship** with the patient. This is based on reassurance, trust, intimacy, and 'being there.' The connection between nurse and patient enables caring in the technological environment.

- The Intensive Care nurse is expected to establish a **professional therapeutic relationship** with the family or significant other and includes the ability to assess their individual needs. Providing support for family is an integral part of the process of care. The Intensive Care nurse's connection is with the patient and family and provide care to meet their individual needs.

- The Intensive Care nurse is required to **display leadership** in a **management and education role**. This includes the ability to act as a positive role model for other nurses, motivate and supervise them in their achievement of professional growth and development. The **organisation** in the Intensive Care setting must provide leadership for the achievement of excellence of nurses. Transcending obstacles to personal growth and development includes overcoming deficits in knowledge, a lack of interest, complacency and cultural barriers. **Widespread diversity** in nurses' ability to **develop themselves professionally** is **of concern**. In dealing with widespread gender imbalances and lack of autonomy these participants confirmed the need for mentoring in ICU.

The third objective was to elicit from other clinical nurse practitioners their opinions of the competencies they required or used in the ICUs. The results and discussion of the third objective were presented in **Chapter Six**. The third objective sought to **verify the opinions** of **the key informants** by other clinical nurse practitioners of the competencies they required or used in the Intensive Care units. This was achieved through an in-depth qualitative study using focus group discussions with nine Intensive Care nurse participants. The focus group discussion was conducted after the initial interviews were audio-taped and transcribed in accordance with the method proposed by Tesch (1990 in Creswell, 2009:185-190). Findings of the third objective are presented as follows:

- Comparing responses from both groups of Intensive Care nurses (individual and focus group interviews) reveals common similarities in identifying the competencies required by Intensive Care nurses.

- They agreed on importance of foundational care practices. Some differences were noted between the groups in that focus group participants considered high efficiency in basic nursing care to be **broader in the care elements** and **less than those in evidence-based practice** described in the individual interviews.

- They agreed on the importance of critical thinking in decision making, including application of knowledge and self-knowledge in safe practice.

- Participants agreed on factors in emotional competencies related to communication and offering support for nurses. Some differences were noted in **collegial relationships, cooperation and coordination roles between nurses,** as described in the individual interviews.

- They agreed on transcending obstacles to growth and development. However, elements of enablers for growth and development, such as peer support for learning, were emphasised through the focus group discussion.

The fourth objective involved compiling a preliminary set of competencies from evidence generated in steps 2 to 3. The results and discussion of the fourth objective were presented in **Chapter Seven**. The fourth objective sought to compile a preliminary set of competencies. This was achieved by interrogation of the evidence generated from the expert group of Intensive Care nurses (clinical nurses, educators and preceptors), with other Intensive Care nurses in the Intensive Care setting and the literature control.

The fifth objective involved triangulation of the developed set of competencies in the literature. The results and discussion of the fifth objective were presented in Chapter Seven. The fifth objective sought to establish the relevance of the developed set of competencies in the literature. This was achieved by interrogating the relevance of the developed set of competencies in the literature control.

The sixth objective involved categorising, integrating and synthesising the concepts to develop the competency standards. The results and discussion of the sixth objective were presented in Chapter Seven. The sixth objective sought to generate the competency standards for the care of the critically ill patient. This was achieved by integration of synthesis of the conclusions drawn from steps 1 to 3, including development of relational statements within the competency standards. Two types of logical reasoning were applied in the development of competency standards and included inductive and deductive reasoning. The inductive phase occurred during the integration and synthesis phase of the generation of the competency standards. Deductive reasoning applied in this study included the recommendations from an integrated and synthesised conclusion drawn from steps 1 to 3. Conclusions for the development are presented as follows:

- Competency standards related to **professional, legal and ethical practice** include the ability to **act accountably and take responsibility** for independent decisions; demonstrate ethical sensitivity by **upholding the professions code of conduct** and **code of ethics** and function **according to the scope of practice and level of competence**.

- Competency standards related to **care and management** includes the ability to **maintain** a **safe environment** that facilitates healing and well-being of the patient. This includes the ability to **assess, monitor and manage** multiple sources of data when **making judgments** or managing responses for **nursing interventions**, **use of technological resources** and **evidence-based practice protocols** and drug regimes. It also includes the ability to manage the care of the patient and their family members in order to **promote comfort** in a high risk technological environment.

- Further, competency standards related to **leadership and management** include the ability to maintain **working partnerships** with other members of the multi-disciplinary team. This is based on **collaboration, communication, respect and good interpersonal relationships**, which enables them to establish and maintain collaborative relationships with members of the multidisciplinary team, and **create a supportive environment** with colleagues. Acquiring

leadership skills is based on advanced education and extensive workplace experience.

- Competency standards related to **professional, personal and quality development** include providing **support for development of self and other nurses**. This includes the ability to act as a **role model, mentor and preceptor** for the development of others. This includes the ability to **reflect on own practice**, **conduct self-appraisals** and to undertake activities to maintain self-development through **continuing education** and participating in **evidence-based practice** or **conducting research** informally or formally through higher education institutions

The seventh objective was to verify the competency standards for Intensive Care nurses who care for critically ill patients. The results and verification process of the competency standards are presented in Chapter Eight. Verification of the competency standards related to step 7 of the research design. The purpose of verifying the competency standards was to assess their accuracy and quality, refine and further develop the competency standards and to ensure content validity. Feedback, recommendations, criticism and suggestions were analysed, incorporated and presented.

The study is unique because the competency standards are the first to be developed in South Africa for the university-public sector and tertiary level hospital. The research design and research method for the development of the competency standards are unique, as the researcher described the clinical profile of critically ill patients. The research findings include both quantitative and qualitative research.

The qualitative study research gave the opportunity for Intensive Care nurses to voice their opinions of care provided and their personal preferences. Both the quantitative and qualitative findings produced unique findings. The most significant finding included the level of complexity of the critical ill patient as reflected by a high level of pre-existent co-morbid illness, unscheduled surgery and mortality rates in this young patient population.

The most significant finding in the qualitative study included recognition that competence in Intensive Care nursing is complex and not limited to advanced knowledge and

specialised skills, but also includes emotive competence when assessing patients' need to guide decision making. Assessment and clinical judgment, when working with a critically ill patient without the use of assisting technological and supportive devices, implies a level of knowledge and experience acquired by these nurses and confirms the differentiation which seems to be consistent in developing from novice to advanced and expert nurse in this study. Another interesting finding was that the level of provided care for a critically ill patient is unpredictable as reflected in the gradual fluctuations in the total TISS-28 scores on days two, five, eight and 15. This finding may also have implications for the level of staffing requirements in the Intensive Care unit.

8.5 LIMITATIONS

There are some limitations in this study which warrant attention.

The scope of Intensive Care nursing practice is complex and dynamic. There may be some fragmentation in the attempt to describe it systematically as common areas must be identified and grouped together. It is important for the reader to appreciate the inter-connectedness of the entities that comprise the scope of Intensive Care nursing.

The performance criteria provided in the standards are an example of behaviours illustrating the competency standards. Although many examples of behaviours are provided they are not all inclusive. The performance criteria needs to be updated periodically to reflect the advances and changes in evidence based practice in Intensive Care nursing.

Although the purposive sampling technique used in this study provided a broad representation of the setting in which Intensive Care nursing was practiced, sampling was driven by qualitative rather than statistical consideration and results may not be generalised to other settings.

This study was conducted in only one institution out of the number of ICUs in the country, which may limit the intention to generalise the study. But also to mitigate for this by referring to numbers and the purpose of the study which was academic including having

given detailed process and procedures of the study for the readers to judge if they can apply this study in their contexts as stipulated in trustworthiness.

8.6 RECOMMENDATIONS

Recommendations arising from the study are discussed under the headings of recommendations for clinical practice, nursing education and further research.

8.6.1 Clinical Nursing Practice

The competency standards for Intensive Care nursing have been proposed to ensure optimal care is provided to the patient and their family, enhance the level of nursing practice, recognise and reward excellence and support professional regulation. Thus it is hoped they will also serve as guides to promote the on-going development of newly qualified and experienced Intensive Care nurses in the achievement of professional excellence.

8.6.2 Nursing Education

The Intensive Care nursing competency standards generated in this study have implications for curriculum development and the profession with regard to the level of educational preparation of Intensive Care nurses. This recommendation is supported in the finding of the level of pre-existent chronic illness conditions along with the acute needs of critically ill patients, evidence based practice and the need to promote patient-family centred nursing care.

The description of categories and sub-categories of competencies in this study will also inform Intensive Care providers of the types of competencies which would be most beneficial for Intensive Care nurses to obtain. The competency standards provide a mechanism for assessing clinical practice and may be appropriate as standards for Intensive Care nursing education.

8.6.3 Further Research

The study was developed in a single study setting to support a new area of development for Intensive Care nursing. It is not clear whether the competency standards can be used effectively to assess the performance of students, or if it is appropriate to meet these standards prior to qualification as an Intensive Care nurse. Given the complexity of Intensive Care nursing and the associated challenges, further studies should be conducted on the utility of the competency standards as a curriculum guide and clinical competency assessment tool in educational settings.

Finally, the implications for clinical research are significant. Clinical intervention research in Intensive Care nursing, focusing on the effectiveness of competencies for promoting well-being and recovery of patients with critical illness, is of primary importance, particularly because a great deal of nursing research consists of small scale, descriptive studies.

8.7 CONCLUSION

The aim of the study, to development competency standards for Intensive Care nurses who care for critically ill patients, has been met. The competency standards will inform both nurses seeking employment in Intensive Care nursing and nurses currently working in the area about the expectations placed on the professional nursing role and the potential for growth.

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DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

DATA COLLECTION TOOL

1.0 PATIENT DATA

RESEARCH CODE NUMBER	
1.1 GENDER	male / female
1.2 AGE	
1.3 DATE OF ADMISSION	
1.4 REASON FOR ICU ADMISSION	Medical / Scheduled Surgery / Unscheduled Surgery
1.5 CO-MORBIDITIES	yes / no
If yes, specify	
1.6 SEVERITY OF ILLNESS SAPS II score on admission	
1.7 LEVEL OF PROVIDED CARE TISS -28 score on admission	
1.8 DATE OF DISCHARGE FROM ICU	
1.9 LENGTH OF STAY IN ICU	
1.10 OUTCOME	Survial / Non Survival
1.11 TISS-28 score per patient / per stay	
1.12 TISS-28 score per patient per day	

2.0 SEVERITY OF ILLNESS ON ADMISSION TO INTENSIVE CARE UNIT

	Variable / Scoring Guidelines	Findings	Points	Score
2.1	**Age in Years** *age in years at time of last birthday*	**< 40** **40 - 59** **60 - 69** **70 - 74** **75 - 79** **> = 80**	**0** **7** **12** **15** **16** **18**	
2.2	**Heart Rate in beats per minute** *use the highest or lowest heart rate in past 24 hours whichever gives the higher number of points*	**< 40** **40 - 69** **70 - 119** **120 - 159** **> = 160**	**11** **2** **0** **4** **7**	
2.3	**Systolic Blood Pressure in mmHg** *use the highest or lowest blood pressure in past 24 hours whichever gives the highest number of points*	**< 70** **70 - 99** **100 - 199** **> = 200**	**13** **5** **0** **2**	
2.4	**Body temperature** *use highest temperature*	**< 39 C** **> = 39 C**	**0** **3**	
2.5	**If on ventilation or CPAP PaO2 / FiO2** *use only if on ventilation or CPAP using the lowest ratio*	**< 100** **100 - 199** **> = 200**	**11** **9** **6**	
2.6	**Urinary Output in L per 24 hours** *if time period less than 24 hours adjust urine output for period to 24 hours*	**< 0.500** **0.500 - 0.999** **> = 1.000**	**11** **4** **0**	
2.7	**Serum Urea mmol/L** *use the highest value*	**< 10** **10 - 29.9** **> 30**	**0** **6** **10**	
2.8	**WBC count in 1000 per uL** *use the highest or lowest WBC in past 24 hours whichever gives the higher number of points*	**< 1.0** **1.0 - 19.9** **> = 20**	**12** **0** **3**	
2.9	**Serum Potassium in mmol/L** *use the highest or lowest potassium in past 24 hours whichever gives the higher number of points*	**< 3.0** **3.0 - 4.9** **> = 5.0**	**3** **0** **3**	
2.10	**Serum Sodium in mmol/L** *use the highest or lowest sodium in past 24 hours whichever gives the higher number of points*	**< 125** **125 - 144** **> = 145**	**5** **0** **1**	
2.11	**Serum Bicarbonate in mmol/L** *use the lowest value*	**< 15** **15 - 19** **> 20**	**6** **3** **0**	
2.12	**Serum Bilirubin in umol/L** *use the highest value*	**< 4.0** **4.0 - 5.9** **> = 6.0**	**0** **4** **9**	
2.13	**Glasgow Coma Scale** *use the lowest value if patient sedated* *use the score before sedated*	**< 6** **6 - 8** **9 - 10** **11 - 13** **14 - 15**	**26** **13** **7** **5** **0**	
2.14	**Chronic Diseases** *HIV positive with AIDS defining opportunistic infection or tumor; malignant lymphoma Hodgkins disease leukemia or multiple myeloma; metastases demonstrated at surgery, radiographically or other suitable method*	**none** **metastic carcinoma** **hematologic malignancy** **AIDS**	**0** **9** **10** **17**	
2.15	**Type of admission** *scheduled surgery if scheduled at least 24h prior to operation; unscheduled if operated on with less than 24h notice; medical if no surgery within 1 week of admission to ICU*	**scheduled surgery** **medical** **unscheduled surgery**	**0** **6** **8**	

SAPS II Score	

3.0 LEVEL OF PROVIDED CARE

	Variables / Scoring Guidelines	TISS-28 Score	OA Patient Score	Day 1 Patient Score	Day 2 Patient Score	Day 3 Patient Score	Day 4 Patient Score	Day 5 Patient Score	Day 6 Patient Score	Day 7 Patient Score
	Basic Activities									
3.1	**Standard monitoring;** *hourly vital signs, and calculation of fluid balance*	5								
3.2	**Laboratory investigations;** *biochemical and microbiological* *Arterial Blood Gas* *Point of care glucose testing*	1								
3.3	**Single medication;** *any route (IV, PO, IM etc)*	2								
3.4	**Multiple intravenous medication;** *more than one drug, single shots or continuously*	3								
3.5	**Routine dressing change;** *care and prevention of decubitus and daily dressing changes* *Prone ventilation*	1								
3.6	**Frequent dressing changes;** *at least one time each nursing shift or extensive wound care*	1								
3.7	**Care of drains;** *all except gastric tube*	3								
	Cardiovascular Support									
3.8	**Single vasoactive medication;** *any vasoactive drug*	3								
3.9	**Multiple vasoactive medications;** *more than one vasoactive drug disregard type and dose*	4								
3.10	**Intravenous replacement of large fluid losses;** *fluid replacement >3L per square meter/ per day, disregard type of fluid administered*	4								
3.11	**Peripheral arterial catheter**	5								
3.12	**Left atrial monitoring,** *PAC with / without cardiac output measure*	8								
3.13	**Central venous line**	2								
3.14	**Cardiopulmonary resuscitation after cardiac arrest:** *in past 24 hrs (single precordial percussion not included)*	3								
	Ventilatory Support									
3.15	**Mechanical ventilation;** *any form of mechanical ventilation or assisted ventilation with or without PEEP, with or without muscle relaxants, spontaneous breathing with PEEP*	5								
3.16	**Supplemental ventilatory support;** *breathing spontaneously through ET-tube without PEEP, supplemental oxygen by any method except mechanical ventilation parameters apply*	2								
3.17	**Care of artificial tube;** *endotracheal or tracheostoma*	1								
3.18	**Treatment of improving lung function;** *thorax physiotherapy, incentive spirometry, inhalation therapy, intratracheal suctioning*	1								

	Renal Support									
3.19	**Dialysis;** *hemofiltration and dialysis techniques*	**3**								
	CVVHD / HD									
3.20	**Quantitative urine output measurement**	**2**								
3.21	**Active diuresis ;** *eg furosemide > 0.5 mg/kg/day for overload* single shots / continuous	**3**								
	Neurological Support									
3.22	**Measurement of intracranial pressure**	**4**								
	Metabolic Support									
3.23	**Treatment of complicated metabolic acidosis / alkalosis**	**4**								
3.24	**Intravenous hyperalimentation** **Rate of TPN**	**3**								
3.25	**Enteral feeding** **Rate of feed**	**2**								
	Specific Interventions									
3.26	**Single interventions in ICU;** *naso or tracheal intubation, introduction of a pacemaker, cardioversion, endoscopies, emergency surgery in past 24h, gastric lavage. Routine interventions without consequences to the clinical condition of the patient such as radiographs, echography, ECG, dressings or introduction of venous or arterial catheters are not included*	**3**								
3.27	**Multiple specific interventions;** *more than one, as described above*	**5**								
3.28	**Specific interventions outside of ICU;** *surgery or diagnostic procedures*	**5**								

SUM TISS-28 POINTS	0	0	0	0	0	0	0	0

APPENDIX B

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

INFORMATION SHEET

Dear _____

(name of potential patient / relative participant)

My name is Shelley Schmollgruber and I am presently registered as a PhD student at the University of the Witwatersrand in the Department of Nursing Education. I hope to conduct a research project and would like to ask you to consent to my including your family member in my sample with the patients I hope to study whilst they are in the intensive care unit.

The aim of the study is to identify patients' needs for nursing care in the intensive care unit with the purpose of determining which nursing functions and skills are important for nurses to have in the intensive care unit. Your participation will mean that I can have access to the patient's records in the intensive care unit from the time of admission to the discharge of the patient from the intensive care unit. I will collect the required information about the patients' management and nursing care on a daily basis. While there are no direct benefits to you or the patient being included in the study, your participation will provide valuable information for the future planning of nursing interventions that are important to patient care.

Participation in this study is voluntary, and even after the study begins you can decide to terminate the study at any point, which will have no effects on services that you or your relative may receive from this institution or the health care providers. I will also contact your relative in the recovery period to give permission for the information obtained to be included in the study. Your relative has the right not to participate or to withdraw from the study at any time, should they so feel the need to. This will not affect their treatment in anyway.

The purpose of the study is to describe the components of best nursing practice in the care of patients in the intensive care unit and to propose standards of competency for nursing care. No reports of the study will identify you or your relative in any way. Results of the study will be given to you should you wish.

The appropriate people and research committees of the University of the Witwatersrand, and Johannesburg Hospital have approved the study and its procedures.

Thank you for taking the time to read this information sheet. Should you have any further questions about the study or your rights as a study participant. I can be reached at the Faculty of Health Sciences, Department of Nursing Education, telephone number 488 – 4271 Cell 072 3359250.

APPENDIX C

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

FAMILY MEMBER / RELATIVE CONSENT FORM

I _____ (name) the _____ (relationship)

of the patient give permission to be included in the 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

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

TEMPORARY CONSENT BY SENIOR CONSULTANT OR DEPUTY ACTING IN THE CAPACITY OF "PATIENTS FRIEND"

I _____ (name of consultant), understand that the patient _____ (name of the patient), would be eligible to participant in the study. I hereby give temporary consent to the patient being included in the study in the absence of any family members / relatives present in the intensive care unit and by virtue of the patient being unable to give fully informed consent due to his/her condition.

My consent is based on the proviso that the researcher will approach the family members / relatives to sign the consent form at their earliest presence in the intensive care unit.

I also understand that the patient will be approached in the recovery period by the researcher and asked to give written consent for the information to be included in the study. Should the family members / relatives or patient not agree to participant in the study the information will not be used.

_____ _____

Date Signature

_____ (Witness)

APPENDIX E

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

RETROSPECTIVE PATIENT CONSENT FORM

I, _____(name of the patient) understand that my relative, _____ (name of relative), has given consent to my being included in the study and hereby give consent for the information obtained to be used in the 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 F

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

INDIVIDUAL INTERVIEW GUIDELINES

UNSTRUCTURED QUESTION

"Focusing on your specific specialty and based on your experience, what practice-based competencies do you believe to be essential for nurses to acquire in the provision of effective care to your patients that require intensive care?"

INFORMATION TO BE ELICITED BY THE INTERVIEW

- General plan of **medical care** which includes directives, regimes and protocols
- **General procedures** performed in the unit and required nursing skills or assistance
- Specific issues of **specialisation** unique aspects of the unit
- General plan of **nursing care** which includes patient-centred care, proactive management, degree of autonomy, negotiation, communication skills, continuance with care plan, technical appraisal and problem solving responses
- **Vigilance** which includes theoretical knowledge and experience, awareness of potential complications and environmental safety checks and problems solving responses
- **Flexibility** and the ability to cope with unpredictable events in the patient or environmental issues
- Critical thinking skills in the ability to analyse the situation and determine what went wrong (**reflective practice**)
- **Emotional support** of patients, relatives and colleagues
- **Professional education** and on-going development

APPENDIX G

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

INFORMATION LETTER

Dear Colleague,

My name is Shelley Schmollgruber, I am an intensive care nurse and I am currently registered to read for a PhD at the University of the Witwatersrand. I intend to explore the competencies that nurses' require and use in the provision of patient care in the intensive care unit. May I ask you to consider participating in this study? As a registered intensive care nurse, I would be interested in your viewpoint as an 'expert' or 'experienced clinical practitioner'.

Should you agree to participate, I will ask that you allow me to interview you, either individually or in a focus group either with or without other health care professionals at a venue of your choice. I will schedule an appointment at a date and time convenient to you. The individual interview should take a maximum of three hour's duration, whereas the focus group should take approximately two hours. With your permission, I will audio-tape the interviews for transcription and analysis.

Participation is entirely voluntary. You may choose not to participate or withdraw from the study at any time. Anonymity and confidentiality is guaranteed. I will personally transcribe the tape recordings they will be kept separately from the transcripts and they will be destroyed once the study is completed. No names or any other identifying information regarding the hospital or the intensive care unit will be noted on the transcribed data. All transcriptions will be kept under lock and key and only I and my supervisor will have access to the data. I will be happy to supply you with a copy of the transcription of the interview should you so wish. Information in the report will be written in general terms and no personal information will be given.

I appreciate that you will derive no direct benefit from participating. However, I hope that the completed study will assist nurses working in the intensive care setting to understand accountability and responsibility more effectively in the provision of care in the intensive care unit.

I have applied to the Faculty of Medicine Post-Graduate Committee and to the Ethics Committee of the University of the Witwatersrand to conduct the study. In addition, I have also applied to the management of Johannesburg Hospital for permission to conduct the study.

Thank you for taking the time to read this information letter. If you wish to participate in the study please complete the attached biographical questionnaire. However, should you require any more information, you are welcome to contact me in the Department of Nursing Education, area 261 / 4 or at the telephone numbers listed below.

Yours sincerely,

Shelley Schmollgruber
Telephone : 488 4271 (work) Cell phone : 072 3359250

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

BIOGRAPHICAL QUESTIONNAIRE FOR NURSES

Instructions:
a. If you wish to participate in the study, please complete the following biographical questionnaire
b. Return in sealed envelope

Thank you for taking the time to complete this biographical questionnaire
Shelley Schmollgruber

---

1 What age group do you belong to:

20 - 29 years	
30 - 39 years	
40 - 49 years	
50 - 60 years	

2 Please list your academic qualifications

3 State the year you qualified as an intensive care nurse

4 Indicate your position in the ICU by ticking one of the following:

ICU Nurse	Shift Leader	Unit Manager

5 Please state your contact details

Name Unit

telephone

APPENDIX I

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

CONSENT FORM

I , _____ (please print name) give permission to be included in the 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 J

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

AUDIO-TAPING CONSENT FORM

I , _____ (please print name) give permission for audio-taping to be included in the 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

APPENDIX K

EVALUATION TOOL

AGREE INSTRUMENT II

DOMAIN I. SCOPE AND PURPOSE

1. The overall objectives of the guidelines is (are) specifically described:

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
This deals specifically with the potential health impact of a population on a society of patients or individuals. The overall objectives of the guidelines should be specific to the clinical or health topic.

2. The health question (s) covered by the guidelines is (are) specifically described

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
A detailed question covered by the guideline should be provided, particularly for the key recommendations (see item 17), although they need not be phrased as a question.

3. The population (patients, public etc) to who the guidelines is meant to apply is specifically described

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
A clear description of the population (i,e, patients, public) covered by a guideline should be provided. The age range, sex, clinical description, and comorbidity may be provided.

DOMAIN 2: STAKEHOLDER INVOLVEMENT

4. The guidelines development group includes individuals from all the relevant professional groups

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
The item refers to the professionals who were involved at some stage of the development process. This may include members of the steering group, the research team involved in selecting and reviewing /rating the evidence and individuals involved in formulating the final recommendations.

5. The views and preferences of the target population (patients, public, etc) have been sought

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
Information about target population experiences and expectations of health care should inform the development of the guidelines.

6. The target users of the guidelines are clearly defined

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
The target population should be clearly defined in the guideline so the reader can immediately determine if the guideline is relevant to them.

DOMAIN 3: RIGOUR OF DEVELOPMENT

7. Systematic methods were used to search the evidence

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
Details of the strategy used to search the evidence should be provided including search terms used, sources consulted, and dates of the literature covered.

8. The criteria for selecting the evidence are clearly described

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
Criteria for including/excluding evidence defined by the search should be provided. These criteria should be explicitly described and reasons for excluding the evidence should be clearly stated.

9. The strengths and limitations of the body of evidence are clearly described.

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
Statements highlighting the strengths and limitations of the evidence should be provided.

10. The methods for formulating the recommendations are clearly described

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
A description of the methods used to formulate the recommendations and how final decisions were arrived at should be provided.

11. The health benefits, side effects, and risks have been considered in formulating the recommendations.						
1 Strongly disagree	2	3	4	5	6	7 Strongly agree
Comments The guideline should consider health benefits, side effects and risks when formulating the recommendations.						

12. There is an explicit link between the recommendations and the supporting activities						
1 Strongly disagree	2	3	4	5	6	7 Strongly agree
Comments An explicit link between the recommendation and evidence on which they are based should be included in the guidelines. The guideline user should be able to identify the components of the body of evidence relevant to each recommendation.						

13. The overall guidelines have been externally reviewed by experts prior to publishing						
1 Strongly disagree	2	3	4	5	6	7 Strongly agree
Comments A guideline should be externally reviewed before it is published. Reviewers should not have been involved in the guidelines development group.						

14. A procedures for updating the guidelines is provided						
1 Strongly disagree	2	3	4	5	6	7 Strongly agree
Comments Guidelines should reflect current research. A clear statement about the procedures for updating the guideline should be provided. For example a timescale has been given or a standing panel is established who receives regularly updated literature searches and makes changes as required.						

DOMAIN 4: CLARITY OF PRESENTATION

15. The recommendations are specific and unambiguous						
1 Strongly disagree	2	3	4	5	6	7 Strongly agree
Comments A recommendation should provide a concrete and precise description of which option is appropriate in which situation and in what population group, as informed by the body of evidence.						

16. The different options for management of the conditions or health status are clearly described						
1 Strongly disagree	2	3	4	5	6	7 Strongly agree
Comments A guideline that targets the management of disease should consider the different possible options for screening, prevention, diagnosis or treatment of a condition it covers. T						

17. Key recommendations are easily identifiable.						
1 Strongly disagree	2	3	4	5	6	7 Strongly agree
Comments						

User should be able to find the most relevant recommendation easily. These recommendations answer the main question that have been covered by the guidelines and can be identified in different ways.

DOMAIN 5: APPLICABILITY

18. The guideline describes facilitators and barriers to its application

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
There may be existing facilitators and barriers that will impact the applicability of guideline recommendations

19. The guideline provides advice matters and/or tools on how the recommendations can be put into practice

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
There may be existing facilitators and barriers that will impact on the applicability of guidelines recommendations.

20. The potential resource implications of applying the recommendations have been considered.

1 Strongly disagree	2	3	4	5	6	7 Strongly agree

Comments
For a guideline to be effective it needs to be disseminated and implemented with additional materials.

21. The guideline presents monitoring and/or auditing criteria.						
1 Strongly disagree	2	3	4	5	6	7 Strongly agree
Comments The recommendation may require additional resources in order to be applied. For example, there may be a need for specialised staff, new equipment and expensive drug therapy. These may have cost implications for health care budgets. There should be a discussion in the guidelines of the potential impact of the recommendations or resources.						

DOMAIN 6: EDITORIAL INDEPENDENCE

22. The views of the funding body have not influenced the content of the guideline						
1 Strongly disagree	2	3	4	5	6	7 Strongly agree
Comments Many guidelines are developed with external funding (eg government, professional associations, charity organisations, pharmaceutical companies. There should be an explicit statement that the views or interests of the funding body have not influenced the final recommendations.						

23. Competing interests of guidelines development group members have been recorded and addressed.						
1 Strongly disagree	2	3	4	5	6	7 Strongly agree
Comments There are circumstances when members of the development group have competing interests. There should be an explicit statement that all group members have declared whether they have any competing interests.						

OVERALL GUIDELINES ASSESSMENT

For each question, please choose the response which best characterizes the guideline assessed:

1.Rate the overall quality of this guideline

1 Lowest possible quality	2	3	4	5	6	7 Highest possible quality

Comments
The overall assessment requires the AGREE II user to make a judgment as to the quality of the guidelines, taking into account the appraisal items considered in the assessment process.

2. I would recommend the guidelines for use

Yes	
Yes, with modifications	
No	

NOTES

APPENDIX L

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

EXPERT INFORMATION LETTER

Dear Colleague,

My name is Shelley Schmollgruber, I am an intensive care nurse and I am currently registered to read for a PhD at the University of the Witwatersrand. I am hoping to complete a research project for the development of competency standards to inform intensive care nursing practice.

I hereby invite you as an expert in the field to be part of an expert group in assisting me to validate the completed set of competency standards to inform intensive care nursing practice. The validation will involve a checklist of the competency standards to inform intensive care nursing practice that I would like you to complete. This will require you to rate all the items independently using a four-point Likert scale, as to whether you find the items relevant and if they represent the critical attributes of nurses working in the intensive care units of our settings.

Participation in the validation process is completely voluntary. Due to the need to contact you, I would kindly request that you provide personal details on the check list that will be presented to you. As you are an acknowledged expert in the area under study, you will appreciate that your anonymity will be compromised. However, I undertake to ensure that no identification of your personal information will be given in reporting on your opinions so as to ensure your confidentiality. If you consent to be part of the expert group, please complete the attached consent form and return it to me in the addressed and stamped envelope enclosed.

I appreciate that you will derive no direct benefit from participating. However, I hope that the completed study will assist nurses working in the intensive care setting to understand accountability and responsibility more effectively in the provision of care in the intensive care unit.

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

Thank you for taking the time to read this information letter. Should you require any further information regarding your rights as a study participant you are free to contact me in the Department of Nursing Education, area 261 / 4 or at the telephone numbers listed below.

Yours sincerely,

Shelley Schmollgruber
Telephone: 011 488 4271 (work) Cell phone: 072 3359250

APPENDIX M

DEVELOPMENT OF COMPETENCY STANDARDS TO INFORM INTENSIVE CARE NURSING PRACTICE

CONSENT FORM

I , _____ (please print name) give permission to be included in the 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 N

TRANSCRIPT FROM INDIVIDUAL INTERVIEWS

Commenced at 11h21 – 12h20

INTRODUCTION:
This participant is an expert and highly experienced intensive care nurse. She holds a Master's degree and one additional sub-speciality qualification, but has spent the past 20 years working in the ICUs. The main areas of clinical practice include a complex mix of critically ill patient situations, although she is often called upon to assist in the other ICUs. She is professionally active, recognized and highly respected by her colleagues in the ICUs.

R: Would you like me to repeat the question

T2: Okay

R: In your opinion and based on your level of expertise and experience can you tell me about the competencies that are essential for ICU nurses to acquire in the delivery of effective patient care

T2: Okay that you can divide up basically into your mechanical tasks because those are sometimes essential for continuity of care not usually a problem with us but it might be a problem elsewhere where a doctor is not around I also feel that nurses should not be doing these tasks for the convenience of doctors …
so with mechanical tasks I would tend to feel that they must stick rather to nursing tasks which are our suctioning of the patients the trachea cares the nurses competencies that we have taken the sort of procedures that we did for procedures for the nurses otherwise I also just feel that they can become too important in putting in central lines and neglecting general patient care so when it comes to mechanical tasks
I feel that it is not necessary for a good ICU sister in a government sector to need to extend very far where she is err going we always can find a doctor to put a central line in or to intubate
I think things that we can but that comes under decision making extubation we do but we don't make the decision to extubate … as far as decision making goes I think what one to be competent one needs to be able to make good decisions and (pause)
To make good decisions you need the ability you need to have and basically it is it is knowledge you need the knowledge which you need other than what you get from your basic training and your basic ICU training as well (pause)
It is up to the individual to keep themselves updated so then in an academic hospital again it is fairly easy because there are academic ward rounds most of the doctors if they refer to an article if you nag them long enough they will bring you an article or tell you where to get it so you can get hold of articles to err to update your knowledge umm (clear throat) umm so I think for decision making err knowledge is the most important (pause)
I also feel that from a practical point of view you need role models you need experienced people who are doing the right thing (pause) because a problem that I think that we had was is having inexperienced people watching alleged role models doing the wrong thing and err accepting that that is the right way to do it so

I think that the fact that we have such junior work staff is a problem we do need a whole range of people from plus 20 plus years of experience right the way down whereas we are not getting that I think that is one of the problems that we have with competence …we are acquiring knowledge there.

R: can you elaborate

T2 : yes … I know when we trained not many people had social problems there are an enormous range of social problems which drain your energy at home so you come to work minus the energy to apply yourself or get knowledge from a ward round or any other way

R: okay (agreeing)

T2: So although I think that knowledge is important I do realize that the people we are working with now [emphasized] particularly culturally have a lot more problems than maybe someone like you or I in acquiring knowledge for example coming to the library on a Saturday morning so you and I get into our car and we don't worry about the cost of petrol but what about somebody who has now got to pay to get here and back pay to photostat in the library that will be a chunk out of their family income particularly as a lot of nurses are err breadwinners so I perceive that as a barrier as well it its costly to stay very updated

R : okay (pause) so if we say that knowledge is quite important for ICU practice the nurse then has these barriers how would that impact on her ability to nurse effectively

T2: look I think that it does impact but I think there are ways around it that I think people don't look at for example … I put stuff into the unit for them but no one ever read that stuff so I am saying there could be a barrier but
I think that there is a lack of interest generally in acquiring knowledge people want to do the job get paid for it and go home (pause) and …
I also think that once one has got a qualification a critical care speciality qualification in ICU that is where there knowledge ends and I found so many people who were promising students have totally failed to develop after they are qualified and yet they were good students

R : do you think this has something to do with the environment

T2: Yes I do (pause) I think that no one is held accountable for what they do so that you can get away with no knowledge no one approaches you are not accountable people in this hospital don't get sued for what they do to brush it under the carpet (long pause) so why spend our money and energy acquiring knowledge when you can bundle along without it

R : okay so in order to be a competent ICU nurse you think this nurse needs knowledge

T2: absolutely … without a doubt they also need a good grounding of physiology

R: tell me more about

T2: mmm [long pause]

R : maybe break it down a bit

T2: Well look I basically think that you need a good knowledge of physiology because if you have a good knowledge of physiology the pathophysiology is something wrong in that pathway so I think you need a good grounding of your physiology because even when it comes to drugs if you know your physiology you know where it is working or what it is blocking or enhancing so what it is going to cause,
so yes I think they need knowledge of pathophysiology of drugs of this and that but they lack the physiology of this to build any of this on so
I think if you had a superb knowledge of physiology I think that it would just help you so much because you can give a drug see what happens to the patient and you can almost work out what must therefore be doing to a patient but without the physiology you can't even work things out for yourself.

R: that's fine, is there anything else

T2: … but I think what one also needs to know whether you are a safe practitioner you need to know your scope of practice you need to know your acts and omissions I don't know if you want to get into that side

R: that's fine

T2: but you need to know your boundaries within which you practice and even within that you need to know your own limitations and own strengths because not all of us are going to be equally good at certain things

R: okay we have just talked about physiology and scope of practice

T2: well knowledge also comes from experience so you don't necessarily need to go to a book you can learn a from people you work with and just I don't want to say trial and error in an ICU because you shouldn't have trial and error treatment with err patients but err you can get a huge amount I would say trial and error but I am not meaning it as anything dangerous ….
so you are no necessarily changing a treatment you are just getting better at doing that so I think that err comes from experience

R : that's fine mmm lets talk about technologies, What are your views?

T2: I think that is vitally important but I also think that technology must not be the most important thing but
I think it is very important you have got to be the short of person who can deal with equipment failure of equipment new equipment err quickly grasp what to do with it but
I don't think that the technology is more important than the patient themselves and
you have also seen where leads come off and people jump onto a patient and do cardiac massage where there is a beautiful arterial tracing a lovely saturation on the monitor (pause) you know they have looked at the one straight line and technology says the patient is asystolic but the fact that he might be eating his lunch is too bad you lie him flat and do cardiac massage and you know that that has happened

R : ja

T2: but so I know I do think that it is important but there are a lot of medico-legal things associated with technology (pause) a huge amount and

R: …can you expand a bit

T2: well just the fact that err I make a change on a ventilator with no knowledge to back what I am doing you know it all without necessarily understanding that ventilator and we have seen that particularly with the siemens where you didn't directly dial in a tidal volume you had to work it out from you minute volume and your rate
we saw horrendous tidal volumes because they didn't understand although they knew what a tidal volume was and they wanted to go up or down they didn't necessarily do that on that ventilator because they didn't understand how it happened on that ventilator

R : are you saying that they shouldn't make adjustments

T2: No I am saying they should I definitely think that they should but
I think that they need to have the knowledge and skills to do it they need to understand what they are working with (pause) they need to understand the ventilator the monitor the err swan ganz what ever they need to know how to work it and they need to be able to know how to interpret what they get from it

R: can we go back and talk some more about decisions nurses make in ICU

T2: I would like to say because I think the right answer is basically about the nursing care of the patient but
extended practice is a big thing and I feel I would like to say as an expert nurse I would like to be able to even discuss even medical management of a patient … which basically should be the doctors decision to decide so
I would I feel that I have a role to play I know the doctor has to right down what the ultimate thing is but I would like to be able to have my say and be heard in the decision making even on medical matters because
I feel over the years I have gained a fair bit of knowledge and often there is quite junior doctors and I do know sometimes which is a better inotrope or a better method of doing things than maybe they would although they are effectively a medical therapy

R: are you saying they make decisions together

T2: yes absolutely (pause) because they make different contributions to patient management

R: I have heard doctors prescribe nursing care. How do you feel about this ?

T2: I feel even just sticking to the pressure care a junior nurse should have picked this up in her three years or four years of basic years of training so I don't think it is not an ICU nursing skill that one should have grasped this long before you get into your speciality before you qualify you should have grasped this basic concept and

I think that most of the basic concepts of nursing aseptic technique things you should have grasped before you qualify as a sister … it decreases the patient's chances of a good outcome the patient is going to be contaminated you are looking at the patient outcome

R: So you think doctors and nurses have similar roles in ICU

T2: Yes … well again coming back to our scope of practice there are certain things we are and aren't allowed to do so I can give drugs in an emergency
I can't just come along and look at cultures and prescribe I am not covered for doing that so I do think that they have an err important role to play with the medical therapy but
I think that we should have input and
I think if we had more knowledge doctors would ask us more doctors tend to in our ICUs totally go over they don't ask us our opinions they just carry on and no one queries what they have done know I feel that I have a right to query even the medical treatment of a patient

R: tell me about things nurse do in ICU

T2: nurse is there for the nursing care but I also think ICU there is extended practice there I personally err would be quite pleased to be competent to put in underwater drains central lines things like that which
I didn't really get the opportunity to do in ICU because of the workload and because there are a lot of junior doctors needing the experience but
I would want it as I do it for continuity of care for a patient should there not be a doctor or a competent doctor because
I think it would be very nice to be able to show him how to do it so to acquire those skills

R: I have heard nurses do the orientation of new doctors to ICU how does this work?

T2: mmm named unit where I mainly worked it was the charge sister

R: are you saying there no doctors here tell me what you have seen

T2: very little err or very little that was visible to us very little that happened in the unit whether they had a talk with the doctor out of the unit senior doctor would say if you had a problem ask us or one of the sisters but there was err no
I didn't see much doctor orientation for doctors in the unit they did show junior doctors how to do things if they absolutely couldn't do things if there was not a registrar to show them a more senior registrar to show them they would but it wasn't really the norm

R: what do you think it means?

T2: Well one would think that they think highly of us to allow us to do this there are people that do it superbly and do it adequately but
there is a great difference in depending on the person doing the orientation so I think you can't lump all nurses together in saying we are capable of doing it

R: tell me when do doctors and nurses would work together

T2: when the doctors are putting things in

R: like putting in central lines or doing procedures

T2: Yes they do but I don't mean that you run after them and set the trolley for them I think you need to work collaboratively with doctors and
I think we will often think of how comfortable the patient is in that position I will go and explain to him you going to be upside down for a little while whereas doctors don't always think of doing that so
I think ja we definitely have a role or a responsibility towards both the patient but I also think doctors and nurses have a responsibility towards each other as well you help each other out
I think pooled knowledge is always better than just one person and someone will come with more experience so you can't get the swan ganz in lets turn him onto the side which a junior doctor might not know but after a number of years in ICU the sisters may well know

R : okay can I ask you have you ever worked with clinical trials in the ICU unit

T2: long pause not really directly, I was involved as a student nurse I think it was [named drug] which we didn't even know. We were told go and do those observations quarterly hourly the whole night so you ran and did it we no one ever told us that there was a trial remember when there was a blowup about doctors getting gifts and this and that and one of the trials that I had been involved in was a doctor and hey mentioned this drug and area and I had been involved but I didn't know at the time that it was a trial I did it [*voice change noted on tape soft sheepish whisper*]

R: I understand what you are saying, How do you see the nurse's role now?

T2: I think she does umm the person at the bedside needs to know the sister needs to be told what is going on they need to be even if it is looked at as a secondary role if they are not they might be administering the drug
I think that I might need to know if not more than her about the drug you know to be able to be the advocate of my patient so as to speak

R: tell me about critical thinking

T2: long long pause …. You see I would say you need critical thinking to make decisions so for me it is almost you need to knowledge and experience to be a critical thinker so I don't know if you would like me to break it down a bit more

R: carry on

T2: Well I think critical thinking you would be using when you worked in ICU for a while [because] you don't even think what you are doing you just instinctively know what to do.
I think things that don't occur often or are new happenings that is when you need your critical thinking skills by that I mean it doesn't just come automatically
I think your critical thinking skills come in things that are not every day in ICU and I think you need knowledge to back it because it is something that you are not necessarily fully au fait with doing but you are accountable for everything that you are doing so

I must have something to back me up now if I don't have knowledge or experience what does back me up with those decisions on what I did at that point in time is that what you are looking for in critical thinking?

R: yes, yes that is fine. Tell me what things nurses do like every day things ?

T2: Well basically if I take what we do in [named unit] we start off doing a set of observations which I think is vitally important because you cannot just take what is on the chart as being valid and what is happening and anyway it is an hour old when you get there so I think that is vitally important.
Another thing I think is hugely important which almost comes before doing those observations because at a glance you can look at a patient and if he looks a good colour and the ventilator is not alarming and this and that but are you alarms set is your patient's environment safe if he arrests two minutes after I take him over can I do I have to run for an ambubag or do I have to run for something else so
I think to me the most important when I arrive at a patient is looking at his environment before I even look for the finer details about this patient I will look at the environment
the finer details you say you should have gotten at the handover
I think it is more important to get your environment set up and make sure that your first set of obs is in the condition he appears to be and
then look for err for deeper things umm you could err I don't know if it is important that you look in the history for things or you do your own physical assessment of the patient first but I think it is quite important I don't want to turn a patient at 10'0 clock in the morning and see a rash over his back that I didn't know if it was there at seven o'clock I want to know if it was there at seven o'clock and could this be from the antibiotic or is it from this or that so
at seven o'clock I can document that I have taken over a problem because sometimes people are busy and they turn a patient at twelve o'clock and they find something I think that it is unacceptable to find something that has obviously been there for five hours
So I think that the physical examination an in-depth history the baseline observations and the safety of your environment are the first things that one must do and
obviously looking at your patient is he wake and how well do I need to communicate with him. I communicate with even brain dead patients because you never know who can hear you but I always talk to patients I say I'm listening to your chest and doing this and that. I always introduce myself to a patient so
should they even if they are deeply sedated you never know they might remember or it might give them a feeling of security you know when they hear your voice so they know that you are around but
I think that a lot of that can be integrated with experience because I used to do my observations and safety of environment at in one go because while I was looking at the heart rate I was looking at all the alarms while I was dong my ventilator observations I would be looking at if there was an ambubag or is there a suction so I think that you can integrate quite a lot and when I listened to the chest I looked at the patient when I felt for pedal pulses I looked at the patient so
it is not necessarily putting each one in a box but I think with experience you can do a whole lot of those or the one.

R: That's fine. You mentioned dying patients can you expand on this aspect of care now

T2: mmm I think that is i something that particularly the ICU nurses are uncomfortable with because our role is not to keep … the dying people comfortable rather our role is to keep them alive and I find that people are in an … uncomfortable situation when they are now caring for a dying patient.
I used to find it uncomfortable because it was not my role I was there to keep him alive not to let him die so but I think that err I had a major problem with people on whom if they had pulled out on err a patient and they pulled out on the nursing care yes remove medical therapy.
I don't think you at any point even after they have died remove the nursing care the dignity the family I found it is just so important and I found that there is a great lack of that.
If there was a patient that they pulled out maybe from when they pull out and when they die is **24 hours later they are not turned they are not suctioned their mouths are not cleaned and until that patient dies he is a human being he is your patient and if he was on three hourly turnings before he goes on three hourly turnings.**
I personally wanted them to look as nice and as comfortable as possible for the family I wanted the family to see them comfortable and
I just I know a lot of people are uncomfortable with it which I'm not is to involve the family to let them sit there explain to them if you know the whole day that he is going down I will point it out ands ay the heart rate is starting to go down now the blood pressure is dropping so I just kept them very informed

R: Why do you think people are not comfortable with that

T2: Well I think that death is not a comfortable thing at the best of times and I also think that a lot of nurses are not comfortable they can relate to patients sometimes they don't even relate or I find them they don't relate to families
families get in their way they are an inconvenience and they don't see the families as a part of the whole as part of that person no and
I sometimes feel that the nurses think they own those patients we don't families own those patients at the bedside not us and
I think you keep your patient comfortable when he is dying give him the morphine give him what ever is going to turn him clean his mouth and I think a major role comes in supporting that family and
if a family chose to be there and wanted to be there alone I allowed that if they wanted me to be there I was absolutely available and I was never far and I would say I am just outside and I would be at the bed just outside the door so if they did that was by the time unless it was a sudden death by the time
I would explain to them in layman's terms that you know towards the end then they might say can we stay now so I would say you are welcome to stay or are you still happy to be on your own but I find that no body struggled who came with experience and also the older [we become] also the more we experience our family now has ….. [tearful now]

R: we can stop now if you would like to

T2: No I will be fine

R: I am sure you were thinking of your own experience [reflection]

T2: absolutely and I really respect for now how those relatives want to deal with it because I heard people be being rude to relatives about being there or either not being there

and they say you are getting under foot go away and yet as soon as the relatives left they left the patient alone as well

R: tell me more about how decisions are made

T2: usually it is a doctor's decision and a doctor is very seldom queried on this mmm
I did'nt often query the fact that this had been the decision because I also felt that I could look at the patient and say you are going no where you know a 95 year old who is on a 5 mics of adrenalin is never going to make it you know fixed dilated pupils maybe whatever but I felt if I had disagreed on one or two occasions I did and I felt I was heard by the doctors and
I think in fact in [named unit and person] was the only one who said lets pull out like this, all the others had a more gradual approach but I did find him open if you wished to discuss it and you felt unhappy with and
I think if you said we absolutely disagreed we would usually ask for an explanation if we weren't sure but I think if we absolutely disagreed I think he would have gone along with us and I think he would have respected our decision

….

R: you mentioned it is bad thing, can you tell me how you think it affects us

T2: Well I think lets err (long pause) I think it makes a nurse feel that I am not important in making a decision and it further removes her from being part of the multidisciplinary team because someone else higher better qualified people with more status make the decision and I think that it impacts very negatively on nursing that we are not making the decision so what are we are we the maids you know when

R: when you say nursing are you talking ICU nursing or nursing in the broader context

T2: broader … generally I am speaking fairly broadly because when you are on a shift with 8 people you are lucky if you have got two ICU trained (pause) but I even find ICU trained even don't query the decisions

R: what do you think the problem is?

T2: (long pause) mm now as we are I think that there is a little bit a lot of the doctors are white and the nurses are black err black women are below men and black women whether servants or maids of white masters house so I don't know if there is a carry over of that but they are really obedient to the doctors and
I am not saying that I am disobedient and no disrespect meant but I feel that I can sometimes challenge what they are saying and I sometimes wonder if it is not a black women's syndrome if you know the picture I am trying to paint

R : ja

T2: they are not on a level of a doctor or a male and particularly not a white doctor

R: not sure I understand we have always worked with black nurses what is different from now

T2: I think in the early days when the black nurses came to they were more progressive people who had made it sort of person people who had something to say for themselves and could get to where they were going … so it is not that they are not exceptional individuals in more ways where I think black nurses of the past were exceptional individuals

R: do you think nurses move into ICU too quickly

T2: Yes I think people do move very quickly into the ICU … I think if you had maturity then you can deal with those conflicts and hopefully once they are sorted out they will not reoccur

R: You spoke earlier that people have a lot more social issues I have also noticed we are in a situation with some nurses where it is almost that distance self from patient. Have you seen this?

T2:I agree with you a hundred percent that and then I wonder if that has not come from apartheid where times were tough and the individual had to fight for themselves and I don't know if they have learnt to mmm their care to go very much further than themselves or their families I don't know but I think it is because of the difficult times that they have lived in and still live in

R: Tell me have you had situations in the ICU where you have disagreed with the doctors (pause) if you could maybe share that with me

T2: I have I can't think of any (long pause) I can't think of any specific but I have and I always felt that you don't approach any one aggressively so I have always come and said which I read in the literature as well … so that has always been my approach because I have read in the literature that nurses don't want to be seen as the decision maker so they are very subtle so I am very subtle in my approach

R: and does it work

T2: mmm I think I err I would push it to a conclusion because they might say I see what you are saying but if they are fully logical and they have got something I haven't though about I will definitely think about it so I don't presume I am right but I sometimes will feel maybe I am but they might point out something that just something that I have missed and I say okay I see your point yes you are quite right but I they have sometimes said thank you for your input definitely I quite agree with you I didn't know or I didn't realize or I hadn't thought of that so I think it has worked out both ways

R: and when it has'nt quite worked out

T2: mm (long pause) in that I have phoned a consultant over and above err the registrar's instructions
if I felt exceptionally strongly about it I have phoned a consultant that I am not happy with this, is this what they agree with and I don't stick my neck out unless I am going to be sure so inevitably the consultant has said do as I say but not to keep me happy but because it is the right thing

R: what things would make you feel strongly about

T2: ach when people make a value against evidence-based practice when you know it is the best thing to do

R: and how would you know it is the best thing to do

T2: from the literature from the ward rounds from experience in the unit and you will remember the days when we had very high pressures and we had hundreds of pneumo's you know you can't do that anymore you know you can't leave pressures that high (pause) we have read about it we have had lecturers on it we have physically seen it working so I and I am never aggressive and I will say I really disagree with you I think I am going to lets phone Prof and just get his opinion on this

R: so what are worried about

T2: patient outcome is that I am the patient's advocate I owe it to the patient to do the best I am able and suggest the best I am able to give the patients

R: okay I think that we can start to wrap up I think that we have covered quite a broad area we have spoken about knowledge, we have spoke about the medical team we have spoken about the ICU nurse's decision making critical thinking routine is there anything negotiation we have spoken a while is there anything else that you would like to add or feel we have'nt covered

T2: I don't think any new things but I just love that word collaboration between nurses and doctors it just sounds so wonderful and I feel that is where we should be we are professional people and we should recognize each other's own specialities but then we have got to bring equally to the table and we are not the doctors are bringing and we are not
I think we have and infact we have practiced collaboratively we have slid away from that and I think because I was in [named unit] for so long and new the doctors from the olden days my collaborative relationship did'nt slip but I don't think many others have collaborative relationships

R: Are you saying nursing has changed?

T2: yes definitely ... I think we have failed to meet the challenge and I think it is sad for nurses because when you think nurses not necessarily who we have got here that nurses should have continued to progress

R: Do you have any thoughts on how to explain this?

T2: mm and I do just certainly blame apartheid because I know when the first black nurses came in things would be done and they would do wrong things and have it corrected behind their backs or made excused for them or pussy footed around because you had to be seen being nice to the blacks because of apartheid and
I actually think we stifled there progression you cannot move on unless you make mistakes learn move on get helped and I think we have failed to do that we failed to do that and

I think I am not blaming the black nurses for the slide I am blaming us as well doctors nurses every body for the slide

R: are you okay for us to end now?

T2: yes

Ended 0.59:20

Conclusion

I found the interview with this participant to be quite easy. Even though at times I did sense overwhelming feeling of sadness as I listened to her talk about how nursing care has changed. She became quite emotional when she discussed the fact that there is a tendency to 'they pulled out nursing care', at this point she burst into tears, I sensed that she was reflecting on her own experience but stated quite angrily 'I heard them being rude to the relatives'. Embarrassed by the outburst and tears, she kept apologizing. I having had some insight into her recent personal experiences sensed that perhaps she was relating more to her recent personal experiences. She did come back later to thank me.

A second episode was noted on listening to the interviews around the discussion of 'clinical trials' she was involved as a student 'told to do and did it, not one told us it was a clinical trial it came out years later'. I sensed strong feelings of guilt as she just about whispered 'I did it'.

I felt knowledge and collaboration were strongly emphasized in this interview. Substandard care was mentioned. This was emphasized by detailed accounts of perceived not so competent situations. It appears from this participant that accounts of substandard nursing care raise many emotions in highly experienced nurses, which also led to distancing by creating us/them like situations. This is clearly evident in this discussion, but not unusual as some of the other participants used the same techniques in their interviews.

APPENDIX O

TRANSCRIPT FROM FOCUS GROUP DISCUSSION

Nine nurses participated in the focus group discussion. All were registered intensive care nurses. Four had functioned as senior nurses and the remaining five were clinical nurses.

FG ICN 1	ICU nurse shift leader
FG ICN 2	ICU nurse shift leader
FG ICN 3	ICU nurse
FG ICN 4	ICU nurse
FG ICN 5	ICU nurse
FG ICN 6	ICU nurse shift leader
FG ICN 7	ICU nurse
FG ICN 8	ICU nurse
FG ICN 9	ICU nurse shift leader

R. In your opinion and based on your experience what competencies do you think ICU nurses require and use for giving care to critically ill patients?

PG1 Well you can't be a shift leader if you have not done a course.

R: Why would this be a problem?

PG 1: She is responsible for the overall standard of care. She is the person who is accountable for everything that is done. She is like the supervisor.

PG2: the shift leader is important because we have so many untrained nurses so her role is vital to ensure that these nurses know what they are doing. This is an intensive care environment and patients are critically ill.

PG 5: I agree but I think that the shift leader fulfils is the decision making role. She must ensure that the nurses make the correct decisions and that patients are safe.

R: why is it important to keep patients safe?

PG 5: it is important because not all nurses are ICU trained and they make decisions about patient's treatment by making adjustments to treatments. Mistakes can happen fast because they are mostly untrained shift leader will check this so she keeps all patients safe.

PG1: the shift leader is also the one who talks to the doctors she knows what the treatment goals are. She will help the other nurses to keep those goals.

PG 2: we don't have doctors all the time there. The shift leader helps them by being there.

PG: 5 she also helps junior doctors when they don't know what to do. So she is not only there for the nursing staff. These days we are having a lot of junior doctors in ICU and it is stressful.

R: Where are your senior doctors?

PG2: our doctors operate in theatre so they can't be in ICU all the time. We do have an ICU doctor but he also helps in theatre when they need him. They do come to see if we call them.

PG 8: The consultants should be there to show the junior doctors what to do but they are not they expecting us to do this.

PG 3: I think it is easy for the shift leader to show them how because we know the procedures and we can guide them. We have been working in ICU for a long time and we know what to do so we tell them.

R: what will happen if the shift leader is not there?

PG 1: well it will mean that we will have to work even harder now and do everything else as well.

PG 9: They are expecting the shift leader to take a patient and do everything else as well. I think it is bad now these girls also have to do calls on the weekends just like the matrons. So they are expected to leave the ICU and go and do the call when they come back to ICU they must then pick up on their patients. I worry what happens if something goes wrong with the patient who will be accountable. I don't think that anyone is thinking of this.

PG7: it is in the scope of practice that the nurse is accountable for what she does to a patient and for what she doesn't do. So while she goes walking around the hospital to check all the wards and if something happens to the patient while she is away she will be held accountable because that is her patient.

PG 2: I don't know how they come up with all these ideas. They say that ICUs are spending too much money and that is why they can't keep the shift leader. I went to the meeting and people were angry they said everybody has a supervisor even the cleaning staff now why can't the ICU nurses also have a supervisor. They said we are spending too much money.

PG7: Everybody knows that ICUs are expensive it is in the literature it is all over the world Of course we all know this. Why don't they know maybe they should ask us we can tell them, but they don't talk to us they just tell us what is going to happen tomorrow.

R: Which competencies do you think you need?

PG1: Our assessments tell us what we need to do to care for patients. Assessments tell us what the patient needs.

PG2: I think that care is much broader in an ICU because you have to be a caring person to do care. You have got to be that before you can do actions. That is what I think care is much broader.

PG 5: they must care for the patient all those things like hygiene, suctioning, pressure part care, mouth care. All those things are in our scope of practice.

PG 4; there are also other cares like nutrition, ventilator care, sedation and comfort cares.

PG 6: also end of life care. We are doing a lot of that now these days because a lot of patients are dying as well in the ICU. I think for many nurses it is difficult because nurses don't like to see a patient dying in ICU.

R: Don't you think any nurse can do care. Why do you need an ICU nurse to do care?

PG5: all nurses do care but an untrained nurse can't care for a patient who is ventilated. It is not easy to turn a ventilated patient if you don't know how to do this. You tube will be out before you know it and your patient will be in trouble. The doctor will be very angry with you.

PG7: I think that if you are not trained how will you know how to titrate and adjust medication. You need an ICU nurse to be able to put that together before she knows what she must do. The machines don't tell you what you must do you need an ICU nurse to work that one out.

PG3: a general nurse might know what a monitor is but she doesn't know how to pick up subtle changes on that monitor. An ICU nurse knows what that is and she will also know why. These days that is very important in ICU.

R: Tell me do you think care is the same as caring?

PG1: for me caring is the process of doing care. It is what we do.

PG 2: I agree but I also think that caring is much more personal, it is a relationship with the family as well.

PG 4: I think that caring is both the process of doing care it is personal and that means knowing the patient. You have to know about the patient all those little things about the patient like what they like and what they don't like. We know these things from the family. So I think that caring process begins when you establish a rapport with the family. They tell you things about who the patient.

R: Do you mean like personal things

PG4: yes that is what I mean.

R: then are you saying person things from the family are different to what you know about the patient from the monitors and equipment in ICU?

PG4: yes.

This followed a lively discussion about the patient as a person. It was agreed that intensive care nurses do caring … absolutely caring … it is being close to the patient and knowing about the patient as a person … the personal relationship about the patient this is what the family will tell you.

PG7: I think we ICU nurses render holistic care ...This includes the care of the family. ICU is a frightening and stressful situation for the family. It is important that we support the family through this experience.

PG5: We know family support each other, but I think in difficult situations the family also supported me through many experiences, it was like a partnership for us to see the patient getting better

Notes:
Interestingly, I noted that on the ICU chart the smallest of areas reflected the heading 'nursing care' the listed items included nebulizer, physio, trach & ET care, eye/mouth care, pressure part care, care turning, genital care, catheter, bath and dressings. This is a total of 5 cm. ? How big is the ICU chart I must measure this to determine the ratio?

R: What competencies do you need for basic care?

FG6: well that is all those things we do routinely in ICU?

R: Does this mean suctioning, hygiene, mouth care, pressure part care, nebulizers things like that?

FG2: Yes basic care is all those basic things like physical care. You know like in Maslow's hierarchy. I can't remember exactly but I think he said basic needs must be met before the other needs.

FG 1: Basic care is also nutrition, cleanliness, equipments, treatments all those sort of things

FG3: well it is suctioning patients, bathing patients, doing dressings those things that the scope of practice tells us we must do for a patient. Those are the things that nurses are responsible for. Those are the things that nurses do. You don't need a doctor to tell you that you must do it. It is your scope of practice.

FG5: I feel that basic care also includes communication. We work with technology and by talking to patients we help to meet their emotional needs. You know it is frightening for a patient in ICU.

R: Can we talk more about emotional needs of patients?

FG5: well just the fact that you are on a ventilator the patient can't talk so he is frightened and he is anxious about what is happening to him. If you talk to him you can tell him what is happening you can explain to him why he can't talk. You know so many nurses don't talk to patients. I have spoken to many patients when they are out of ICU and they have told me that they couldn't
understand why people weren't hearing them. They didn't know that there was a tube there that was blocking the vocal cords. They thought that we weren't listening and that made them very anxious and frustrated. So I think that it is important to talk to patient and relieve their psychological distress as well.

FG7: I have noticed that nurses have difficulty talking to patients who don't respond to them especially untrained nurses.

R: Has anybody else experienced this?

FG4: yes they are too busy looking at the monitor and fiddling with the ventilator they don't even realize that there is a human being lying in that bed.

FG1: talking to patients is not easy. These days many nurses come to work in ICU and they have never worked in the wards before. So now what do they know about sick patients. As a shift leader you will have many problems because you can't play with our patients they are unstable you must know what you are doing and you must know that this is a person lying there. They must be supervised all the time to make sure that they do it right. They only look at the numbers and nothing else.

Notes:
I remembered a situation when we were so busy in ICU we needed extra help. There was a young nurse who was very keen on ICU and when the matron's brought her in I showed her quickly what to and how to turn the nobs and get the readings. I instructed her on the parameters and when to call me. That was all I could do in the short space of time. She managed quite well the night and closely adhered to the instruction that I had given her. But the next day I heard from the wards that she was so excited she could do exactly what the ICU nurses did all they do is turn nobs and write down the readings. That was her perception of what an ICU nurse did. She had not seen the bigger picture of me guiding her in the background and keeping a watchful eye over her patient from a distance. For me it was an exhausting night.

R: Tell me about some of the decisions that you make?

This was followed by a long period of silence.

FG3: Decisions about nursing care well that would be when to turn a patient when to do mouth care when to suction a patient those sorts of things.

FG5: No that not what we mean. Okay alright those things but there are also other things. Like we make decisions when to do a blood gas if we see that the patient is not okay. We make things like when to start an inotrope or to change inotropes if the blood pressure is not okay.

FG4: We make decisions like when to call a doctor is we need them and we also make a decision when to start emergency treatment. Yes we make all those decisions as well. If you look at the scope of practice at all those things that we are responsible for I think those are the things that we make decisions on.

FG2: the other day we had an incidence the nurse made a decision on the patient. It was a life threatening decision. The doctor said that was her opinion and she should have called him. It was a big argument in the unit. I don't know why he was complaining because it was the right decision that the nurse made and he said it was not in her scope of practice.

FG4: I think that they don't know what is in our scope of practice. Of course we can do more things than is in the scope of practice because we have that knowledge and skill I don't think that other nurses have that. We are trained to do that because we are ICU nurses.

FG2: Yes but the doctor was not happy. I stepped in there and explained to him a nurse can make that decision because she is accountable for practice. If you weren't here and she felt that the patient was in danger she can intervene. Look at it the blood pressure was dropping she noticed the rhythm was not okay and she started to pace the patient and then she went to phone you. She was watching the patient all the time and she documented all of that. How can you say she made the wrong decision you weren't even here. He wasn't happy that I stepped in but he sort of accepted that.

Notes:
As I listened to her story I couldn't help myself thinking why could they (doctors) not have just thanked her. I don't think that they realize we are put in situations where we are willing to take risks to keep our patients safe. I really and truly don't think I would ever just jump in and intervene unless I was absolutely sure I knew what was happening there. I was trained that way. An ICU nurse must be sure of what she is doing. If not then you call a doctor or you find someone who knows what is going on.

R: Has anyone else experience this?

FG 4: This happens sometimes. The doctors think that we want to take over their work. We also do things like put in lines when we need them on patients.

FG7: we don't do that that often because our patients come from theatre or casualty they have those lines. Yes I think it is like that in most of the units. Sometimes you will find a doctor can't put in an arterial line on a trauma patient and then we put in those lines to help them.

R: Do all nurses put in arterial lines.

FG4: I do but I don't think all nurses do they will do an arterial blood gas if they have to. We will know when we need to do this from our cares like if you make a change on the ventilator and see that the patient is not doing okay then you will make a decision to do a blood gas to find out what the problem is.

FG5: obviously if a patient needs that I will do it because I am an ICU nurse. I don't think all nurses do this some these days will say it is not my job. They say doctor must come and see the blood pressure is low and then he will tell me what I must do.

R: tell me about ward rounds in ICUs.

FG1; ward rounds are where decisions are made. You need to know the decisions they are like the goals toward which you must work. This is what you must do in your care of that patient.

R: I have heard some nurses will say ward rounds are for doctors to talk to us, do you agree?

FG2: No I don't I think that it is for us to advocate for patients. That is why we have to be there when decision are made about patients. I have noticed when the doctors don't look at patients they are to busy talking to the charts and other things in the files. The patient hears the doctor is talking and he looks out at you. I think to see if you are in agreement with

what the doctor is saying. You must advocate for the patient to seen that he gets the right treatment that is the most important part.

FG6: I also think that you must be there because sometimes you must advocate for the family as well when decisions are made. I mean like things when they want to pull out treatment.

FG2: I think that your presence there is to reassure the patient. He trusts you that you will act on his behalf when treatment decisions are made.

R: What do you think a nurse needs when working with technology?

FG3: I think technology is important but I don't think that it is so important. I know we have got a new era with the technologies and things like that but I find people tend to over rely on technology and forget those general things. Like a normal blood pressure.

FG2: These days they can't even take a blood pressure without a dynap they can't even do that anymore. They must know how to calibrate a machine it is important that they know how to troubleshoot equipment they must know how to make changes correctly at all times they must have knowledge to correlate a good decision from a wrong decision.

FG7: I agree they must know good and not so good decisions … I think that it is important that even after they have done that. They must think about what made it a good decision or a not good decision that is how we learn to make right decisions.

FG4: I think that it is important to know how to troubleshoot equipment and to make right decisions. You must know in ICU you can't just turn a nob you must have knowledge to do that. It is all part of keeping a patient safe. I just feel don't touch if you don't know rather ask someone if you are not sure.

FG2; we keep on saying ask someone if you are not sure. Who is that person now that they have taken away the shift leader.

FG5: I was thinking the same thing. It is stressful to work in ICU. I don't know what we are going to do. We need help in finding a solution.

R: who do you think will help you?

FG5: I don't know but I think I will speak to my Professor I will tell him what they have done.

FG2; I did speak to my Professor he is not happy and he said I must'nt allow any shift to be without a shift leader. I don't know if this is going to help me because he does'nt have to face the nursing management I have to do this. What would you do in this situation?

R: I am not sure but let's ask the group?

FG7: I remember years ago when we were working in named unit. We also had staff shortages and they brought us nurses who had never worked in ICU before. It was terrible. This was when they first brought in agency nurses. We couldn't work with them so we

monitored all the patients we used those scores and then we showed management how sick our patients were. They had to listen to us because we had the evidence to prove that we were not talking rubbish. It was a lot of work for us but we did it because we knew it would help our patients. I think that we should at something like this.

FG 4: that sounds like a good idea. Where can we get those forms to score our patients?

R: I will see what I can do. I should be able to come up with something that might help you.

FG4: it is always nice to know that you are there and that you really care about us. We know that you understand what we are going through because you have been there.

R: Tell me in your opinion what do you consider as a highly skilled nurse?

FG2: for me that would be the ideal ICU nurse practitioner.

FG5: For me it would be a nurse who is seen doing and being knowledgeable people would see that she has got a lot to offer. She wouldn't have to say to people look at me I am highly skilled. It would be notable.

R: How would you describe the competent ICU nurse?

FG9: I would say cognitive ability would be thinking from the head and not from the heart. They would have the ability to make rational decisions and practice self control and self understanding. I would want them to be always aware of their surroundings and be an independent decision maker. They must be a fast thinker and quick in action. From a psychomotor perspective I would want them to be able to use their hands in relation to mind. It is about transferring cognitive knowledge or understanding into actions. There must be mind and body coordination. I also think they must be able to lead by example. From an affective perspective they must be a good listener, empathetic and assertive. Being able to depersonalize issues is important. There must be dedication and respect for others. For me these would be the traits of a highly skilled ICU nurse.

R: What about the others, do you all agree?

After a long period of silence …the other participants agreed.

R: Before I begin to summarize our discussion, is there anything else anyone would like to add?

After a long period of silence, the participants were thanked and the discussions ended.

APPENDIX Q

UNIVERSITY OF THE WITWATERSRAND.JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Schmollgruber

CLEARANCE CERTIFICATE	PROTOCOL NUMBER M040211
PROJECT to inform intensive care nursing practice	Development & application of competency standards
INVESTIGATORS	Ms S Schmollgruber
DEPARTMENT	Nursing Education
DATE CONSIDERED	04.02.27
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

CHAIRPERSON .....
(Professor PE Cleaton-Jones)

04.03.11

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Dr GLangley

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and ONE COPY returned to the Secretary at Room 10005, 1Oth Floor, Senate House, University.

I!We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. I agree to a completion of a yearly progress report.

PLEASE QUOTE TilE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX U

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Gauteng Department of Health

Enquiries: Ms. L. Mvumvu
Office of the CEO

24 March 2004

Ms. Shelley Schmollgruber
Department ofNursing Education
Faculty ofHealth Sciences
University of the Witwatersrand
7 York Road
Parktown
2193

Re: Research at Johannesburg Hospital

Your letter-dated 16.03.04 has reference. Permission is granted to conduct your research on Intensive Care Units at Johannesburg Hospital.

Please liase with Mrs. Lange at 488-3785 for the necessary arrangements.

Yours sincerely

Chief Executive Officer

cc. Mrs. Lange