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SCHOOL OF NURSING AND MIDWIFERY

COLLEGE OF HEALTH SCIENCES

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**ASSESSING NURSES' COMPETENCIES IN MANAGING CRITICALLY ILL
PATIENTS IN THE INTENSIVE CARE UNIT. A STUDY AT THE KORLE-
BU TEACHING HOSPITAL**

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PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF
AMPHIL IN NURSING DEGREE**

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DECLARATION

This is to certify that this thesis is the outcome of a study undertaken by Esther Owusu-Takyi under supervision towards the award of a Master of Philosophy Degree in Nursing at the School of Nursing and Midwifery by the University of Ghana. All materials used in this study have been duly acknowledged in both the text and the list of references.

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ABSTRACT

Critically ill patients have life-threatening health problems that leave them in a vulnerable state and thus need urgent medical attention. The critical care nurse (CCN) forms an integral part of the expert team of medical professionals who provide the needed care for such patients and spend the most time with the patient. The CCN possesses the requisite set of competencies to decide care strategies for patient management for optimum recuperation, and comfort for the patient. Lack of these competencies as a result of the shortage of CCNs could have dire consequences for the patient in the ICU. Critical care nurses form approximately one-third of the nursing workforce in the ICUs of Korle-Bu Teaching Hospital (KBTH). Thus, evaluation of nurse competencies in the ICUs of KBTH was found to be necessary. A quantitative and cross-sectional study employing a 66-item questionnaire was used to assess demographic characteristics, critical thinking, professional development and practice, and communication and coordination competencies of 133 nurses from all the ICUs at the Korle-Bu Teaching Hospital (KBTH). Benner's scale was used to guide the grading of the level of competence of all consenting participants. The study revealed that more than 80% of nurses in the ICUs were competent although critical care nurses formed less than one-third of participants. The areas of competencies assessed were also found to correlate strongly with each other ($p < 0.001$). Competence was found to be significantly associated with age, status in the ICU, level of education, specialty, and years of experience ($p < 0.001$). Additionally, logistic regression analysis showed that the years of experience, as well as Senior and Principal officer ranks significantly ($R^2 = 0.407$, $F(4, 128) = 21.98$, $p < .001$) predicted the overall competence of the ICU nurse. Steps would have to be taken to train and mentor younger and less experienced staff of the ICU even if they are trained as critical care nurses to achieve an acceptable level of competence in their duties towards the critically ill.

DEDICATION

This work is dedicated to my family for their understanding, support, and patience throughout this journey.



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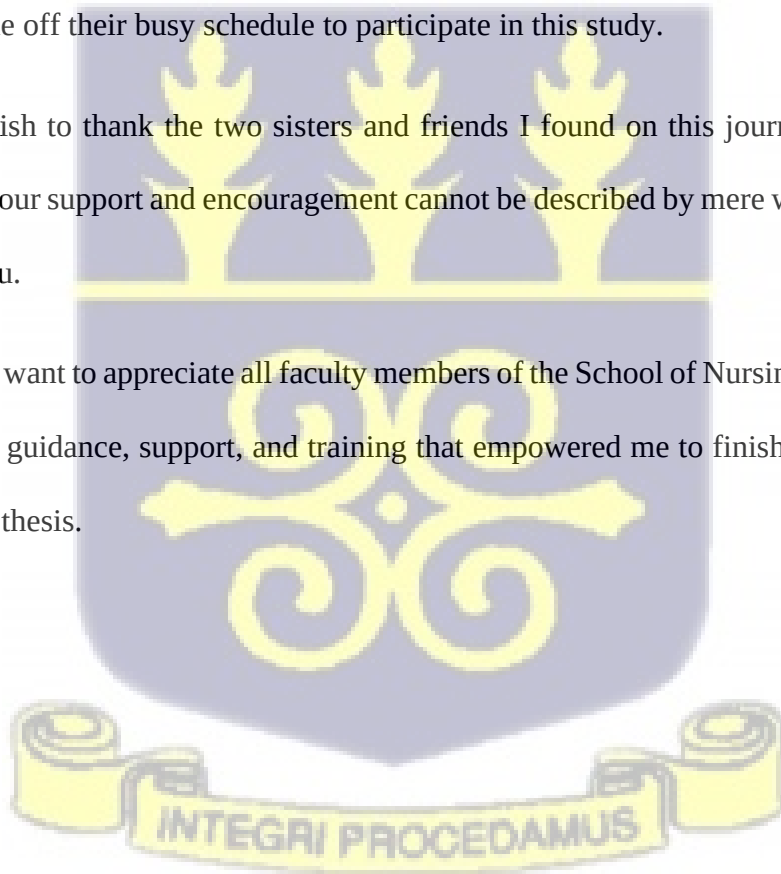


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LIST OF ABBREVIATIONS

ABCDE:	Airway, Breathing, Circulation, Disability, and Exposure
ABGs:	Arterial Blood Gases
BIPAP:	Bilevel Positive Pressure
CCFMENS:	Core Competence Framework Model for Emergency Nurse Specialist
CCN:	Critical Care Nurse/Nursing
CCNC:	Core Clinical Nursing Competence
CIRN:	Competency Inventory for Registered Nurses
COPD:	Chronic Obstructive Pulmonary Disease
COVID-19:	Coronavirus Disease 2019
CPAP:	Continuous positive pressure
CPD:	Continuing professional development
ECG:	Electrocardiogram
GCS:	Glasgow Coma Scale
HICs:	High-Income Countries
IBM:	International Business Machines Corporation
ICN:	International Council of Nurses
ICP:	Intracranial pressure
ICU:	Intensive care unit
IRB:	Institutional Review Board

IT: Information Technology

KBTH: Korle-Bu Teaching Hospital

KNCCS: Korean nurses 'Core Competency Scale

LICs: Low-Income Countries

LMICs: Lower Middle-Income Countries

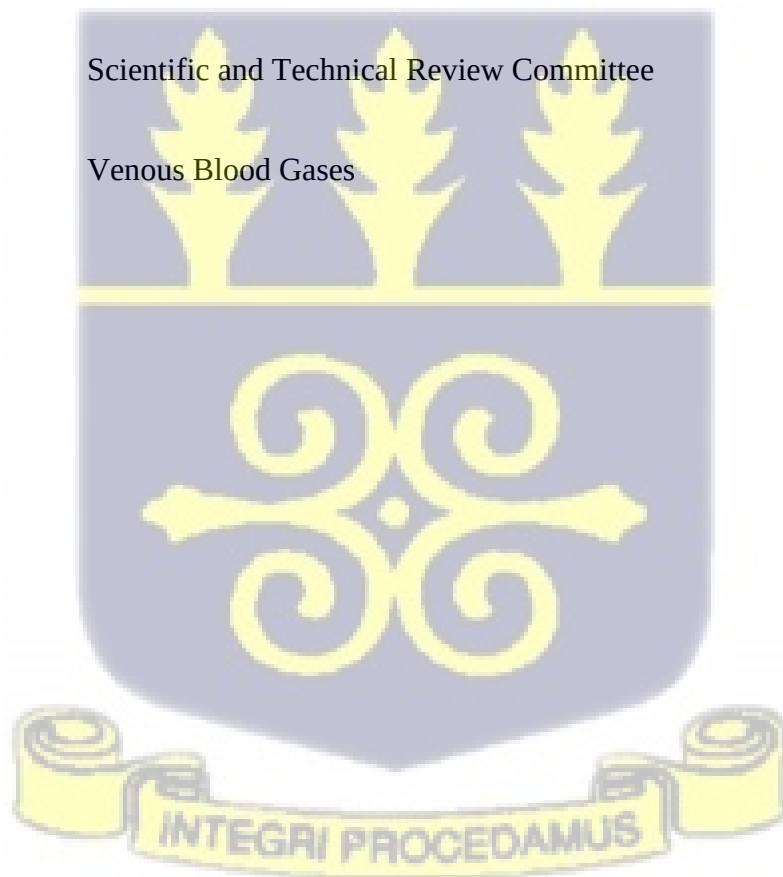
NMC: Nursing and Midwifery Council

PCC: Patient-centered care

SPSS: Statistical Package for Social Sciences

STC: Scientific and Technical Review Committee

VBGs: Venous Blood Gases



1.1 Background

Critical illness or acute illness denotes any life-threatening, reversible condition of a severe stage, that could lead to a poor outcome or death if left untreated (Baker, 2015; Schell et al., 2018). Critical illness rarely strikes without warning, but it is often preceded by a sequence of unrecognized changes (in some cases) in important clinical signs over several hours (Vincent, 2019). Patients with conditions such as Pneumonia, Eclampsia, Sepsis, Peritonitis, Haemorrhage, Asthma, Trauma, Stroke (Schell et al., 2018), acute-on-chronic liver disease, haematological malignancy, et cetera become critically ill (Khan & Ridley, 2014). Several millions of deaths have been crudely estimated to result from critical illness across the globe each year (Schell et al., 2018). The process of caring for patients who have or are in danger of acquiring life-threatening diseases is known as critical care (Jackson & Cairns, 2021). Patients with critical illnesses are often managed in the intensive care unit (Vincent, 2019). The intensive care unit (ICU) is a geographically distinct location where high staffing ratios, improved monitoring, and organ support can be provided to reduce patient morbidity and mortality (Jackson & Cairns, 2021). The ICU provides an organized system for the provision of care by a specialized medical and nursing team. It also provides an enhanced capacity for the monitoring of multiple modalities of physiologic organ insufficiency and supports sustaining life (Vincent, 2019). Medical care involves care provided by surgeons, intensivists, and pulmonologists. The surgeon provides advice and guidance for specific management of the surgical condition, wound care, nutrition, and anticoagulation therapy during the postoperative period (Jackson & Cairns, 2021). Nursing care or roles on the other hand include handling referrals and admissions to the ICU, managing and monitoring airway and respiratory support, cardiovascular support, renal support, gastrointestinal support and nutrition, infection prevention and control,

communication with patients, and patient's family and control among others. (Scholtz et al., 2016). Furthermore, the ICU requires the use of preventative measures, early warning and response systems, and a multidisciplinary approach both before and during the stay in the ICU (Jackson & Cairns, 2021).

Reportedly, mortality and morbidity rates are greater for patients admitted to the ICU compared to those admitted to standard wards (Akkoç et al., 2017; Elhadi et al., 2021; Khan & Ridley, 2014). The high morbidity and mortality have been associated with the age of the patient, level of hospital care, annual patient volume, the number of comorbidities, the acuteness or severity of the patient's condition on admission, competence of ICU team members et cetera (Akkoç et al., 2017; Weigl, Adamski, Goryński, et al., 2018). Geographical location and income categories have been reported to influence mortality rates in the ICU. Mortality rates in the ICU in some high-income European countries were 6.7 to 17.8%. Similar mortality rates have been reported for other high-income countries such as the USA (11.3%) as well as Australia and New Zealand (7%) (Weigl, Adamski, Goryński, et al., 2018). Relatively higher ICU mortality rates (26% and 23.2% respectively) have been reported in other high-income countries such as Italy (Elhadi et al., 2021) and Spain (Borobia et al., 2020). A study in China, an upper-middle-income country, reported that among 344 ICU patients, the mortality is estimated to be about 38.7% within 28 days after ICU admission (Wang et al., 2020). In a meta-analysis of 24 studies outside of Africa and in this case low to lower-middle-income countries, ICU mortality was 41.6% (34.0–49.7%). However, the only study from the African region will be that of Biccard et al., 2018, which found a 48.2% mortality rate among patients in several African countries (Biccard et al., 2018). The survival and fatality rates of ICU admissions in African nations are, however, little documented. (Siaw-Frimpong et al., 2021). Researchers in

Africa would have to pay attention to this gap and would need to look into this area as this can help determine the trajectory and impact of ICU care in African countries.

Intensive care unit (ICU) bed capacity among 19 Asian countries revealed that there were 3.6 critical care beds per 100,000 population. Lower (2.3 critical care beds per 100,000 population) values were reported in low- and lower-middle-income economies compared to the upper-middle-income economies (4.6 critical care beds per 100,000 population) and high-income economies (12.3 critical care beds per 100,000 population) (Phua et al., 2020). Larger variations in ICU bed capacities were realized across countries and regions of the same World Bank income classification (Phua et al., 2020). For every 100,000 people in Germany, Canada, and the United Kingdom, there were 24.6, 13.5, and 3.5 ICU beds respectively (Phua et al., 2020). In developing countries, large urban areas mostly and exclusively hosted the available ICUs (Siaw-Frimpong et al., 2021). Africa is estimated to have 0.8 critical care beds per 100,000 population (Ayebale & Kassebaum, 2020). For every 100,000 population, South Africa (High income) has 8.9 ICU beds, and Uganda (low income) has 0.1 ICU beds. West Africa has an estimated critical care bed capacity of 0.6 per 100,000 population while Ghana has 0.9 critical care beds per 100,000 population (Ayebale & Kassebaum, 2020). In Ghana, there are a total of 113 adults and 36 pediatric ICU beds for up to thirty (30) million people. In Ghana, there is a significant shortage of ICU beds. Compounding this challenge is the inequitable distribution of these beds across the country and the low intensivists to nursing staff ratio in the ICUs (Siaw-Frimpong et al., 2021).

Patients who are critically ill usually have poor respiration, circulation, or awareness, and they require immediate intervention and therapy to be stabilized (Engebretsen et al., 2021). Clinical management of the critically ill comprises many activities but essentially includes airway management (oxygen administration, suctioning, and chest physiotherapy), haemodynamics monitoring (Arterial Blood Gases, ABGs, Venous

Blood Gases, VBGs, Central Venous Pressure, CVP, and vital signs), cardiac management (Electrocardiogram “ECG” monitoring, pacemaker and defibrillation), drug administration (inotropes), neurologic management (monitoring Intracranial pressure, ICP and Glasgow Coma Scale, GCS) and physiologic alteration management (CII) (Brown & Cadogan, 2015). To aid the work of ICU personnel equipment such as pulse oximeters, cardiac monitors, blood gas analyzers, ventilators (Continuous positive pressure (CPAP) and bilevel positive pressure (BIPAP), defibrillators, spirometers, systems as well as other essential equipment are provided within the ICU space (Baker, 2015). Robertson and Al-Haddad (2013) suggested that management of the critically ill patient requires health care expert evaluation using the airway (monitoring patency), breathing (respiratory rate), circulation (pallor, haemorrhage), disability (physical or mental impairment that prevents a person from moving, sensing, or carrying out specific actions), and exposure (unseen haemorrhage, wound leakage) (ABCDE) approach to improve health outcomes of these patients (Robertson & Al-Haddad, 2013). This implies that critically patients require specially trained healthcare providers especially nurses to care for them. This is because it is universally known that the nurse spends the most time with patients on admission and this is most true for the critical care unit nurse (Scholtz et al., 2016). This makes the nurse best suited to recognize subtle changes in a patient and take action either independently or with other members of the critical care team (Vincent, 2019). Detecting critical illness early, before it progresses to the point of being life-threatening, is difficult and time-consuming and thus requires specialized training, as well as experience (Feliciano et al., 2021).

Nursing in the ICU focuses on all areas of fundamental nursing care and life support. The nurse in the ICU further combines the essence of nursing with observation, in-depth and even intuitive interpretation, and response to the slightest imbalance or

deviation in a patient's state to provide optimum care for the critically-ill patient (Jackson & Cairns, 2021). Critical care nurses (CCN) working in the ICU must function within their own culture to adapt to a fast-paced and stressful setting (Scholtz et al., 2016). Owing to the fast-paced and stressful ICU setting, nurses' competencies particularly in critical thinking, professional development and practice as well as communication and coordination are deemed indispensable in the ICU setting (Fan et al., 2016). These make up the critical thinking competence the nurse must possess to work efficiently in the ICU (Fan et al., 2016; Fukada, 2018; Khanmoradi et al., 2021). Care in the ICU also requires that the nurse understands the legal and ethical principles of the profession and recognizes the importance of quality improvement and performing actions relating to it (Bahreini et al., 2011). This role will require active participation in professional learning activities and training, constantly improving professionally, and gradually honing the nurse to become a specialist (Fan et al., 2016). This is very important to allow patients to derive the best, relevant and expedient care from the ICU nurse (Fan et al., 2016). Communication is an integral nursing role that is meant not only for purposes of therapy but also for information sharing between the nurse and the patient, other healthcare staff at the ICU, and patient relations. Most patients in the ICU are not able to communicate well owing to the nature of the illness, level of consciousness, and therapeutic intervention (e.g on a mechanical ventilator) among others (Dithole et al., 2016). The nurse would have to initiate communication most of the time and also be able to communicate with the patient's family (Dithole et al., 2016; Slatore et al., 2014). To summarize the points raised thus far, nurses working in the ICU must possess specific knowledge, technical proficiency, and interpersonal abilities to meet the needs of patients who are seriously ill, (Bloomer & Bench, 2020).

In a high-income country (HIC) like the United States of America (USA), the American Association of critical care nurses (AACN) agrees that nurses in facilities that take care

of severely ill patients have to be competent. They however noted that staffing in the ICUs has neglected the proper match between nurse competencies and patient needs. Only 39% of ICU nurses were said to have the knowledge and abilities necessary to care for seriously ill patients. From 2013 to 2018, scores for effective decision-making, communication, and teamwork increased across the board. They also reported that support for continuing education also improved from 74% to 79%. Although there has been much improvement in the critical care nurse working environment in the USA, 54% of nurses working in critical care settings intend to quit their current role within the next year or the next 3 years (Ulrich et al., 2019)

The burden of critical illness in low-income (LICs) and lower-middle-income (LMICs) countries is substantial and its outcome has been reported to be poorer compared to high-income countries (HICs). In the HICs, resources to manage the critically ill, high-cost technologies, and highly trained and specialized teams of healthcare staff are readily available (Vukoja et al., 2014). However, this cannot be said for the LICs and LMICs concerning the care of the critically ill (Macey et al., 2022; Vukoja et al., 2014). Intensive care unit (ICU) development in low-income nations has been hampered by the high cost of training healthcare staff, infrastructure, and supplies (Murthy et al., 2015; Papali et al., 2019). There is a dearth of information on nurses working in the ICU with regards to competence, work settings, capacity, communication and coordination, conditions of service, and job satisfaction among others in low-income countries (Murthy et al., 2015). This information is crucial to building strong and resilient nursing care in ICUs in these low-resource environments. Macey et al., 2022 also reported that human and physical resources for ICUs varied greatly by location, but were frequently cited as insufficient to satisfy demand in Low-income and Lower middle-income country health systems (Macey et al., 2022).

To provide the patient with safe and effective treatment, the nurse tending to them needs to be qualified, have a full awareness of the subject, and possess specialized knowledge. (Nobahar, 2016). Local and international authors agree that this specialized knowledge enhances competence and would most probably be acquired from the nurse undertaking a post basic Diploma/Master's degree in critical care nursing (Briggs et al., 2006; Macey et al., 2022; Schmollgruber, 2007). A survey in the United States among 50 states and a few island states that fall in the LMIC category indicated that a little over 60% of ICU nursing staff had specialty qualifications in critical care nursing and about 24% had graduate qualifications (Ulrich et al., 2019). In Ghana, most nurses who work in ICUs do not qualify for critical care nursing (Osei-Ampofo et al., 2018). By their education, nurses who are not certified in intensive care nursing are assumed not to have been exposed to the specialized knowledge necessary to practice in the ICU environment. This disqualifies them from caring for critically ill patients as they are deemed incompetent (Scholtz et al., 2016). The shortage of nursing staff in Ghana is mostly to blame for the high proportion of "non-qualified" nurses seen in ICUs. Due to this circumstance, the ICUs are now lacking ICU-qualified nurses, who have had to be replaced by non-ICU-qualified nurses (Siaw-Frimpong et al., 2021). According to Morrison, as cited by Scribante & Bhagwanjee (2007), providing nursing care without the proper training could be seen as an intrusion that could be harmful to the patient. When inexperience is combined with staff shortages, inadequate supervision, and a lack of support staff, patients may be exposed to adverse outcomes and mistakes are more likely to occur. (Madede, et al., 2017; Morrison, et al., 2001; Scribante & Bhagwanjee, 2007). Variations in education or training, as well as experience, may compromise consistency in the competence of the nurses in the ICU, and this further would compromise patients' health and safety (Vaismoradi, et al., 2020). The consequences of having a nurse who might not be competent due to not having received the

specialized knowledge necessary to care for the critically sick patient could be dire and result in the patient getting worse, the patient's treatment failing, and at worst, higher mortality and morbidity (Feliciano, et al., 2021; Kushemererwa, et al., 2020). The above exposition makes it important to assess nurses' level of competence in managing critically ill patients in the ICU in the Ghanaian Hospital setting given the peculiarity of available resources.

1.2 Problem Statement

About 85% of patients admitted to ICUs are managed as critically ill patients; however, the competence of critical care nurses as core staff of the ICU in managing such patients has been reported to be average in developed countries (Botha, 2012; Osei-Ampofo et al., 2013). Nurses' knowledge of the critically ill in countries with improved staffing and relatively advanced medical resources has also not been impressive. Such scenarios in developing African countries are a recipe for disaster when coupled with the ongoing rise in ICU admissions due to the COVID-19 pandemic and other pathologies affecting the respiratory system directly or indirectly (Botha, 2012). In overwhelming circumstances, patients on mechanical ventilation who are deemed to be critically ill are likely to be cared for by general nurses who have limited competencies in management protocols, and monitoring of severely ill patients in the ICU (Wells et al., 2021). Within the African context, studies conducted in South Africa and Rwanda have reported that even where the nursing education is of good standards, the level of competence in the ICU is far from ideal (Botha, 2012). In Ghana, there are inadequate skilled critical care nursing experts and those that exist are over-burdened with high volumes of work. At the point when patients show up at the emergency unit, they are seriously ill, as they have postponed looking for medical services until critically ill (Japiong et al., 2016; Osei-Ampofo et al., 2013). These difficulties become dire if there

is a mismatch between the competence of the nurse in the ICU and the skill required to care for such patients.

Evidence suggests that a great proportion of nurses working in ICUs in Ghana lack the requisite critical care competencies expected for nursing the critically ill. This challenge may result in the critically ill patient suffering complications, prolonged stays at the ICU, and increased costs of care (Siaw-Frimpong et al., 2021). It appears that no study has assessed the competencies of nurses working in the ICU as well as factors that influence their competence level. Neither are there reports on the competencies of nurses in managing critically ill patients in the ICUs of hospitals in Ghana.

1.3 Purpose of the Study

The purpose of the study was to assess nurses' competencies in the management of critically ill patients in the intensive care units of the Korle-Bu Teaching Hospital in Ghana.

1.4 Objectives of the Study

The objectives of the study are to:

- i. Describe nurses' critical thinking, professional development and practice, and communication and coordination competencies in the care of critically ill patients in the ICU.
- ii. Investigate the relationship between nurses' critical thinking, professional development and practice, and communication and coordination competencies.
- iii. Elucidate the demographic predictors of nurses' critical thinking, professional development and practice, and communication and coordination competencies in the ICU.

1.5 Research Questions

To ensure that the research objective is achieved, the study will be guided by the following questions:

- i. What are nurses' critical thinking competencies, professional development and practice competencies, and communication and coordination competencies in managing critically ill patients in the ICU?
- ii. What is the relationship between nurses' critical thinking competencies, professional development and practice competencies, and communication and coordination competencies?
- iii. What are the demographic predictors of critical thinking, professional development and practice, and communication and coordination competencies of nurses in the ICU?

1.6 Significance of the Study

Little is known or documented about the nurses' competencies in the management of critically-ill patients in the intensive care units in Ghana. This study is important because intensive care unit admissions are increasing globally largely owing to the rise in non-communicable diseases with accompanying pulmonary pathologies. The COVID-19 disease pandemic and other complicated illnesses with its associated increase of admissions into the intensive care units have equally placed a high demand for advanced skills in the ICU. This situation has placed more weight on the need to improve competencies among nurses. Core competencies would therefore be required to improve patient outcomes.

The study will provide information on the perceived competence level of staff working in the intensive care units in the premier teaching hospital in Ghana. The study will unearth the kind of training needed by the staff in the ICU to enable them to work effectively and efficiently. Furthermore, the findings would guide the management of

the hospital and leadership of the ICUs on nursing staff recruitment for the ICU. The relationship between nursing education level and the competencies required for nursing the critically ill in the ICU would be established and this would provide evidence for recruitment and training needs for the nursing team in the ICU. Last but not the least, the findings of the research will add to the existing knowledge on critical care nursing and will guide and encourage the conduct of future studies in critical care nursing.

1.7 Operational Definition of Terms

Nurse: A well-trained and licensed medical professional who provides nursing care for the sick.

Competent: Having sufficient skill, knowledge, ability, or qualification to do something well enough to achieve a basic standard.

Competence: Knowledge, skills, talents, and behaviors that contribute to individual and organizational success.

Critically ill patient: A patient with severe or life-threatening illness or injury

Intensive Care Unit (ICU): A specialized unit in a hospital or health care facility that provides care for patients who are acutely unwell and require critical medical care.

CHAPTER TWO

LITERATURE REVIEW

This chapter highlights the literature reviewed concerning assessing the competence of nurses in managing patients in the ICU. This is to help relate the present study to other studies bordering on the same or similar theme. It will as well identify gaps in other studies and help disseminate the findings of other research works. The first part of the review will elaborate on the three (3) conceptual frameworks that were considered for

this study, out of which one was selected as a model for the study. The focus of this study was to assess nurses' competencies in managing patients in the ICU. Hence a search for models on nursing competencies was carried out. Three (3) models of nursing competencies were found namely the Competency Outcomes Performance Assessment (COPA) Model (Lenburg et al., 2008), Quality and Safety Education for Nurses (QSEN) model (DiCenso et al., 2005), and the Core Competence Framework Model for Emergency Nurse Specialist (CCFMENS) by Fan et al., 2016.

The limitations of the models that were set aside and the justification for the use of the Core Competence Framework Model for Emergency Nurse Specialists (CCFMENS) by Fan et al., 2016 will be discussed. The next session will focus on the adaption and adaption of the constructs of the Core Competence Framework Model for Emergency Nurse Specialists (CCFMENS) with study objectives. The last section of this chapter will review information about the competence of the nurse in the ICU. This will be broken down into sub-sections namely; critical thinking, professional development and practice, communication and coordination, and finally, predictors of competence of the nurse in the ICU. Online databases that were accessed to review literature included PubMed, Google Scholar, CINAHL, Cochrane Medical Library, Science Direct, Sage journal online, and Health Source. Keywords such as "Nursing competence", "Intensive care unit (ICU)", "critical thinking", "Professional development and practice", "communication and coordination in the ICU", and "Roles and responsibilities of nurses in the ICU", "factors that predict competence in the ICU" were employed to search for relevant literature. Other related literature to the above search terms was also used to supplement the literature on the competence of nurses in the ICU.

2.1 Conceptual Framework applied in the study

The conceptual framework explains the path of research. It is arranged in a logical structure that gives direction and meaning to the theoretical constructs in the research (Imenda, 2014). The conceptual frameworks that were read concerning the research were, the Competency Outcomes Performance Assessment (COPA) Model (Lenburg et al., 2008), Quality and Safety Education for Nurses (QSEN) model (DiCenso et al., 2005), and the Core Competence Framework Model for Emergency Nurse Specialist (CCFMENS) by Fan et al., 2016.

2.1.1 The Competency Outcomes Performance Assessment (COPA) Model

The Competency Outcomes Performance Assessment (COPA) Model was designed in the early 1990s by Lenburg based on 17 years of experience directing and consulting with the clinical assessment-based Regents College. The model was created and organized as a theoretical educational framework to support nursing practice competency. This model is double-edged in that it applies to both the learning (training) as well as the practice (work) environments to determine levels of competence for a student to graduate or for the practicing nurse to be endorsed by the employer or her supervisor. This paradigm is organized around four crucial conceptual pillars and is founded on the ideas of competency-based, practice-oriented procedures and outcomes, namely “ a) the specification of essential core practice competencies, b) end-result competency outcomes, c) practice-driven, interactive learning strategies, and d) objective competency performance examinations in all courses” (Lenburg et al., 2008). This model aims to promote quality care and safety for patients. Eight (8) core practice competency categories that are derived from the COPA model include Skills in evaluation and intervention, communication, critical thinking, human care and relationship building, teaching, management, leadership, and knowledge integration

(Lenburg et al., 2008). However, the model does not provide a guide to measuring competence based on patient characteristics-driven intervention by the nurse.

2.1.2 The Quality and Safety Education for Nurses (QSEN) model

The goal of the Quality and Safety Education for Nurses (QSEN) model is to equip nurses with the knowledge and skills they need to enhance the standard of care and safety in the healthcare facilities where they work. The developers of this model adapted the Institute of Medicine (IOM) competencies for nurses comprising: “Patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, and informatics” (Cronenwett et al., 2007). The purpose of this model was to enable the definition or description of what is meant by being a competent nurse and earning the respect thereof. Additionally, they wanted to outline the skills that all registered nurses should possess. These abilities are listed under what the nurse is required to know: her attitude, as well as the set of skills he or she needs to possess to be respected as a competent professional. Although the core competencies by the IOM are five (5), safety was considered in the QSEN model making a total of six (6) core competencies for nurses (Cronenwett et al., 2009).

The advantage of this model is that it combines patient preferences and values with the clinical knowledge required to recognize when clinicians (nurses) should stray from evidence-based recommendations to provide high-quality, patient-centered care. (Ciliska, 2005; DiCenso et al., 2005).

It however appears that this model is focused more on nursing education and training than being an assessment model for measuring the competence of practicing nurses.

2.1.3 Core Competence Framework Model for Emergency Nurse Specialists (CCFMENS)

The conceptual model by Fan et al, 2016 on Core Competence Framework Model for Emergency Nurse Specialists (CCFMENS) was adapted and modified to suit the objectives of the study. This model was developed as an assessment tool for nurse emergency specialists as well as critical care nurses in 2016 by Fan, et al. This model's main goal was to support and direct Chinese nursing administrators in creating core competency requirements for emergency nurse specialists. The CCFMENS is presented in the form of concentric circles (figure 1). The essential elements of the emergency nurse's core competence, based on the nurse's clinical practice, are contained in the second layer of the concentric circle. These components include knowledge, skills, and abilities. The outer ring identifies five distinct competency modules that are in line with the fundamental demands on the knowledge, skills, and abilities of the nurse. The first circle's five modules have the following connotations: Professional practice and development as demonstrated by nursing conduct that complies with the law and professional ethics. To safeguard the rights of both people and communities, this behavior required knowledge and experience. To tackle nursing problems in a complicated clinical setting and find answers, critical thinkers must be able to self-regulate their judgment and reflection processes in a meaningful and purposeful way. Analysis, judgment, assessment (evaluation), reasoning, and prediction are some of the most important critical thinking skills. Important aspects of management include planning, organizing, controlling, and coordinating nursing procedures to raise the standard of care and maintain patient safety. Communication and coordination denote the capacity to interact and work together with patients, their families, and other healthcare professionals. Professional development entailed actively engaging in learning opportunities and training, continuously raising professional standards, and progressively becoming a nurse specialist. (Fan et al., 2016).

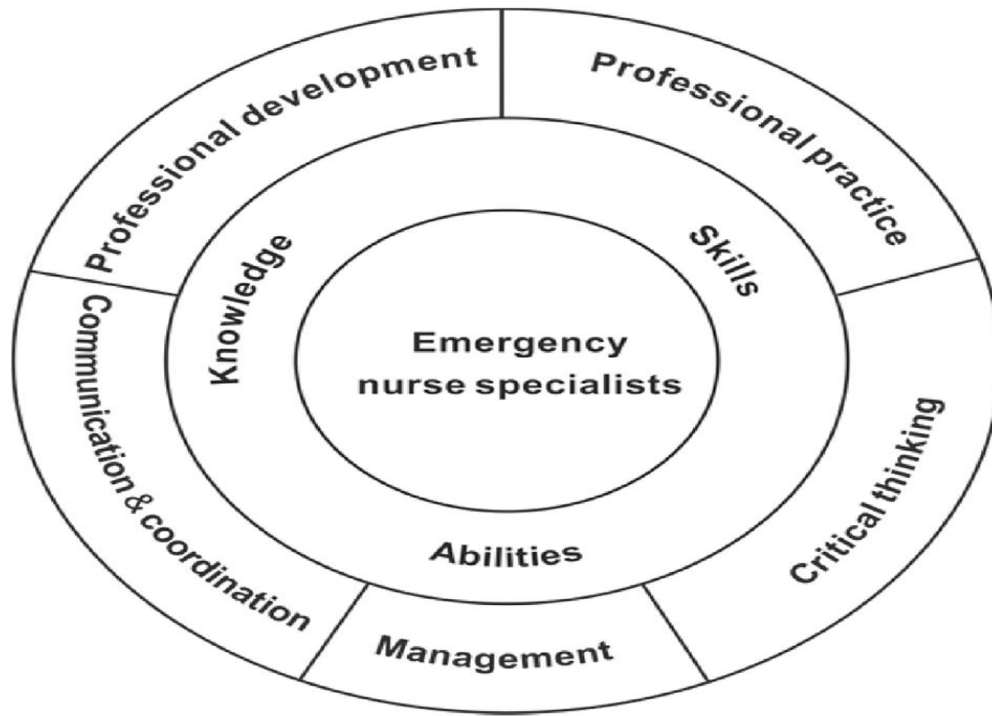


Figure 1. Conceptual framework for the Core competence framework model for ENS (Fan, Gui, Xi & Qiao, 2016)

From the above diagram (Fig. 1), the conceptual model by Fan et al, 2016 on Core Competence Framework Model for Emergency Nurse Specialists (CCFMENS) is broad and all the concepts in this model were not used in this study. The concepts of the model used in this study included critical thinking, professional practice, professional development, and communication and coordination.

The CCFMENS offers nurse administrators resources and instructions for teaching and assessing clinical emergency nurses' essential competencies which in this case applies to the nurses working in the ICU. Additionally, ICU nurses can use the CCFMENS for self-evaluation based on predetermined goals to improve and appropriately modify their compassionate behavior and support the advancement of high-quality comprehensive care. The CCFMENS' drawback is that its creators neglected to look into the

relationships between nurse core competency, nursing education, and quality of care.

Hence, no objective in this regard was set for the current study.

This model was selected because the competence constructs were chosen after a thorough review of the literature, as well as from approved sources from the International Council of Nursing, the United States, the United Kingdom, Australia, Hong Kong, and Taiwan, as well as China's requirements for professional nurse registration. (Affara, 2009; Fan et al., 2016; O'Connell & Gardner, 2012). Furthermore, this model was found to be most suitable for this investigation among others that the researcher came across from the literature.

The purpose of the study is to assess nurses' competence in the management of critically ill patients in the intensive care unit. The study will focus on nurses working in the intensive care unit and describe their critical thinking competencies, professional development and practice competencies, and communication and coordination competencies in the care of critically ill patients in the ICU. The study will further investigate the relationship between nurses' critical thinking competencies, professional development and practice competencies, and communication and coordination competencies and elucidate the predictors of nurses' critical thinking, professional development and practice, and communication and coordination competencies in the management of critically ill patients in the ICU. Also due to time and financial constraints, all the aspects not relevant to this study were excluded. Only aspects of the model that falls under the research objectives were assessed. Hence a modified conceptual framework based on the original model was developed for this study (Fig. 2).

In this modified model (Fig 2) adapted from the Core competence framework model for Emergency Nurse Specialists (Fan et al., 2016), three constructs namely critical

thinking, professional development and practice and communication, and coordination competencies were used to describe the ICU nurses competencies concerning clinical practice needed for the management of critically ill patients in the ICU. Professional development, communication and critical thinking all sum up nurses' competencies. But for this study, the researcher examined the individual competencies to unearth their representation among nurses in Ghana.

2.1.4 Justification for the use of the Core competence framework model for Emergency Nurse Specialist

The model provides references and guides for nurse managers to train and evaluate the core competencies of clinical emergency nurses (Fan et al., 2016) which applies to nurses working in the ICU. The model can also be used for objective self-evaluation to foster the development of caring behaviors and the enhancement of overall care quality. (Vujanić et al., 2020).

Furthermore, the scale from this framework could be used to discover factors that influence nursing care competency in the ICU and aid research in competency-based education programs (Yoon, 2021).

Finally, this model was chosen because the constructs are applicable and can be adapted to the objectives of this study



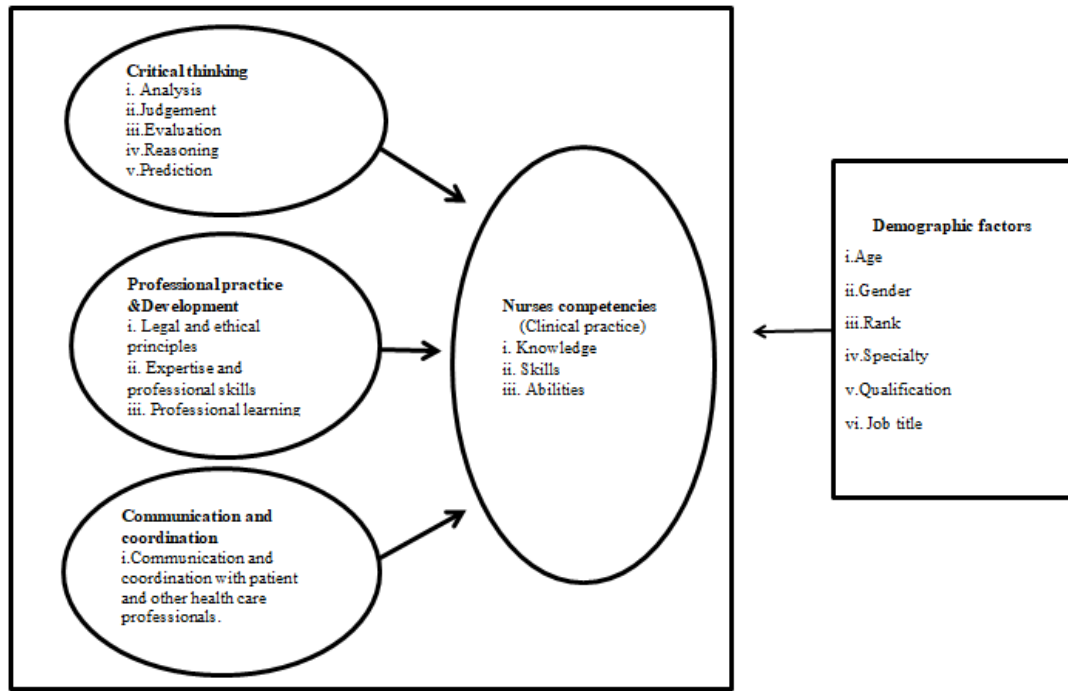


Figure 2. Modified Conceptual framework on Competencies for ICU nurses adapted from the Core competence framework model for Emergency nurse Specialist (Fan, Gui, Xi & Qiao, 2016)

2.2 Literature review

The section presents the studies reviewed on the objectives of the study

2.2.1 Critical thinking, Professional practice and development, and communication and coordination competencies in the care of the critically ill patient

Competence is a familiar term in nursing, which implies that the nurse can work efficiently and exhibit a comprehensive understanding of a situation. Benner defined competence as, “the ability to perform an assigned task with desirable outcomes under varied circumstances of the real world” (Benner, 1984). When a person performs a certain activity, they are said to be competent if they possess a combination of knowledge, abilities, and attitudes that take into account the work's wider practice implications as well as its impact on the patient. (Schmollgruber, 2015). Pijl-Zieber et

al., 2014 also defined competence as the ability to undertake tasks correctly and skillfully (Pijl-zieber et al., 2014).

Nurses must ensure safe and high-quality patient care. To effectively perform this role, their competency to perform both clinical and non-clinical tasks is essential to providing patients with safe and effective care (Hassankhani et al., 2018). To accomplish this, they must increase their nursing expertise and apply it to their daily work. Although nurses are required to have competency in technical skills, they also need skills in decision-making, prioritization, and collaboration (Harding et al., 2013).

In understanding and evaluating the concept of competence, nursing competency is described under three theories including behaviorism, trait theory, and holism. Behaviorism refers to competency with the capacity to perform individual key activities and is assessed by demonstration of those skills. The Trait theory considers individual characteristics required for properly completing duties such as knowledge and critical thinking among other traits referred to as competency. Holism experts define competence as a collection of attributes—knowledge, skills, attitudes, ability to think, and values—that are required in specific situations. (Fukada, 2018). These theories also guided the formulation of the objectives for this study.

Studies on critical thinking as a measure of competence will be discussed according to the researcher's understanding of previous works of other researchers and how they fit into the context of the current work. According to the chosen model for this study, critical thinking is vital to the role of the nurse and especially so for the nurse taking care of a critically ill patient in the ICU. In this context, critical thinking may be defined as the active reasoning skills that permit the appropriate assessment and prediction of patient conditions, dealing with adjustments, comprehension and analysis, judging and making choices, and evaluating the clinical situation (Fan, et al., 2016; Fukada, 2018;

Khanmoradi, et al., 2021). Additionally, critical thinking entails making decisions based on scientific knowledge principles, identifying priority risks in clinical settings, and making judgment calls that are informed by both factual knowledge and excellent judgment. Furthermore, critical thinking entails selecting multiple approaches to address clinical problems, planning clinical research data collection, integrating pertinent data from various sources, as well as using a variety of information-finding techniques, and incorporating pertinent research findings into nursing practice. (DeGrande, et al., 2018). Additionally, critical thinking was defined by Papathanasiou and his associates as the mental process of actively and skillfully observing, experiencing, synthesizing, and evaluating gathered information through observation, experience, and communication that results in a decision for action. (Papathanasiou, et al., 2014). According to Ignatavicius (2001), critical thinking nurses should possess the following cognitive skills: interpretation, analysis, evaluation, inference, explanation, and self-regulation. These traits are in sync with the core competencies as proposed by Fan et al., (2016).

Assessment and prediction as functions of critical thinking include the evaluation of laboratory results, vital signs, physical assessment data, etc. to determine their significance. It also includes understanding the meaning of a patient's behavior, especially in the case of critically ill patients who may not be able to express themselves verbally (Ignatavicius, 2001).

The nature and scope of ICU nursing expose the nurse to a diverse patient population (socio-cultural disparities), rapidly changing and clinically unclear situations, as well as sophisticated logistics and procedures. ICU nurses must therefore be prepared to competently handle a variety of clinical issues and provide care to patients in a timely and efficient manner. (Bam et al., 2020; Jastremski, 2000).

Ignatavicus summarized a critical thinking nurse as one who is outcome-driven, open to new ideas, adaptable, willing to change, innovative, creative, analytical, communicative, assertive, persistent, caring, energetic, risk-taking, knowledgeable, resourceful, observant, intuitive, and able to think "beyond the box" (Ignatavicius, 2001).

According to the CCFMENS Model, professional practice for nurses involves the application of nursing knowledge and professional skills. Additionally, it shows nursing conduct that adheres to the moral and ethical standards of the industry. To defend the rights of individuals and groups calls for knowledge and expertise. It involves the ability of the nurse to comprehend the function of professional organizations and actively participate in them, to show initiative in one's own personal development, to take advantage of learning opportunities for ongoing professional and personal growth, and to be aware of one's learning requirements (Fowler, 2015). The nurse's professional practice also entails demonstrating self-awareness of one's weaknesses and strengths, understanding pertinent and current information about the health care system, being aware of the legal and ethical principles that apply to the profession, and applying knowledge and professional skills. (Liu, et al., 2009).

Professional development places a strong emphasis on participating actively in professional learning opportunities and training, continuously raising professional standards, and advancing toward nurse specialist status over time. (Fan et al., 2016). It also reflects the ability of the nurse to learn about the patient, patient conditions, clinical points for monitoring progress et cetera. Additionally, the nurse's ability to carry out research in the work environment and make inferences to impart patient care, impart clinical skills to other nurses, educate patient's relations about their condition and allay their anxieties, and many others are good markers of professional development (Fan et al., 2016; Fukada, 2018). Nursing professional development in simple terms keeps the

nurses up to date on the latest techniques, technology, and evidence so that they can provide quality care to patients. Additionally, professional development among nurses helps them cope with an ever-changing healthcare environment by preparing them for current and future roles. (Brunt & Morris, 2021).

Nurses' lifetime learning is centered on continuing professional development (CPD) programs, which are essential for maintaining the relevance and adequacy of nurses' knowledge and abilities. Continuing professional development for nurses can be mandatory or optional depending on the country or the setting within the health facility (Pool et al., 2016). For example, participation in CPD programs is not obligatory in countries such as Ireland, Netherland, and Sweden (Ross et al., 2013). However, participating in CPD programs is compulsory in countries such as Australia, the United Kingdom, Spain, and Belgium (Brekelmans et al., 2013) just to mention but a few. It must be noted also that in jurisdictions where CPD is required by nursing regulatory authorities, nurses are required to participate in CPD programs that are relevant to their areas of practice (Brekelmans et al., 2013). In Ghana, participating in CPDs is mandatory for all registered nurses and midwives and this is regulated by the Nursing and midwifery council (NMC), which has instituted a system to ensure the professional development of its members (NMC, 2022).

In summary professional development and practice among nurses are not separate entities or activities. They complement each other and are needed to ensure that nurses at any point in time provide safe, timely, and well-informed care to clients.

In meeting essential patient-centered care, the nurse at the ICU should be able to provide holistic treatment that respects the patient as a complete participant in the care that is empathetic, well-coordinated, age- and culture-appropriate, secure, and efficient. The preferences, values, and needs of the individual are respected through holistic care (NOF Nursing Core Competencies, 2016). Communication is an integral nursing role

that is meant not only for purposes of therapy but also for information sharing between the nurse and the patient, the nurse and other healthcare staff at the ICU, and the nurse and patient relations (Dithole et al., 2016). This very crucial nursing role is very important to providing effective and efficient patient-centered care (Tembo et al., 2015). It requires the nurses to be able to adapt their actions to those of others, work cooperatively with other healthcare professionals to solve problems to meet patient needs, verbally communicate facts, ideas, and feelings to other members of the health team, build trust by keeping promises and commitments, recognize the differences in the cultural practices and worldviews of individuals and groups, demonstrate a willingness to share the workload when necessary, and express facts and thoughts in writing concisely and clearly. (Lui et al, 2009).

Lack of communication between the nurse and the critically ill patient may compromise the continuity of care in the ICU. Studies on nurse-patient interactions have revealed that nurses only marginally assess the communication needs of ICU patients and communicate with them ineffectively. (Pullen, 2005). Tembo et al. (2015) indicated that more efforts would be required to assist nurses to communicate more effectively with ICU patients (Tembo et al., 2015). According to a report by Hofhuis et al. from 2008, patients have favourable opinions of nurses when they are forthcoming with information and take the time to explain nursing procedures and treatments. The ICU patients' levels of stress and anxiety decreased as a result of the nurses' actions. Patients in turn have expressed appreciation for nurses including them and their family members in the decision-making processes (Terragni et al., 2010).

ICUs are employing multidisciplinary approaches to provide optimum care for the critically ill. For this reason, the management of an ICU patient is provided for by a multidisciplinary team of health workers usually led by an intensivist (Alsharari et al., 2020).

According to Shultz and McDonald, 2014, care coordination is the purposeful arrangement of patient care tasks among two or more parties (including the patient) involved in patient management to hasten the efficient provision of healthcare services. (Schultz & McDonald, 2014). This role involves coordinating activities of personnel and other resources contributing to appropriate patient care activities, and it is organized by the exchange of information by individuals responsible for different aspects of care (Schultz, E. M. & McDonald, 2014).

It is common knowledge that nurses stay longer at the bedside to see to the steady but sometimes unpredictable progress of the patient and so Alsharari et al., 2020 suggested that the nurse takes the centre stage in coordinating the care of such patients (Alsharari et al., 2020). Nursing care coordination is therefore a critical competency to be upheld in the management of the patient who is critically ill. Hence, Alsharari and his colleagues suggested four (4) domains for the assessment of competence for nurses: Promotion of team cohesion, comprehension of care coordination requirements, gathering and sharing of information, and creation and concise expression of the care vision (Alsharari et al., 2020).

2.2.2 Relationship between nurses' critical thinking, professional development and practice, and communication and coordination competencies.

The competence of the ICU nurse is a multidimensional concept. The competence of the ICU nurse contains four bases: knowledge base, skill base, attitude base, and value base (Lakanmaa et al., 2015). The multidimensionality of competence here means that there is a link or relationship between these dimensions of competence and that incompetence in any one may lead to dire consequences for the patient (O'Leary, 2012; Zheng et al., 2017). Following admission of a patient to the ICU, he or she receives multiple interventions to prevent worsening of the initial condition, and hopefully, lead to moving the patient from the "danger" zone (Vincent, 2019). At the end of the day,

the nurse in the ICU would be assessed by his or her ability or contribution to a successful recovery of the patient (Khan & Ridley, 2014; Scholtz et al., 2016). As a result, care for the critically ill must be viewed as a continuum, a continuous series of interconnected events that begins right from diagnosis of disease and continues through the ICU stay, recovery, and rehabilitation (Vincent, 2019). Better collaboration, communication, and teamwork between the primary care team members are thus crucial to patient survival and quality care in the ICU (Reader et al., 2007; Vincent, 2019). In a study by Happ et al. 2011, they observed that nurses initiated most communication (86.2%) exchanges with the patient (Happ, M. B., Garrett, K., Thomas, D. D., Tate, J., George, E., Houze, M., Radtke, J., & Sereika, 2011). This has been necessitated by most patients' inability to speak while on admission mainly owing to their state of consciousness, being on mechanical ventilators, and intubation (Happ, 2021). It was suggested by Wei et al. (2019) that the core abilities of intensive care unit (ICU) nurses comprised the critical capacity to affect patient safety and interdisciplinary collaboration. The capacity to integrate a broad range of professional thought and technical skills can be characterized as one of the primary characteristics of ICU nurses. These competencies however need to be constantly refined and developed to make the ICU efficient and effective (Wei et al., 2019). This need calls for professional development programs christened continuous professional development to consolidate and secure positive outcomes for patient care in the ICU (Brunt & Morris, 2021; Mlambo et al., 2021; Pool et al., 2016). The chosen model (CCFMENS) clearly demonstrates that there is a relationship of interdependence between the constructs on competence all feeding into the holistic competence of the ICU nurse (Fan et al., 2016). Although most literature on competence of nurses in the ICU do not state categorically that there is a relationship between critical thinking, professional development and

practice as well as communication and coordination, the discussion so far seem to suggest that there is.

2.2.3 Demographic Predictors of competence of the ICU nurse

The competency of nurses and their socio-demographic variables are strongly linked (Feliciano et al., 2021). From Fig. 2 (Conceptual framework on Competencies for ICU nurses adapted from the Core competence framework model for Emergency Nurse Specialists) above, some demographic factors are highlighted as associated with the competence of the emergency nurse which invariably applies also to the ICU nurse. The demographics included age, gender, rank, specialty, qualification or level of education, and the job title or status at the ICU. Literature on some of these variables and their association with the competence of the nurse were reviewed.

From the perspective of Numminen, et al. (2013), age and employment experience substantially influence nursing professionals' competence. It is common knowledge that newly recruited nurses are usually younger and have little to no experience in the hospital setting except for the exposure they had during their training at some health facilities. Findings from the study by Numminen, et al. (2013) concluded that the competence level of experienced nurses was good. Nurse managers compared to their subordinates are equipped with wide knowledge and skill and most times have the most experience in the unit. As much as it is not always the case that nurses playing a leadership role in the unit are the oldest or most experienced, they are usually competent and ensure that their colleagues meet the requirements to ensure the quality of care and maintenance of best practices to ensure better patient outcomes (Numminen, et al., 2014). Age was also found to be a predictor of critical thinking competence among nurse managers compared to general nurses in a study by Zuriguel-Pérez, et al. (2018). The results of their study suggested that the global critical thinking level of nurse

managers superseded that of general nurses. They were however quick to point out that age played a significant role in this level of competence among nurse managers. This was further corroborated by studies that point out that nurse managers were significantly older than general nurses on a unit-by-unit basis (Zuriguél-Pérez et al., 2018). According to Feng et al. (2010), clinical nurses' critical thinking abilities and attitudes are influenced by their age. Song et al., 2020 bemoaned the high attrition rate in the newly recruited nursing staff of most hospitals. He pointed out that over 20% of these nurses quit as a result of their perceived low levels of competence. It is also quite evident that most of these nurses are young and have little to no experience (Song & McCreary, 2020). Age remains a critical factor when the competence of the nurse is in discussion (Feng et al., 2010; Salonen et al., 2007).

The status of a nurse in the ICU plays a critical role in determining the level of competence. Status here defines the role of the nurse either as a leader (manager, shift leader, unit head, or clinical facilitator) or having a general role in the ICU (Numminen, et al., 2014). Numminen, et al. (2014) again noted that the nurse manager has an essential influence on the competence of the general role nurse. Comparison of competence levels between nurse managers and general role nurses went in the favour of nurse managers (Mirlashari, et al., 2016; Numminen, et al., 2014).

An assessment of the critical thinking competence revealed higher scores for nurse managers than in general role nurses. Age, shift work pattern, and educational degree were all connected with nurse supervisors having higher levels of critical thinking proficiency. The same factors were also found to be predictors of critical thinking competence among nurses (Zuriguél-Pérez, et al., 2018).

The length of clinical experience or to put it simply, work experience has also been noted among some studies as being a significant predictor of the competence of nurses generally and not just in the ICU. Takase (2012), highlighted that the length of clinical

experience does not only influence their competence in general but also their professional development (Takase, 2013). She further noted that competence development in nurses was marked by two distinctive curves: a rapid rise in the early stages of the nursing career and a slower increase subsequently. The length of clinical experience has also been established to influence the critical thinking competence of the nurse. This is because, the nurse from the early career stages experiences various situations in the clinical setting that help to develop their critical thinking competencies (Feliciano, et al., 2021; Feng, et al., 2010; Fero, et al., 2009; Lakanmaa, et al., 2015; Lee & Oh, 2020; Salonen, et al., 2007; Murshid, 2021).

Yoo et al., 2020, also noted that compared to nurses in wards, communication skills among ICU nurses are relatively underdeveloped. When compared to their older and more experienced counterparts, younger and less experienced nurses showed the same characteristics (Song & McCreary, 2020; Yoo, et al., 2020). This has called for an assessment of communication competence among ICU nurses in this country.

Level of education has usually been a common demographic factor associated with many measurable outcomes among many professional groups. It has been established to impact both theory and practice in many fields of endeavor (Glaesser, 2019). Nursing as a profession and particularly the intensive care nurse has not been left out of the discussion about competency and its relationship with the level of education. Zuriguel-Pérez, et al. (2018), in their study that sought to compare the level of critical thinking as an aspect of competence of the ICU nurse between nurse managers and general role nurses indicated that educational level was associated with a higher critical thinking prowess in nurse managers. The study further established educational level to be a predictor of critical thinking among nurse managers. In Saudi Arabia, Feliciano, et al. (2021), also established that the level of education significantly impacted the competency of nurses.

In the acute clinical setting, it is important to be able to take critical decisions in many unusual situations. High critical thinking ability is therefore a must in the ICU. The earlier submitted research seems to agree that the level of education impacts positively competence in the ICU (Feliciano, et al., 2021; Zuriguel-Pérez, et al., 2018).

Nibbelink & Brewer, 2018 however, seem to hold a different opinion on the impact of the level of education on critical thinking. Accordingly, they stated that, is uncertain whether education has an impact on clinical decision-making and think that education alone may not be the best indicator of clinical decision-making effectiveness (Nibbelink & Brewer, 2018).

These discussions above make it crucial to determine the competence level of ICU nurses as well as determine predictors of competence among this critical group at the Korle-Bu Teaching Hospital.

2.4 Summary critique of the literature review

Literature was reviewed on the competence of nurses generally as it may apply to nurses working in the ICU. The literature first of all had to consider theoretical frameworks or models that could be applied to guide the study. These included literature on the Competency Outcomes Performance Assessment (COPA) Model (Lenburg, et al., 2008), Quality and Safety Education for Nurses (QSEN) model (DiCenso, et al., 2005), and the Core Competence Framework Model for Emergency Nurse Specialist (CCFMENS) by Fan, et al. (2016). Among these, the latter was chosen to guide this research. Subsequently, competence among nurses working in the ICU was reviewed: critical thinking, professional development and practice as well as communication and coordination competencies. Additionally, literature on demographic factors that could predict the competence of nurses in the ICU was reviewed. The review unearthed the fact that very little research has been conducted concerning the competence of nurses

in the ICU worldwide as compared to other nurse categories such as nurses in emergency settings.

The literature reviewed comprised approximately 30 studies from across the world with a breakdown as follows: 8 studies from the Western world, 3 studies from Sub-Saharan Africa (Nigeria and Ghana), 15 studies from Asia and the Middle East, and 2 from Ghana.

The review shows there is limited research from sub-Saharan Africa, especially Ghana, on the competence of nurses working in intensive care units. More studies have been conducted on this topic in Western and Asian countries. The review calls for more research in Ghana and other African countries to address this gap.



3.1 Study Design

A quantitative research approach and a cross-sectional correlational design were employed for this study. This cross-sectional correlational design enabled the assessment of the competencies of nurses working in the ICU concerning some factors

that could predict the level of competence. This design allowed the researcher to look at two or more variables at the same time and was effective for describing the relationship between the measured variables (Breakwell, 1995). The cross-sectional correlational design can provide the researcher with the opportunity of having a one-time measure of the study variables. According to Levin (2006), a cross-sectional design is an observational study in which data is collected and analyzed at a certain period. It is also cost-effective and less time-consuming. The demerit of this type of design is that findings from the analysis do not give a strong basis to establish a cause-and-effect relationship between the variables.

3.2 Research Setting

The study was conducted at the Korle- Bu teaching hospital (KBTH) in the Accra Metropolis of the Greater Accra Region of Ghana. Korle-Bu Teaching Hospital (KBTH). The hospital was built during the governorship of Sir Gordon Guggisberg the then Gold Coast, in 1923. The hospital is situated at Korle-Gonno, a suburb of Accra, in the Ablekuma South constituency. The boundaries of the hospital are Korle-Gonno in the South, Accra Central to the East, Laterbiokorshie to the North, and Mamprobi to the West. It was built initially as a general hospital to attend to the health care needs of the indigenous people. Korle-Bu in the literal sense means, “Valley of the lagoon”. The Hospital attained teaching hospital status in 1962. It is the foremost tertiary health care facility to be built in Ghana and happens to be the third largest referral facility in Africa. It currently has 21 clinical and diagnostic departments and three Centers of Excellence. The clinical and diagnostic departments include Obstetrics and Gynaecology, Family Medicine/Polyclinic, Reconstructive Plastic Surgery and Burns Centre, and Accident and Orthopaedics. Internal Medicine and Therapeutics, Surgery, Child Health, Anaesthesia, Accident & Emergency, and Psychiatry. The rest are Radiology, Pathology, Pharmacy, and Laboratory. There are also non-clinical departments such as

Engineering, Finance, and General Administration. Additionally, the KBTH provides urbane scientific treatment procedures in various sub-specialties such as Reconstructive Plastic Surgery, Paediatric surgery, Neurosurgery, Cardiothoracic Surgery, Radiotherapy, Nuclear Medicine, Dental/Oral maxillofacial, Renal, Oncology, Ophthalmology, Ear, Nose & Throat (ENT), Orthopaedics, and Dermatology. The hospital also has three National Centers of Excellence namely, the National Cardiothoracic Centre, the National Reconstructive Plastic Surgery and Burns Centre, and the National Centre for Radiotherapy and Nuclear Medicine. These Centers host a large number of clients within the country and from some West African countries and include countries such as Burkina Faso, Nigeria, Togo, and Benin among others (KBTH, 2022).

Having grown from a bed capacity of 200 to 2000, KBTH has over 4000 medical and paramedical staff: Doctors, nurses, laboratory scientists, pharmacists, health informaticians, dieticians and nutritionists, radiographers, and many more. The hospital currently hosts an average out-patient attendance of 1,500 with approximately 250 in-patient admissions.

Korle-Bu Teaching Hospital has presently engaged approximately 3,000 nurses with a total of 182 working in the ICU. The ICUs where the study was conducted has one hundred and forty-nine (149) beds with a staff strength of 182 of all category of nurses (Critical care nurses, Registered general nurses, Registered midwives, health care assistants, and enrolled nurses). Of the 149 beds, 36 are in the pediatric units and 113 are within the adult care units (Osei-Ampofo et al., 2018; Siaw-Frimpong et al., 2021).

The hospital currently has 7 ICUs found in the following departments/units: Maternity, Paediatrics, Surgical, Obstetrics & Gynaecology, National Cardiothoracic, and internal

medicine (KBTH Annual Report, 2016). The KBTH was chosen for this study mainly because it hosts the majority of ICUs and critical care nurses in the country.

3.3 Study Population

The study population for this study is the entire nursing staff of all ICUs at the KBTH. However, for this study, the target population was all the available nurses working in the ICUs within the KBTH. The population of ICU nurses in the hospital was 182.

3.3.1 Inclusion Criteria

The study included

1. Registered nurses (RGN) working in the intensive care unit
2. Registered critical care nurses who were working in the ICU

These nurses should have at least one year post qualification experience. This was to assess whether nurses attained satisfactory competence in the ICU within a year post-recruitment

3.3.2 Exclusion Criteria

1. Nurses who are working in the ICU but are on clinical rotations
2. Auxiliary nurses working in the ICU
3. Nurses who are on leave (sick, annual, study, or maternity leave) were also excluded from the study.
4. General nurses or critical care nurses working in the ICU but are not willing to participate

3.4 Sampling Method

A sample is a subset of the population elements being studied. An element is the most fundamental unit for or about which data is collected. Study participants were selected as an initial step in conducting the research. This process is referred to as sampling. Etikan, Musa, & Alkassim (2016) defined sampling as selecting a subset of the

population under study. Taherdoost (2016) further characterized sampling as the strategy used in examining a destined number of participants taken from a target population. In this study, the non-probability convenience sampling technique was employed since subjects were chosen based on their availability at the time of the study.

3.5 Sample size

The sample size was calculated using Yamane's (Yamane, 1967) formula as cited by Adam (2020). This is shown below:

$$n = \frac{N}{1+N(e)^2}$$

Where: n = required sample size, N = study population size (i.e. the total number of professional nurses in ICUs, 182), and e = desired margin of error (0.05)' or significance level.

Substituting the values for the factors in the formula: $N= 182$ and $e= 0.05$, the minimum sample size required for the study will be;

$$n = \frac{182}{1+182(0.05)^2} \quad n= 125$$

The minimum sample size calculated is 125 however, 10% of the calculated sample size was added to the 125 to accommodate for participants who may not answer all the questions on the questionnaire.

Thus 10% of " n " = 125×0.10 , $n = 12.05$

$$\therefore n = 138$$

Consequently, 138 people were needed to reach the study's desired sample size. As a result, generalization of the results was possible, sampling errors were reduced, and the sample size was representative of the target population. (Ary et al., 2013; Polit & Beck, 2013).

3.6 Data Collection Tool

The study employed a structured questionnaire (**Appendix H**) consisting of validated competency items from three (3) competency assessment tools/frameworks: the Korean Nurses 'Core Competency Scale (KNCCS) (Lee et al., 2017) (**Appendix I**), the Competency Inventory for Registered Nurses (Liu et al., 2009) (**Appendix J**) and the International Council of Nurses (ICN) Framework of Competencies for the nurse Specialist (Affara, 2009) (**Appendix K**). Items selected were chosen because they could address the objectives of the study. No single competency assessment tool from among the three selected tools could fulfill achieving all the objectives alone. This made it necessary to select items from the three assessment tools to prepare the questionnaire (final tool) used for the study. The final questionnaire comprised 66 items and divided into two sections (A and B). Section A covered Demographic data such as age, gender, marital status, profession, professional qualification position, work experience and leadership role, among others (16 items in total). Section B starts with an explanation of the Benner Scale and how it is to be used to score the level of competence “(Novice=1, Advanced Beginner=2, Competent=3, Proficient=4, Expert=5)”. This is followed by 50 items and divided into three (3) sub-sections as follows: (1) critical thinking (8 items), (2) professional development and practice (16 items), and (3) communication and coordination (26 items) competencies in the management of the critically ill patient. The overall reliability coefficient score for the items was 0.99.

3.7 Data Collection Procedure

The researcher visited the ICU, presented herself to the head of the unit, and explained the purpose of her visit. Letters of introduction from the School of Nursing and Midwifery, University of Ghana, and the KBTH Administration as well as approval for the study from the STC and ethical clearance letter from the KBTH-IRB were also presented to the unit head. The Head of the ICU then introduced the researcher to the

nurses in the unit. Following the introduction and purpose of the visit to the nurses in the unit, the researcher then went ahead to talk to each nurse on a one-on-one basis. Concerns on risks, benefits, confidentiality, and other ethical issues about the research were provided to the prospective participant, and they were allowed to ask questions to throw more light on aspects of the study they did not understand. Following this, the prospective participant was asked if they wanted to participate in the research. When the nurse agrees to be part of the study, a consent form (**Appendix G**) was provided for their signature. Each consent form was witnessed by colleague nurses on duty. The researcher then introduced and explained the content of the questionnaire to the participant and guided them on how to respond to the questions following the Benner Scale. The questionnaire was then left momentarily for the participant to respond to or complete. The researcher stayed close by to explain any question that the participant needed further explanation. An average of 20-30 minutes was used by participants to complete the questionnaire. Questionnaires were given out and collected the following day to participants who were busy at the time of visit to the ICU. Coded IDs were assigned to each questionnaire to maintain the anonymity of the participants. Documentation and storage of data were keyed into a Microsoft Excel spreadsheet to ease data handling and analysis. The researcher ensured that the facility's regulations on data collection as directed by the KBTH-IRB as well as the safety protocols for COVID-19 prevention were strictly adhered to. These safety protocols included the wearing of face masks, social distancing, regular handwashing, or use of hand sanitizers among others.

3.8 Validity and Reliability of Research Instrument

The degree to which a concept is precisely quantified in a quantitative investigation is known as validity. (Heale & Twycross, 2015). Content validity was achieved by carrying out an extensive and rigorous review of the most recent and relevant literature.

The content of the questionnaire was assessed by the supervisors to ensure that it validly targets the objectives of the study.

Reliability determines the accuracy of a research instrument (Heale & Twycross, 2015). To assess reliability, the questionnaire was piloted at the ICU and other units of the Ho Teaching Hospital where critically ill patients are found. This activity helped to modify and correct questions which were ambiguous or not clearly understood. The researcher ensured that the face validity and content validity of the questionnaire together with its sub-subscales were met. The instrument was adapted from the revised International Council of Nurses (ICN) Framework of competencies for the Nurse Specialist, the Korean Nurses 'Core Competency Scale (KNCCS, Cronbachs alpha coefficient, 0.97), and the Competency Inventory for Registered Nurses (CIRN, Cronbach's alpha coefficient, 0.89). These competency frameworks have been used in similar peer-reviewed studies among health workers and nurses thus they can be considered to be valid (Delobelle et al., 2009; Gillispie & Davis, 1996; Li et al., 2020; O'Leary, 2012; Park & Kim, 2017; Yu et al., 2022). The internal consistency of the scale was evaluated using Chronbach's alpha coefficient. The Cronbach's alpha coefficient was 0.994 and this is considered acceptable for the adapted instrument (Pallant, 2007). External validity was achieved using appropriate statistical software such as the IBM SPSS version 23 to analyze the data.

3.9 Data Management

All the completed questionnaires were assigned anonymised codes kept in a cabinet accessible only to the researcher and supervisors. The coded identities made it impossible to draw a relationship or link between the respondents' demographics, their units, and their responses or data. Only the researcher and supervisors had this information for purposes of further analysis. Storage devices in the form of personal computers and pen drives were used to store information on the demographics as well

as the competence responses from the respondents using secured passwords. The completed questionnaires will be kept for about 5 years following the study after which the data will be destroyed. Data provided by participants was cleaned by taking out responses that were ambiguous and participants who were later found not to qualify for the study before being analyzed and used by only the investigator and the supervisors of the project.

3.10 Data Analysis

In this study, analysis of the data was done using the IBM SPSS software version 23. In analysing the data, descriptive statistics were carried out to organise and describe the data. Categorical variables were summarised using frequencies and percentages while continuous variables were summarized by computing means and standard deviations. Student's t-test was used to assess differences among groups. Other inferential statistical tests such as Pearson's Product Moment Correlation (Pearson's r) and regression analysis were used to report relationships between the variables as well as their statistical significance. Variables for the logistic regression were entered step-wisely (forward method) to determine the model that explains best the changes in the dependent variable (level of competence). A computer algorithm known as step-wise regression uses only statistically significant predictors to create the "best" multiple regression model from a larger pool of potential predictive variables (Frey, 2018). The study results were illustrated using tables for easy interpretation of research findings. For two-sided statistical tests, an alpha level less or equal to ($\leq$) .05 was considered a statistically significant result. The 95% confidence interval was used for all calculations in the study. For missing values, pairwise exclusion was done for descriptive and inferential analyses. This implies that cases were used for analyses as long as they had the relevant data required for that specific analysis.

Competence among the study participants was categorized as (i) Competent and (ii) Less competent as shown in Table 1 below. In this study, a competent staff from the ICU adjudges him or herself to be competent, proficient, or an expert concerning a particular role or activity in the ICU. A less competent staff opts for a novice or advanced beginner concerning a particular role or activity. Patients in critical care benefit from the care of highly qualified nursing staff. Each staff in the ICU should be competent that is to say, graded as being competent, proficient, or an expert. This would mean more effective and efficient outputs to incur minimal losses in patient care and improve health outcomes (Lakanmaa et al., 2015).

Table 1. Competent versus Less Competent ICU Nurse

LESS COMPETENT		COMPETENT		
Novice	Advanced Beginner	Competent	Proficient	Expert

3.11 Ethical Considerations

The administrators of the KBTH were provided with an introduction letter from the School of Nursing and Midwifery at the University of Ghana, Legon. A copy of the study proposal was subsequently submitted to the Scientific and Technical Committee (STC) of the Korle-Bu Teaching Hospital for approval of the study. Approval from the STC was followed by an application to the Institutional Review Board (IRB) for ethical clearance (KBTH-IRB/000133/2021) to allow data collection to commence. Ethical considerations protect the right of the participants and give legal backing concerning ethical issues associated with the study (WHO, 2019). All data obtained from the patient's medical records were kept private. The researcher adhered to the following rules for ethical reasons in the conduct of the research: confidentiality, voluntary participation, and anonymity. For purposes of confidentiality, participants received guarantees that their information wouldn't be shared with anybody not directly

connected to the study. After being properly informed of the study's objectives and learning that participation was entirely voluntary, participants volunteered to take part. Each participant was given a coded number to preserve anonymity and to prevent anyone other than the researcher from connecting information to the participants. Informed consent was sought from the participants by first of all explaining the entire study to each participant and giving a copy of the consent form to each to read through. Each participant was encouraged to ask any questions about any issue they did not understand. They were further assured that they could discontinue the study at any time and that they would not be penalized or suffer any consequences should they choose to discontinue. Participants then signed or thumb-printed the consent form before they were handed the questionnaires to complete. Approval for the study was sought from the Scientific and Technical Committee of KBTH (**Appendix C**). An ethical clearance certificate was obtained from KBTH-IRB (**Appendix D**) before the participants were contacted.

CHAPTER FOUR

RESULTS

Data obtained from one hundred and thirty-three (133) nurses working in 8 ICUs at the Korle-Bu Teaching Hospital that participated in the study are presented in this chapter. This study sought to assess nurses' competence concerning care in the ICU. Analysis of the collected data was conducted using IBM-SPSS version 23.0. Descriptive analysis was done and data were presented as frequencies, means, and standard deviation as summaries of the data gathered. Participants were categorized into two (2) groups of competence: Less competent and competent for ease of analysis as already indicated in the data analysis strategy in Chapter 3 (Methods). Pearson's correlation was used to

determine the relationship between the types of competence and linear regressions were used to determine factors that significantly influenced the competence of nurses at the ICU. For the convenience of use and comprehension, the results of the numerous tests are condensed into subsections.

4.1 Socio-demographic characteristics of study participants

The majority (73.68%) of the study participants were female nurses and more than half of this number were aged from 21-30 years (55.73%). Participants aged 41 years and above were in the minority (3.81%). The majority of participants are first degree holders and less than 10% have a postgraduate qualification. Most of the participants (77.44%) have worked for 1-5 years in the ICU while 3.01% have over 10 years of experience working in the ICU. Nurses specialized in critical care are in the minority (30.10%) of the participants. Table 1 highlights the demographic characteristics of the participants. The majority (n=77, 57.90%) of the participants had training as registered general nurses. Concerning ranks, nurses categorized as juniors (staff nurses, senior staff nurses) were relatively more than nursing officers, and senior and principal nursing officers with 41.35%, 24.81%, and 33.84% respectively. Regarding roles in the ICU, the majority (n=110, 82.71%) had a staff position with the minority playing leadership roles (17.29%).

Table 2. Socio-demographic characteristics of participants

Characteristics	Frequency (n)	Percentage (%)
Age (years)		
21-30	73	55.73
31-40	53	40.46.
41 and above	5	3.81
Gender		
Female	98	73.68
Male	35	26.32
Educational Level		

Degree	80	60.15
Diploma	43	32.33
Masters	10	7.52
Years of Experience		
1-5 years	103	77.44
6-10 years	26	19.55
Above 10 years	4	3.01
Specialties		
CCN	40	30.10
RGN	77	57.90
Other	16	12.00
Rank		
Juniors	55	41.35
Officers	33	24.81
Senior and Principal Officers	45	33.84
Status at ICU		
Leader	23	17.29
Staff	110	82.71

4.1.1 Comparison of competence scores for demographic factors associated with critical thinking, professional development and practice, and communication and coordination competencies

This section sought to compare the competence of participants across some factors associated with competence in the ICU (Tables 2a, 2b, and 2c). There was no statistical difference between the mean scores for competencies in critical thinking, professional development and practice, communication and coordination among male and female participants ($p>0.05$). However, participants who were managers had higher mean scores for the three competence categories ($p<0.001$) compared to those in non-managerial roles at the ICU.

Participants aged 41 years and above ($p<0.001$), with Masters degrees ($p<0.001$), with experience of 10 years and above ($p<0.001$), with CCN background ($p<0.001$), and staff with higher ranks ($p=0.007$) had higher mean competence scores compared to others.

Table 3. Comparison of competence scores for demographic factors (nominal variables) associated with critical thinking, professional development and practice, and communication and coordination competencies of nurses in the ICU



Critical Thinking competence				
Gender	Mean	SD	T	P-value (2-tailed)
Male	25.5	6.4	-1.40	.170
Female	27.7	8.4		
Status at ICU				
Manager	30.8	5.8	-3.80	<.001
Staff	25.0	6.9		
Specialty				
Non-CCN	24.0	6.7	-4.90	<.001
CCN	29.8	5.9		
Professional development and practice competence				
Gender				
Male	53.3	11.8	-0.60	.532
Female	54.9	15.2		
Status at ICU				
Manager	61.3	8.0	-4.50	<.001
Staff	52.1	13.0		
Specialty				
Non-CCN	50.1	11.9	-4.80	<.001
CCN	60.4	11.4		
Communication and Coordination competence				
Gender				
Male	88.9	17.3	-1.00	.316
Female	92.6	21.6		
Status at ICU				
Manager	101.3	10.2	-5.00	<.001
Staff	87.5	19.0		
Specialty				
Non-CCN	85.6	17.8	-3.90	<.001
CCN	98.0	17.3		

Table 4. Comparison of competence scores for demographic factors (ordinal variables) associated with critical thinking, and professional development and practice competencies of nurses in the ICU

Critical thinking competencies				
Age (Years)	Mean	SD	F	P-value (2-tailed)
21-30	23.4	6.2	14.90	<0.001
31-40	29.2	6.4		

41 and above	32.0	7.1		
Level of Education				
Diploma	21.7	6.6	15.70	<0.001
Degree	27.8	6.2		
Masters	30.5	6.0		
Years of Experience				
1-2 years	22.6	6.6	23.20	<0.001
3-4 years	29.0	4.7		
5 years and above	30.2	5.9		
Rank				
Juniors	22.0	6.4	24.60	<0.001
Officer	26.9	5.5		
Senior Officers	30.3	5.8		

Professional Development and Practice competencies				
Age (Years)	Mean	SD	F	P-value (2-tailed)
21-30	49.7	12.0	10.40	<0.001
31-40	58.3	11.7		
41 and above	64.8	13.2		
Level of Education				
Diploma	44.8	10.9	20.90	<0.001
Degree	57.5	11.5		
Masters	61.6	9.5		
Years of Experience				
1-2 years	47.7	11.6	21.40	<0.001
3-4 years	57.4	9.4		
5 years and above	61.9	11.3		
Rank				
Juniors	45.4	10.6	29.80	<0.001
Officer	57.4	10.7		
Senior Officers	61.1	10.6		

Table 5. Comparison of competence scores for demographic factors (ordinal variables) associated with communication and coordination competencies of nurses in the ICU

Communication and coordination competencies				
Age (Years)	Mean	SD	F	P-value (2-tailed)
21-30	84.1	16.9	10.00	<0.001
31-40	96.2	17.8		

41 and above	104.8	20.0		
Level of Education				
Diploma	77.5	17.9	18.20	<0.001
Degree	95.3	15.7		
Masters	99.9	16.6		
Years of Experience				
1-2 years	81.5	17.7	18.00	0.001
3-4 years	96.5	13.2		
5 years and above	100.1	16.2		
Rank				
Juniors	79.6	17.5	20.20	<0.001
Officer	93.1	16.7		
Senior Officers	100.0	14.4		

4.2 Critical thinking competencies in the care of the critically ill in the ICU

Critical thinking competencies among the participants were categorized into reasoning, prediction, decision making, problem-solving, evaluation, and judgment with 8 activities giving a maximum score of 40 per participant. Table 2 indicates that the majority of participants showed competence (Competent, Proficient, and Expert) concerning the variables on critical thinking while a minority showed less competence. The participants were relatively least competent in the area of decision making (26.32%) and relatively most competent for making clinical judgments (76.69%). Table 3 illustrates descriptive information relative to participants' view on critical thinking competencies in the care of the critically ill in the ICU. Most of the participants indicated that they were competent in, “defending decisions using scientific knowledge principles” (n=99, 74.40%), “Identification of priority risk in clinical situations” (n=101, 75.90%), “figuring out more than one way to solve confronting clinical problems” (n=99, 74.40%), “integrating pertinent data from multiple sources” (n=99, 74.40%) and “making intervention decisions based on knowledge acquired from

nursing education programs” (n=104, 78.20%). The minority indicated that they were novices or advanced beginners.

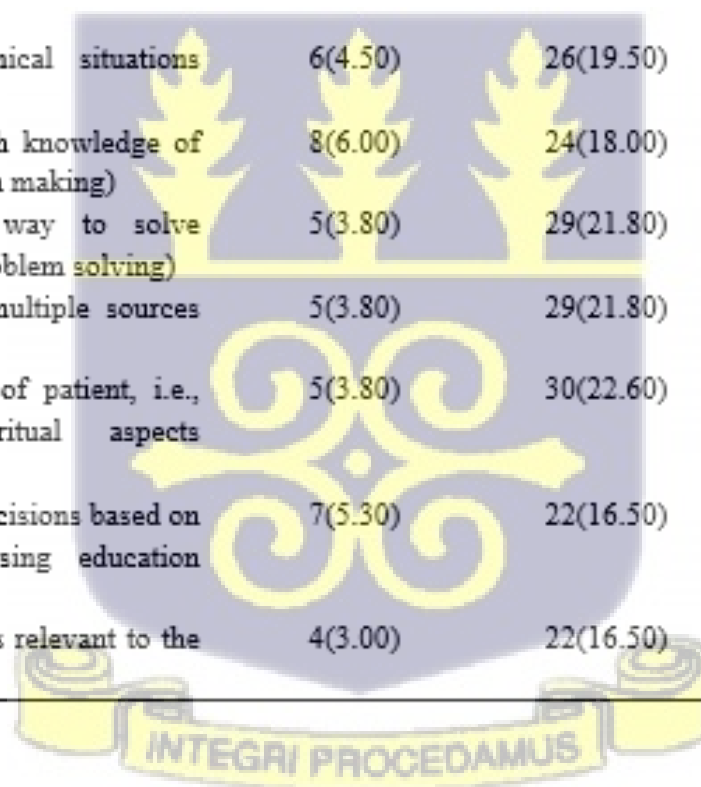
Table 6. Descriptive statistics of critical thinking competence variables

Critical Thinking Variables	COMPETENCE LEVEL	
	Less Competent n (%)	Competent n (%)
Reasoning	34 (25.56)	99 (74.44)
Prediction	32 (24.06)	101 (75.94)
Decision making	35 (26.32)	98 (73.68)
Problem-solving	34 (25.56)	99 (74.44)
Evaluation	34 (25.56)	99 (74.44)
Judgment	31 (23.31)	102 (76.69)



Table 7. Descriptive statistics of critical thinking competencies in the care of the critically ill in the ICU

	Novice or beginner	Advanced Beginner	Competent	Proficient	Expert
Variable	n (%)	n (%)	n (%)	n (%)	n (%)
Defends decisions using scientific knowledge principles (reasoning)	11(8.30)	23(17.30)	58(43.60)	27(20.30)	14(10.50)
Identifies priority risk in clinical situations (prediction)	6(4.50)	26(19.50)	47(35.30)	45(33.80)	9(6.80)
Makes decisions that reflect both knowledge of facts and good judgment (decision making)	8(6.00)	24(18.00)	24(30.10)	46(34.60)	15(11.30)
Figures out more than one way to solve confronting clinical problems (problem solving)	5(3.80)	29(21.80)	45(33.80)	33(24.80)	21(15.80)
Integrates pertinent data from multiple sources (evaluation)	5(3.80)	29(21.80)	50(37.60)	32(24.10)	17(12.80)
Assesses all health dimensions of patient, i.e., physical, psycho-social, spiritual aspects (judgment)	5(3.80)	30(22.60)	41(30.80)	40(30.10)	17(12.80)
Make nursing and intervention decisions based on knowledge acquired from nursing education programs (decision making)	7(5.30)	22(16.50)	46(34.60)	38(28.60)	20(15.00)
Prioritize nursing interventions as relevant to the patient (judgment)	4(3.00)	22(16.50)	40(30.10)	43(32.30)	24(18.00)



4.3 Professional development and practice competencies in the ICU

Sixteen activities giving a maximum score of 80 were considered to derive participants' competencies in professional development and practice in the care of the critically ill in the ICU. The findings are summarized in Table 5 below.

From Table 5, there was a clear indication that most of the participants were competent concerning their professional development and practice.

The participants indicated a relatively high competence (n=111, 83.50%) with regards to using learning opportunities for ongoing personal and professional growth, displaying a positive attitude, taking initiative and setting examples to others, and utilizing technological advances to improve nursing and health care. The highest number (n=114, 85.70%) indicating competence was seen with regards to understanding the legal and ethical principles of the profession and recognizing the importance of quality improvement and performing actions relating to it.

A minority of the participants indicated that they were novices or at the advanced beginner stage of competence for the areas being assessed. However, there were relatively more participants (24.00%) who were less competent with regards to understanding the role of professional organizations and participating actively in them.

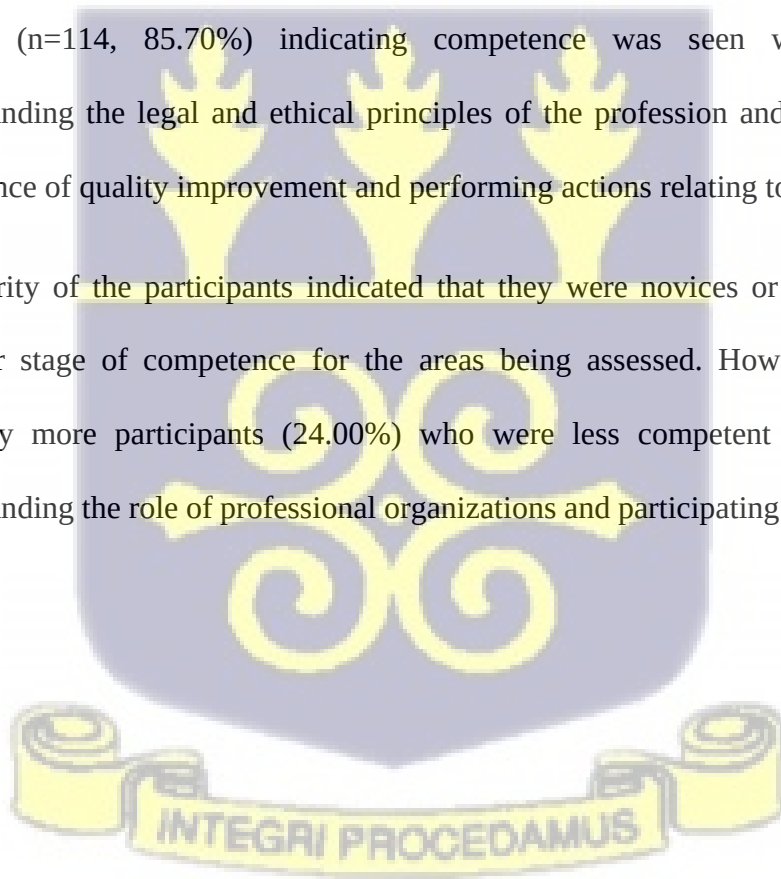


Table 8. Descriptive Statistics of professional development and practice competencies in the care of the critically ill in the ICU

Variable	Novice or beginner	Advanced Beginner	Competent	Proficient	Expert
	n (%)	n (%)	n (%)	n (%)	n (%)
Understands role of professional organizations and actively participates in them	6(4.50)	26(19.50)	49(36.80)	32(24.10)	20(15.00)
Displays self-direction in personal development	6(4.50)	21(15.80)	44(33.10)	41(30.80)	21(15.80)
Uses learning opportunities for ongoing personal and professional growth	4(3.00)	18(13.50)	53(39.80)	42(31.60)	16(12.10)
Recognizes own learning needs	7(5.30)	24(18.00)	47(35.30)	35(26.30)	20(15.00)
Demonstrates self-awareness of personal limitations & strengths	4(3.00)	20(15.00)	47(35.30)	43(32.30)	19(14.30)
Understands relevant and current information concerning health care system	4(3.00)	20(15.00)	53(39.80)	35(26.30)	21(15.80)
Understands Legal and ethical principles of the profession	5(3.80)	14(10.50)	51(38.30)	41(30.80)	22(16.50)
Uses expertise and professional skills	5(3.80)	19(14.30)	53(39.80)	41(30.80)	15(11.30)
Display a positive attitude, take initiatives and set an example to others	5(3.80)	17(12.80)	51(38.30)	38(28.60)	22(16.50)
Assume responsibility and accountability for own role in the nursing care	2(1.50)	29(21.80)	46(34.60)	41(30.80)	15(11.30)
Identify hazards to patient safety and make the necessary quality improvements to prevent harm	2(1.50)	23(17.30)	55(41.40)	35 (26.30)	18(13.50)
Recognize the importance of quality improvement and perform actions relating to this	3(2.30)	16(12.00)	54(40.60)	44(33.10)	16(12.00)
Understand and perform the needs of socially-disadvantaged and vulnerable groups as their objectives	3(2.30)	24(18.00)	49 (36.80)	42(31.60)	15(11.30)
Provide nursing care that integrates needs of patients and their family	4(3.00)	19(14.30)	50(37.60)	44(33.10)	16(12.00)
Incorporates relevant research findings into nursing practice	3(2.30)	26(19.50)	45(33.80)	44(33.10)	15(11.30)
Utilizes technological advances to improve nursing and health care	5(3.80)	17(12.80)	48(36.10)	39(29.30)	24(18.00)

4.4 Communication and coordination competencies in the ICU

The breakdown of activities (26) and scores (maximum obtainable score of 130) that depict participants' communication and coordination competencies in the ICU has been highlighted in Tables 9 and 10 below.

Although most of the participants indicated competence in all the activities assessed, a sizeable proportion indicated proficiency in a number of the parameters. Overall, less than one-tenth of the participants indicated they were novices or advanced beginners for all the activities assessed. A minority of the participants indicated being less competent for all the activities tabled to derive communication and coordination competencies. The activity most participants were least competent was in expressing disagreements in a constructive manner (n=24, 18.05%).

Many of the participants (n=120, 90.20%) indicated competence in, “communicating facts, ideas and feelings to other health team members verbally”, “acknowledging the differences in beliefs and cultural practices of individuals and groups”, and “assessing the progress of nursing care or patient education with relevant members of the healthcare team”. The majority (n=121, 91.00%) however, indicated that they “document medical records to promote better communication between team members”.

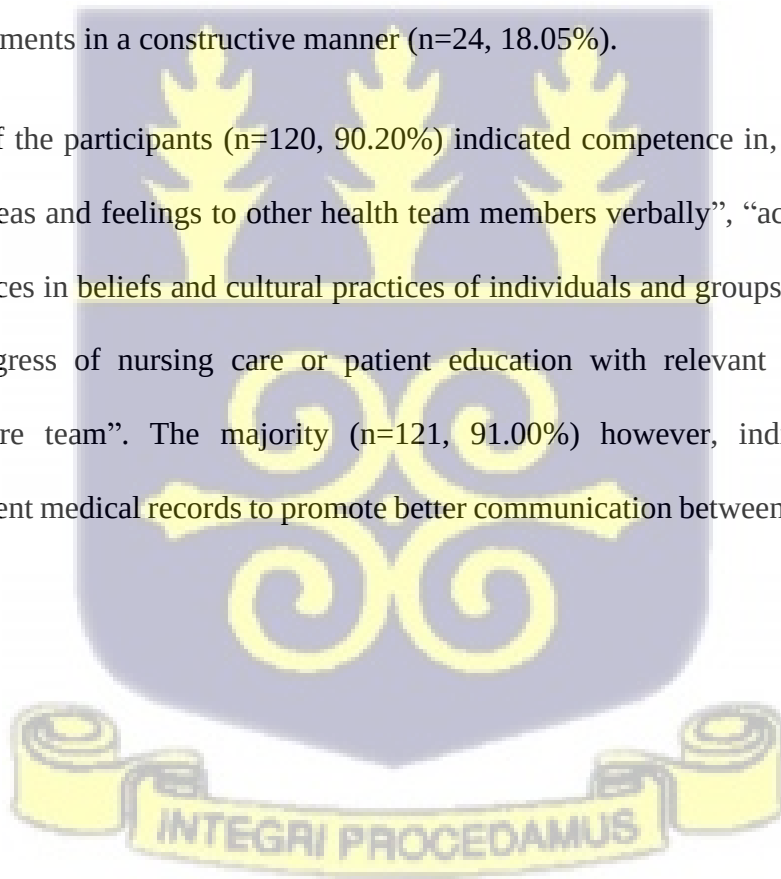


Table 9. Descriptive statistics of communication and coordination competencies in the care of the critically ill in the ICU

Variables	Novice or beginner	Advanced Beginner	Competent	Proficient	Expert
	n (%)	n (%)	n (%)	n (%)	n (%)
Able to provide culturally-sensitive care	4(3.00)	19(14.30)	53(39.80)	39(29.30)	18(13.50)
Identifies and includes immediate patient needs in the plan of nursing care	3(2.30)	21(15.80)	46(34.60)	45(33.80)	18(13.50)
Give emotional support to families	4(3.00)	14(10.50)	54(40.60)	44(33.10)	17(12.80)
Develops a nursing care plan for a specific patient based on a primary and secondary data base	3(2.30)	19(14.30)	52(39.10)	41(30.80)	18(13.50)
Delivers accurate, comprehensive and effective nursing in accordance with the plan of care	4(3.00)	15(11.30)	46(34.60)	56(42.10)	12(9.00)
Involves the patient and family in the planning and implementation of care	2(1.50)	21(15.80)	45(33.80)	44(33.10)	21(15.80)
Uses different ways to search for information	3(2.30)	19(14.30)	49(36.80)	44(33.10)	18(13.50)
Assists in the clinical research data collection	8(6.00)	16(12.00)	47(35.30)	48(36.10)	14(10.50)
Detects and document significant changes in a patient's condition	5(3.80)	14(10.50)	51(38.30)	43(32.30)	20(15.00)
Evaluates results of nursing care interventions	3(2.30)	17(12.80)	40(30.10)	49(36.80)	24(18.00)
Adjusts actions in relation to other's actions	5(3.80)	14(10.50)	49(36.80)	47(35.30)	18(13.50)
Cooperates with other care providers helping to meet patient needs	4(3.00)	18(13.50)	46(34.60)	38(28.60)	27(20.30)
Communicates facts, ideas and feelings to other health team member verbally	2(1.50)	11(8.30)	54(40.60)	47(35.30)	19(14.30)
Builds trust by keeping word, commitments, and promises	3(2.30)	16(12.00)	46(34.60)	45(33.80)	23(17.30)
Acknowledges the differences in beliefs and cultural practices of individuals/groups	2(1.50)	11(8.30)	55(41.40)	44(33.10)	21(15.80)
Shows willingness to share workload when needed	3(2.30)	11(8.30)	49(36.80)	39(29.30)	31(23.30)

Table 10. Descriptive statistics of communication and coordination competencies in the care of the critically ill in the ICU

	Novice or beginner	Advanced Beginner	Competent	Proficient	Expert
Variables	n (%)	n (%)	n (%)	n (%)	n (%)
Expresses facts and thoughts in writing in a clear and organized	4(3.00)	12(9.00)	54(40.60)	46(34.60)	17(12.80)
Expresses disagreements in a constructive manner	6(4.50)	18(13.50)	55(41.40)	38(28.60)	16(12.00)
Verbally communicate issues, emotions and thoughts relating to the nursing practice	3(2.30)	15(11.30)	49(36.80)	51(38.30)	15(11.30)
Exchange constructive feedback and criticisms between colleagues	6(4.50)	15(11.30)	62(46.60)	36(27.10)	14(10.50)
Support nursing students to reach the objectives of their clinical training	4(3.00)	16(12.00)	48(36.10)	43(32.30)	22(16.50)
Incorporate the needs of the individual into the nursing plan or adapt it as necessary	5(3.80)	13(9.80)	53(39.80)	49(36.80)	13(9.80)
Assess the progress of nursing care or patient education with relevant members of the healthcare team	2(1.50)	11(8.30)	58(43.60)	45(33.80)	17(12.80)
Document medical records to promote better communication between team members	2(1.50)	10(7.50)	51(38.30)	46(34.60)	24(18.00)
Communicate to patients the procedural aspects, contents and purposes of the medical service that they will receive	3(2.30)	15(11.30)	55(41.40)	37(27.80)	23(17.30)
Give comprehensive report of the patient's condition during ward rotations or during delegation or transfer of roles	2(1.50)	16(12.00)	43(32.30)	43(32.30)	29(21.80)

4.5 Overall competency in critical thinking, professional development and practice, and communication and coordination competencies

Analysis of the overall competence among the participants from the 8 ICUs indicates that about 87.21% (116 out of 133) of participants were competent in critical thinking, professional development and practice, as well as in communication and coordination (From Table 8). Participants had a mean score of 26.00 ± 7.00 for critical thinking competencies out of a possible total value of 40. The majority ($n=111$, 83.46%) scored above the minimum threshold of 20 indicating a good competency in critical thinking. For professional practice competencies, the mean score was 53.70 ± 12.80 out of a possible total value of 80. The majority (117, 87.97%) scored above the minimum threshold of 40 indicating good competency in professional practice. Regarding coordination competencies, the mean score of 89.90 ± 18.50 was obtained out of 130 points. More than two-thirds ($n=120$, 90.23%) of the participants scored above the minimum threshold of 65 indicating a good competency in coordination.

Table 11. Overall competency based on critical thinking, professional development and practice, and communication and coordination competencies

Type of competency	Mean $\pm$ (SD)	Less Competent	Competent
		n(%)	n(%)
Critical thinking competencies	26.0 ± 7.0	22(16.54)	111(83.46)
Professional development & practice competencies	53.7 ± 12.8	16(12.03)	117(87.97)
Communication & Coordination competencies	89.9 ± 18.5	13(9.77)	120(90.23)

4.6 Correlation between critical thinking, professional practice, and coordination competencies

Table 9 below shows the relationship between the three variables being assessed on competence. There is a significant ($p < .001$) and strong positive correlation between critical thinking competencies, professional practice competencies, and coordination competencies. This indicates that one is either competent in all three areas of competence in the ICU or just not competent in any of them. It further means that all three areas of competence being considered are equally important in determining the competence of the nurse in the ICU.

Table 12. Correlation between critical thinking, professional practice and development, and communication and coordination competencies

	1	2	3
1. Critical thinking competencies	-		
2. Professional practice and development competencies	.88**	-	
3. Communication and Coordination competencies	.82**	.90**	-

Note: **- Correlation is significant at the 0.01 level (2-tailed)

4.8 Predictive analysis of demographic factors determining competence in the ICU

A stepwise regression analysis was conducted using the Forward technique to determine demographic factors that predict critical thinking, professional development and practice, and communication and coordination competencies in the ICU. The forward selection technique starts with no variables in the model and then step wisely adds each variable

using a selected model fit criterion. Variables with $P < 0.05$ were considered significant predictors of competence. Variables included in the final model are those that give the most statistically significant amelioration of the fit. This process is repeated until none of the variables enhances the model to a significant (statistically) level. Nominal categorical variables (Gender, Status at the ICU, and Specialty) and ordinal (Educational level and Rank) were dummy coded (Table 13) before their inclusion in the regression analysis. Continuous variables such as Age and Years of experience were also included in the regression analysis.

The table below shows the dummy coded variables considered with the respective references

Table 13. Dummy codes for categorical variables

Categorical Variable	Dummy codes	Reference
Status at the ICU	Staff	Staff
	Leader role✓	
Specialty	Non-CCN	Non-CCN
	CCN✓	
Educational Level	Diploma	Diploma
	Degree✓	
	Masters✓	
Rank	Staff nurse-Senior Staff nurse	Staff nurse-Senior Staff nurse
	Officer✓	
	Senior Officer (Senior-Principal) ✓	
Gender	Male	Male
	Female ✓	

Only the checked dummy variables were tested in the regression analysis.

4.8.1 Demographic predictors of Critical thinking competence of the ICU nurses

Table 14 below shows the model that predicted critical thinking competence per the forward regression method. The model explained 37.6% of the variance in critical thinking competence of the ICU nurse $R^2 = 0.376$, $F(3, 129) = 25.940$, $p < .001$. The model further suggested that years of experience ($B=0.109$, $t=4.59$, $p<0.001$), Senior officer ($B=0.721$, $t=4.60$, $p<0.001$), and officer ($B=0.459$, $t=2.92$, $p=0.004$) ranks significantly predicted the critical thinking competence of the ICU nurse.

Table 14. Logistic regression analysis of demographic predictors of critical thinking competencies of the ICU nurse

Variables	B	95.0% C.I for B	T	P
Constant	2.511	2.299-2.723	24.433	0.000
Experience (Years)	0.109	0.062-0.155	4.590	0.000
Senior & Principal officer Rank	0.721	0.411-1.031	4.603	0.000
Officer Rank	0.459	0.147-0.770	2.915	0.004

Note: **Predictor variables entered step-wisely included Experience, age, gender, officer rank, senior and principal officer rank (rank), female gender, degree, masters (qualification), leader (status in the ICU), CCN (Specialty).

C.I = Confidence Interval



4.8.2 Demographic predictors of Professional development and practice competencies of the ICU nurse

Table 15 below shows the model that predicted the Professional development and practice competence per the forward regression method. The model explained 41.9% of the variance in competence related to Professional development and practice of the ICU nurse $R^2 = 0.42$, $F(4, 128) = 23.06$, $p < .001$. The model further suggested that years of experience ($B=0.097$, $t=4.66$, $p<0.001$), Senior Officer ($B=0.608$, $t=3.87$, $p<0.001$ and Officer ranks ($B= 0.499$, $t=2.96$, $p=0.004$) significantly predicted the competence relating to professional development and practice of the ICU nurse. Although degree qualification was part of the independent variables in the model, it did not significantly predict professional development and practice competencies.

Table 15. Logistic regression analysis of demographic predictors of Professional development and practice competencies of the ICU nurse

Variables	B	95.0% C.I for B	T	P
Constant	2.575	2.374-2.776	25.34	0.000
Experience (Years)	0.097	0.056-0.139	4.66	0.000
Degree	0.164	-0.108-0.436	1.19	0.235
Senior & Principal officer Rank	0.608	0.297-0.919	3.87	0.000
Officer Rank	0.499	0.165-0.832	2.96	0.004

Note: **Predictor variables entered step-wisely included Experience, age, gender, officer rank, senior and principal officer rank (rank), female gender, degree, masters (qualification), leader (status in the ICU), CCN (Specialty).

C.I = Confidence Interval

4.8.3 Demographic predictors of Communication and coordination competencies of the ICU nurse

Table 16 below shows the model that predicted competence relating to communication and coordination among ICU nurses per the forward regression method. The model explained 33.70% of the variance in competence related to Professional development and practice of the ICU nurse $R^2 = 0.337$, $F(3, 129) = 21.81$, $p < .001$. The model further suggested that years of experience ($B=0.091$, $t=4.65$, $p<0.001$), Degree qualification ($B= 0.353$, $t=3.27$, $p<0.001$), and Senior officer rank ($B=0.276$, $t=2.30$, $p=0.023$) significantly predicted the competence relating to communication and coordination of the ICU nurse.

Table 16. Logistic regression analysis of demographic predictors of communication and coordination competencies of the ICU nurse

Variables	B	95.0% C.I for B	T	P
Constant	2.828	2.637-3.018	29.36	0.000
Experience (Years)	0.091	0.052-0.129	4.65	0.000
Degree	0.353	0.139-0.567	3.27	0.001
Senior & Principal officer Rank	0.276	0.038-0.513	2.30	0.023

Note: **Predictor variables entered step-wisely in the forward regression included Experience, age, gender, officer rank, senior and principal officer rank (rank), female gender, degree, masters (qualification), leader (status in the ICU), CCN (Specialty).

C.I = Confidence Interval

4.8.4 Demographic predictors of overall competency in the ICU nurse

To predict general competency determinants in the ICU nurse, the forward regression method was employed to deduce a model that would significantly explain the variance in the dependent variable (overall competence). Table 17 below shows the model that predicted competence relating to the overall competence of the ICU nurses per the forward regression method. The model obtained explained 40.70% (Table 9i) of the variance in the overall competence of the ICU nurse $R^2 = 0.407$, $F(4, 128) = 21.98$, $p < .001$. The model further suggested that years of experience ($B=4.678$, $t=4.80$, $p<0.001$), Senior officer ($B=25.031$, $t=3.42$, $p=0.001$) and officer ranks ($B=16.313$, $t=2.08$, $p=0.040$) significantly predicted the overall competence of the ICU nurse. Although degree significantly predicted the overall competence in the earlier models it did not predict significantly ($B=10.479$, $t=1.638$, $p=0.104$ for the same in the last model that significantly explained the variance in overall competency.

Table 17. Logistic regression analysis of demographic predictors of the overall competence of the ICU nurse

Variables	B	95.0% C.I for B	T	P
Constant	134.144	124.781-143.506	28.35	0.000
Experience (Years)	4.678	2.751-6.605	4.80	0.000
Degree	10.479	-2.180-23.139	1.64	0.104
Senior & Principal officer Rank	25.031	10.546-39.516	3.42	0.001
Officer Rank	16.313	0.779-31.847	2.08	0.040

Note: **Predictor variables entered step-wisely included Experience, age, gender, officer rank, senior and principal officer rank (rank), female gender, degree, masters (qualification), leader (status in the ICU), CCN (Specialty). C.I = Confidence Interval

In summary, the results so far have given substantive evidence that more than 80% of the participants in this study are competent in critical thinking, professional development and practice, and communication and coordination in the ICU. Also, years of experience and senior rank (Senior and Principal officer) happened to be the common predictors of competence of the ICU nurse with regards to critical thinking, professional development and practice, and communication and coordination in the ICU.



CHAPTER FIVE

DISCUSSION OF FINDINGS

This chapter will discuss the findings from the study seeking to assess nurses' competence in the management of critically ill patients in the intensive care units of the Korle-Bu Teaching Hospital which is the largest referral health facility in Ghana. This will involve the description of nurses' critical thinking competencies, professional development and practice competencies, and communication and coordination competencies in the care of critically ill patients in the ICU. The study also sought to investigate the relationship between nurses' critical thinking competencies, professional development and practice competencies, and communication and coordination competencies. The discussion will also elucidate the predictors of nurses' critical thinking competencies, professional development and practice competencies, and communication and coordination competencies in the care of critically ill patients in the ICU. The study employed a questionnaire comprising two main sections: demography and competence assessment. The demography section provided general information about the participants and also possible correlate information for the competencies assessed. The Benner scale (Benner, 1982) was used to determine the level of competence of the participants.

The results of the study under the following themes will be discussed: socio-demographic characteristics of the participants, General competence in the ICU, critical thinking competence, professional development and practice competence, communication and coordination competence, the relationship between the categories of competence, factors associated with competence in the ICU, and predictors of competence in the ICU.

5.1 Socio-demographic characteristics of participants

This study reports a higher number of females (73.70%) compared to males. Evidence from some studies suggests that there is a higher female nurse population both locally and internationally (Appiah et al., 2021; Arif & Khokhar, 2017; Kronsberg et al., 2017).

Records from the Ministry of Health and the Ghana Health studies also corroborate the current findings that male nurses are in the minority (13.50%) of nurses in Ghana (Ghana Health Service, 2018; MOH, 2016). From 2008 to 2018, Ghana embarked on a massive scale-up of training and production of nursing and midwifery staff across the country which was to address the marked shortage of nurses and midwives in the country. This resulted in a rapid demographic shift in this essential workforce by 2018 with 71.00 to 93.00% of the nursing and midwifery workforces being 35 years or younger compared to 2.8 to 44% in 2008 (Asamani et al., 2019). The present study has about 79.00% of the participants being 35 years or younger agreeing with the study of Asamani, et al. (2019). Most participants held basic nursing diplomas or first degrees, with few postgraduates. However, only 30.1% of these nurses have qualification in critical care nursing. Strategic upskilling through in-service ICU training and sponsoring higher nursing degrees can enhance competence development among these nurses (Hampton et al., 2023).

5.2 General competence of nurses in the ICU

Professional disciplines such as nursing place a lot of emphasis on the competency of their professionals as efficient performance or otherwise is directly linked to patient health outcomes (Oldland et al., 2020). To the best of my knowledge, there is very little published concerning the assessment of nurses' competencies in managing the critically ill patient in

ICUs in Ghana, although there are articles concerning the competencies of nursing students, and other health practitioners (Song & McCreary, 2020; Wilkinson, 2013).

The overall mean scores of the competency of nurses in the ICU unit based on critical thinking, professional development and practice, and communication and coordination competencies were 26.00 ± 7.00 , 53.70 ± 12.80 , and 89.90 ± 18.50 respectively. Proportion-wise, the nurses that show these competencies respectively were 111(83.50%), 117 (88.00%), and 120(90.20%). Although the mean score of all the competencies was above the 50% mark, it still leaves questions about the implication of having less competent professionals in the ICU to handle patients under critical conditions. The study found 83-90% of participants demonstrate competence across critical thinking, professional development, and communication/coordination parameters. However, 16-25% remained less competent on specific critical thinking and communication elements like decision making and handling disagreements. Wheelan (2006), however, noted that missed learning opportunities likely contributed to this observation during early career stages when nurses lack adequate supervision and feedback (Wheelan, 2006). Formalizing intensive preceptorships and regular competency assessments can strengthen areas needing support.

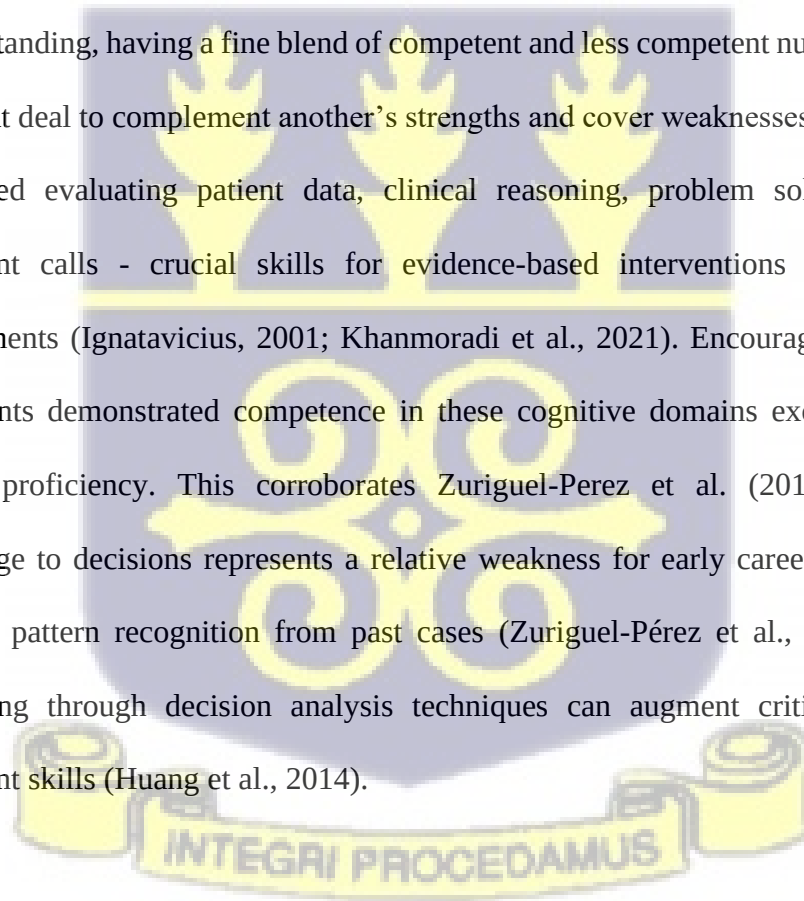
5.3 Critical thinking competence

Participants assessed in critical thinking were most competent in making clinical judgments (76.70%) but less competent in the area of decision-making (26.30%). This explains why they are less confident in their decision-making because nurses are trained to manage situations while they wait for final and crucial decisions from medical doctors. However, they are also able to defend decisions using scientific knowledge principles (74.40%),

identify priority risks in clinical situations (75.90%), come up with multiple solutions to confronting clinical problems (74.40%), integrate pertinent data from multiple sources (74.40%), and make intervention decisions based on knowledge acquired from nursing education programs (78.20%) (Nibbelink & Brewer, 2018). Specifically, the competencies of nurses at the ICU in terms of critical thinking recorded 99 (74.40%) for reasoning, 101(75.90%) for prediction, 98 (73.70%) for decision making, 99 (74.40%) for problem-solving, 99 (74.40%) for evaluation and 102 (76.70%) for judgment. Although the competency level observed in the study appears to be appreciable, the proportion of low competency is alarming. This is alarming because the intensive care unit requires a high level of precision and accuracy in terms of handling patients in critical conditions lest they expire. On average, about one-quarter of the participants were less competent in critical thinking. The implication of this negative situation could translate into detrimental consequences to patients on the one hand and health care professionals on the other hand. Studies over the past decades have unearthed consequences of nurses' lowered competence in the health sector with detrimental consequences on the health care environment. For instance, worldwide, 3-16% of hospitalized patients suffer injury as a result of wrong medical intervention, with higher adverse effects recorded in the intensive care units and emergency departments (Oyebode, 2013). Furtherance to that, Brennan et al., 2004 reported that of the 3.70% of adverse effects that occur with hospitalizations, 27.60% of these were due to poor decision-making by health workers resulting in 70.50% temporary disability cases, 2.60% permanently disability, and 13.60% led to mortalities. Stakeholders are urged to include the option of using legal redress as a means of ensuring that the government and healthcare providers keep their promise of providing quality maternity

care to reduce preventable deaths on the basis that medical negligence is a problem in some areas of Ghanaian healthcare (Morhe et al., 2019). Subsequently, the tendency of the healthcare providers as well as the healthcare industry to lose their credibility with patients and their relatives culminating in an increased incidence of medical litigations and complaints towards healthcare professionals (Choy & Ismail, 2017) will likely reduce.

On the other hand, it can be inferred from the demographic distribution of the participants that, the marginal number of the less incompetent participants is because, there has been an enrollment of new nurses recently (MoH, 2019) and this category of nurses may have not yet gathered the requisite competency that comes along with years of practice. That notwithstanding, having a fine blend of competent and less competent nurses in a team will do a great deal to complement another's strengths and cover weaknesses. Critical thinking constituted evaluating patient data, clinical reasoning, problem solving, and sound judgement calls - crucial skills for evidence-based interventions in complex ICU environments (Ignatavicius, 2001; Khanmoradi et al., 2021). Encouragingly, 74-83% of participants demonstrated competence in these cognitive domains except for decision-making proficiency. This corroborates Zuriguel-Perez et al. (2018) that applying knowledge to decisions represents a relative weakness for early career nurses who rely more on pattern recognition from past cases (Zuriguel-Pérez et al., 2018). Deliberate scaffolding through decision analysis techniques can augment critical thinking and judgement skills (Huang et al., 2014).



5.4 Professional development and practice competencies of nurses in the ICU

There was also a clear indication that competence with regards to professional development and practice was with nurses' ability to understand the legal and ethical principles of the profession and recognize the importance of quality improvement and performing actions relating to it. Most participants indicated very high competence in documenting medical records to promote better communication between team members similar to Bahreini et al., (2011) that head nurses considered nurses' (general staff) to be more competent in the categories of "diagnostic functions" and "managing situations". Adib Hajbaghery & Eshraghi Arani, (2018) also found that nurses' score of clinical competence was good from their viewpoint and excellent from the head nurses' viewpoint. This is because a major part of nursing training stresses medical record-keeping, documentation, and as well as teamwork (Urquhart et al., 2018). The health sector in general is structured such that, all cadres need one another to be able to issue the best medical care to patients, hence the need for proper documentation and communication of patient records. Similar findings were established by Salonen, Kaunonen, Meretoja, & Tarkka, (2007) that nursing professionals considered themselves competent in the areas of helping roles, managing circumstances, diagnostic functions, teaching, coaching, and work role competencies. This demonstrated that competencies in skills and tasks falling into the categories of Ensuring quality and Therapeutic interventions were highly rated but managerial and supervisory roles were rated low. This could be rooted in the way nurses are trained and assessed with how they care and empathize with patients and less in the light of managerial skills.

The need for professional development and practice in the nursing profession cannot be underrated. However, workload, time constraints, inadequate educational resources, and to some extent financial commitment make some health professionals neglect continuous

professional development programs (Bindon, 2017). But interestingly the professional regulatory body i.e. Nursing and Midwifery Council (NMC) has instituted a system to ensure the professional development of its members (NMC, 2022). Before an individual can renew their pin annually, they would have to meet a continuing professional development (CPD) requirement. This system has ensured that professionals are always up to speed with current medical trends.

In this study, 88.00% representing 117 participants were competent in professional development and practice. Specifically, the competencies recorded included 24(18.00%) in the utility of technology to advance health care, 22(16.50%) in displaying a positive attitude, taking initiative, and setting an example to others as well as understanding the legal and ethical principles of the profession. Also, 21(15.80%) in both understanding relevant and current information concerning the health care system and displaying self-direction in personal development. Having 24(18.00%) of the participants reporting to be experts in the utility of technology to advance health care can be considered a move in the right direction. This will have a positive implication for the general practice of health care in the study jurisdiction, as the phase of robotics and artificial intelligence are becoming commonplace. A range of bedside gadgets is used by the intensive care unit (ICU) to provide care for seriously unwell patients. These tools, which provide the patient with a vital medical service, include physiological monitoring, ventilators, infusion pumps, and bedside computer terminals (Alsohime et al., 2021). Nurses welcoming these technological initiatives, especially in the ICUs is a green light for the betterment of the Ghanaian healthcare system at large. That notwithstanding, there is the need to train these nurses

accordingly to receive the necessary IT training owing to the nature and fast-paced information age (Darvish et al., 2014).

It is also thrilling to ascertain that an appreciable number shows a positive attitude which is essential in enhancing good patient–nurse interpersonal relationships. The existence of a good patient–nurse interpersonal relationship, creates an enabling environment for the patients to recover early as they are emotionally and psychologically at peace. This accession is in line with the finding of Molina-mula & Gallo-estrada (2020), who also reiterated that a good nurse-patient relationship goes a long way to decrease the duration of hospitalization of patients and feel satisfied with the care provided. On the other hand, negative attitudes of health professionals tend to dampen patients’ spirits and as result are left unsatisfied with treatment outcomes (Van Boekel et al., 2013).

In summary, the majority of the participants displayed competence in utilizing learning opportunities for professional growth and understanding ethical/legal principles. However, about a quarter lacked grasp of health systems issues and professional nursing organizations - likely reflecting inexperience and training gap. Bridging this requires expanded continuing education covering both clinical and health systems topics like emerging technologies, quality improvement, and leadership essentials (Wheelan, 2006).



5.5 Communication and coordination competence of nurses in the ICU

Communication is the foundation of the nurse-patient relationship and is a key component of trust and comfort (Dithole et al., 2016). Furthermore, communication is a crucial component of patient-centered care (PCC) and studies have shown that patients and their families have endorsed good communication as being a vital part of high-quality care in the ICU (Slatore et al., 2014). It has been established that more than 2.7 million patients in intensive care units (ICUs) in the United States are unable to communicate verbally, owing to the use of artificial airways and assisted ventilation. Additionally, Sedation, weariness, psychosis, or neurological dysfunction can all obstruct communication by the patient during severe illness (Happ, M. B., Garrett, K., Thomas, D. D., Tate, J., George, E., Houze, M., Radtke, J., & Sereika, 2011).

In acute medical settings such as the ICU, effective team communication and coordination are regarded as critical for increasing quality and safety (Y. Y. Wang et al., 2018).

Healthcare practitioners, patients, and families use communication as the major means of exchanging information, eliciting preferences, communicating assessments and plans, and making decisions (Slatore et al., 2014). According to some patient safety research, communication breakdowns have been identified as a cause of many critical occurrences in the ICU (Reader et al., 2007). To make appropriate and continuous patient care choices, team members in the ICU coordinate the collection, integration, and interpretation of patient and team-related information (Miller et al., 2010). For the formulation of negotiated common treatment goals and short-term patient outcomes, interdisciplinary dialogue within a team is critical (Reader et al., 2011). Thus, communication among the care team as well as between the caregiver and the patient and patient families is crucial in achieving holistic care in the ICU.

On the other hand, ineffective communication leads to patient complaints and anxiety, as well as other unfavorable outcomes like lengthier hospital stays, higher death rates, burnout, job stress, and attrition. (Yoo et al., 2020).

The majority of bedside care is provided by nurses, who also interact with patients and their families the most. (Slatore et al., 2014). In these circumstances, nurses must act quickly based on their knowledge, which calls for a high level of linguistic competency to fully understand the needs of patients and their families. (Yoo et al., 2020). Also, during the COVID-19 epidemic, the role of the critical care nurse in supporting patient communication and facilitating communication between patients and their families has never been more crucial or tragic (Happ, 2021).

In the present study, 26 activities that depict participants' (ICU nurses) communication and coordination competencies in the ICU were assessed. The activities can be summarized as focussing on intra- and inter-personal communication, communication with families and colleagues in a culturally and religiously sensitive manner, written and verbal communication, sensitivity to emotions and ego of colleagues for effective and purposeful communication, and care coordination.

A significant proportion (>80.00%) indicated proficiency in most of the activities assessed. Overall, less than one-tenth of the participants indicated they were novices or advanced beginners for all the activities assessed.

Many of the participants (n=120, 90.20%) indicated competency in vocally expressing facts, ideas, and sentiments to other healthcare team members, respecting the variations in cultural practices and beliefs of individuals and groups and discussing the status of patient education or nursing care with the appropriate members of the healthcare team. The

majority (n=121, 91.00%) however, indicated the highest competency in documenting medical records to promote better communication between team members.

Most of the participants who recorded low competence scores for communication and coordination were younger and less experienced nurses. This finding is corroborated by the findings of Yoo, et al. (2020) who reported that Critical care nurses who were younger and less experienced have less developed communication skills than their older and more experienced colleagues (Yoo, et al., 2020).

According to the WHO, care coordination is, “A proactive approach to bringing together care professionals and providers to meet the needs of service users to ensure that they receive integrated, person-focused care across various settings” (WHO, 2018).

Intensive care coordination is a nonlinear process, and intensive care teams frequently fail to discuss how to set goals, trigger, and coordinate actions or evaluate their success (Reader, et al., 2011).

Complex decision structures and role relations characterize ICU communication and care coordination (Miller et al., 2010). This was reflected in the competency scores of shift leaders, clinical facilitators, and unit managers having higher competency scores compared to the other staff playing general roles in the ICU. This finding was corroborated by the study by Yoo, et al. (2020).

The activity for which most participants were least competent was in expressing disagreements in a constructive manner (n=24, 18.05%). This can fuel conflicts in the work environment and also affect the effectiveness of the team and collaborative efforts to help care for the patient. This may further lead to unprofessional behaviour, increase stress psychologically, emotional fatigue, reduced commitment to set goals, and even

maltreatment of patients to mention but a few of the negative repercussions of this undesirable attitude in the ICU (Dehghan Nayeri & Negarandeh, 2009). Nurse managers have a major role to play in averting such occurrences in the ICU and teaching their subordinates how to avoid activities that could create conflicts (Johansen, 2012).

Communicating with teams and patients, cultural sensitivity, and documenting effectively are fundamentals for ICU nurses coordinating multidisciplinary care (Alsharari et al., 2020; Dithole et al., 2016). Encouragingly most participants demonstrated competence in these constructs, although lower proficiency coordinating disagreements constructively underscores that conflict management remains an advanced skill (Almost et al., 2016). Targeted training using simulation scenarios can enhance communicative capacity and teamwork skills vital for complex ICU environments (Ayed et al., 2015).

5.6 Relationship between the categories of competence

5.6.1 Correlation between critical thinking, professional practice competence, and communication and coordination competence.

In the study, there was a significant ($p < .001$) and a strong positive correlation between critical thinking competencies, professional practice competencies, and coordination competencies. This indicates that one is either competent in all three areas of competence in the ICU or just not competent in any of them. It further means that all three areas of competence being considered are equally important in determining the competence of the nurse in the ICU. A similar study by Koskinen, Likitalo, Aho, Vuorio, & Meretoja (2014), found that when evaluating the participating nurses' competence profile, nurses and head

nurses gave each participant high scores in all seven competency areas. In terms of assisting role, diagnostic functions, work role, teaching-coaching, and therapeutic interventions, there were no statistically significant variations between the groups' responses when the summative scores were compared. This agrees with another study by Mirlashari, Qommi, Nariman, Bahrani, & Begjani (2016), who reported a direct statistically significant relationship among all aspects of clinical competence. The strong positive correlation in this study implies that an increase in one area of competence invariably increases in the other areas of competence. This is essential because patient safety may be compromised if an ICU nurse cannot provide clinically competent care (Tamadoni, et al., 2020). For instance, ICU nurses must possess the ability to identify differences in patient situations, carry out independent nursing interventions, anticipate instructions, and prioritize care based on the circumstances. This is because the capacity to think critically can directly impact patient safety. These actions require critical thinking ability, advanced problem-solving skills, and the ability to communicate clearly (Tamadoni, et al., 2020). Strong significant positive correlations existed between critical thinking, professional development, and communication/coordination competencies. This aligns with the conceptual model that holistic nursing competence integrates knowledge, practice values and interpersonal capabilities (Fukada, 2018). It also indicates that these elements reciprocally influence each other – better critical thinking fosters communication, while professional development enhances clinical reasoning, collaborating within teams improves judgements, and so on (Almost, et al., 2016). Therefore, improving competence requires strategies crossing cognitive, psychomotor and affective learning domains.

5.6.2 Demographic Factors associated with critical thinking, professional development and practice, and communication and coordination competencies.

The mean score of nurses' critical thinking, professional development and practice, and communication and coordination competencies was found to be significantly associated with status at ICU, specialty, age of staff, educational attainment, years of experience, and professional rank of the ICU nurses. A similar pattern was observed with all these variables against the various competencies. Nurses in managerial positions, were specialist nurses in critical care, advanced in age, had higher educational attainment, more years of experience, and higher professional ranks recorded higher mean competent scores for all the competency areas investigated. This finding is therefore in congruence with a study by Fero, Witsberger, Wesmiller, Zullo, & Hoffman (2009), who found that nurses with bachelor's degrees demonstrated a high level of critical thinking competence on assessment than diploma nurses. Another cross-sectional study conducted in Saudi Arabia by Feliciano, et al. (2021) showed that years of work experience and level of education correlated significantly with professional competence thereby further corroborating this current study finding. However, a study by Feng, Chen, Chen, & Pai (2010) showed no significant correlation between critical thinking and level of education in clinical nurses. A possible reason for the findings of the current study could be because, before one attains managerial status at the ICU, they must be able to supervise, represent and defend professional codes of practice as their subordinates will depend on them for instructions on cases that they are presented with. Also, as the age of nurses advanced, their professional development and practice competence improved. Generally, those above 40 years recorded

higher mean scores than those between 31 – 40 years and the latter age group also recorded higher mean scores than those between 21-30 years. The participants above 40 years in this study had a longer time in the service compared to their younger counterparts, as a result, they have relatively improved in their professional development and practice. This is because, with time, they may have attended many CPD programs and attended to many critical cases. Furthermore, it was not surprising that study participants with master's degrees had higher mean scores than those with bachelor's and diplomas. This finding may be explained by the significant experience gained through higher education, which complements their practical experience (Lee & Oh, 2020). Additionally, those with more than 4 years of work experience significantly recorded the highest mean score across the various competencies. As explained by Lee & Oh (2020) Less-experienced nurses find it challenging to utilize critical thinking due to the disconnect between theory and practice with their education and the actual workplace environment. Finally, nurses of senior officer rank significantly showed higher mean scores than officers and junior ranked nurses further corroborating the earlier discussion.

5.7 Demographic predictors of competence of nurses in the ICU

Competency is generally referred to as having the skill and ability to safely and effectively carry out a duty or deliver a service. Competencies are behavioral or holistic attributes that categorize, organize, and map learning outcomes and are often used in nursing to inform nursing curricula development and decision-making on health policies (Rietze, et al., 2018).

The current study observed that years of experience ($B=0.109$, $t=4.59$, $p<0.001$), Senior officer ($B=0.721$, $t=4.60$, $p<0.001$), and officer ($B=0.459$, $t=2.92$, $p=0.004$) ranks

significantly predicted the critical thinking competence of the ICU nurse. This result is consistent with the report of Zuriguel-Pérez, et al. (2018) which stated that years of employment and experience at different hospitals were elements that were strongly associated with critical thinking proficiency. Also, the results of this study are consistent with the study by Zuriguel-Pérez, et al. (2018), which indicated that levels of critical thinking were higher in nurse managers than in general staff (registered) nurses. Khanmoradi, Aghajanloo, Dinmohammadi, & Ramazani Badr (2021), also reported that clinical decision-making is significantly associated with age and work experience.

More so, the findings of this study indicated, that years of experience ($B=0.097$, $t=4.66$, $p<0.001$), Senior Officer ($B=0.608$, $t=3.87$, $p<0.001$ and Officer Ranks ($B=0.499$, $t=2.96$, $p=0.004$) significantly predicted the competence relating to professional development and practice of the ICU nurse. This finding indicates that increasing the number of years in practice increases one's professional development and practice competencies. This result is consistent with that of Mirlashari, et al. (2016) who reported a practice where the treatment of patients in the ICU must be delivered under the direction of and by neonatal intensive care nurses who have received specialized training and have at least five years of experience in the nursing field. A study conducted by Khanmoradi et al., (2021) indicated that Clinical decision-making is significantly associated with age, gender, and work experience. This is consistent with the findings of the current study that, years of experience, Senior Officer and Officer Ranks significantly predicted the competence relating to professional development and practice of the ICU nurse. This current study is also consistent with that of Okumura, Ishigaki, Mori, & Fujiwara (2019), which indicated that nurses with more years of experience working in ICUs scored higher on the C3Q

safety, compared with nurses with less experience. Additionally, their analysis showed that having more ICU experience was considerably more associated with higher ratings than having more overall nursing experience. This current study is inconsistent with that of (Lakanmaa et al., 2015) which indicated that experienced nurses who have worked in ICU rated their clinical competence higher than professional competence. This could be a result of the high technical and scientific talent required within the ICUs.

Years of experience ($B=0.091$, $t=4.65$, $p<0.001$), Degree qualification ($B= 0.353$, $t=3.267$, $p<0.001$) and Senior officer rank ($B=0.276$, $t=2.30$, $p=0.023$) significantly predicted the competence relating to communication and coordination of the ICU nurse.

Takase (2013), further agrees with the premise of the current findings that, the relationship between levels of nursing competence and the length of clinical experience showed a rapid increase in competence levels at the early stage of the nursing career and a slower increase later. The results supported the learning curve model and hence concluded that nursing competence development can be divided into two separate phases: a period of rapid expansion, followed by a period of stability. Nevertheless, the mode of increase may vary depending on which aspect of nursing competence is being examined. Numminen, Meretoja, Isoaho, & Leino-Kilpi (2013), also found age and work experience to positively correlate with competence. Nurses' self-assessed competence showed a general tendency to increase with age and with work experience, both in health care and in the current work unit. However, the competence level seemed to remain the same in older age groups and nurses with long work experience in medical and surgical clinical fields.

In the current study, years of experience ($B=4.678$, $t=4.80$, $p<0.001$), and senior rank [Senior officer ($B=25.031$, $t=3.42$, $p=0.001$) and officer ranks ($B=16.313$, $t=2.08$,

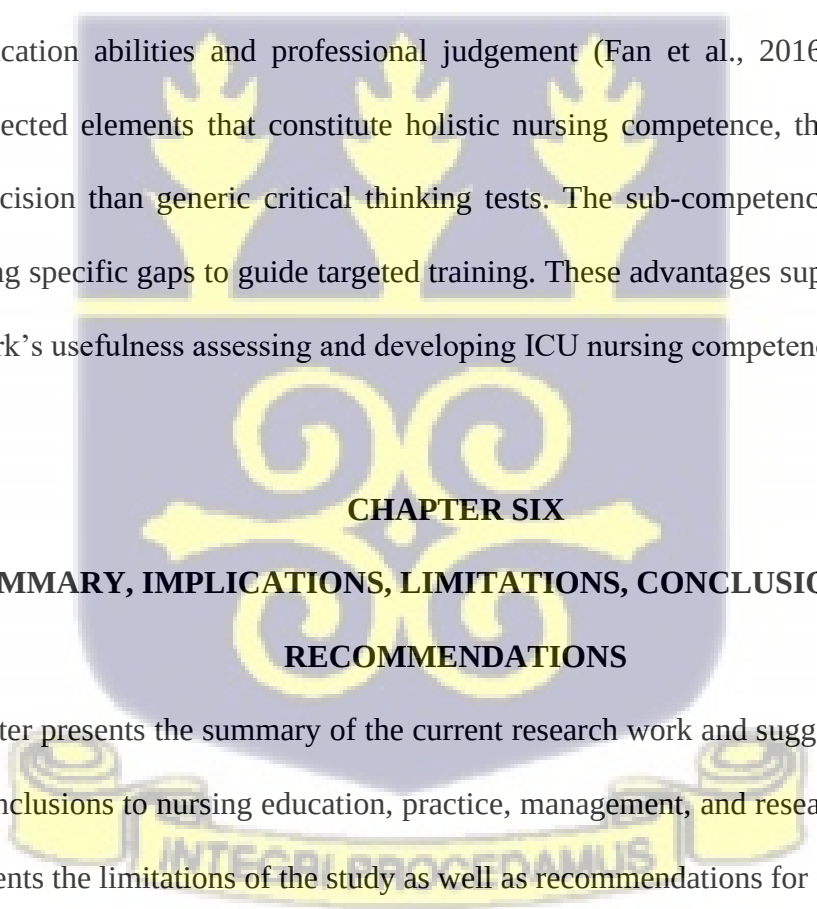
$p=0.040$)] were significant predictors of overall competence of the ICU nurse as well as with regards to critical thinking, professional development and practice, and communication and coordination. Concordant results have been reported by other studies (Adib Hajbaghery & Eshraghi Arani, 2018; Koskinen et al., 2014; Numminen et al., 2014; Salonen et al., 2007), where nurses in higher cadres and with more experience performed better than their opposing counterparts in lower cadres or with fewer years of work experience. For instance, in Numminen et al., (2014), nurse managers rated their nurses' competence (VAS score means) higher than self-assessed scores by the same nurses in the ICU to general nurses. In all other categories except the helping role, managers' assessment of the frequency of action was higher than nurses. Koskinen et al., (2014) had head nurses assess their competence to be higher than the general role of nurses. Salonen et al., (2007) studied newly registered nurses and found that nurses' self-assessed competence levels ranged from moderate to good. A statistically significant association was seen between competence level and age, length of current work experience, and the frequency of using competencies.

Years of experience and senior nurse leadership ranks predicted higher competence across all categories, after accounting for qualifications, specialty and other variables. This echoes studies finding enhanced critical thinking, coordination, ethical decision making and professionalism associated with extensive clinical exposure and managerial mentorship (Numminen et al., 2014; Schuelke & Barnason, 2015). It suggests longstanding organizational socialization processes play a key role in consolidating nursing competencies over time through communities of practice and role modeling (Wenger, 2010). Implications point to formally harnessing expertise diffusion from veterans to

novice nurses, especially through decentralized coaching relationships aside hierarchical reporting.

5.8 The usefulness of the model employed

The adapted Core Competence Framework Model provided a useful scaffold assessing multifaceted nursing competencies within complex ICU environments. Its validity was evidenced by significant positive correlations between measured constructs and factorial predictive analysis. This resonates with the model's origins characterizing emergency nursing competencies spanning cognitive aptitudes, integrated knowledge, clinical skills, communication abilities and professional judgement (Fan et al., 2016). By mirroring interconnected elements that constitute holistic nursing competence, the model offered more precision than generic critical thinking tests. The sub-competencies also enabled identifying specific gaps to guide targeted training. These advantages support the adapted framework's usefulness assessing and developing ICU nursing competencies.



CHAPTER SIX

SUMMARY, IMPLICATIONS, LIMITATIONS, CONCLUSIONS, AND RECOMMENDATIONS

The chapter presents the summary of the current research work and suggests implications of the conclusions to nursing education, practice, management, and research. The chapter also presents the limitations of the study as well as recommendations for future research.

6.1 Summary of The Study

Patients with critical illness or acute illness are encountered very commonly in the intensive care unit (ICU). The condition of these patients is usually life-threatening and could lead to a poor outcome or death if left untreated or not attended to promptly. The ICU provides specialized care directed at reversing or reducing the severity of such conditions and improving the survival and well-being of such patients. The ICU is manned by a team of specialists whose training is to meet the objectives of providing specialized care to increase survival and reduce the chances of a patient dying as a result of an acute or critical illness. The team is made up of Intensivists, medical doctors of varied specialties, and critical care nurses, among others. However, nurses and for that matter critical care nurses spend the most time with the patient providing specialized nursing care and monitoring the health of the patient, and liaising with the rest of the team to ensure the best health outcomes.

The ICUs of most hospitals in Ghana lack critical care nurses. Owing to that, nurses without the requisite training are employed to complement the effort of the very few critical care nurses. However, over the period these nurses learn at the bedside and others through training and workshops to improve their level of competence to cater for patients in the ICU.

It is, however, imperative that the competencies of nurses in the ICU be assessed from time to time to help the institution to address training needs and guide the recruitment of new staff to the ICU. Osei-Ampofo, et al. (2013) following their research firmly established that there are inadequate skilled critical care nursing experts in Ghana (Osei-Ampofo et al., 2013) and the few available are over-burdened with high volumes of work. Evidence suggests that a great proportion of nurses (generally) working in Ghana hospital ICUs lack the requisite critical care competencies expected in critical care nursing. This disparity may

result in the critically-ill patient suffering complications, prolonged stays at the ICU, and increased costs of care. There is a dearth of information on the accuracy of this assertion.

Korle-Bu Teaching Hospital (KBTH) is the premier tertiary referral center in Ghana and has the most ICUs in the country. The study aimed at assessing nurses' competence in the management of critically ill patients in the intensive care units of the KBTH. The areas of competence assessed included critical thinking, professional practice and development, and communication and coordination.

The findings from this study aim to provide baseline data and reference points for other studies related to nurses' competence in the ICUs. The findings of the study will also enhance leadership planning, educational initiatives, and quality management improvement in critical care training curriculum, future research, and policy formulation to improve competencies working in ICUs in Ghana and beyond.

A quantitative research approach and a cross-sectional correlational design were employed for this study. The study included all consenting registered nurses offering nursing care in the intensive care unit as well as those with critical care certificates who were present at the ICU during the study period. Nurses on clinical rotations and auxiliary nurses were excluded from the study since they work under supervision and would not provide a true picture of the competence of nurses in the ICU. Out of the minimum sample size of 38 participants, 133 were successfully recruited into the study using a simple random sampling technique. The study adopted a structured questionnaire consisting of validated scales from the Core Clinical Nursing Competence (CCNC) Scale, Korean Nurses 'Core Competency Scale (KNCCS), and the Competency Inventory for Registered nurses and the International

Council of Nurses (ICN). The questionnaire comprised 50 items and was divided into 3 sections based on the nurses' competencies in managing critically ill patients and covered all of the key theoretical constructs that were modified for this study. The questionnaire was in 2 major parts: demographics and competence assessment. Results were shown in tables for ease of visualization and interpretation. Competence scores were rated based on the Likert scale from Benner's model on competence: novice, advanced beginner, competent, proficient, and expert. Mean scores were compared by independent t-tests, correlations were also done using Pearson's moment correlation, and logistic regression was conducted using a step-wise (forward) method to determine factors that significantly predict competence among participants.

6.1.1 General competence in the ICU

Over 80% of nurses in the ICUs showed adequate competence concerning critical thinking, professional practice and development, and communication and coordination. Although this may be good, the concern is that nurses who may not be satisfactorily competent (approximately 20%) could still be a danger to some patients. Efforts to improve the level of competence of nurses in the ICUs would go a long way to save many lives, reduce the length of stay in the ICU, and invariably save both time and money for the patient and their relations.

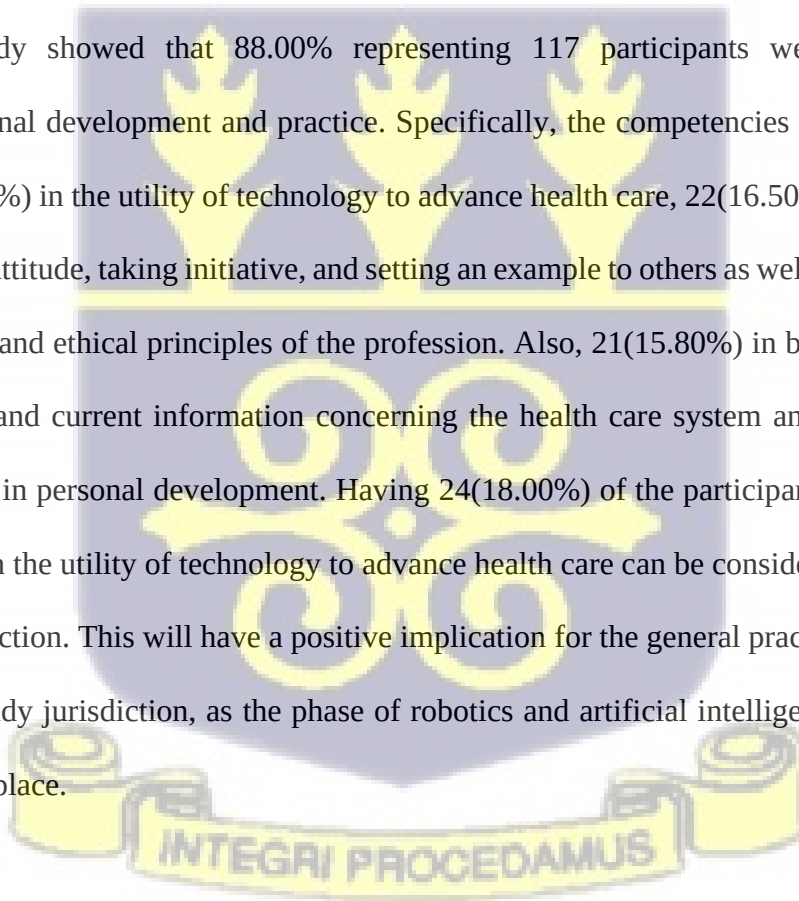
6.1.2 Critical thinking competence

Owing to the very busy and sometimes "chaotic" nature of the ICU, nurses would have to take certain decisions that may decide the recovery or deterioration, or even demise of the patient. These decisions must be timely or would result in an irreversible situation for the

patient. Competencies of nurses at the ICU in terms of critical thinking recorded 99 (74.40%) for reasoning, 101(75.90%) for prediction, 98 (73.70%) for decision making, 99 (74.40%) for problem-solving, 99 (74.40%) for evaluation and 102 (76.70%) for judgment. Although the competency level observed in the study appears to be appreciable, the proportion of low competency is alarming. This is alarming because the intensive care unit requires a high level of precision and accuracy in terms of handling patients in critical conditions lest they deteriorate further or even die.

6.1.3 Professional development and practice competencies

This study showed that 88.00% representing 117 participants were competent in professional development and practice. Specifically, the competencies recorded included 24(18.00%) in the utility of technology to advance health care, 22(16.50%) in displaying a positive attitude, taking initiative, and setting an example to others as well as understanding the legal and ethical principles of the profession. Also, 21(15.80%) in both understanding relevant and current information concerning the health care system and displaying self-direction in personal development. Having 24(18.00%) of the participants reporting to be experts in the utility of technology to advance health care can be considered a move in the right direction. This will have a positive implication for the general practice of health care in the study jurisdiction, as the phase of robotics and artificial intelligence are becoming commonplace.



6.1.4 Communication and coordination competence

Twenty-six (26) activities that depict participants' (ICU nurses) communication and coordination competencies in the ICU were assessed. The activities focussed on intra- and inter-personal communication, communication with families and colleagues in a culturally and religiously sensitive manner, written and verbal communication, sensitivity to emotions and ego of colleagues for effective and purposeful communication, and care coordination.

Over 80.00% of participants indicated proficiency in most of the activities assessed. Overall, less than one-tenth of the participants indicated they were novices or advanced beginners for all the activities assessed. The study realized that it was the younger and less experienced nurses who recorded low competence scores for communication and coordination. This finding agrees with the findings of Yoo *et al.*, who reported that Critical care nurses who were younger and less experienced have less developed communication skills than their older and more experienced colleagues (Yoo et al., 2020). Nurses who played leadership roles such as shift leaders, unit heads, and clinical facilitators also showed a higher level of competence in communication and coordination compared to the general pool of nurses in the ICU. The same participants (leaders) were found to be more experienced and older and thus also corroborating the findings of Yoo et al., 2020.

6.1.5 Demographic predictors of competence in the ICU

Logistic regression was employed to determine predictors of competence among the various categories for competence in the ICU nurse. A step-wise (forward) method was

employed. the forward regression method helped to deduce a model that would significantly explain the variance in the dependent variable (Competence). The model obtained explained 40.70% (Table 9i: in chapter 4) of the variance in the overall competence of the ICU nurse $R^2 = 0.407$, $F(4, 128) = 21.98$, $p < .001$. The model further suggested that years of experience ($B=4.678$, $t=4.80$, $p<0.001$), Senior officer ($B=25.031$, $t=3.42$, $p=0.001$) and officer ranks ($B=16.313$, $t=2.08$, $p=0.040$) significantly predicted the overall competence of the ICU nurse. Although degree (having a first degree) significantly predicted the overall competence in the earlier models it did not predict significantly ($B=10.479$, $t=1.638$, $p=0.104$) same in this model for the overall competency.

Hence, we may say that the years of experience and senior rank (Senior and Principal officer) happened to be the common predictors of competence of the ICU nurse with regards to critical thinking, professional development and practice, and communication and coordination in the ICU.

6.2 The Implication Of The Study

An ICU at any point in time has practicing nurses, students on clinical attachments and rotation, as well as supervisors and managers. All these categories of persons would benefit from the findings of the study because the findings have direct relevance to nursing practice, education, management, and research.

6.2.1 For nursing practice

Worldwide, it has been about 3-16% of hospitalized patients suffer injury as a result of wrong medical intervention, with higher adverse effects recorded in the intensive care units and emergency departments (Oyebode, 2013). Furtherance to that, (Brennan et al., 2004)

reported that of the 3.70% of adverse effects that occur with hospitalizations, 27.60% of these were due to poor decision-making by health workers resulting in 70.50% temporary disability cases, 2.60% permanent disability, and 13.60% led to mortalities. As already discussed, decision making which encompasses analyses, evaluation, and judgment is a subset of critical thinking. A little below 20% of participants were found not to have an appreciable competence when it comes to critical thinking. By this nurse managers, shift leaders, as well as clinical facilitators would have to work harder to bring their newly employed staff to speed in the shortest possible time, most likely within their first year of joining the ICU. New staff may also have to be placed under the direct supervision of experienced staff for training and mentoring. In the least, any nurse in the ICU after one year of training and supervisory oversight should at least be ranked as competent in the area of critical thinking.

Regarding professional practice and development, the study noted that nurses perceived themselves as competent in the areas of helping roles, managing circumstances, diagnostic functions, teaching, coaching, and work role abilities. This showed that administrative and supervisory positions received poor ratings whereas skills and duties related to ensuring quality and therapeutic interventions received good ratings. This could be rooted in the way nurses are trained and assessed with how they care and empathize with patients and less in the light of managerial skills. This is a challenge as it makes it difficult for the succession of leadership roles. Hence, managers would have to consciously mentor their subordinates to be able to take over their roles.

Communication and coordination among nurses in the ICU were relatively poor among the young and less experienced. Such groups in the ICU will need to be intentionally trained

and mentored in that aspect to improve the overall scores on communication and coordination of the ICU nurse. This can be further improved by allowing the young and less experienced nurses in the ICU to take special CPD programs within their first year of practice to translate into better health outcomes for patients.

6.2.2 For nursing education

Student nurses would have to be taught the art of critical thinking right from the classroom and their assessment (log) books must have scores for critical thinking ability. A conscious and intentional effort would have to be made about this to help reduce how long it would take to train the newly employed nurse in the ICU or any other department of the hospital. The curriculum for training nurses in the country would also have to include courses that help in developing the critical thinking skills of the student nurse.

Management roles in the ICU were scored relatively low from the perspective of the young and less experienced nurses. This is particularly so conspicuous in the case of nurses who have not had prior experience or exposure to another ICU. To get nurses to have relatively adequate knowledge and know-how on management roles, an intentional effort at the training institutions would have to be made to impart the art and science of playing leadership roles in the ICU. Also, communication skills that are nursing-related must be added to the curriculum on communication skills to improve the skill and ensure that newly employed graduates would be adequately equipped to function well in the ICU. There may be a need to train the tutors further in teaching and imparting the skill of communication and coordination generally so that they can also transfer the skill and knowledge efficiently to the student nurses.

6.2.3 For nursing research

The current study did not register a perfect (100.00%) score for competence among the participants. The ICU is a very sensitive unit in the hospital that can save the lives of many, reduce stay and cost during admission to the hospital, and prevent deterioration of patients' health when admitted early. Hence, it would be most desirable that competence scores would be perfect for all nurses who participated in the study. It is however not known what accounted for the low competence scores. Although the low competence scores were associated with age, rank, and years of experience, one cannot tell the finer details accounting for their performance.

A qualitative study or thematic approach which may employ interviews and focus group discussions to assess critical thinking, professional practice and development, and communication and coordination competencies among the participants would help unravel the finer details accounting for the low competency scores among some sections of participants. With this, a well-tailored approach can be taken to address the factors responsible for these deficiencies.

6.3 Limitations of the study

The results may not fully represent the competence of the entire nursing population in the ICUs as some staff was on leave and some did not consent to participate. Hence, the results of this study cannot be generalized to a larger context or other facilities in Ghana. Also, the study on nurses' competencies are limited to ICU nursing and exclude emergency and nursing in the general wards.

6.4 Conclusion

The results so far have given substantive evidence that more than 80% of the participants in this study are competent in critical thinking, professional development and practice, and communication and coordination in the ICU. Mean scores for competence were generally more favorable towards older nurses, those with more years of experience, higher ranks, higher levels of education, and those who played leadership roles. Also, years of experience and senior rank (Senior and Principal officer) happened to be the common predictors of competence of the ICU nurse with regards to critical thinking, professional development and practice, and communication and coordination in the ICU. However, it would be costly to have some staff of the ICU not appreciably competent to avert the demerits that come along with such deficits for ICU work. Stakeholders such as the management of KBTH, patients, patient's relatives, the nursing directorate, the Nursing Training Institutions, the nurses and Midwives Council (N&MC), and the Health Ministry and its agencies would have to team up to ensure that we have competent nurses at all times to safeguard patient health and safety and reduce lawsuits from patients and their relations for unsatisfactory performance.

In conclusion, most participants demonstrated competence in managing ICU patients, but some skills gaps existed, especially regarding decision making and health systems understanding. Seniority and experience predict higher competence, underscoring the need to bolster experiential learning and role modeling. An expanded competency development agenda using the study's adapted framework can guide strengthening ICU nursing practice in Ghana.

6.5 Recommendations

6.5a To the Ministry of Health

Korle-Bu Teaching Hospital is directly supervised by the Ministry of Health and it behooves the ministry to ensure that well-qualified and competent staff are recruited and employed to take up job positions in the hospital. It is recommended that the ministry:

- Ensures the establishment of well-tailored training programs that would ensure that the level of competence of nurses posted to the ICU is satisfactory.
- Should put in place through the management a system that guarantees at all times that nurses that have not been assessed as proficient enough in the exertion of some duties work strictly under supervision.
- Would liaise with the training institutions to revise the curricula to sharpen the acuity and proficiency of students during training for critical thinking, communication and coordination, as well as professional practice and development.

6.5b To the management of KBTH

Although the study showed a significant difference in the competency scores of nurses who had qualifications in critical care compared to the “others”, having a CCN qualification did not significantly predict competence for any of the categories assessed. This however does not preclude that there is no difference in performance between CCN and non-CCN staff at the ICU. It is however ideal to have persons with the requisite training for the ICU do that job than gamble with those not trained for the purpose. It is therefore recommended to the management of the KBTH:

- To employ more CCN-qualified nurses to manage patients in the ICUs

- To organize more training programs to help improve their skill and knowledge practically on patients in the ICU

6.5c To the intensive care facility management

The study has observed so far that having a CCN qualification is not a golden ticket to perform with the competence associated with experience, and senior rank in the ICU. The following are therefore recommended to the management or leadership of the ICU to ensure satisfactory performance and improvement in competence. The management:

- Must have a mentorship program that would help to quickly transfer knowledge and skill to newly employed and less experienced staff to ensure better health outcomes for the patients in the ICU.
- Must ensure that newly employed staff are well oriented and supervised to reduce the incidence of morbidity and mortality associated with novice and immature actions or inactions.
- Must deliberately groom the young staff for leadership roles which come by increasing knowledge and skill in handling all sorts of situations in the ICU. This could be done through the organization of various aptitude tests and simulations to assess their competence. A reward system should be introduced to encourage promising staff to aim for excellence in the exertion of their duties at all times.

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APPENDIX A: INTRODUCTORY LETTER



**UNIVERSITY
OF GHANA**

ID: 10754090

SCHOOL OF NURSING AND MIDWIFERY
COLLEGE OF HEALTH SCIENCES

27th July, 2021

**The Chairperson
Institutional Review Board
Korle-Bu Teaching Hospital
Accra.**

Dear Sir/Madam,

LETTER OF INTRODUCTION – ETHICAL CLEARANCE

I write to introduce to you **Esther Owusu-Takyi**, an MPhil Nursing student at the School of Nursing and Midwifery, University of Ghana, Legon.

The Scientific Review Committee of the School has approved the thesis topic: **“Assessing Nurses’ Competencies in Managing Critically Ill Patient in The Intensive Care Unit (ICU): A Study at The Korle-Bu Teaching Hospital.”**

As part of the School’s requirement, the student is required to obtain ethical clearance before embarking on data collection.

I hope that the Board will consider the proposal and grant her ethical clearance to enable her to undertake the study.

Thank you.

Yours faithfully,

**Charles A. Klutse
School Administrator**

P. O. Box LG 43, Legon, Accra, Ghana | Tel: +233 (0) 303 970 801
Email: nursing@ug.edu.gh | Website: www.nursing.ug.edu.gh



INTEGRI PROCEDAMUS

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APPENDIX B: LETTER OF SUPPORT FROM SUPERVISORS



**UNIVERSITY
OF GHANA**

SCHOOL OF NURSING AND MIDWIFERY
COLLEGE OF HEALTH SCIENCES

ID: 10754090

27th July, 2021

The Chairperson
Institutional Review Board
Korle-Bu Teaching Hospital
Accra.

Dear Sir/Madam,

LETTER OF SUPPORT – ETHICAL CLEARANCE

This letter is to support the application for ethical clearance of **Esther Owusu-Takyi**, an MPhil. Nursing student in the Department of Mental Health at the School of Nursing and Midwifery, University of Ghana, Legon.

As part of the programme, she is to undertake a research on the topic: “Assessing Nurses’ Competencies in Managing Critically Ill Patient in The Intensive Care Unit (ICU): A Study at The Korle-Bu Teaching Hospital.”

I hope that the ethics review Board will consider the proposal to enable her collect data.

Thank you.

Yours faithfully,


Ms. Patricia Avadu
Primary Supervisor

P. O. Box LG 43, Legon, Accra, Ghana | Tel: +233 (0) 303 970 801
Email: nursing@ug.edu.gh | Website: www.nursing.ug.edu.gh





**UNIVERSITY
OF GHANA**

SCHOOL OF NURSING AND MIDWIFERY
COLLEGE OF HEALTH SCIENCES

ID: 10754090

27th July, 2021

The Chairperson
Institutional Review Board
Korle-Bu Teaching Hospital
Accra.

Dear Sir/Madam,

LETTER OF SUPPORT – ETHICAL CLEARANCE

This letter is to support the application for ethical clearance of **Esther Owusu-Takyi**, an MPhil. Nursing student in the Department of Adult Health at the School of Nursing and Midwifery, University of Ghana, Legon.

As part of the programme, she is to undertake a research on the topic: “Assessing Nurses’ Competencies in Managing Critically Ill Patient in The Intensive Care Unit (ICU): A Study at The Korle-Bu Teaching Hospital.”

I hope that the ethics review Board will consider the proposal to enable her collect data.

Thank you.

Yours faithfully,

Dr. Samuel Adjorlolo
Secondary Supervisor

P. O. Box LG 43, Legon, Accra, Ghana | Tel: +233 (0) 303 970 801

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INTEGRI PROCEDAMUS



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APPENDIX C: STUDY APPROVAL BY THE KBTH STC

In case of reply the number
And the date of this
Letter should be quoted

My Ref. No.
Your Ref. No.



KORLE BU TEACHING HOS
P. O. BOX KB 77,
KORLE BU, ACCRA.

Tel: +233 302 667759/673034-
Fax: +233 302 667759
Email: Info@kbth.gov.gh
pr@kbth.gov.gh
Website: www.kbth.gov.gh

28th August, 2021

ESTHER OWUSU-TAKYI
SCHOOL OF NURSING AND MIDWIFERY
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA, LEGON

SCIENTIFIC AND TECHNICAL COMMITTEE APPROVAL
PROTOCOL IDENTIFICATION NUMBER: KBTH-STC 000133/2021

The Korle Bu Teaching Hospital Scientific and Technical Committee (KBTH-STC), on 28th August, 2021 approved your submitted study protocol.

TITLE OF PROTOCOL: "Assessing Nurses' Competencies in Managing Critically Ill Patient in the Intensive Care Unit. A Study at the Korle-Bu Teaching Hospital"

PRINCIPAL INVESTIGATOR: Esther Owusu-Takyi

This approval requires that you forward your approved document to Korle Bu Teaching Hospital –Institutional Review Board (KBTH-IRB) for the ethical aspect of the proposal to be assessed before the project can be initiated.

This STC approval is valid till 30th December, 2021

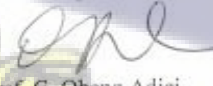
You may, however, request extension of the approval period, or renewal as the case may be, should the study extend beyond the stated period.

Upon completion, you are required to submit a final report on the study to the STC. This is to enable the STC ensure among others that, the project has been implemented as per the approved protocol. You are also required to inform the KBTH-STC and Research Directorate of any publications that may emanate from the research findings.

Kindly note that, should the need arise, the KBTH-STC or IRB may institute appropriate measures to satisfy itself that study is being conducted according to the highest scientific and ethical standards.

Please note that any modification to the study protocol without Scientific Technical Committee (STC) approval renders this approval invalid.

Sincere regards,


Prof. G. Obeng Adjei
Chairman, KBTH-STC

Cc: The Chairman, KBTH-IRB

APPENDIX D: IRB APPROVAL FROM KBTH

In case of reply the number
And the date of this
Letter should be quoted

My Ref. No. *KBTH/00133/21*
Your Ref. No.



KORLE BU TEACHING HOSPITAL
P. O. BOX KB 77,
KORLE BU, ACCRA.

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Website: www.kbth.gov.gh

30th August, 2021

ESTHER OWUSU-TAKYI
SCHOOL OF NURSING AND MIDWIFERY
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA, LEGON

**"ASSESSING NURSES' COMPETENCIES IN MANAGING CRITICALLY ILL
PATIENT IN THE INTENSIVE CARE UNIT: A STUDY AT THE KORLE-BU
TEACHING HOSPITAL"**

KBTH-IRB /000133/2021

INVESTIGATOR: Esther Owusu-Takyi

The Korle Bu Teaching Hospital Institutional Review Board (KBTH IRB) reviewed and granted approval to the study entitled: "Assessing Nurses' Competencies in Managing Critically ill Patient in the Intensive Care Unit: A Study at the Korle-Bu Teaching Hospital"

Please note that the Board requires you to submit a final review report on completion of this study to the KBTH-IRB.

Kindly, note that, any modification/amendment to the approved study protocol without approval from KBTH-IRB renders this certificate invalid.

Please report all serious adverse events related to this study to KBTH-IRB within seven days verbally and fourteen days in writing.

This IRB approval is valid till 30th June, 2022. You are to submit annual report for continuing review.

Sincere regards,

DR. DANIEL ANKRAH
VICE CHAIR (KBTH-IRB)
FOR: CHAIR (KBTH-IRB)

Cc: The Chief Executive Officer, KBTH
The Director of Medical Affairs

APPENDIX E: LETTER OF AFFIRMATION OF RECEIPT OF KBTH-IRB

In case of reply the number
And the date of this
Letter should be quoted

My Ref. No. KBTH/MS/STC/13/21

Your Ref. No.



KORLE BU TEACHING HOSPITAL
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Website: www.kbth.gov.gh

2nd September, 2021

ESTHER OWUSU-TAKYI
SCHOOL OF NURSING AND MIDWIFERY
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA
LEGON

**INSTITUTIONAL APPROVAL: KORLE BU TEACHING HOSPITAL-SCIENTIFIC
AND TECHNICAL COMMITTEE/INSTITUTIONAL REVIEW BOARD (KBTH-
STC/IRB/000133/2021)**

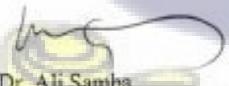
Following approval of your study entitled "Assessing Nurse' Competencies in Managing critically ill Patient in the Intensive Care Unit: A study at the Korle Bu Teaching Hospital" by the Korle Bu Teaching Hospital-Scientific and Technical Committee/Institutional Review Board.

I am pleased to inform you that institutional approval has been granted for the conduct of your study in Korle Bu Teaching Hospital.

Please contact the Head of Department to discuss the commencement date of the study.

Please note that, this institutional approval is rendered invalid if the terms of the Institutional Reviewed Board/Scientific and Technical Committee approval are violated.

Sincere regards,


Dr. Ali Samba
Director of Medical Affairs
For: Chief Executive

INTEGRA PROCE DAMUS

APPENDIX F: LETTER OF INTRODUCTION TO ALL ICUs

**MEDICAL DIRECTORATE
KORLE BU TEACHING HOSPITAL**

2nd September, 2021

LETTER OF INTRODUCTION – ESTHER OWUSU-TAKYI
“ASSESSING NURSES COMPETENCIES IN MANAGING CRITICALLY ILL PATIENT
IN THE INTENSIVE CARE UNIT: A STUDY AT THE KORLE BU TEACHING
HOSPITAL”

I have the pleasure to introduce to you the above named Investigator from School of Nursing and Midwifery, University of Ghana, Legon. Esther Owusu-Takyi sought and has been granted approval to conduct a study entitled: “Assessing Nurses competencies in managing critically ill Patient in the Intensive Care Unit: A study at the Korle Bu Teaching Hospital”.

She is to contact you to discuss the commencement date of the study.

Please verify her identity with a Government issued National ID card and accord her the needed assistance.

Attached is the Scientific and Technical Committee and Institutional Review Board approval, which specifies the terms.

Sincere regards,



Dr. Ali Samba
Director of Medical Affairs
For: Chief Executive

DISTRIBUTION

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- CHILD HEALTH, KBTH
- RECONSTRUCTIVE PLASTIC SURGERY & BURNS CENTRE, KBTH
- PAEDIATRICS UNIT, KBTH

APPENDIX G: PARTICIPANT CONSENT FORM

Title: Assessing Nurses' Competencies in Managing Critically Ill Patient in the Intensive Care Unit a Study at the Korle-Bu Teaching Hospital

Principal Investigator: Esther Owusu-Takyi

General Information about Research

Your participation in this study will contribute to building knowledge that will help in developing nurses' competencies in managing critically ill patient in the intensive care unit. You will be required to complete a questionnaire that may take 15-20 minutes of your time. Your responses will be confidential and your participation in this study is voluntary. Your candid response to this questionnaire will be appreciated.

Possible Discomforts: You may experience some discomfort responding to the questions. Some may be easy and others difficult and sensitive. Answer them to the best of your ability knowing that a true assessment will influence the translation of the findings into practical interventions for an improved care in the ICU. You can withdraw from participating at any time and be rest assured will not put you at a disadvantage from the researcher or your superiors.

Possible Benefits: The current study when completed will provide vital information to perceived competent level of staff working in the intensive care units in Ghana. The study will unearth the kind of training needed by the staff in the ICU to enable them work effectively. The relationship between nursing education level and the competencies required for ICU care would be established. Furthermore, the findings from this study will inform policies to guide proper training and the recruitment of staff into the ICU for clinical practice. Also, the findings of the research will add to the existing knowledge in the area of critical care nursing and will guide and stimulate future studies in this area.

Confidentiality: Any information obtained from you during the study would be treated confidential. This means that you would not be identified individually in any way as a result of your participation in this research.

Voluntary Participation: Participation in this study is entirely voluntary. You may refuse to participate in this research without suffering any consequences.

Contacts for Additional Information: Esther Owusu-Takyi, University of Health and Allied Sciences, Ho. PMB 31, Mobile 0243066703, Email: eowusu-takyi@st.ug.edu.gh

Your right as a Participant: This research has been reviewed and approved by the Institutional Review Board of Korle Bu Teaching Hospital for Medical Research (KBTH-IRB). If you have any questions about your rights as a research participant you can contact the IRB Office between the hours of 8am-5pm through the landline 0302666766 or email addresses: rdo@kbth.gov.gh

VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research title (ASSESSING NURSES COMPETENCE IN MANAGING CRITICALLY ILL PATIENT IN THE INTENSIVE CARE UNIT, A STUDY AT THE KORLE-BU TEACHING HOSPITAL IN GHANA) has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

Date

Signature

APPENDIX G: PARTICIPANT CONSENT FORM CONT'D

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

Name of witness

Signature of witness

Date

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

Name of Person (Researcher) who Obtained Consent

Signature of Person (Researcher) Who Obtained Consent

Date

Assigned Questionnaire number.....



APPENDIX H: RESEARCH QUESTIONNAIRE

QUESTIONNAIRE ON ASSESSING NURSES' COMPETENCIES IN MANAGING CRITICALLY ILL PATIENT IN THE INTENSIVE CARE UNIT.

Department/Unit: _____

By completing this questionnaire, you will be contributing to the goal of assessing nurses' competencies in managing critically ill patient in the intensive care unit. Your responses will be confidential and your participation in this study is voluntary. Your candid response to this questionnaire will be appreciated.

Questionnaire Number: _____

Date: _____

Please read all questions first and choose or tick the appropriate answer or write your comment in the space provided

SECTION A

DEMOGRAPHIC DATA

1. Age (years).....
2. Gender: ☐ Female ☐ Male others (specify).....
3. Which of the following specialties do you already have? (Tick as many as applicable).
☐ Registered General Nursing
☐ Registered Midwifery
☐ Community Health Nursing
☐ Ophthalmic Nursing
☐ Critical Care Nursing
Others(Specify).....
4. What is your level of qualification?
☐ Diploma ☐ Degree ☐ Masters ☐ PhD
5. How long have you worked in the ICU?.....
6. What is your rank?.....

APPENDIX H: RESEARCH QUESTIONNAIRE CONT'D

7. What is your status in the ICU?
☐ Unit manager ☐ shift leader ☐ Clinical facilitator ☐ Staff
 Other (please specify)
8. Please choose from among the list which ICU discipline you have the most experience
 Trauma ICU ☐ Surgical ICU ☐ Medical ICU ☐ Pediatric ICU ☐ NICU ☐
 Neurology ICU ☐ Cardiothoracic ICU ☐ Obs & Gynae ICU ☐ General ICU ☐
 Reconstructive ICU ☐ Emergency ICU ☐ Other (Please specify).....
9. How will you rate your level of competence with regard to managing critically ill patients?
☐ Novice ☐ Advanced beginner ☐ Competent
☐ Proficient ☐ Expert
10. Do you for care for the critically ill patient under supervision?
☐ Yes ☐ No ☐ Sometimes
11. How often do you care for the critically ill patient under supervision?
☐ Never ☐ Sometimes ☐ Most of the time ☐ All the time
12. Are you a licensed critical care nurse? ☐ Yes ☐ No.
13. For how long have you been attending continuous professional development programs (CPD) on care of critically ill patients?
☐ 1-2 years ☐ 3-4 years ☐ 5 years and above
14. How often do you attend training programs on care of critically ill patients in a year?
☐ Once ☐ Twice ☐ Thrice ☐ 4 times ☐ 5 times ☐ >5 times
15. Do you independently retrieve information on intensive and critical care nursing?
☐ Yes ☐ Sometimes ☐ No
16. Do you use nursing journals in information retrieval on intensive and critical care nursing?
 Yes ☐ ☐ No
 Choose below all that apply if you ticked yes
 (i) International scientific journals ☐
 (ii) National scientific journals ☐
 (iii) Professional journals ☐

APPENDIX H: RESEARCH QUESTIONNAIRE CONT'D**SECTION B**

Nurses critical thinking, professional practice competencies and coordination competencies in the managing of the critically ill in the ICU.

The Benner's Clinical Competency scale (Benner, 1982) will be used to guide responses to the questionnaire below following a 5-point Likert-type scale and interpreted as follows:

Scale	Level of clinical competence	Interpretation of Competence
1	Novice or beginner	Has no background experience of the situation they are handling; may have basic background information from theory but often are unable to discern application of this knowledge. Novices are taught rules to help them perform.
2	Advanced Beginner	Can demonstrate marginally acceptable performance and have had some prior experience. During this phase the nurse needs assistance setting priorities but can perform the task independently. People in this stage function primarily by rules or task orientated learning.
3	Competent	The nurse now has the basic skills down and is hardwired. They now recognize patterns and apply critical thinking to the task at hand. They can also independently set priorities and goals and manage complex situations. Employees in this area usually have 2-3 years of experience in the given area or skill. The conscious, deliberate planning characteristic of this level helps achieve efficiency and organization.
4	Proficient	The nurse now has a deep understanding of the situation and less conscious planning is necessary. Their practice is efficient and flexible. Employees in this area usually have 3-5 years of experience in the given area or skill.
5	Expert	The employee no longer relies on analytic principles (rules, guidelines) to connect their understanding of the situation to an appropriate action. The expert operates from a deep understanding of the total situation. Employees in this area usually have more than 5 years of experience in the given area.

APPENDIX H: RESEARCH QUESTIONNAIRE CONT'D

	Critical thinking competencies in the care of the critically ill in the ICU	1	2	3	4	5
17.	I defend decisions using scientific knowledge principles (reasoning)					
18.	I identify priority risk in clinical situations (prediction)					
19.	I make decisions that reflect both knowledge of facts and good judgment (decision making)					
20.	I figure out more than one way to solve confronting clinical problems (problem solving)					
21.	I integrate pertinent data from multiple sources (evaluation)					
22.	I assess all health dimensions of patient, i.e. physical, psycho-social, spiritual aspects (judgment)					
23.	I make nursing and intervention decisions based on knowledge acquired from nursing education programs (decision making)					
24.	I prioritize nursing interventions as relevant to the patient (judgment)					
	Professional development and practice competencies in the care of the critically ill in the ICU					
25.	I understand role of professional organizations and actively participates in them					
26.	I display self-direction in personal development					
27.	I use learning opportunities for ongoing personal and professional growth					
28.	I recognize own learning needs					
29.	I demonstrate self-awareness of personal limitations & strengths					
30.	I understand relevant and current information concerning health care system					
31.	I understand Legal and ethical principles of the profession					
32.	I use expertise and professional skills					
33.	I display a positive attitude, take initiative and set an example to others					

APPENDIX H: RESEARCH QUESTIONNAIRE CONT'D

34.	I assume responsibility and accountability for own role in the nursing care					
35.	I identify hazards to patient safety and make the necessary quality improvements to prevent harm					
36.	I recognize the importance of quality improvement and perform actions relating to this					
37.	I understand and perform the needs of socially-disadvantaged and vulnerable groups as their objectives					
38.	I provide nursing care that integrates needs of patients and their family					
39.	I incorporate relevant research findings into nursing practice					
40.	I utilize technological advances to improve nursing and health care					
	Communication and coordination competencies in the care of the critically ill in the ICU	1	2	3	4	5
41.	I am able to provide culturally-sensitive care					
42.	I am able to identify and include immediate patient needs in the plan of nursing care					
43.	I give emotional support to families					
44.	I develop a nursing care plan for a specific patient based on a primary and secondary data base					
45.	I deliver accurate, comprehensive and effective nursing in accordance with the plan of care					
46.	I involve the patient and family in the planning and implementation of care					
47.	I use different ways to search for information					
48.	I assist in the clinical research data collection					
49.	I detect and document significant changes in a patient's condition					
50.	I evaluate results of nursing care interventions					
51.	I adjust actions in relation to other's actions					
52.	I cooperate with other care providers helping to meet patient needs					
53.	I communicate facts, ideas and feelings to other health team member verbally					
54.	I build trust by keeping word, commitments, and promises					
55.	I acknowledge the differences in beliefs and cultural practices of individuals/groups					
56.	I show willingness to share workload when needed					

APPENDIX H: RESEARCH QUESTIONNAIRE CONT'D

57.	I express facts and thoughts in writing in a clear and organized					
58.	I express disagreements in a constructive manner					
59.	I verbally communicate issues, emotions and thoughts relating to the nursing practice					
60.	I exchange constructive feedback and criticisms between colleagues					
61.	I support nursing students to reach the objectives of their clinical training					
62.	I incorporate the needs of the individual into the nursing plan or adapt it as necessary					
63.	I assess the progress of nursing care or patient education with relevant members of the healthcare team					
64.	I document medical records to promote better communication between team members					
65.	I communicate to patients the procedural aspects, contents and purposes of the medical service that they will receive					
66.	I give comprehensive report of the patient's condition during ward rotations or during delegation or transfer of roles					

Thank you for agreeing to participate in this study



APPENDIX I: KOREAN NURSES' CORE COMPETENCY SCALE

Appendix 1. Korean Nurses' Core Competency Scale (KNCCS).

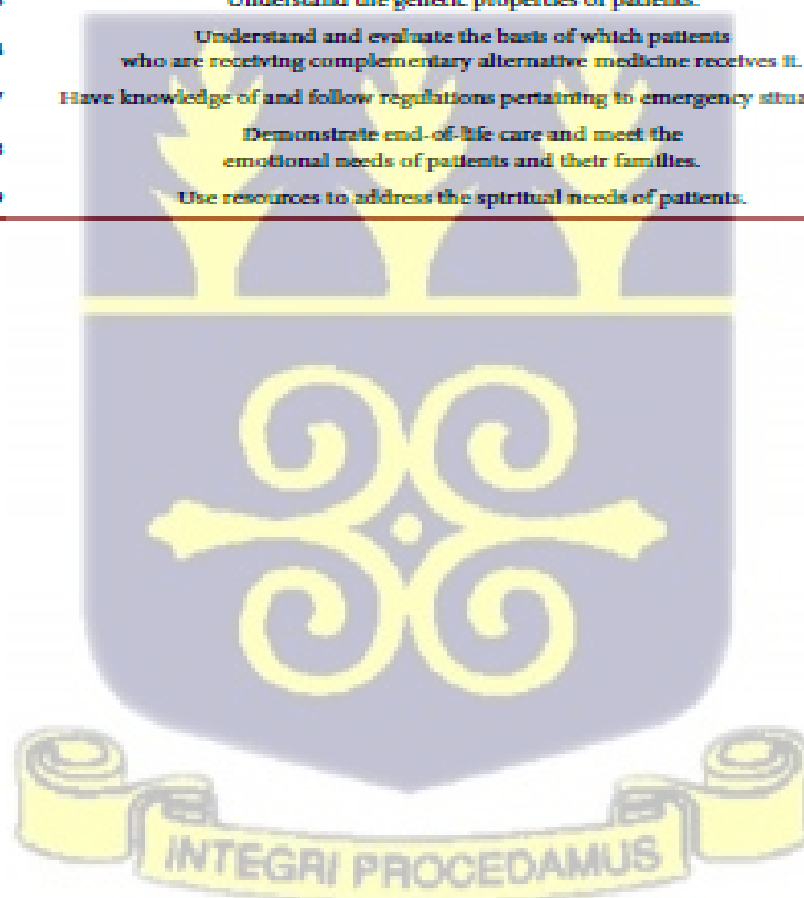
Item no.	Subscales and item titles	Factor loading
Subscale 1–Human understanding and communication skills		
34	Help patients to articulate thoughts and emotions about their health.	0.66
40	Verbally communicate issues, emotions, and thoughts relating to the nursing practice.	0.62
50	Recognize patients as spiritual beings requiring spiritual care.	0.62
39	Exchange constructive feedback and criticism between colleagues.	0.59
37	Help families of patients to respect patient autonomy through sufficient consultations.	0.58
48	Recognize the support and the help that colleagues need.	0.58
36	Demonstrate therapeutic communication skills, such as sympathy, listening skills, restating patients' accounts, and clarifying an issue.	0.55
41	Establish productive working relationships with colleagues and within the healthcare institution.	0.54
49	Explain coherently the physical, the mental, and the social needs of a patient.	0.54
38	Support nursing students to reach the objectives of their clinical training.	0.53
51	Understand the different needs of patients from culturally diverse backgrounds in a cross-cultural society.	0.51
47	Recognize the values, the strengths, and the weaknesses of self.	0.51
45	Seek help to relevant persons for nursing resources (including human resources).	0.49
52	Incorporate the needs of the individual into the nursing plan or adapt it as necessary.	0.49
43	Assess the progress of nursing care or patient education with relevant members of the healthcare team.	0.43
46	Document medical records to promote better communication between team members.	0.43
54	Teach patients through appropriate educational mediums or those preferred by the patient.	0.42
35	Communicate to patients the procedural aspects, contents, and purposes of the medical service that they will receive.	0.41
53	Provide a differential approach to patient education according to the developmental stage of the patient.	0.40
42	Plan nursing interventions that reflect opinions of multidisciplinary teams.	0.35
44	Give a comprehensive report of the patient's condition during ward rotations or during delegation or transfer of roles.	0.35
Subscale 2–Professional attitudes		
59	Practice in accordance to the philosophy, the policies, and the values of the healthcare institution.	0.73
60	Adhere to the legal and ethical roles and responsibilities of a nurse.	0.72
64	Display a positive attitude, take initiatives, and set an example to others.	0.70
58	Participate actively in educational and research activities for personal and professional development.	0.70
61	Assume responsibility and accountability for own's role in nursing care.	0.70

Continued

63	Participate in enhancing the nursing profession by becoming involved in nursing associations or council activities.	0.67
57	Have a clear professional identity as a nurse.	0.65
62	Identify hazards to patient safety and make the necessary quality improvements to prevent harm.	0.64
65	Use self-reflective practice to prevent exhaustion of personal mental and physical resources.	0.60
66	Delegate nursing responsibilities appropriately and accept accountability for the consequences.	0.51
68	Recognize the importance of quality improvement and perform actions relating to this.	0.47
70	Communicate opinions on health policy as a member of society and as an expert in the medical healthcare profession.	0.46
69	Understand and perform the needs of socially-disadvantaged and vulnerable groups as their advocates.	0.44
Subscale 3-Critical thinking and evaluation		
7	Make nursing and intervention decisions based on knowledge acquired from nursing education programs.	0.66
6	Prioritize nursing interventions as relevant to the patient.	0.62
2	Interpret both subjectively and objectively-collected patient data.	0.60
4	Practice evidence-based nursing care.	0.60
3	Identify and use resources required for nursing care.	0.59
9	Consider the specific situation of the patient when making decisions in nursing care.	0.58
10	Judge the relevance of the decisions or instructions of various multidisciplinary experts.	0.54
1	Predict potential clinical hazardous situations of a patient.	0.53
8	Make decisions in nursing care that takes into account ethical values.	0.52
5	Use findings of nursing research in nursing practice.	0.51
15	Assess changes in patients continuously.	0.50
17	Systematically evaluate results of nursing care and level of patient satisfaction.	0.49
11	Provide nursing care that integrates needs of patients and their families.	0.47
12	Undertake decisions about the most optimal care for patient in multiple perspectives.	0.43
Subscale 4-General clinical performance		
20	Use mechanical devices required for nursing care.	0.69
22	Administer drugs safely and accurately.	0.63
19	Perform the basic nursing techniques in nursing practice.	0.63
21	Use information technology in nursing care.	0.61
32	Share appropriate knowledge of self-care and teach techniques relating to this to patients impending discharge.	0.55
23	Have knowledge of the pharmacological effects and of the potential adverse effects of a drug and monitor the outcome accordingly.	0.54
31	Establish a plan of discharge for a discharging patient.	0.53

Continued

13	Be knowledgeable enough to understand the pathophysiological state of a patient.	0.42
33	Provide discharging patients with information to resources of the local community and of community health centers.	0.40
30	Adapt teaching to the needs of the patient and family.	0.40
14	Practice accurate nursing assessment such as nursing history and physical examination through questioning.	0.39
16	Practice following a plan of nursing care.	0.37
18	Comply with nursing standards and protocols of the healthcare institution.	0.34
Subscale 5-Specific clinical performance		
56	Plan a tailored nursing intervention that considers the patient's genetic characteristics.	0.61
26	Perform nursing care required by critically ill patients.	0.59
27	Practice physical nursing that includes symptom management in patients approaching their end of life.	0.58
25	Take appropriate actions in emergency situations as a member of the medical team.	0.56
55	Understand the genetic properties of patients.	0.56
24	Understand and evaluate the basis of which patients who are receiving complementary alternative medicine receives it.	0.51
67	Have knowledge of and follow regulations pertaining to emergency situations.	0.43
28	Demonstrate end-of-life care and meet the emotional needs of patients and their families.	0.34
29	Use resources to address the spiritual needs of patients.	0.08



APPENDIX J: COMPETENCY INVENTORY FOR REGISTERED NURSES

# Item	Dimensions and item statements	Factor loading
<i>Dimension 1 – clinical care</i>		
2	Provides culturally-sensitive care	0.725
29	Identifies and includes immediate patient needs in the plan of nursing care	0.686
5	Give emotional support to families	0.670
9	Assesses all health dimensions of client, i.e. physical, psycho-social, spiritual aspects	0.657
12	Develops a nursing care plan for a specific patient based on a primary and secondary data base	0.641
16	Delivers accurate, comprehensive and effective nursing in accordance with the plan	0.532
21	Involves the patient and family in the planning and implementation of care	0.517
26	Utilizes technological advances to improve nursing and health care	0.455
3	Detects and document significant changes in a patient's condition	0.403
40	Evaluates results of nursing care interventions	0.327
<i>Dimension 2 – leadership</i>		
30	Recognizes other's contribution and achievement	0.605
34	Accepts and uses constructive criticism	0.625
35	Delegates responsibility for care based on assessment of abilities of individuals	0.581
38	Gets group approval in important matters before acting	0.531
41	Acts to develop an atmosphere for teamwork and cooperation	0.524
45	Promotes cooperation, trust, and open exchange of ideas	0.510
51	Resolves conflict in a positive way	0.472
13	Identifies and understands others' personal strengths and weaknesses	0.402
15	Coordinates the relation between nurses and all related personnel	0.369
<i>Dimension 3 – interpersonal relation</i>		
19	Adjusts actions in relation to other's actions	0.725
24	Cooperates with other care providers solving to meet patient needs	0.606
32	Communicates facts, ideas and feelings to other health team member verbally	0.590
36	Builds trust by keeping word, commitments, and promises	0.571
37	Acknowledges the differences in beliefs and cultural practices of individuals/groups	0.478
57	Shows willingness to share workload when needed	0.442
4	Expresses facts and thoughts in writing in a clear and organized way	0.361
23	Expresses disagreements in a constructive manner	0.337
<i>Dimension 4 – legal/ethical practice</i>		
10	Carries out nursing practice according to legal requirements and organizational policy	0.646
11	Functions in accordance with legislative and common law affecting nursing practice	0.576
27	Takes responsibility for one's own performance	0.567
33	Serves as an advocate for the rights of clients or groups	0.556
39	Respects the patient's/client's right to privacy	0.547
46	Ensures confidentiality and security of written and verbal information acquired in a professional capacity	0.515
47	Reports all perceived malpractice incidents to responsible persons	0.506
52	Respects the patient's/client's right to choice and self-determination in nursing and health care	0.425
<i>Dimension 5 – professional development</i>		
6	Understands role of professional organizations and actively participates in them	0.602
58	Displays self-direction in personal development	0.582
55	Uses learning opportunities for ongoing personal and professional growth	0.479
56	Recognizes own learning needs	0.357
28	Demonstrates self-awareness of personal limitations & strengths	0.353
31	Understands relevant and current information concerning health care system	0.310
<i>Dimension 6 – teaching-coaching</i>		
48	Identifies learning needs of others including patients, families, and junior nurses	0.578
43	Coaches junior nurses to meet both the task needs and their developmental needs	0.510
20	Takes up the preceptor role to support new nurses in adapting to a new working environment	0.491
18	Initiates the appropriate orientation programs for new nurses	0.484

continued: COMPETENCY INVENTORY FOR REGISTERED NURSES

# Item	Dimensions and item statements	Factor loading
8	Uses opportunities for patient teaching when they arise	0.463
42	Develops an explicit teaching strategy to teach patients and families	0.367
<i>Dimension 7 – critical thinking/research aptitude</i>		
54	Defends decisions using scientific knowledge principles	0.613
1	Identifies priority risk in clinical situations	0.603
49	Makes decisions that reflect both knowledge of facts and good judgment	0.561
22	Figures out more than one way to solve confronting clinical problems	0.553
44	Assists in the clinical research data collection	0.471
7	Integrates pertinent data from multiple sources	0.360
17	Uses different ways to search for information	0.343
53	Incorporates relevant research findings into nursing practice	0.319



APPENDIX K: ICN FRAMEWORK OF COMPETENCIES FOR THE NURSE**SPECIALIST****ICN Framework of Competencies for the Nurse Specialist****Accountability**

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Accepts accountability for own professional judgement, actions, outcomes of care and continued competence in accordance with scope of practice, increased responsibility, legislative acts and regulations.	Accepts accountability for increased responsibility, for own professional judgement, actions, outcomes of care and continued competence in accordance with scope of practice, legislative acts and regulations.	- Specialist scope of practice - Codes of practice of other professionals involved in multidisciplinary team work - Concepts of shared competencies, responsibility and accountability - Professional supervision of practice – legal and institutional policies and protocols
Recognises the limits of scope of practice and own competence.	Recognises the limits of scope of practice and own competence.	
Seeks guidance from appropriate others when encountering situations beyond own knowledge, competence or scope of practice.	Consults with or refers to appropriate others when encountering situations beyond own knowledge, competence or scope of practice.	
Recognises and respects the different levels of accountability for the range of available personnel.	Recognises and respects different levels of accountability for the range of available personnel.	
Participates in activities related to improving access to the range of services required for effective health services.	Participates in activities related to improving access to the range of services required for effective specialist services.	

Ethical Practice

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Practises in a manner that conforms to the <i>ICN Code of Ethics for Nurses</i> , the professional code in force in the jurisdiction and employer's code of conduct.	Practises in a manner that conforms to the <i>ICN Code of Ethics for Nurses</i> , the professional code in force in the jurisdiction and employer's code of conduct.	- Contemporary ethical issues specific to specialty practice area in daily practice and in exceptional situations - Approaches to ethical decision-making – analysing and proposing solutions - Advocacy strategies for the client/patient, for specialist service, supportive policies and resources at strategic levels (e.g. gaps in service, resource issues, education of health professionals, legal barriers) - Human and health rights instruments available in context of care and their applications in specialty practice area - Confidentiality and privacy specific to specialty practice area - Concepts of society, custom, beliefs and values specific to specialty practice area and impact on health care - Knowledge of practices and beliefs in ethnic/religious groups specific to specialty practice area: - Communication - Food - Personal hygiene - Physical contact - Family - Religious requirements - Health practices - Adapting practice to meet ethnic/religious beliefs and practices - Strategies for dealing with harmful traditional practices - Safety (of practice and environmental) concerns specific to specialty practice area
Engages in effective ethical decision-making with respect to own professional responsibilities or where ethical issues affect the broader health care team.	Engages in effective ethical decision-making with respect to own professional practice areas or where ethical issues affect the broader health care team.	
Acts in an advocacy role to protect human rights and questions violations of client in accordance with jurisdictional and the <i>ICN Code of Ethics for Nurses</i> .	Acts in an advocacy role to protect human rights and questions violations of client in accordance with jurisdictional and the <i>ICN Code of Ethics for Nurses</i> .	
Maintains confidentiality and security of written, verbal and electronic information acquired in a professional capacity.	Maintains confidentiality and security of written, verbal and electronic information acquired in a professional capacity.	
Respects the client's right to privacy and dignity.	Respects the client's right to privacy and dignity.	
Respects the client's right to information, choice and self-determination in nursing and health care.	Respects the client's right to information, choice and self-determination in nursing and health care.	
Challenges behaviour and health care practice that could compromise client safety, privacy or dignity.	Challenges behaviour and health care practice that could compromise client safety, privacy or dignity.	
	Demonstrates professional integrity, probity and ethical conduct in response to industry marketing strategies when prescribing drugs and other products.	

APPENDIX K: ICN FRAMEWORK OF COMPETENCIES FOR THE NURSE SPECIALIST CONT'D

Legal Practice

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Practises in accordance with professional, relevant civil legislation and regulations.	Practises in accordance with professional, relevant civil legislation and regulations including those specific to specialty practice area.	▪ Laws relevant to practice in specialty practice area including special rights and service access issues ▪ Professional regulation of specialty practice area including obtaining and maintaining registration/licence ▪ Codes/rules/regulations specifically pertaining to specialty practice area
Practises in accordance with jurisdictional and local policies and procedural guidelines.	Practises in accordance with jurisdictional and local policies and procedural guidelines.	
Recognises and acts upon breaches of law relating to the professional role and/or professional code of conduct/code of practice.	Recognises and acts upon breaches of law relating to the professional role and/or professional code of conduct/code of practice.	

Principles of Care Provision

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Uses knowledge from nursing, health and other disciplines combined with best available evidence to explain nursing decisions and interventions.	Uses knowledge from nursing, health and other disciplines combined with best available evidence to explain nursing decisions and interventions.	▪ Knowledge of national and local resources (e.g. information, support groups, services) available relevant to specialty practice area ▪ Theoretical underpinning of nursing practice in clinical specialty ▪ Case management: – Components of case management – Case management models – Role in case management ▪ Skills: – Case management – Principles of disaster planning – Special requirements for patients in specialty practice area in disaster situations – Strategies to ensure disaster measures meet and continue to be relevant to specialty needs
Applies contemporary knowledge from different sources and the best available evidence to base professional decision-making and practice.	Applies contemporary knowledge from different sources and specialty practice area and the best available evidence to base professional decision-making and practice.	
Applies critical thinking skills and a systems approach to problem solving and nursing decision-making across a range of professional and care delivery contexts.	Applies critical thinking skills and a systems approach to problem solving and nursing decision-making and specialty care delivery contexts.	
Delivers care consistent with professional and organisational standards, policies, protocols and procedures.	Delivers care consistent with professional and organisational standards, policies, protocols and procedures applicable to specialist nursing practice.	
Recognises culturally sensitive needs and adapts practice accordingly.	Recognises culturally sensitive needs and adapts practice accordingly.	
Incorporates traditional healing practices valued by clients and with proven beneficial or harmless effects into care activities.	Incorporates traditional healing practices valued by clients and with proven beneficial or harmless effects into care activities.	
Applies advocacy skills to assist clients unable to represent or speak for themselves.	Applies advocacy skills to assist clients unable to represent or speak for themselves regarding specialty care requirements.	

APPENDIX K: ICN FRAMEWORK OF COMPETENCIES FOR THE NURSE SPECIALIST CONT'D

Principles of Care Provision (contd)

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Acts as an information and education resource for clients seeking to improve life styles, adopt illness/injury prevention activities and cope with changes in health, disability and death.	Acts as an information and education resource in the specialty practice area for clients seeking healthier life styles, adopt illness/injury prevention activities and cope with changes in health, disability and death.	
Provides guidance/instruction in the development and/or maintenance of independent living skills.	Provides guidance/instruction in the development and/or maintenance of independent living skills.	
Recognises opportunities and provides guidance/education to individuals, families and communities to encourage adoption of illness prevention activities and maintenance of healthy lifestyles.	Recognises opportunities and provides guidance/education to individuals, families and communities to encourage adoption of illness prevention activities and maintenance of healthy lifestyles.	
Selects teaching/learning strategies appropriate to the needs and characteristics of the individual or group.	Selects teaching/learning strategies appropriate to the needs and characteristics of the individual or group.	
Evaluates learning outcomes and modifies teaching/learning approaches and content accordingly.	Evaluates learning outcomes and modifies teaching/learning approaches and content accordingly.	
Demonstrates awareness of major developments and the potential application of current communication/health technologies in health care.	Keeps abreast of developments and potential applications of emerging communication/health technologies in health care.	

Health Promotion

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Maintains own health and personal fitness for/at work.	Maintains own health and personal fitness for/at work.	▪ Impacts of national and local health and social policies that affect specialty practice area ▪ Agencies – governmental and non-governmental – involved in providing services relevant specialty practice area ▪ National and local health promotion and prevention strategies in specialty practice area ▪ Knowledge of tools for health promotion and disease prevention suitable for use with individuals, groups and communities including screening, counselling and anticipatory guidance specific to specialty practice area ▪ Approaches to providing timely information and education about disease to patients/clients, family and others about treatments, the effects, and self-management strategies across the continuum of care ▪ Disease related changes that may lead to sensory, perceptual and cognitive limitations and memory changes affecting understanding and learning - Skills: - Identifying and interpreting health and social policy relevant to area of specialist practice - Policy formulation - Working with policy makers - Working with patient/advocacy/specialty groups related to specialty practice area - Coalition building
Cooperates with nurses, other professionals and community groups in activities to reduce illness and promote healthy life styles and environments.	Cooperates with other professionals and community and specialty interest groups in activities to reduce illness and promote healthy life styles and environments in areas important to specialty practice.	
Incorporates into practice a perspective that takes account of the multiple determinants of health.	Incorporates into practice a perspective that takes account of the multiple determinants of health.	

APPENDIX K: ICN FRAMEWORK OF COMPETENCIES FOR THE NURSE SPECIALIST CONT'D

Health Promotion (contd)

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
		- Planning and implementing disease prevention and health promotion programmes (individual and community focused) targeting issues relevant to specialty practice area - Communication skills to promote exchange of information and positive partnerships/collaboration to meet care needs - Use of information technologies and community networks to communicate information - Educational programme evaluation ▪ Accessing and applying range of information and resources for use in developing and implementing patient and community education programmes

Assessment

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Gathers accurate and relevant objective and subjective data through systematic health and nursing assessments.	Gathers accurate and relevant objective and subjective data required for practice in specialty practice area through systematic health and nursing assessments, ordering diagnostic tests and procedures as permitted in the scope of specialist practice and legislation.	▪ Epidemiology, physiology, advanced pathophysiology, and psycho-social aspects relevant to specialty practice area ▪ Knowledge of techniques, tools, guidelines, laboratory investigations and methods to obtain comprehensive data about patient/client health status/condition necessary to formulate diagnoses ▪ Skills: - Advanced clinical assessment skills relevant to area - Interviewing and history taking - Physical examination - Psycho-social status and functioning - Use of standardised assessment tools - Diagnostic process – clinical reasoning, clinical judgement and decision making (integration and interpretation of data from different sources including interpretation of relevant laboratory and diagnostic test results)
Organises, synthesizes, analyses and interprets data from different sources to derive a nursing diagnosis and determine a care plan.	Organises, synthesizes, analyses and interprets data from different sources to derive nursing diagnoses and determine a care plan.	
Shares and documents findings accurately and in a timely manner complying with professional standards and organisational policies.	Shares and documents findings accurately and in a timely manner complying with professional standards and organisational policies.	



APPENDIX K: ICN FRAMEWORK OF COMPETENCIES FOR THE NURSE SPECIALIST CONT'D

Planning

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Formulates a comprehensive care plan with identified care outcomes based on nursing diagnoses, findings from a nursing and health assessment, inputs from other health team members, and nursing practice standards.	Formulates a comprehensive care plan with identified care outcomes based on nursing diagnoses, findings from a nursing and health assessment, inputs from other health team members, and nursing practice standards.	▪ Major treatment modalities, clinical management (including symptom and complications management) and care provision relevant to specialty practice area ▪ Pharmacology knowledge specific to specialty practice area ▪ Medication and treatment prescribing protocols applicable to specialist practice area ▪ Knowledge of services and community resources across the care continuum relevant to specialty practice area ▪ Databases and sources of evidence-based/best practice relevant to specialty practice area ▪ Nursing practice models ▪ Care planning across the continuum of care ▪ Skills: – Multidisciplinary care planning (disease management, symptom control, anticipating, preventing and dealing with complications, life style management, care coordination)
Applies critical thinking and clinical reasoning skills underpinned by knowledge of nursing and other disciplines to the care planning process.	Applies critical thinking and clinical reasoning skills underpinned by knowledge of the area of specialist practice and other disciplines to the care planning process.	
Establishes priorities for care in collaboration with other care providers and clients.	Establishes priorities for care in collaboration with other care providers and clients.	
Involves clients where possible in care planning ensuring that they receive accurate, understandable information on which to base consent for care.	Involves clients where possible in care planning ensuring that they receive accurate, understandable information on which to base consent for care.	
Involves an advocate when clients, families or carers request support or have limited abilities in decision-making, giving informed consent, or where there is a language barrier.	Involves an advocate when clients, families or carers request support or have limited abilities in decision-making, giving informed consent, or where there is a language barrier.	
Regularly reviews and revises the care plan, where possible in collaboration with other members of the health/social health team, and clients.	Regularly reviews and revises the care plan, where possible in collaboration with other members of the health/social health team, and clients.	
Maintains a current, accurate care plan and related records.	Maintains a current, accurate care plan and related records.	

Implementation

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Implements a range of procedures, treatments and interventions that fall within scope of practice for the registered nurse and are in accordance with nursing and best practice standards.	Implements a range of procedures, treatments and interventions that fall within scope of specialist practice and are in accordance with specialist nursing and best practice standards.	▪ Skills: – Advanced clinical nursing skills related to specialty practice area – Management of emergency situations specific to specialty practice area
Documents interventions and client responses accurately and in a timely manner.	Documents interventions and client responses accurately and in a timely manner.	
Responds appropriately and in time to unexpected or rapidly changing situations.	Responds appropriately and in time to unexpected or rapidly changing situations.	
Responds immediately and appropriately to emergency and disaster situations, including launching life support procedures when necessary, and other emergency/disaster procedures.	Responds immediately and appropriately to emergency and disaster situations taking a leadership role in triage and coordination of care for clients with specialty care needs.	

APPENDIX K: ICN FRAMEWORK OF COMPETENCIES FOR THE NURSE SPECIALIST CONT'D

Evaluation

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Monitors and documents progress toward expected outcomes accurately and completely.	Monitors and documents progress toward expected outcomes accurately and completely.	Monitoring and evaluation tools specific to specialty practice area
In consultation with clients, families and/or carers, and health team members, evaluates progress towards planned outcomes.	In consultation with clients, families and/or carers, and health team members, evaluates progress towards planned outcomes.	
Uses evaluation data to modify the care plan.	Uses evaluation data to modify the care plan.	

Therapeutic Communication and Interpersonal Relationships

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Initiates, develops and discontinues therapeutic relationships through the use of appropriate communication and interpersonal skills.	Initiates, develops and discontinues therapeutic relationships using a range of advanced communication and interpersonal skills.	- Disease related changes that may lead to sensory, perceptual and cognitive limitations and memory changes affecting communication - Dynamics of conflict and negotiation processes, how these dynamics manifest themselves and how to achieve solutions that are mutually acceptable. - Information technology applications to health care - Skills: - Supportive communication skills to provide information about potentially distressing or embarrassing issues sensitively and responsively - Negotiation and conflict resolution skills - Information technology skill required for the care process, access information and support research activities
Maintains a relationship that respects the boundary between clients and self.	Maintains a relationship that respects the boundary between clients and self.	
Listens to others in an unbiased manner, respects points of view of others, and promotes the expression of diverse opinions and perspectives.	Listens to others in an unbiased manner, respects points of view of others, and promotes the expression of diverse opinions and perspectives.	
Communicates clear, consistent and accurate information verbally, or in written and electronic forms, that falls within professional responsibility and maintains confidence in care.	Communicates clear, consistent and accurate information verbally, or in written and electronic forms, that falls within professional responsibility and maintains confidence in care.	
Interacts in a manner that is respectful and culturally appropriate to the clients, family and/or carers from diverse cultural backgrounds.	Interacts in a manner that is respectful and culturally appropriate to the clients, family and/or carers from diverse cultural backgrounds.	
Facilitates access to information or refers request to the appropriate person.	Facilitates access to information or refers request to the appropriate person.	
Communicates and shares relevant information including views of clients, families and/or carers with other health team members involved in providing services.	Communicates and shares information including views of clients, families and/or carers with other health team members involved in providing services.	

APPENDIX K: ICN FRAMEWORK OF COMPETENCIES FOR THE NURSE SPECIALIST CONT'D

Leadership and Management

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Advocates for and acts within span of control to create a positive working environment.	Advocates for and acts within span of control to create a positive working environment.	▪ Knowledge: – Organisational and leadership models including the characteristics of effective leadership styles, leadership development and succession planning – Change models and change management – Familiar with concepts of governance and their implications for management – Conversant with concepts associated with vision, strategy, goals and objectives – Aware of the impact of positive practice environments, their characteristics and how they impact on service delivery, recruitment and retention – Conversant with local policy development, implementation and review processes ▪ Skills: – Problem identification, solutions generation using tools such as SWOT, stakeholder analysis and no directive questioning – Team building – Time management and deployment of resources – Complaints management and resolution – Translating policy into practice in specialty practice areas (e.g. developing protocols/ guidelines, job descriptions) – Planning and developing individual staff including assessment and appraisal – Contribute to committee work – Identify and communicate resource requirements – Monitor and evaluate services
Adapts leadership style and approaches to different situations.	Adapts leadership style and approaches to situations specific to the specialty practice area.	
Confronts conflict in a non-judgemental fashion, making effective use of communication skills and existing mechanisms to achieve resolution.	Confronts conflict in a non-judgemental fashion, making effective use of communication skills and existing mechanisms to achieve resolution.	
Contributes to team leadership by reinforcing goals so as to promote respect and confidence amongst the team.	Leads in a manner to inspire respect and confidence from others.	
Able to articulate own leadership contributions and support expectations of other team members.	As team leader and in line with current job description, clearly defines contributions and expectations required of team members.	
Prioritizes workload and manages time effectively.	Prioritizes workload, manages time effectively and allocates resources to optimise outcomes.	

Leadership and Management (contd)

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Contributes to the review and modification of current organisational and practice policies and procedures currently in force.	Contributes to the review and modification of current organisational and practice policies and procedures currently in force and provides leadership in developing and implementing organisational and practice policies and procedures specific to the specialty practice area.	
Contributes to education and professional development of students and colleagues in the workplace.	Contributes to the development and implementation of specialist education and professional development of students and colleagues in the workplace.	
Provides feedback, offers suggestions for changes and deals effectively with the impact of change in own practice or on the organisation.	Uses the change process to influence the introduction of innovations and adaptations to specialist practice and service organisation.	

APPENDIX K: ICN FRAMEWORK OF COMPETENCIES FOR THE NURSE SPECIALIST CONT'D

Safe Environment

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Uses appropriate assessment tools to identify actual and potential risks to safety and reports concerns to the relevant authority.	Uses appropriate assessment tools to identify actual and potential risks to safety and security and reports concerns to the relevant authority.	▪ Is knowledgeable of: – Special safety risks for client/patient related to specific health problems of patients/clients in specialist area – Evidence-based protocols/guidelines/processes of care designed to reduce adverse events – Concepts, elements, and methodologies that are involved in undertaking a risk assessment and management ▪ Skills: – Risk assessment and implementing risk management interventions
Takes timely action through the use of quality improvement risk management strategies to create and maintain safe care environment and meet national legislation and workplace health and safety requirements, policies and procedures.	Takes timely action through the use of quality improvement risk management strategies to create and maintain safe care environment and meet national legislation and workplace health and safety requirements, policies and procedures.	
Ensures the safe and proper storage, administration and recording of therapeutic substances.	Ensures the safe and proper storage, administration and recording of therapeutic substances.	
Administers and records medication, assesses side-effects and titrates dosages in accordance with authorised prescriptions.	In accordance with prescriptive authority selects/prescribes/administers medication, including accurate dosage, routes and frequency pattern, based upon accurate knowledge of the pharmacological effect, patient characteristics and concurrent therapies.	
Complies with infection prevention procedures and challenges breaches in other practitioners' practice.	Complies with infection prevention procedures and challenges breaches in other practitioners' practice.	
Knows responsibilities and procedures to follow in the event a disaster is declared.	Identifies and plans for specific measures necessary to deal with patients/clients in specialty practice area in the event of a disaster.	

Interprofessional Health Care

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Understands and values the roles, knowledge and skills of members of the health team in relation to own responsibilities.	Understands and values the roles, knowledge and skills of members of the health team in relation to own responsibilities.	▪ Partnership and collaboration: – Principles, definitions of elements of successful partnership and collaborative practice – Practice models including models for partnership and collaborative practice ▪ Skills: – Initiating and responding to referrals
Works collaboratively with other professionals in health care to enhance nursing and other health services being accessed by clients.	Works collaboratively with other professionals in health care to enhance nursing and other services offered in specialty practice area.	
Uses knowledge of effective inter- and intra-professional working practices.	Uses knowledge of effective inter- and intra-professional working practices.	
Presents and supports the views of clients, families and/or carers during decision-making by the inter-professional team.	Presents the views of clients, families and/or carers in decision-making by the inter-professional team and assists with negotiation of mutually agreed decisions.	
Refers clients to ensure patients/clients have access to best available interventions.	Refers clients and accepts referrals from other health care providers to ensure clients have access to best available intervention.	

APPENDIX K: ICN FRAMEWORK OF COMPETENCIES FOR THE NURSE SPECIALIST CONT'D

Delegation and Supervision

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Delegates activities to others, according to ability, level of preparation, proficiency and legal scope of practice.	Delegates activities to others, according to ability, level of preparation, proficiency and legal scope of practice.	▪ Skills: – Role definition – Consulting skills
Accepts delegated activities in line with personal level of proficiency and legal scope of practice.	Accepts delegated activities in line with personal level of proficiency and legal scope of practice.	
Monitors and uses a range of supportive strategies including precepting when supervising and/or monitoring delegated care.	Monitors and uses a range of supportive strategies including precepting and mentoring when supervising and/or monitoring delegated care.	
Maintains accountability and responsibility when delegating aspects of care to others.	Maintains accountability and responsibility when delegating aspects of care to others.	
Contributes to policy and protocol development that relates to delegation of clinical responsibilities.	Contributes to policy and protocol development that relates to delegation of clinical responsibilities specific to specialty practice area.	

Enhancement of the Profession

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Promotes dissemination, use, monitoring and review of professional standards and best practice guidelines.	Promotes dissemination, use, monitoring and review of professional specialist standards and best practice guidelines and participates in developing and adapting standards to the practice context.	▪ How policy is made – process, reform, environment, policy makers ▪ Strategies for influencing national and local policies makers ▪ Professional networking ▪ Research: – Using research to improve practice and to develop policy, e.g. reading and interpreting research studies – Identifying research questions – The research process – Ethical issues related to research – Funding of research ▪ Skills: – Writing a research proposal – Literature search skills – Critical appraisal of research in relation to clinical practice – Communicating research— public presentation, report writing, writing for publication – Advocacy (e.g. developing and delivering advocacy messages – lobbying, briefing notes, position papers, press releases, media interviews)
Promotes and maintains a positive image of nursing.	Promotes specialist nursing practice as an essential part of health service delivery.	
Acts as an effective role model for students and within the care team.	Acts as an effective role model for students and within the care team.	
Acts as a resource for students, other members of the health team and the public.	Acts as a resource in specialty practice area for students, other members of health team, health planners and the public.	
Values research in contributing to developments in nursing and uses findings as a means to improving standards of care.	Contributes to knowledge and practice development of the clinical nursing specialty through identifying and conducting research in areas of need.	
	Advocates for and participates in obtaining public, legal and employer recognition of specialist qualifications, title protection and related scope of practice.	
Scans practice environment and nursing literature to identify emerging trends and issues.	Scans practice environment and specialist nursing literature to identify emerging trends and issues.	
Engages in advocacy activities through the professional organisation to influence health and social care service policies and access to services.	Engages in advocacy activities through professional organisations to influence health and social care service policies and service provision important to the specialty practice area.	

APPENDIX K: ICN FRAMEWORK OF COMPETENCIES FOR THE NURSE SPECIALIST CONT'D

Quality Improvement

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Follows evidence-based and best practice guidelines in the delivery of nursing practice.	Uses and contributes to research into the evidence base for safe, effective, efficient practice in specialty practice area.	- Systematic review and clinical audit processes - Best practice – identifying best practice and tools for sharing best practice
Participates in quality improvement and quality assurance procedures.	Uses systematic review to improve client experience and outcomes in specialty practice area.	- Skills: – Carrying out a clinical audit

Continuing Education

Registered Nurse competencies	Nurse Specialist competencies	Knowledge and skills <i>in addition</i> to those acquired for practice as a registered nurse
Undertakes regular review of own practice by engaging in reflection, critical examination and evaluation and seeking peer review.	Undertakes regular review of own practice by engaging in reflection, critical examination and evaluation and seeking peer review.	- Processes of self assessment and peer review - Professional portfolio – what, how and uses - Performance appraisal – approaches, tools
Assumes responsibility for lifelong learning, own professional development and maintenance of competence.	Assumes responsibility for lifelong learning, own professional development and maintenance of competence.	
Takes opportunities to learn with others contributing to health care.	Participates in uni- and multidisciplinary teaching learning.	

