CLINICAL PLACEMENT SUPPORT AS A MEANS OF ENHANCING CRITICAL CARE COMPETENCES AMONG ICU NURSING TRAINEES. A CASE OF UGANDA HEART INSTITUTE, MULAGO.

BY

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19/U/GMVP/19018/PD

A DISSERTATION SUBMITTED TO THE DIRECTORATE OF RESEARCH AND GRADUATE TRAINING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER OF VOCATIONAL PEDAGOGY OF KYAMBOGO UNIVERSITY

SEPTEMBER, 2023

DECLARATION

I, the undersigned declare that this dissertation submitted is my original work, and has never been presented to any institution for any academic award.

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APPROVAL

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DEDICATION

The dissertation is dedicated to my family, especially my son “Nasasira Elisha Tumwiine” for the patience and support while I was at the University; the UHI Critical care family for the support, and encouragement provided.

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LIST OF ACCRONYMS/ABBREVIATIONS

CBET: Competence-Based Education and Training

CCD: Critical Care Department

CCN: Critical Care Nurse

CPS: Clinical Placement Supervision

FW: Future Workshop

HSSP: Health Sector Strategic Plan

ICU: Intensive Care Unit

IHSU: International Health Sciences University

ILO: International Labour Organization

KYU: Kyambogo University

MNS: Masters in Nursing Science

MOH: Ministry of Health

MVP: Masters in Vocational Pedagogy

UHI: Uganda Heart Institute

VET: Vocational Education and Training

ABSTRACT

Modern and active teaching and learning methods form an important and integral part in the education of nursing trainees; the acquisition of adequate and relevant skills lead to development of competencies and critical thinking skills, which are relevant in the word of work and ensure patient safety in critical care department. Clinical placement support involves timely assessments, practical hands-on training, mentoring and timely evaluations and feedback, and requires trained and competent critical care nurses, nursing faculty and instructors. Declining clinical placement support during placement was the primary concern, as the nursing trainees are not adequately prepared to deliver cardiac critical care services due to knowledge and practice gaps.

This study aimed at improving critical care competencies by empowering ICU nursing trainees with knowledge and skills through practical clinical placement support that bridges the gap that exists in the training process

The study employed a participatory action research design, with qualitative and quantitative data sources, guided by the future workshop model. Participation in the action research was voluntary, collaborative and all the stakeholders actively participated. These included; twenty-three (23) stakeholders, ten (10) ICU nursing trainees, two (2) intern nurses, four (4) nursing educators, one (1) cardiorespiratory therapist, two (2) biomedical engineers, one (1) cardiologist and three (3) nursing assessors. Observation, demonstration, education sessions, clinical practice, procedure reviews, key informant interviews, focus-group discussions, critical care nurse competence checklist and photography where employed as methods of data collection. Both descriptive and comparative approaches where used to analyze the data. The Critical care nursing assessment competency checklist was developed and used during the project implementation; to ensure active learning and participation; the nursing trainees, ICU staff and the researcher participated in all the aspects of the project that included planning, development of the assessment tool, assessment, training and evaluation of competences.

As a result, work-based training using applicable pedagogical approaches of learning by doing, inquiry based learning, reflective practice and simulations quickened the realization and application of desired competencies. . It was recommended that the tool be reviewed and adopted by other departments, more time allocated by clinical instructors to learners, the critical care management should set minimum rotation durations that all ICU nursing trainees should adhere too, collaboration between MOES and MOH institutions to ensure longer clinical placements. In conclusion, the critical care nurse competence checklist would serve as a guide in the assessment of competences, development and training of skills among ICU nursing trainees.

CHAPTER ONE: INTRODUCTION

1.0 Overview

This study and chapter presents, Vocational Training and Vocational Pedagogy as a field, the background to the study, the motivation statement, situation analysis, statement of the problem, the purpose of the study, objectives of the study, research questions, scope of the study, significance of the study, and justification of the study.

Modern and active teaching and learning methods form an important and integral part in the education of nursing trainees; the acquisition of adequate and relevant skills lead to development of competencies and critical thinking skills, which are relevant in the word of work and ensure patient safety in critical care department.

1.1 Vocational Training and Vocational Pedagogy

The term Vocational Education and Training (VET), is a form of education aimed at equipping people with knowledge, expertise, awareness, insight, know-how, skills and competencies required in particular occupations, or more broadly in the labor market,(Cedefop, 2015).

It is the training in skills and teaching of knowledge related to a specific trade, occupation or vocation in which the student or employee wishes to participate, (Okumu I, M & Baale, 2019).

It is a multifaceted approach with three partly overlapping perspectives; the epistemological /pedagogical (more experience-based) perspective, which draws attention to sectorial abilities thus supporting learning and development of Competences;

The system perspective which targets and centers on Provider organization, the socioeconomic and labour market perspective which draws attention to the functions of VET

in society and the labour market while preparing graduates for the changing requirements across working life, (Cedefop, 2017).

In this study, the researcher defined, Technical, Vocational Education and Training, (TVET), as a model of education and training that is technical in nature and connected to an occupation or employment, aimed at providing hands-on skills within professional trades, ensuring lifelong learning or continuing education in order for a person to be employable in the world of work, (UNESCO, 2021).

The training geared towards the study of technologies and related sciences, the acquisition of practical skills, attitudes, understanding and knowledge related to graduates finding a job or becoming self-employed in the various sectors of economic and social life, (ILO., 2002).

The Ugandan economy needs a highly skilled workforce; and with skilled individuals, any education system to be effective, critical emphasis should be put on the value of measurable skills, knowledge acquisition with articulable learning outcomes, which incorporate classroom teaching strategies and learning activities, skills laboratories and clinical workplaces, (Lucas et al., 2012).

VET in Uganda has been concerned with the development of practical skills within a defined work domain through a hands-on student task engagement to problem solving, which has led to an increase in the amount of content retained, more student engagement and stimulation in the learning process. There has been an increased desire to learn and the students are more empowered in their learning situations, with improved critical thinking skills and clinical experience, (UNESCO, 2021). These deliberate interventions have enhanced and improved learning objectives, which have made learners more effective and productive in the nursing trade.

In Sub-Saharan Africa, and Uganda in particular has experienced significant growth and progress in student enrollment due to the rapid transformations and foreign investments which have led to a boost in the urge and requirements for greater technological skills and qualified competent nursing teams. According to the (World Bank, 2018), there remains a large deficit as countries observe a big gap in the requirements needed in the provision of vocational skills and a shortage of adequately educated and trained workforce which are a deterrent to further economic growth and development, (Ministry of Education and Sports, 2011).

Vocational Education in Uganda has faced dare challenges, objections and confrontations that have included stigma, lack of confidence, inequality in pay status, workers value, power and rank, inconsistent policies and decisions, public maladministration and bureaucratic corruption. The philosophical vulnerabilities and capacity compromises in decision making and action, historical, cultural and socio-economic discrimination which have contributed to failure in proper competence development in training, (Okware & Ngaka, 2017).

VET in Sub-Saharan Africa characterized by under investment in TVET institutions with low enrollment rates, lack of practical relevance/quality in the world of work, and a lack of policy environments. The lackluster government methods and approaches that cultivate interest in TVET education in order to boost the necessary and needed skills, practices and competencies that help answer the real, tangible and actual market demands, (World Bank, 2018).

The concept of Vocational Pedagogy refers to a field of knowledge oriented towards promotion of precise practices, processes, discussions and appropriate learning methods taught in the context of practical problem-solving skills, hands-on training, experiential learning, and the real world of work. This involves feedback mechanisms, questioning,

reflection, theoretical models and explanations, which enhance improved skills acquisition and development, (Lucas et al., 2012).

Vocational Pedagogy refers to a framework of learning which involves learning by observing and imitating others, practicing, conversations and feedback, teaching and helping each other through real-world problem-solving techniques. It also entails learning through an enquiry approach in which the learners develop critical thinking applications, and appropriate skills needed for innovation and scientific technologies in the world of work, (Ralhan, 2015).

Vocational Pedagogy embraces a learner centered approach as opposed to the traditional teacher centered learning. In this case, the learning focuses on the technological pedagogical content and knowledge (TPACK) framework: which enforces the science of innovative listening, transcribing scientific information, the process of drafting and sketching drawings, observational and idea generation. Reflection in practice with self-directed learning and constructive competition in virtual and simulation learning environments which lead to enhanced learners abilities and skills, (Adams., 2019).

Therefore, Vocational Pedagogy unlike the general education approach applies and engages **l**earning interventions, which focus on enquiry and hands-on training. This learning approach intends to furnish and equip learners with cognitive capabilities and specific competences needed by the learners to make them relevant in the world of work.

Nurse educator's pedagogy underpins their understanding and approach to teaching and learning regardless of the different developed teaching philosophies' of nursing education.

1.1.1 Vocational Education and Training in Nursing

Vocational Education and Training (VET) in Nursing is implemented differently across the different regions and countries.

VET in Ireland refers to further learning educational programs that adults pursue after their formal education. The nurse training programs operate within the national frameworks and education reference system of Ireland, which contributes to the European macro context, called CREDICARE. The trainings are provided under the National Framework Qualifications, which draw comparison with the European Qualifications Framework. The entry requirements involve pre and post registration nursing training programs through formal and informal training access points, (Tutschner & Wittig, 2013).

In United States of America (USA), vocational training in Nursing is provided through various educational pathways; through earning a nursing diploma, an associate degree in nursing (ADN), a bachelor of science in nursing (BSN), an accelerated or entry-level master's degree (not health related) prior to becoming licensed registered nurses (RNs), through the career and technical education centers, (US. Department of Health and Human Services, 2020).

In Africa, investment in vocational training is prevalent and delivered to mid-level health workers whom the health systems rely on for health services. These require shorter training courses, and are usually retained in underserved and under resourced places. They do not usually depend on technology in the provision of patient care, and investigations in their clinical practice, unlike the physicians. Their professional and organizational development and tutelage focuses on basic case identification, patient examination, clinical acumen, interpretation and medical treatment; but their important concerns regarding shortage of skills, insufficient training and expertise due to the quality of teaching and tutelage attained, (Couper et al., 2018).

In Uganda, Vocational Education and Training operates through tertiary health training institutions under the Ministry of Education and Sports, (MOES), which is responsible for

providing and ensuring access to equitable, quality of education and training, oversees the training activities and educational programs in all health-training institutions. The institutions classify as government and private aided, governed through the Directorate of Educational standards; regulated through the Department of Health Education and Training, while the Directorate of Higher, Technical Vocational Education and Training, (HTVET) prescribes, renews, reviews, updates and maintains teaching staff legibility, (Uganda Gazette, 2017).

In cardiac critical care nursing, nurse education involves teaching, incorporating all the nursing processes to improve knowledge, skills and competences.

As a nurse practitioner and mentor, TVET underpins a form of education where learners attain general nursing knowledge. Then assigned to the Uganda Heart Institute to obtain specific cardiac competences in nursing patient care.

1.2 Background to the Study

Acquisition of adequate and relevant skills and competencies have shown to improve the quality of care provided to patients when the nurses are competent. In nursing education, clinical learning and placements are the center of professional development and the empowerment of nurses occurs in a complex and dynamic hospital environment with qualified clinical instructors, clinical staffs and mentors, (Drateru, 2019).

Mentoring of nursing trainees during clinical placements was relevant to ensure the quality of placement learning in critical care units; this involved, facilitating students' learning by creating a supportive learning environment, which enables nurses' individual learning processes, strengthening and empowering nurses' professionalism by developing professional attributes and attaining professional competencies in nursing. The tutoring and guidance

during nursing clinical placements integrates pedagogical, technological, environmental and clinical attributes, (Jokelainen et al., 2011).

There are many advantages of clinical support during placement in the ICU. This mentoring and support has the potential to bridge the gap between general nursing care and cardiac critical care nursing which eases knowledge and skills acquisition, increases confidence in clinical decision-making, critical thinking and problem-solving skills (Cretu & Stilos, 2021), and guarantees personal-professional growth and competence development.

1.2.1 Historical Background

Sir Albert Ruskin Cook under the Church Missionary Society Mission started health care training in Uganda in 1897. Albert Cook graduated from Trinity College, Cambridge in 1893 with a Bachelor of Arts degree, and from St Bartholomew's hospital with a Bachelor of Medicine. He became a medical doctor then came to Uganda and established Mengo Hospital; Albert cook married Katharine Thompson a missionary nurse in 1900, (Musoke, 1968).

Lady Cook was a matron of Mengo Hospital from 1897-1911, the general superintendent of midwives, the inspector of community centers, she was involved in the foundation of Lady Corydon Maternity Training School and founded the Nurses Training College in 1931.

1.2.2 Conceptual Background

Practice-based learning is an essential and effective method of effecting change in practice; in work-based learning, professional tasks are performed to enable clinical skills transfer and prepare nursing trainees for the world of work, in the cardiac ICU, nursing staff acquire, utilize, transfer knowledge and skills which can't be attained through general nurse training.

The learning is deliberate and intended to meet the demands of the world of work. The knowledge creation and utilization is a collective activity where learning becomes everyone's job and the learners demonstrate a learning by doing attitude, which allows them to question underlying assumptions of practice.

This structured learning at the workplace involves student clinical placements, internship, general hospital staff obtaining critical care skills, and traineeships based in the ICU to ensure that trainees obtain the needed skills and competences.

Clinical placements use a dual training system that involves an authorized study block/ placement in which nurse trainees attend clinical placements for structured clinical experience as part of a specific learning unit, it comprises of set out clinical objectives, and assessments associated with the clinical placement and specific instructions.

1.3 Statement of Motivation

Throughout my nursing career as a nurse and mentor in the Critical Care department (ICU) of the Uganda Heart Institute. Which is a teaching hospital and the only government institution that provides super specialized cardiac services in Uganda; it is common practice to receive nursing trainees and critical care nursing fellows in the ICU. With a working experience of sixteen years, there is a need for nurse faculty/educators to change the pedagogical strategies in nursing education in critical care.

As an MVP student at Kyambogo University; the training module of teaching and learning processes in Vocational Pedagogy (VP 611) and Vocational Didactics (VP 612) emphasized activity/work-based learning in vocational didactics. With experiential and situated learning in vocation education and training, the learners develop knowledge through observatory

methods, and then strive to address tasks, in order to develop appropriate competences; the learning is task and outcome oriented.

A need to improve specialized nursing competences through clinical placement support of nurse trainees was realized at the institute, having learning objectives, assessments and evaluations, which are applicable and relevant to achieving core competences before graduation. Student assessments and evaluations need to be highly developed to assess the competences in order to produce competent graduates who are ready for the labor market hence the desire to enhance competence development of nursing trainees.

1.4 Situation Analysis

An increasing number of qualified and graduating nursing trainees at all levels with inadequacies in practical skills in handling cardiac critical care patients go through the Heart Institute from the different training institutions. The researcher engaged key stakeholders using the Participatory Action Research (PAR) method, and we conducted a learning needs assessment in an equitable and democratic problem identification process. This preliminary observation and critical reflection with needs analysis was relevant to transform and remodel the broad concern to an action theme, which became the title for later discussion. This helped to draw a profile for students in order to determine and prioritize the students' learning needs, and then determine solutions to ensure stakeholders make informed decisions, (Urun, Mehmet; & Yarar, 2015).

In an effort to demonstrate critical care competencies needed to perform quality assessments, diagnosis, and implementation, ICU nursing trainees should have adequate and appropriate hands-on training. The situation analysis was done in a sequence of steps to accomplish assigned tasks, which involved identifying tasks, prioritizing, and ordering tasks in order to

achieve the intended result of a clinical process, (Curriculum Development Centers Programs, 2012).

As a nurse and mentor in the critical care department (ICU), the situation analysis involved identification and examination of ICU best practices and protocols that reduce complications in the cardiac critical care department (ICU) leading to quality healthcare.

Therefore, in order to identify the gaps in the provision of quality health care and critical care competences, a situation analysis and future workshop in the Critical care department (ICU) was done to establish the pressing issues. A meeting with stakeholders held in the boardroom who included; Cardiologists, UHI administrators, Nurse Administrators and faculty, Cardio-respiratory therapists, biomedical engineers and ICU nursing trainees. During the situation analysis, the participants identified several challenges/gaps. They included, negative attitude by trainers towards trainees, managing shifts due to heavy workload was hard, limited time allocated to ICU nursing trainees, lack of skills by trainers, no feedback about trainees, lack of clinical placement support from training institutions and the work place, difference in the education levels of nurse trainees etc.

Key outcomes of the process: Nurse Competence development is both theoretical and practical. It involves acquisition of knowledge, skills, attitudes, application of nursing processes and a clear understanding of the ICU procedures and protocols. All of these processes are relevant for learners to be competent.

1.5 Problem identification

Action research emanates from a situational challenge, problem, obstacle or predicament in which health practitioners find themselves. In disease prevention, health promotion and education it is relevant and yet relatively unidentified, neglected, unacknowledged,

unrecognized and understated; this state of affairs has disabled many health researchers who are a valuable resource for managing effective change in practice, (Koshy et al., 2011).

It may be a general concern, work-related, or competence –related problem. In this instance, stakeholders involved in the critical care department realized that there was a gap in the critical care competencies among ICU nursing trainees, due to inadequate clinical placement support from trainers. They also realized that when trainees are assigned to the department for clinical placement, limited time is allocated to them for the placement (one week). Important skills are not attained due to the short timeframe allocated to training, shortage of staff and heavy workload in the unit, their no specific nursing educators assigned to ICU nursing trainees as expected. In this action research project, the researcher concurred with the stakeholders to make it more real and actual so that it becomes relevant to change. With the use of an inclusive and collaborative research tool such as the Future workshop, an agreed upon topic "Clinical placement support as a means of enhancing critical care competences among ICU nursing trainees. A Case of Uganda Heart Institute, Mulago" was formulated.

1.5.1 Future Workshop

Future Workshop as an action research model used in problem identification, and focused on solving and examining problems, oriented towards future solutions. It was used to collect essential qualitative data using research tools such as key interview guides, critical care competence checklists, camera, and audio recorder. Utilizing the mentioned tools, primary data was collected from multiple sources and all the facts needed during the Future workshop meeting where prioritized, clustered, triangulated, substantiated and corroborated for action. The Future workshop according to (Alminde & Warming, 2019) and (Vidal, R, V, 2006) emphasizes teamwork, , critique, advocacy for democratic and participatory methodological approaches, empowerment, collective decision making, focuses on participative group

processes and creative ways of solving real-life problems, and incorporates five phases in the process.

There five phases of the future workshop which were followed in the stakeholders meeting and these included, the preparation phase, critique phase, fantasy phase, implementation phase, and the realty phase.

Preparation phase

Participants where invited using phone calls, internal memos, and face to face interactions, the boardroom prepared, the laptop connected to the electronic board, participant introductions were made, the method, topic, time table introduced to stakeholders and settled, flip charts and markers, cameras, recorders, paper and pens availed, workshop lasted for 2 hours, working breakfast provided.

Critique phase

The stakeholders identified the critical challenges through brain storming, points collected and written down on flip charts for critiquing and unmasking of the actual situation, clustering of challenges and prioritization of critique points done. The action points where critically and thoroughly thought out, investigated, clustered and analyzed into short term, medium and long-term challenges. The long-term gaps necessitated a period of over a year for implementation. for example, the need to harmonize nurse education curricular in health teaching institutions, clinical placement hospitals and the Ministry of Health, so that all nurses who are assigned to the ICU for specialized nurse competences have similar education levels, instead of sending nurses from the enrollment level to master of nursing science nurses to attain the same competences.

The medium term was to be implemented in a duration of three to six months, while short term challenges where to be implemented and evaluated immediately within two to four

months, for example the lack of clinical placement support and feedback about nursing trainees. Due to the limited period for carrying out this action research, together with stakeholders, we opted for short-term challenges. The ranking of clustered challenges done in order to obtain the most pressing challenge.

Fantasy Phase

In this fantasy phase, using creative techniques, brainstorming and imagination, critique points where converted from challenges to positives. In this phase, participants drew an exaggerated picture and developed social fantasies of the future. Suggested solutions to the challenges included, adequate staffing specifically to handle students, there should be trainers of trainees in the unit, clinical training support, set objectives for training, intake of ICU trainees should not be of the same level, accepted minimum competences in the ICU.

Reality Phase

Activities where done democratically, equitably, with full participation of all stakeholders and collective decision making was made and agreed upon through a general consensus, where the four major challenges in order where identified and the most pressing challenge which was highly ranked.

Using pair-wise matrix of ranking, the stakeholders agreed that a lack of clinical placement support for nurse trainees was the most critical deterrent to competence based learning and development as illustrated below.

Table 1: Pair wise ranking matrix for the most pressing challenge

PROBLEM	1	2	3	4	Total	Ranking
1					10	4th
2					12	3rd
3					18	1st
4					16	2nd

Source: Primary Data 03/03/2022

KEY

1. Lack of exposure of the different nurse disciplines to the ICU,
2. Limited time allocated to clinical trainings,
3. **Lack of clinical placement support to nurse trainees,**
4. Lack of feedback mechanism about nurse trainees.

Lack of clinical placement support was the most ranked and stakeholders agreed that it is the most challenging component affecting competence development among ICU nursing trainees at Uganda Heart Institute.

Figure 1: The stakeholders meeting during the Future Workshop

Source: Researcher, 2022

Figure 2: Continuation of the stakeholders meeting during the Future Workshop

Source: Researcher, 2022

Table 2: The challenges identified by stakeholders during the Future Workshop

Key challenges faced in Nurse training	Short term challenges	Main pressing challenge
Negative attitude by trainers and trainees	Lack of exposure of the different nurse disciplines to the ICU	Lack of Clinical placement support for trainees
Staff nurses lack confidence and skills	Limited time allocated to clinical trainings	
Managing work shifts is difficult due to heavy workload	Lack of Clinical placement support to trainees	
Knowledge gap among the different nursing levels	Lack of feedback mechanisms about nurse trainees**.**	
Lack of exposure of the different nursing disciplines to the ICU		
Limited time allocated to clinical trainings		
Lack of enough Protective equipment.		
Difference in the education levels of nurse trainees.		
Lack of Clinical Placement support to trainees		
Lack of Harmonization in Nursing education levels		
Lack of feedback mechanism about nurse trainees		
Socio-economic challenges for trainees		

1.6 Statement of the problem

Declining clinical placement support during placements among nursing trainees in the critical care department was the primary concern of stakeholders. Clinical placement support which involves timely assessments, instruction, guidance, mentoring and evaluation facilitates learning by providing the nursing trainees with a clinical setting and model necessary to develop and attain critical care hands-on skills and competencies through clinical exposure, a feedback mechanism between clinical instructors and trainees and timely evaluations. Clinical placement support incorporates the use of specialized equipment like bedside monitors, mechanical ventilators, syringe pumps and infusion pumps, arterial blood gas machines and many more.

During the situation analysis meeting, the stakeholders realized that heavy workload and inadequate staffing during shifts led to reduced learning opportunities during the clinical placements, (Zulu et al., 2021).

Uganda has under developed critical care services compared to other industrialized and economically advanced countries; where the care of the critically ill patients constitutes a large proportion of their health care spending budget. In second world countries, (Uganda included), with a greater burden of critical illness. There is little and under developed infrastructure to provide essential care for the critically ill. There is limited research to be able to inform policy and meet the needs of the patients; the basic critical requirements such as trained personnel, reliable power supply, medications, functional oxygen supply plants, therapeutic equipment with safe transportation systems are not available, (Williams et al., 2018).

The study therefore sought to address the existing challenges in teaching and learning, by establishing a functional nursing library and study area, a simulation laboratory and usable

critical care nurse competence checklists for pre and post assessment and evaluation of nurses as a medium where trainers and trainees will adequately interact and work together to improve competencies. These would lead to improved competence acquisition.

The integrated multiple evaluative tools include feedback to meet all the educational objectives, annual objective structured clinical examinations, written theory exams, annual observed history and physical examination of patients, (The Independent, 2021).

However many qualified nursing trainees lack the basic critical care competences required to handle and solve the health care needs of the Ugandan population, (Kiguli et al., 2011).

The philosophy of competence-based education and training enables learners acquire job-specific competencies required in the world of work through Learning-Working Assignments which enhance competences,(Ministry of Education and Sports, 2018).

1.7 Purpose of the Study

To enhance critical care competences through clinical placement support among ICU nursing trainees in the critical care department at Uganda Heart Institute, Mulago

1.8 Objectives of the Study

To develop clinical placement support approaches that enhance training and development of critical care competencies among ICU nursing trainees in the Critical care department at Uganda Heart Institute, Mulago.

1.8.1 The specific objectives of the study include:

1) To establish the existing teaching and learning methods in nursing education in the critical care department at Uganda Heart Institute,

2) To establish pedagogical approaches for enhancing critical care competences in the critical care department at Uganda Heart Institute,

3) To implement the established approaches for enhancing critical care competences in the critical care department,

4) To evaluate the outcomes of the implemented established approaches for enhancing critical care competences in the critical care department.

1.9 Research Questions

1) What are the existing Teaching and Learning methods in nursing education in the critical care department at Uganda Heart Institute?
2) What are the Pedagogical approaches employed in the provision of critical care competences among nursing trainees?

3) How will the established approaches for enhancing critical care competence acquisition be implemented?

4) How will the outcomes to the implemented approaches to competence acquisition be evaluated?

1.10 Justification of the Study

Clinical placement units are needed core units during nursing training. Clinical practice is the most pressing challenge, yet the most rewarding component of the training programme. The learners contextualize the clinical skills and competencies learned during study block, and then integrate the knowledge attained and achieved in the practical setting. The success and accomplishment of clinical placements results from interactive efforts by the hospital clinical staff, academic staff, trainees and the clinical placement office.

The need to ensure that nursing trainees attend practicum sites; adequate time should be allocated for the placements, supervision assessments and evaluation by both the academic and clinical staff done to ensure mastery of the critical care competencies needed for the

labour market; it is therefore imperative that we explore approaches aimed at enhancing critical care competences among nurses.

1.11 Significance of the Study

The study has contributed valuable knowledge in the subject area of active participation and so far, it is the only study that has focused on active learning in the nursing division of the Critical care department. The study dealt with an issue that needed more attention and input to improve training in critical care nursing competences. The lack of specifically assigned nurse educators for trainees and limited time allocated during placement in the ICU made it difficult for learners to assimilate and translate the general knowledge into critical care practice, hence improving patient care. The study tackled the issue of clinical placement support to improve student's practical assessments, evaluation and accountability, thus enhancing supervision and mentoring of students by their clinical instructors and nurse faculty in the world of work, and building teamwork between educational institutions and hospitals hence improving the competence-based approach.

1.12 Scope of the Study

1.12.1 Geographical Scope

The study was implemented at the Critical care department of the Uganda Heart Institute, located on the First floor, Block C, Mulago National Specialized Hospital, Mulago Hill, 5 Km by road in the northern part of Kampala City.

1.12.2 Content Scope

The study focused and looked at pathways of enhancing critical care competence acquisition during ICU clinical placements by establishing existing teaching and learning methods, establishing pedagogical approaches for enhancing critical care competences, implementing

established approaches that enhance critical care competences, and evaluating the outcomes of the implemented established approaches in improving competence acquisition.

1.12.3 Time Scope

This study being cyclical in nature took place from February 2022 to August 31, 2022, the duration in which I am required to conduct the research and submit the thesis.

1.13 Definition of Operational Terms

Assessment: This is a process of obtaining information about students learning; evaluate competencies and clinical performance in order to arrive at decisions that improve students.

Cardiovascular competencies: These competencies define exactly what knowledge and skills are necessary to treat cardiac critical care patients.

Cardiovascular intensive care unit: This is a hospital unit that specializes in the care of patients who have experienced conditions like ischemic heart disease, pre and post-operative patients with congenital heart disease and other forms of severe heart diseases.

Clinical instructors: These are senior health care professionals responsible for providing effective instructions, assessments and evaluation during clinical practice.

Clinical Placement: It is an authorized block of study where students attend clinical placements for a structured clinical experience. It involves processes of observation, care planning, implementation and interaction with patients as part of a specific learning unit under the supervision of qualified medical faculty/instructors.

Clinical Placement Support: This is support provided to students while on clinical placements by highly skilled teams comprising of Nurses, Allied Health Professionals, Doctors, clinical instructors to ensure all learners succeed in high quality learning

environments. It involves practical assistance, one on one meetings, and feedback about the placement.

Competence-Based Learning: This is a learner-centred approach that focuses on student assessments, instructions and academic reporting based on students demonstrating that they have attained the desired learning outcomes, knowledge and skills as they progress through their education. This type of learning facilitates in-depth learning.

Critical care nursing: This is highly skilled specialist care provided to the most severely ill or injured patients by a specialized critical care team in the ICU.

Nursing educators: They are nurses who are responsible for teaching and instructing nurses in nursing schools and teaching hospitals, they are responsible for assessing, designing, implementing, evaluating and revising educational programs for nurses.

Nursing trainees: In this context, these are nursing students on a nursing program with skills and experience in an academic year; and are on a planned learning experience in a clinical setting.

CHAPTER TWO: LITERATURE REVIEW

2.0 Overview

This chapter presents reviewed literature related to enhancing critical care competences through clinical placement support for ICU nursing trainees, in order to understand and investigate the research problem identified. The primary strategy used to identify relevant literature included searching databases using a number of keywords that developed following the specific objectives under study. These included clinical placement support, teaching and learning methods in nursing, pedagogical approaches for enhancing critical care competence acquisition, the outcomes of implemented established approaches through participation, monitoring, assessment and evaluation of implemented interventions.

2.1 The existing teaching and learning methods in nursing education.

Clinical Competences are a very important component of teaching and learning in nursing education. It is a combination of skills, attributes and behaviors that are directly related to a successful performance on the job; while competence development is a framework to help students think through manage and facilitate effective and efficient student learning and competency acquisition. The purpose of competence development is to develop interpersonal communication skills and knowledge in critical care through formal trainings, on job-trainings, job simulations, observations, student feedback mechanisms, informal learner coaching, reading and audio-visual references.(United Nations. Office of Human Resources Management, 2010). Hence, competency development helps nursing trainees set personal learning plans that steer their own learning through a deliberate process of learning from experience.

In nursing Education, Teaching and Learning occurs in the classrooms and the clinical area. Nursing trainees have been experiencing challenges during skills acquisition placements that are related to issues in the clinical environment. Such as shortage of clinical staff, and clinical

instructors/tutors, little support supervision, shortage of learning materials and nursing literature in the hospital, impromptu student nurse allocations, lack of clinical role models, limited time allocated for clinical placements, and theory-practice gap among trainers and trainees, (Drateru, 2019).

The existing teaching and learning methods in nursing education generally include; the implementation of process-based education that, involves assimilations, deductive and discovery learning. This process-based learning incorporates the utilization of the nursing process that is systematic, holistic, and patient-focused and guides all nursing actions through critical thinking and scientific reasoning. This 5-step process involves assessment, diagnosis, planning, implementation and evaluation in patient-focused care. Identification of patient's health status, meet patient needs, apply and deliver specific nursing interventions to patients needs are the core components of this process. (Wayne, 2023).

Problem-based learning incorporates group collaborations; problem solving techniques and critical appraisals; this learning approach improves nursing training by empowering them to apply theory to clinical practice, and develop problem-solving skills used to overcome constraints during clinical practice, (Shin & Kim, 2013); while Community based learning is a learning strategy that integrates student learning in academic courses within the community. These learning strategies have been characterized by student-focused small group learning, and community based experiences which are not outcome-based or competency-based curricular, (Kiguli et al., 2011).According to David Kolb's experiential learning model, knowledge is created through transformation of experience, it is an interactive and active learning experience, or "learning by doing" which results in desired outcomes and the learner takes an active role in the learning process, (McCarthy, 2016). This pedagogical approach is applied in nursing education where the learner concretizes experience through assimilation,

conceptualizes knowledge, reflection, critical thinking and active experimentation. Assessing of students' skills levels by clinical instructors enables the mentors and clinical faculty to interact and support learners during clinical placements in order to improve competences.

This theory applied in nursing education, ensures that nursing mentors, assume the responsibility of student learning, give tasks and ensure that learners focus on the tasks given and risks involved in the problem solving, until the learner applies the learned skills. This is an experimental and observational learning theory, which centers on learning through practice and doing, the students are encouraged to learn through practical placements, which enables them to retain knowledge, skills, and competencies and recall facts.

(Kolb, 1984), identified this theory, though its influence came from other theorists such as John Dewey, Kurt Lewin, and Jean Piaget, (Miettinen, 2000). Kolb identified the four different stages of experiential learning; the two initial stages involve tangible concrete learning, contemplative and studious reflective observation, which concentrates on acquiring and holding onto learned experiences; while the other two involve abstract conceptualization and active experimentation which transform learner's experiences. This effectual potent and operative learning is observed as the learner goes through the cycle of experiential learning, (Donovan et al., 2007). In the critical care department, the nursing trainees are encouraged to learn the protocols and practices of the social environment in which they are working in, through observation and reflection.

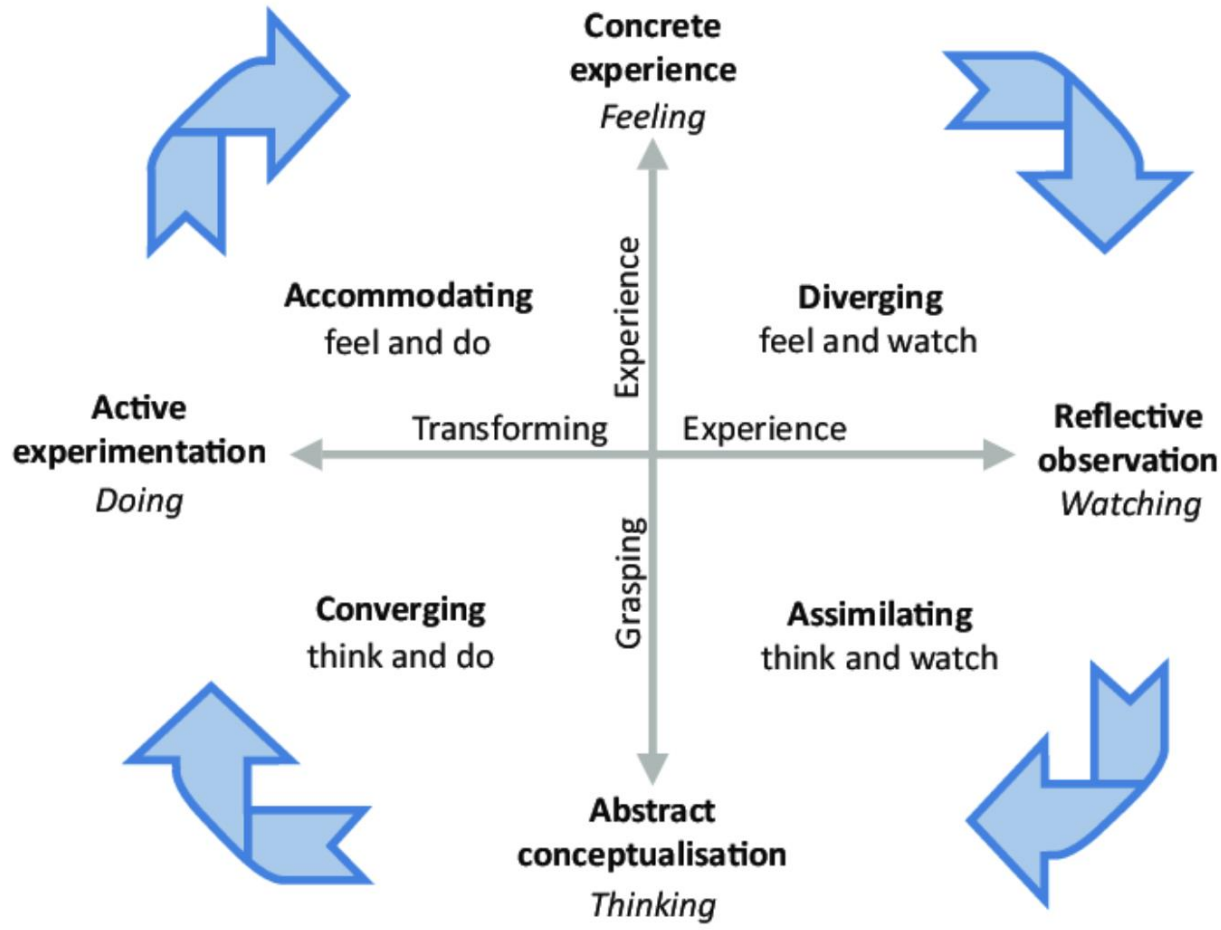


Figure 3: Kolb's Experiential Learning Theory.

Source: Educationaltechnology.net.

The Constructivist's theory of Learning

Vygotsky (1978), described the constructivist theory of learning based on schemas, beliefs and on the activity of learners, constructing or making their own knowledge through experience and it's affected by the mutual collaboration of prior knowledge and new events, (Mcleod, 2019).

This student-centered form of learning is an active process, and the knowledge constructed basing on the existing cognitive structures through simulations and assimilation of new information, that enables knowledge modification hence learning. The process of critical reflection, active knowledge construction and interpretation helps the nursing trainees to

consider information based on experiences, personal views and active participation. (Walker, 2010). In the clinical placement areas, nurse trainees interact with their instructors/ preceptors in order to build on what the student already knows thus helping the trainees to construct new knowledge and competences.

Though many educators have embraced constructivism, several controversies have been cultivated to criticize the constructivist approaches. The researchers opposing constructivism have posted the belief that constructivism encourages a teaching style with unguided or minimally guided instructions for students. The fore mentioned researchers, (Brown & Campione, 1994), (Kirschner et al., 2006), (Moreno, 2004), stipulate that when students learn with minimal instructions, they become lost and frustrated, (Alanazi, 2019).

The procedure of designing minimally guided instructions negates the significance of working memory during learning and more so the learners need to correlate their knowledge to tangible objects in order to ensure that they have acquired the knowledge. The constructionists view knowledge as constructed and understood, not created; it is compatible with the Grounded Theory methodology, (Andrews, 2012).

2.2 The approaches for enhancing critical care competences

Clinical placement support: This is a multi-dimensional component inherent in nursing education which consists of placement learning environments, workplace and classroom learning encompassed with teaching and learning strategies necessary for students to gain competencies, knowledge, skills and attitudes through extensive and thorough clinical and workplace experiences, (Charles Strutt University, 2010). During clinical placement, the clinical supervisors perform key roles of role modelling, assessments, guidance and prioritization, session reviews, evaluations, information exchange and support between the students and experienced multi-disciplinary medical teams.

The intensive care unit (ICU) provides unique opportunities for knowledge and skills acquisition in a dynamic and fast-paced clinical environment. Experience-based training models and evidence-based approaches should be integrated to improve efficiency and efficacy in competence acquisition, (Joyce et al., 2017).

The approaches of identifying learner's needs, teaching directly to those needs, providing specific feedback on learners' performance and emphasizing active learning during bedside teaching, procedural training and patient handover should improve the depth of medical knowledge and technical skills needed for critical care practice.

According to (Namukwaya et al., 2022), critical and effective emergency care in Uganda necessitates skilled, competent and trained nurses to provide critical health care to patients with acute illnesses and severe cardiac ailments, and yet most educational channels/approaches do not adequately prepare nursing trainees to provide critical health care leading to knowledge and competency gaps.

A trained and competent nurse could effectively handle cardiovascular emergencies and initiate the resuscitation process amidst a witnessed cardiac arrest, patients with cardiogenic shock and acute ST elevation myocardial infarction. The nurses' role in documentation, resuscitation, critical decision-making and actions during cardio-pulmonary resuscitation lead to reduced cardiovascular morbidity and mortality.(Victor et al., 2016).

ICU nursing trainees with critical knowledge, practical skills and competencies are key in increasing patient survival, and reducing complications and adverse outcomes; nurses are often the frontline health care providers who carry out patient assessments and determine the severity of patients' life-threatening illnesses. These nurse trainees require a solid foundation

of knowledge and expertise to treat patients with cardiac life-threatening conditions.(Namukwaya et al., 2022).

Cardiopulmonary resuscitation (CPR) training is mandatory for nurses and the ability to respond quickly and effectively to a cardiac arrest depends on the nursing clinical competencies attained during clinical placement. Cardiopulmonary resuscitation entails the use of chest compressions and artificial ventilation to sustain oxygenation and circulatory flow during cardiac arrest, therefore effective placement support and education are key to improving patients' survival outcomes.(Elsayed et al., 2021)

The United Nations targets that by 2030, all learners must acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, (United Nations, 2022).

Peyton's four-step approach is an implemented active learning approach, which consists of four steps, and it is highly effective in the nursing learning processes/ interventions. With demonstration as a first step, it involves teacher presentations and illustrations at a normal pace without added verbal explanations. The second step involves deconstruction in which the teacher performs the intervention by giving detailed descriptions of all the phases of the intervention, then comprehension as a third step, the teacher performs each step of the intervention according to students instructions and the final step is intervention where students perform the skills developed without a teachers help. In the ICU, nurse trainees undergo the four stages in to order to develop critical care competences, (Giacomino et al., 2020).

2.3 To implement the established pedagogical approaches for enhancing critical care competence acquisition.

To mitigate the inherent challenges during clinical placements in the critical care department, diverse strategies have emerged with the ultimate goal of enhancing critical care competencies and skills, (Ramoo et al., 2016). Patient safety and care often is cited as a major prerequisite for the implementation of approaches used to teach health workers.

This section outlines the implementation of the following pedagogical approaches that are relevant during clinical placements for critical care competency acquisition; through, the process of Reflective practice, Inquiry based learning, Simulations, and Learning by doing.

Reflective practice enables learners in nursing to compare their own practices with those of experienced practitioners. It is associated with learning from experience and embraces lifelong learning. It is a readiness to constantly evaluate and review your practice in the light of new learning. It is beneficial because it offers both learners and the nursing educators a conducive environment for learning and improving knowledge through reflection of critical care competences attained during placement, (S. White et al., 2018).

Reflection is the examination of personal thoughts and actions. This skill of learning entails thinking, and reasoning of critical medical information; its aim is to develop professional actions that align with personal beliefs. This process necessitates conscious efforts to look at situations with an awareness of self-convictions, assurance, understanding, and practices, which enable nurses to learn from their work experiences, (Goulet et al., 2016).

Aristotle described this process as an essential effective person-centred professional practice, which develops experiences and competencies reflected in the real practical placement.

In the clinical setting, reflection is an active, persistent and careful consideration of beliefs and knowledge, which enables nurses to stop, think, elucidate, challenge and change ideas and practices, in order to assimilate and integrate new knowledge and ideas to enhance competences. Reflective thinking strongly focuses on the need to test out and challenge true beliefs by applying the scientific approaches through deductive reasoning and experimentation.

The concept of reflection assists nurses in discovering a range of techniques they can use to develop their personal and professional competencies and involves reflection-on-action and reflection-in-action. Reflection-on-action focuses on identifying negative aspects of personal behavior with a view to improve professional competences and carefully re-running past events that have occurred in your mind. Reflection-in-action is the hallmark of the experienced professional and involves examining your behavior and that of others while in a situation. It focuses on knowledge, skills and behavior to ensure that they are able to meet the work demands, (Esther et al., 2015)**.**

Piaget describes the teaching method as one that focuses on exploratory learning where learners individually discover concepts and principles then emphasize clinical activity and experience, nursing instructors facilitate learning by providing opportunities, tasks and experiences for the learners to explore, (Lefa, 2014). In the intensive care unit, trainees develop critical care competences due to their active engagement; experimentation of new things, discussions, reflection then solve patient problems.

Inquiry based Learning: this inquired-based pedagogical model is a student-centred teaching approach that combines learning and practice, it encourages a learning environment where students actively ask questions, actively engage in clinical work and investigate and explore

real clinical issues. This involves structured and Problem-based inquiry approaches where learners apply problem-solving skills to find solutions, (Khalaf & Zin, 2018).

In the clinical setting, ICU nursing students are empowered to explore problems and actively engage in patient management, question the information attained and develop their own solutions to challenges, hence developing critical thinking skills, problem-solving skills, communication skills, creativity, and understand complex topics.

O'Leary's model of action research, stresses that cycles clump together and converge towards better situation clarity, certainty, judgement, and understanding leading to better implementation of action, which is dependent on evaluation processes that alternate between action and critical reflection, (Koshy et al., 2011). This approach of practical learning through experience changes and emphasizes the objective of continuously refining the different learning approaches, data analysis and interpretation in view of the level of understanding attained and developed in each earlier cycle.

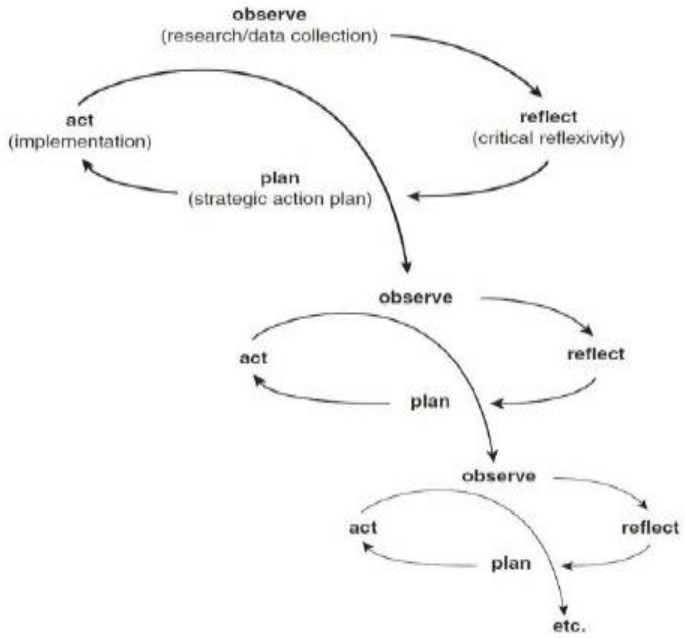


Figure 4: O'Leary's cycle of action research

Simulation-based learning: it is a technique for replacing or completing real-life experiences with guided ones. This approach of learning was beneficial because it offers the students skills, physical assessment, teaching and critical thinking activities in a safe environment with safe interventions and the students complete more activities in less time during simulation compared with the clinical settings, (Sullivan et al., 2019).

Simulation-based learning is a pedagogical approach used to teach course concepts that provide students with opportunities to apply practice learned skills, knowledge and ideas in real-life practical settings. These recurring visual practices and instructional techniques form an accurate view of ICUs, operating rooms, catheterization laboratories, emergency and inpatient departments. These enable students to practice their clinical and decision-making skills in a protected environment and achieve results approximating clinical practice as closely as possible. Through real knowledge and understanding of healthcare sciences, the nursing theories are harmoniously integrated with practical skills, (Koukourikos et al., 2021).

2.4 Evaluate the outcomes of the implemented established pedagogical approaches for enhancing critical care competences.

The study emphasized clinical assessments and learning by doing to improve learners' competencies; their various methods that educators use to assess, measure, evaluate and document the clinical readiness, the training sessions, learning progression and competence acquisition from nursing school to specialized skills, (Jawahar & Kumar, 2021).

Training needs assessment is an assessment gap between required competencies needed in the department and the available competencies possessed by the staff. Studies have shown that practical and theoretical assessments are an integral part of medical training and administrative tools used to update the skills of the staff and on-job trainings.

According to (Munezero et al., 2018), cardiopulmonary resuscitation (CPR) is a critical component of Basic Life Support (BLS) and Advanced Life Support (ALS), a lifesaving procedure that keeps cardiac arrest patients alive long enough for definitive treatment to be delivered; and yet there inadequacies in nurses CPR knowledge and skills depending on how frequent trainings are held. In Uganda, there no established compulsory CPR training schedules for hospital-based nurses compared to developed countries.

The competencies of ICU nursing trainees increase the acquisition of new responsibilities through the specific training of nurses that work in the critical care department, (Santana-Padilla et al., 2019).

Transformative theory of learning

The study was supported by Mezirow's theory of transformative learning which is described as an orientation that holds the way learners reinterpret or obtain new information, evaluate their past ideas and understanding through critical reflection. This theory mainly focuses on adult and distance education, and youth training where the learners adjust their thinking based on new information obtained, critical review and critical reflection leading to transformation of understanding, (Rombola, 2020).

This learning approach employed in nursing education focuses on instrumental and communication learning. Instrumental learning is task-oriented, and involves problem solving and evaluation of cause-effect relationships while communication learning focuses on how people communicate their feelings and desires, (Rombola, 2020). This theory applies to both learners and clinical instructors, because through critical reflection and review with the new information obtained, the general nurses are able to be re-skilled, improve their knowledge base, and develop confidence in training the nursing trainees.

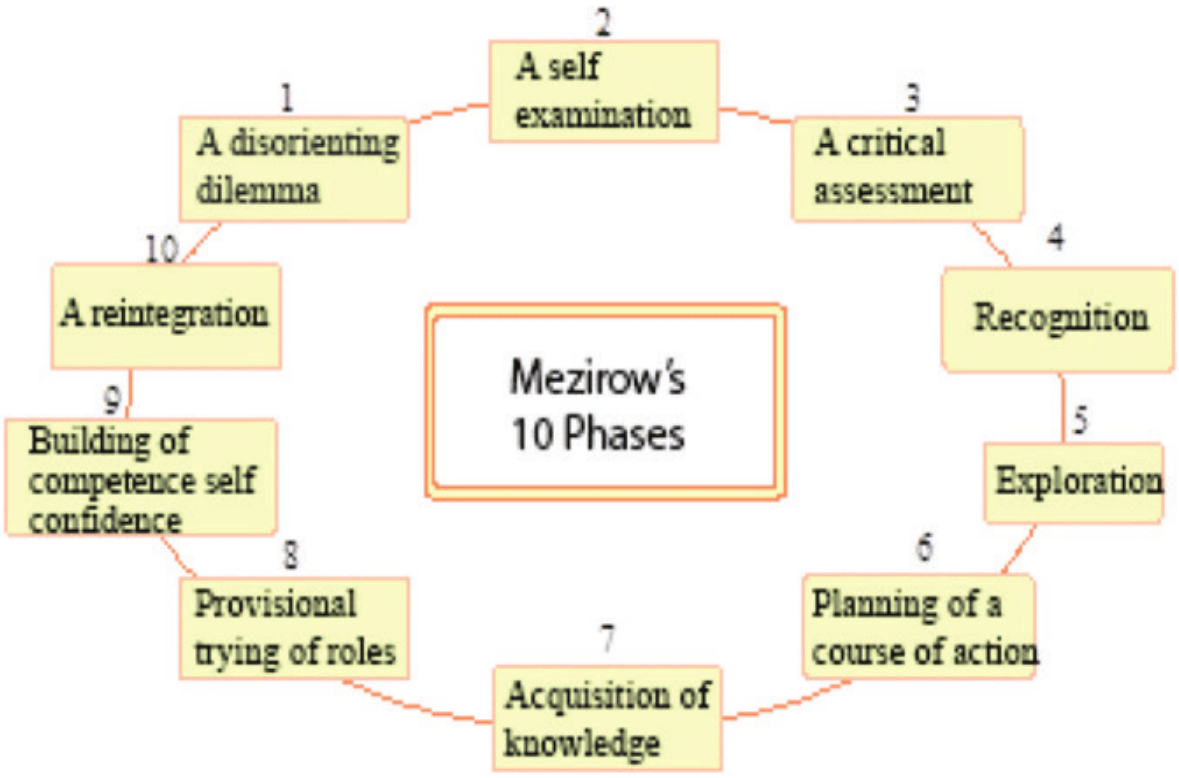


Figure 5: The 10 Phases of Transformative Learning Model

Source: researchgate.net

(Donovan et al., 2007) describes that, the sureness, strength and dependability of this research lies in its continuous focus on creativity and discovering ways of bridging gaps and generating solutions through brainstorming in order to solve practical problems; it empowers nurse clinicians, to engage in research and future development, and the application, implementation and accomplishment of nursing activities.

Figure 6: A Typical Cardiac Intensive Care Unit of the Uganda Heart Institute.

Photo by Researcher, 2022

This work environment necessitates that ICU nursing trainees are allocated ample time for training and competence acquisition to acclimatize themselves with the social environment before they are able to learn the necessary competencies.

Critical competencies and CPR procedure guidelines appear to be limited in Ugandan critical care departments and their few accepted guidelines and formal training programs for resuscitation. The nurses and nursing trainees in the critical care units are trained by anaesthiologists and ICU intensivists, but with lack of continued assessments, evaluation and supervision. Due to the gap in nursing education and practice, it is imperative for nursing trainees to undergo regular trainings, assessments, session reviews, hold continuous medical education sessions in order to improve knowledge and skills in the critical competencies.

Based on the established gaps within the literature review, it was prudent to select the types of methodology that would highlight the problem and the next chapter explains exactly that.

CHAPTER THREE: METHODOLOGY

3.0 Overview

This chapter presents information on the research methods of data collection and analysis used in the study while undertaking the participatory planned approaches to solve the challenge. It describes the research design, study population, sample size, sampling techniques and procedures, data collection methods, instruments, quality control, data analysis, ethical considerations, study limitations, reliability and validity, and dissemination of study. This is in line with (Snapp et al., 2023), description of methodology as procedures used to obtain and analyze data.

3.1 Research design

The study employed a participatory action research (PAR) design. This design is a life-enhancing qualitative inquiry, that engages participants in a collaborative relationship with the researcher, the participants in a democratic, equitable and liberating manner, actively make informed decisions, in all the aspects of the research process; from problem identification, collecting data, analyze and act upon it, in order to find solutions and promote social conversion. It involves dialogue, action inquiry and application, social learning between stakeholders and researchers; it embraces the community strength with sustainable solutions and empowerment, (MacDonald, 2012).

It's based on the proposition of Kurt Lewin, "You cannot understand a system until you try to change it", (Cummings et al., 2016).

The future workshop model that entailed a participatory and consensual approach to collect in-depth information, investigate problems and invent plans to solve them guided the research design; this qualitative inquiry sought stakeholders and learners input into the evaluation of

trainer and trainee training support, and uncovered outcomes that would not have been identified otherwise, (A. M. White & Verhoef, 2005).

The research applied a descriptive and comparative qualitative analysis while undertaking the participatory planned strategies to solve the identified problem. Descriptive analyses involved interviews and other fact-finding queries while comparative analyzes involved pre and post assessment and evaluations. Secondary data was collected during the work process analysis in the future workshop. The quantitative part of the study depended on the usage of measuring tools like the UHI critical care competency checklist to compare competence levels of assessment and evaluation and to identify training gaps among nursing trainees during teaching and learning in the ICU. It was agreeable that mixed methods research was an appropriate approach to any given project, as it yields positive benefits and a greater depth and breadth of data, which is not possible utilizing singular approaches in isolation, (Almalki, 2016). It concentrates on the study of human experiences and the meanings ascribed by individuals living the experience within their natural settings, (MacDonald, 2012).

3.1.1 Fundamental conceptions of Action Research

Action research was measured, since it contends with real-world scenarios happening with in a complex social setting. It involves an action researcher and the direct engagement of stakeholders seeking to help, investigate and improve their situations for social change, (Ng et al., 2013).

In particular, it is a cyclic process based on action; practice alterations, evaluation and remodeling, which entails planning, problem identification for change, self-critical action and reflection, implementation and critical analysis of practices based on collected information in order to introduce relevant practices. This is a deliberate process designed to engage and help

practitioners, learn more about their practices, skills and the social environment in which the practices are expressed and realized.

It is a systematic and transformative approach, that involves collaborative learning by doing and continuous innovation in healthcare through changing the way people learn and interact with each other in their shared environment. The essence of this research was to endeavor to "learn by doing" and focus on real-world concerns in nursing with the involvement of key stakeholders, (Bradbury & Lifvergren, 2016).

The study took place in the workplace and aimed at taking action and creating knowledge in clinical practice thus improving one's practice. The impetus of the study arose from a chosen need to institute change from clinical staff, nurse educators and ICU nurse trainees involved in teaching, learning and management during clinical placement. The questions that arose from the challenges of the stakeholders about clinical placement support improved competencies.

Phases of Action research

The action research methodology employed in this study was informed by writings of (Mertler, 2017), (Atweh et al., 2002), and (Koshy et al., 2011).

According to the above scholars, the central principles of action research include:

- Amend clinical competencies and practice in healthcare by learning through action,
- Repetitive cycles of identifying a problem, planning and action, implementing, and evaluating,
- Act informed by learning through changing established patterns of action points and thinking process,

- Changing the existing conditions through a collaborative, interrogative and participative perspective of social science in healthcare.

Lewin described that action research entails a spiral process of self-reflection, evaluation and contemplation, practical collaboration, emancipatory and recursive, interrogation and inspection of action points, (Hendrics C, 2017). Lewin further argued that workplace democracy increases worker motivation. The study attempted to achieve these concepts, with elaborate emphasis placed on the collaborative, participatory, practical and reflective dimensions. This ensued through clinical and academic staff, hospital administrators working individually and collectively. The action research methodology commits to, and ensures that observatory and identifying problems during clinical placements are fulfilled in a cyclic process of reflection, planning, action, implementation and evaluation of action results. (Elizabeth et al., 2010), argued that because action research is context specific and always entails taking action and evaluating the impact of practice during patient care.

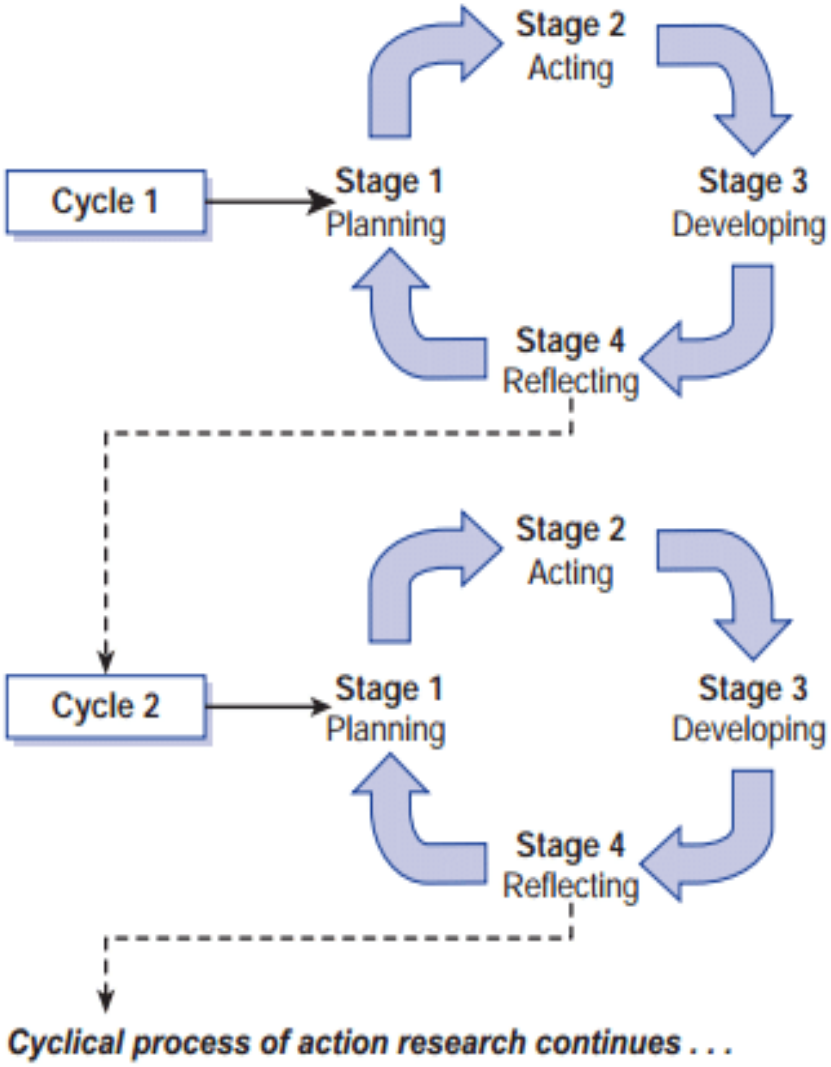


Figure 7: Study design

Source. (Adapted from Mertler & Charles, 2011)

As shown in the figure above, all cycles have been done; assessment of practice necessitating change, implementation and evaluation of the change intervention, cycle 2 was for re-reflection, re-implementation and re-evaluation of competencies among ICU trainees in the critical care department.

3.2 Study Population

This study population comprised of participants from Uganda Heart Institute student nurses, ministry of health ICU nurse trainees, Nurse Interns, nurse educators, Unit in-charges, newly

recruited ICU nurses, Doctors, Cardio-Respiratory Therapists, Biomedical technicians (Critical care team). All the stakeholders who were concerned and interested in addressing the training gaps where purposively selected in the study. All ICU nurse trainees were singled-out, because it was a prerequisite for them to develop the critical care competencies in critical care. Their information was very instrumental for the progress of the action research.

3.3 Sampling Procedures

3.3.1 Sampling Technique

Purposive sampling technique also known as judgmental, selective or subjective sampling that was used is a nonprobability sampling technique chosen by the judgement of the researcher to choose the sample of participants, its useful when randomization is impossible and their limited resources, time and workforce, (Etikan, Ilker. S A. Musa, 2016). This non-probability sampling technique, which is selective and subjective in nature, was used in participant selection as the researcher relied on their own judgment when choosing members to participate in the study, (Ames et al., 2019).

3.3.2 Sample Size

The sample size was determined using Purposive sampling technique. The key informants and participants were singled-out for inclusion in the study; the sampling and participation of individual participants was dependent on voluntary participation upon consent to the study.

3.4 Data Collection methods

Research methods are various procedures and schemes of collecting, measuring and analyzing accurate research insights using standard validated techniques employed by researchers during a research study. The data was collected basing on their relevancy to the research topic; the methods used were observations, photography, focus group discussions

(FGDs), key informant interviews (KII), and individual discussions. The interviews are loosely structured conversations with people who have specialized knowledge about the topic, they explore the subject in depth, examine specialized systems and identify target issues that you may want to investigate further, (Akhter, 2022). The future workshop is a renown participatory interventional method were solutions are developed by involving actors, leaders and participants to develop action plans for improvement in a workplace and interventional solutions for existing problems.(Skoglind-Öhman & Shahnavaz, 2004).

The tools used included interview guides, recorders, camera, pen, pre and post assessment, and evaluation checklists, and a journal. The checklist is a valuable tool to confirm the essential elements of a qualitative inquiry and is an interactive process whereby instructors interact with students in both verbal and written formats to develop competencies (Frels et al., 2011).

Ideas about the implementation of the intended strategies were generated and discussed in regards to how they would be accomplished, (Billett, 2001).

Table 3: Summary of methods and tools for data collection

Data collection methods	**Data collection tools**
Future workshop	Electronic board, flip charts, markers, cameras, recorders, logbooks, papers, smart phones.
Key informant interviews	Interview guides
Focus group discussions	Pre and post assessment and evaluation checklist.
Observations	Critical care competency checklists, camera, sight

Source: Researcher. 2022

3.4.1 Data Collection procedures

A consultative meeting was organized in the department involving medical and nursing teams, ICU nurse trainees, nursing faculty, administrators and other stakeholders.

Brainstorming as a method for problem identification in a democratic and equitable manner was used, challenges involving acquisition of competences in the critical care department where raised by the stakeholders, the challenges where clustered and subjected to a pairwise matrix ranking. Participants collectively agreed that clinical placement support by trainers would enhance competence development, hence graduating nurses with skills and competences ready for the world of work.

Instruments of data collection

The study employed research tools like interview guide, Focus group discussion guide, Observations and critical care competency checklist.

3.4.2 Interview guide

Interview guides in qualitative research seek to understand the world from the participant's viewpoint. It is a list of questions that the interviewer hopes to cover during the interview and the participants provide answers in their own words to raise points they believe are important and uncovers their lived experiences. This provided the researcher with a platform to investigate further, to solve surging problems and to gather data, which couldn't have been obtained in other ways, (Kallio et al., 2016).

The technique as a valuable assessment tool was very helpful in collecting raw information as the researcher consulted and dialogued with the participants in the department. The interviewer had a list of semi-structured questions or themes that were covered and the participants expressed their views with the help of a guide and recorder with freedom and convenience, (Turner, 2010).

3.4.3 Focus Group Discussions

A Focus Group Discussion (FGD) is a method for collecting qualitative data, it gathers individuals together to discuss a specific topic, and open-ended questions are used with the

aim of stimulating an informal discussion with participants to understand their perceptions and beliefs, (Aukrust et al., 2021).

A small group of four people was purposively opted to put their heads together and deliberate about specific emerging needs, develop interventions and test new concepts. It was presumed that small groups' generate opportunities to collect data through group interactions; have a high ability to reason and high face validity. The information collected formulated strategies to address and improve competencies.

3.4.4 Participant Observations

Observation is a systemic data collection method in which the researcher studies individuals or a group of participants not only through observation, but also by participating in the activities too, including using senses to scrutinise them in their natural environment. (Kawulich, 2012). Participatory observation allowed the researcher to see and better understand what people are doing and compare it with what they say; through covert and active participant observation and evaluation, the researcher had access and opportunities to observe and experience the practices and skills of the participants. This technique collected data on the evidence of competence acquisition, assessment methods, and lack of critical skills.

3.5 Quality Control

These data collection tools guided the literature. The study process was supervised and guided by Uganda Heart Institute mentors and technical faculty from Kyambogo University. The participant's views were discussed, equitably and democratically after building consensus and dialogue in the Future workshop.

3.5.1 Informed consent

Informed consent was a continuous process, and involved a person voluntarily agreeing to participate in the research study after being informed about it through verbal discussion with the study staff, followed by documentation on a written, signed, and dated informed consent form. Participant's consent was continually sought during the course of the study, and the participants were notified of any changes to the study, along with any other pertinent information that influenced their decision to remain in the study.

While documentation of informed consent was required in most clinical studies, there are occasions when a waiver or alteration of written informed consent is obtained from the Institutional Review Board (IRB) for some or all study participants. The fundamental criteria for waivers and alterations of informed consent are located in the good clinical practice guidelines.

The informed consent document contained all of the information that the person needed, to make an informed decision about taking part in the study. Many research teams use the consent document to guide the verbal explanation of the study to potential participants. The participants signed and dated the informed consent form before taking part in the study procedures. Signing the consent form was not the final step in the informed consent process. The participants can withdraw consent and decline to participate in the study at any time before or after signing the consent document until their participation in the study is completed, (Nnebue, 2010).

3.5.2 Reliability of the study

Reliability is the extent to which research results are consistent and replicated over time and an accurate representation of the total population under study if reproduced under a similar methodology. Reliability means that the scores of an instrument are stable and consistent,

(Ishtiaq, 2019). It is a concept that evaluates quality in quantitative studies and depends on the likely recurrence of the original data; it is easily understood by identifying the testing methods for stability and consistency. In this study, the measurements to improve reliability included all interviews recorded to present more reliable evidence and avoided bias through conversation recall, (Mohamad et al., 2015).

All the questions were clearly worded, and asked in a natural tone voice. And the participants gave equal opportunity to describe their thoughts and beliefs freely. Pre-practicing of the interviews and focus group discussions ensued in the study.

3.5.3 Validity

This means that the individual scores of an instrument are meaningful and allow the researcher to draw good conclusions from the sample population being studied, (Ishtiaq, 2019).

Validity determines whether the research truly measures that which it is intended to measure, (Golafshani, 2003). A data collection instrument to be considered valid, content selection must be relevant to the gap identified.

The validity of the study was assessed throughout the study from start to conclusion. It was achieved by undertaking validation strategies employed specifically by the research participants that involved investigating the problem from the different stakeholders and presenting of results. To ascertain the validity of the study, the Future workshop was used as a method involving stakeholders to identify the main challenge to skills development and depending on how skilled the trained ICU nurse trainees provided patient care in the world of work.

3.6 Ethical Considerations

The approval for conducting this study was granted by Kyambogo University Directorate of Research and Graduate Training. Technical supervisors guided the study from Kyambogo University and the Critical Care Department of the Uganda Heart Institute.

Informed consent was sought from all the study participants, expressed in writing, and participation was voluntary.

Introduction letters were given to the researcher to be delivered to the Research and Ethics Committee of the Uganda Heart Institute for approval to conduct the study. Confidentiality and Privacy were observed since the research involved participant engagement, and creation of solutions to the existing problems. At the heart of participatory action research, principles were agreed upon, the researcher facilitated the discussion proceedings, and democracy and humanity with respect were ensured.

3.7 Study Limitations

The nature of action research involved studying own weaknesses at the work place, aiming to improve the undesired situation, it is tempting that one may choose to conceal some of the weaknesses. Critical care departments are difficult sites to carry out meaningful research and site training, as the patient lives are more at risk when there multiple interferences. This was however minimized by staying open and allowing critique from participants without taking offense.

3.8 Procedures of data collection

After proposal approval, the researcher received permission from Kyambogo University Directorate of Research, Graduate, and Training to conduct the action research. The Uganda Heart Institute research committee had earlier allowed the researcher to use the boardroom for the future workshop and the Critical care division for her study, there was no need for

further acknowledgement. Once the permission was granted, the researcher proceeded to the hospital administrator to book for the presentation date and future workshop. The date selected was 03/03/2022, time 10 am and venue Uganda Heart Institute Boardroom. The qualitative data was collected from thirteen (13) participants and the quantitative data was collected from ten (10) participants who were given a pre-test to assess their current skills in patient care of a critical cardiac ICU patient during implementation. While in the ICU, each participant practiced under the supervision of a clinical instructor. At end of the one-month rotation, evaluation was done and results were submitted to the department for compilation and analysis. During the future workshop and situation analysis, interviews, observations, audios, photography and group discussion where used. The data written on flip charts by a fellow pedagogue who acted as secretary to the participants.

3.9 Data analysis

It is an illustrative method of collecting, identifying patterns, modeling, transforming, cleansing, and analyzing information to extract insights and conclusions that support decision-making, (Check & Schutt, 2012). The data analysis occurred following completion of data collection, the technique involved transcription of data from the field, coding, categorizing and establishing themes. The interview data was analyzed thematically using a mix of both inductive and deductive coding approaches. The Transformative theory of learning (Mezirow's) and the Experimental learning theory (Kolb) guided the deductive coding process, while the inductive coding process was generated from the interview data. In exploring the teaching methods at the ICU, the major themes identified were Observation, Discussions, Demonstration, and return demonstrations. Among the pedagogical approaches used at the ICU, the main themes were Reflective learning, Learn-by-doing, Simulations, and Inquiry-based learning. The identified pedagogical challenges at the ICU were inadequate teaching and learning resources, short placement periods, and competing responsibilities.

3.10 Dissemination of Study Results

Study findings submitted to Kyambogo University Directorate of Research and Graduate Training to be included in the university library repository; to engage the Uganda Heart Institute cardiac nursing fellowship to adopt the use of the UHI critical care competency checklists to all nursing trainees, interns, and nursing fellows at the institute. Collaborate with research supervisors for publication in journals, workshops and conferences. Present the study findings at the Uganda heart association symposium and the International nurses' day (2024). Inform policy to Health training institutions that allocate nurse trainees to the Uganda Heart Institute. Having deployed the above methodology, the results are now duly presented in the next chapter.

CHAPTER FOUR

INTERPRETATION AND PRESENTATION OF RESULTS, ANALYSIS OF DATA ACTION PLAN IMPLEMENTATION AND EVALUATION

4.0 Introduction

This chapter presents the findings from interventions implemented and their evaluations based on study objectives and the plan of action drawn by the Critical care department stakeholders The findings presented included what was assessed as nurse trainees participated in the study as well as what was gathered and attained from the interviews. An account of who said what, who was assessed, how, when and why was narrated.

The study was set out to enhance critical care competence acquisition among ICU nursing trainees in the critical care department through clinical placement support by nursing instructors and educators. The trainees employed active participation and competence acquisition assessed and measured using the UHI ICU/Critical Care Nurse Competency Checklist; pre-post competence performance scores, self-assessment and validation of competency guide.

Participation in the study was voluntary, involving twenty-three stakeholders, thirteen (13) of the stakeholders were identified as voluntary team players who participated in the implementation of the assigned tasks to ensure that the research questions and the nursing assessments got the intended answers. A total of ten (10) participated in the key informant interviews; seven (7) nurses from the Critical care department, three of which were nursing educators, three (3) were nurse trainees, one (1) was a Biomedical engineer and one (1) was a Cardio-respiratory therapist. The majority were female, within 40 – 49 years of age, Bachelor's degree holders, and with over 6 years of experience. The table below has the detailed characteristics of the participants that participated in the key informant interviews.

In as much as there is qualitative and quantitative data in this study, the quantitative component was to show the level of participation in this action based research that could further be used to influence change and the next action plan within the unit.

The amalgamation of the different methods was necessary to achieve meaningful results; and none of the methods could independently work on their own.

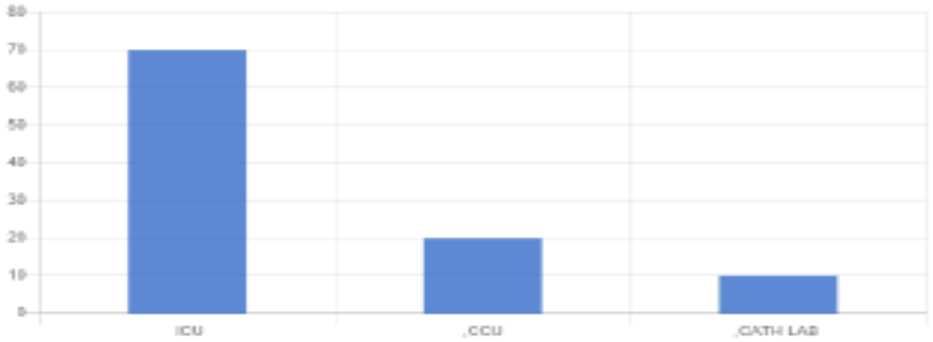
Table 4: Characteristics of the Key Informant Interview participants

ID	Category	Gender	Age group	Education level	Work experience (years)
1	Nursing educator and mentor (ICU/MOH)	Female	40-49	Bachelor's degree	10-15
2	Nursing educator and leader (CCU)	Female	40-49	Bachelor's degree	3-5
3	Nursing trainee	Female	30-39	Bachelor's degree	6-9
4	Biomedical engineer	Male	30-39	Bachelor's degree	6-9
5	Nursing educator and mentor (OPD)	Female	40-49	Diploma	10-15
6	Nursing trainee	Female	40-49	Bachelor's degree	10-15
7	Intern nurse	Female	40-49	Bachelor's degree	10-15

8	Intern nurse	Female	20-29	Bachelor's degree	No work experience
9	Nursing educator and mentor	Female	20-29	Bachelor's degree	6-9
10	Cardio pulmonary therapist	Male	20-29	Bachelor's degree	6-9

Source: Future Workshop meeting, March 2022

The table above and the figure below are representative of the action points implemented by the team players in the department, and they included ICU nursing trainees, nursing educators, mentors, and others.



Value	Frequency	Percentage
ICU	7	70
,CCU	2	20
,CATH LAB	1	10

Figure 8: The number of ICU Nursing trainees who were assessed and evaluated during the implementation of the UHI ICU/ Critical Care Nurse Competency Checklist during ICU placement.

Source: Critical care competency checklist, June- August 2022

The nursing trainee assessments had a representation of ICU, 7/10 (70%); CCU, 2/10 (20%) and the Catheterization Laboratory (CATH LAB), 1/10 (10%);

4.1: The existing teaching and learning methods in nursing education.

To achieve this objective, the researcher together with stakeholders adopted the following strategies: the use of Critical care competence checklists for pre and post assessment and evaluation of nursing trainees, obtaining a functional nursing resource library, a simulation laboratory, demonstrating practical skills to students, allocating specific nursing instructors to handle ICU nursing trainees. The description of these implementable approaches is indicated below; however, some approaches have been mirrored within other interventions.

The participants mentioned various teaching and learning methods. Most profoundly, the nurse educators or instructors relied on observational learning to transmit ideas and skills to trainees. They rely on demonstration of specific critical care skills and competences to trainees after which an opportunity to carryout return-demonstrations of what they have observed. On the other hand, the ICU trainee nurses highlighted supervisor-led discussions as one of the ways they attain knowledge.

4.1.1 Observational learning

The participants mentioned observation as one of the main forms of teaching trainees in the department. Observational learning was frequently ascertained as the best fitting alternative due to the busy schedules in the ICU. **Participant 3** mentioned that:

> *"[In] The initial days, you may not touch the patients, but observe! In addition, if you are eager, you try because when you see the same thing done often, you tell Sister, "can I also try doing it?" And when there's time because it is also a matter of it... if you have time and space, you can be allowed to touch the patient"*

Participant 1 also shared that;

> *"Then we allow our students to do observations because this is a specialized institution. In a specialized clinical area where most of the procedures are not common to our trainees, we get them involved in observational learning and after observing for a given time like 2 weeks or a month, we let them work along with other competent staff."*

4.1.2 Discussions

The participants elaborated more on the use of discussions, specifically group discussions, as another teaching and learning method. Particularly, the nursing trainees use this method to share ideas and knowledge under close supervision of their supervisors. When commenting on the discussions, **participant 7** shared that:

> *". . . It is spearheaded by the in-charge because she is the one who provides the topics for discussion; you choose one to read about, then come and present with your colleagues. It's like a discussion."*

Participant 3 also commented that:

> *". . . The nursing instructors collect us as trainees and other staff, we sit and discuss."*

4.1.3 Demonstration and return demonstration.

The participants shared that nurse educators demonstrate how certain skills are performed, and then allow the trainees to reciprocate what they have learned through a return demonstration. They strongly related this teaching method to the nature of the ICU being a super-specialized institution. **Participant 1** also shared that:

> *"So, they do observations and work alongside the staff who are giving them more training and skills that you can call mentoring. Um, then we later let them have hands-on the patients, in this case, they are doing a return demonstration."*

During the implementation of the study, a nurse educator was transferring skills to the ICU nursing trainees and return-demonstrations were carried out to measure the competences attained.

Figure 9: Demonstration and return-demonstration methods carried out in the ICU.

Photo by Researcher, 2022

While commenting on the available teaching methods in the ICU, **participant 8** said that:

> *"We may demonstrate on a given patient or another patient who comes in a similar state. For example, ECGs are almost the same, so they demonstrate how*

they do it, teach, and then I can demonstrate on that very patient or any other patient that comes in."

Participant 1 also shared that:

"an example would be the use of particular equipment to accomplish let's say clearance. So, there is some equipment that we might bring in and they are new to the nurses and in one way or another, you will have to demonstrate the use of that particular equipment." – Nurse educator.

Figure 10: ***An ICU nurse trainee carrying out return-demonstrations during competence acquisition in the critical care department.***
(Photo by Nurse in-charge, August 2022)

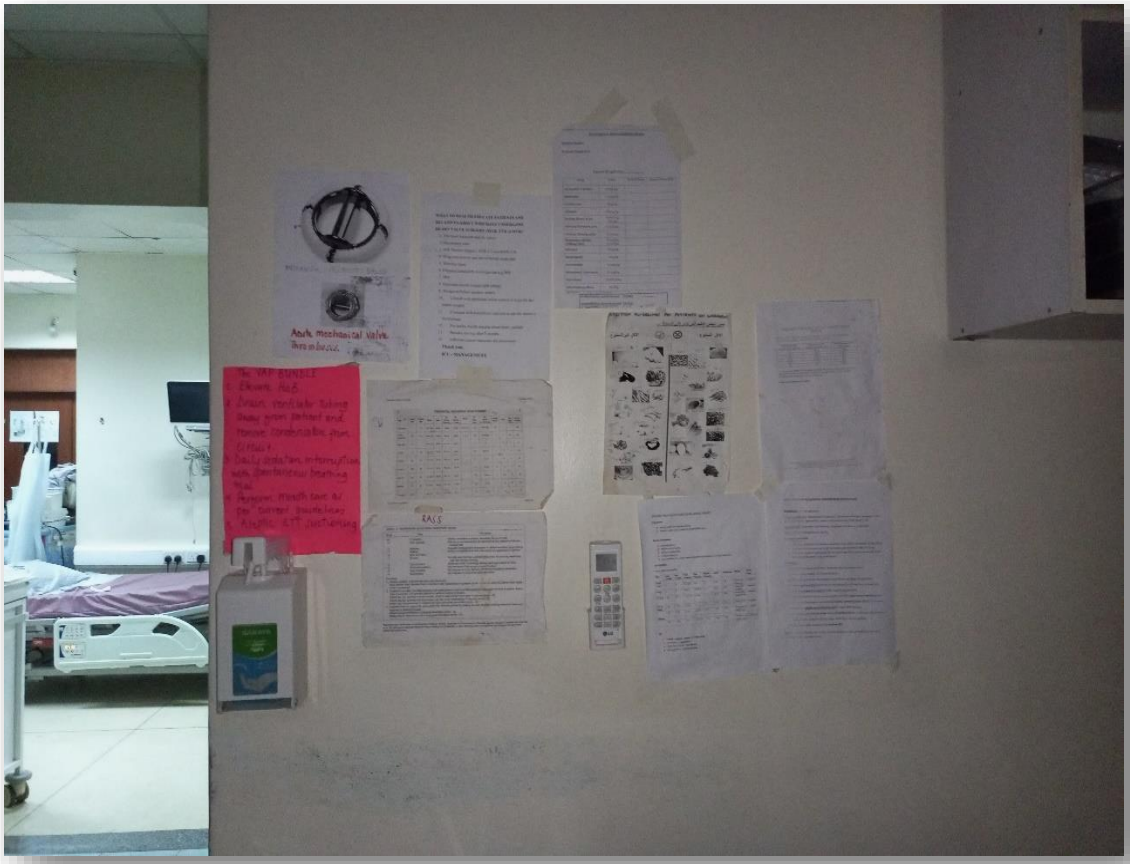


Figure 11: Learning material used for observational learning (Source: ICU Notice Board, 2022)

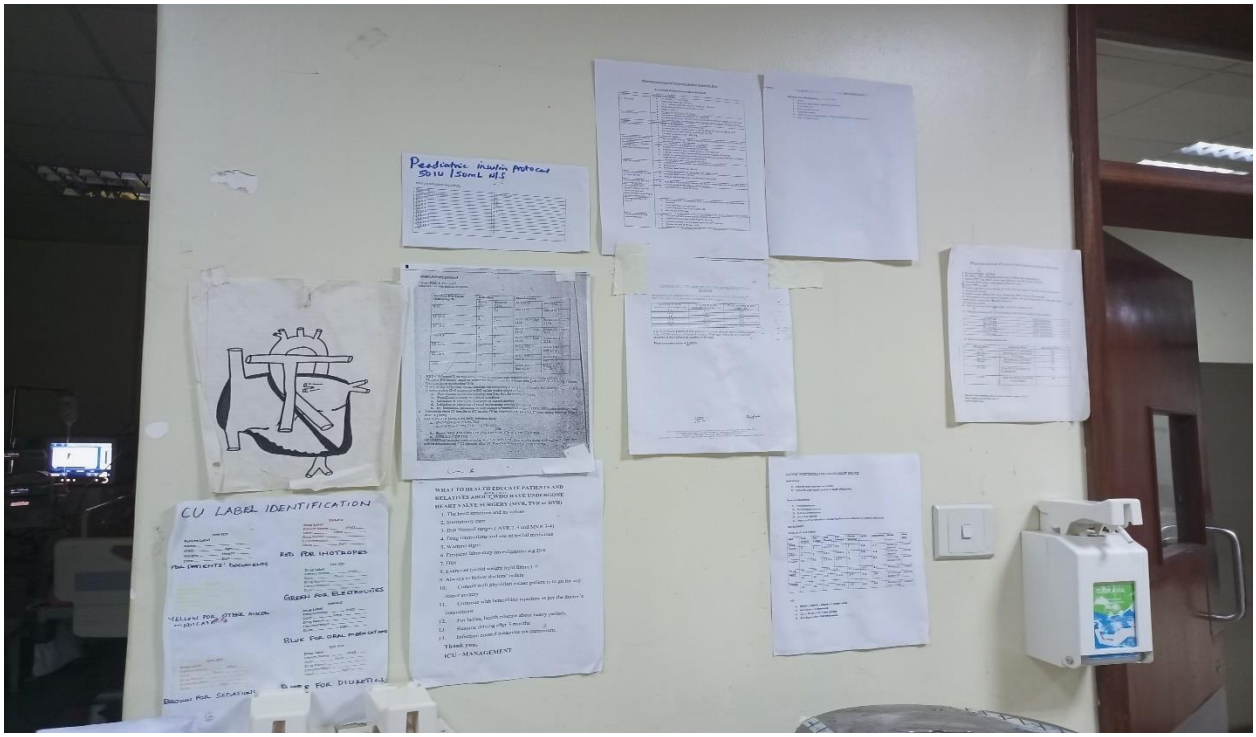


Figure 12: Learning material used for observational learning

(Source: ICU Notice Board 2022)

4.2 The Pedagogical approaches employed in the provision of critical care competences

The overarching themes under the pedagogical approaches employed in the provision of critical care competences in the department were; Learning- by Doing, Simulations, Inquiry-based learning, and Reflective learning.

4.2.1 Simulation Learning

Simulation based learning is a practice of learning that replaces and amplifies real experiences with guided ones, it enables health workers develop knowledge, skills and attitudes using realistic scenarios and equipment that allows for retraining and practice until a skill is mastered, (Lateef, 2010).

One of the most common pedagogical approaches in the ICU is Simulation learning. Many participants mentioned relying on videos showing various procedures; especially those carried out in the operating room and the cardiac catherization laboratory and relayed in the

ICU on computers due to the high numbers of learners in the department. In some cases, the dummies are used since they do not die while videos are used if there is not enough equipment for use that on a specific day.

Participant 2 shared that:

> *"For the simulations, we have videos that we show to them. Because sometimes we may not have all the equipment for that day but we have videos on how they are supposed to be done and how it works. So, in case somebody lands on such equipment, they won't get stuck on what to do".*

Participant 6 also shared;

> *"There was also simulation where they get dummies and let you learn. Sometimes you may not learn from a patient and in some emergencies. So, there's that simulation where they let you learn on a dummy because it doesn't die."*

4.2.2 Learning-by-doing

This method of learning and educational orientation integrates theoretical and practical processes and emphasizes the importance of "hands-on" learning or learning-by doing. It is an active pedagogical approach that occurs during experience. It engages students in the learning process and involves role-playing, clinical experiences, and task management, (Murray, 2018). The nurse trainees learn specialized skills by carrying out procedures and tasks. The participants believed that this approach was one of the best ways a trainee would remember what they are taught during the learning process.

Participant 9 shared that:

> *"You do the teaching then demonstrate how something works and also give them time to use hands-on to also see how it works. Because sometimes it is the most*

appropriate means of teaching whereby somebody can easily remember something which he/ she did hands-on than what they heard."

Participant 8 shared that;

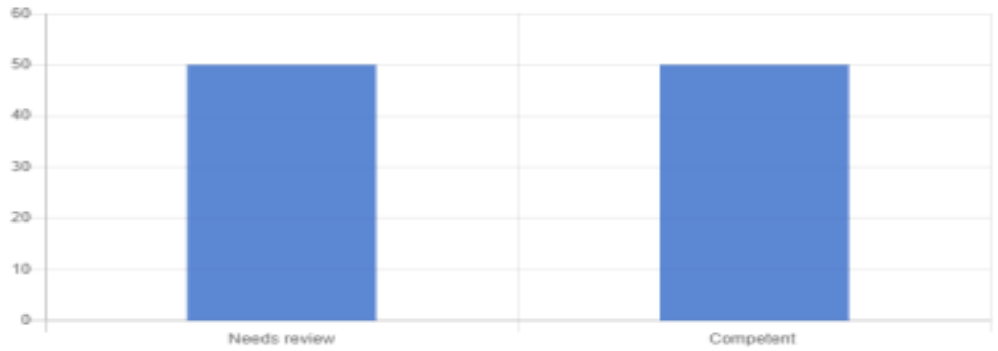
"There's learning by doing; whereby you are allowed to work on a patient under supervision. Like, "do this, put this here" so, you use hands-on skills. It is a hands-on practice and should be evidence-based. "Why are you doing this? Because this and this is happening.".

Figure 13: ICU nurse trainees carrying out patient tasks through experiential learning.

Photo by Researcher, 2022

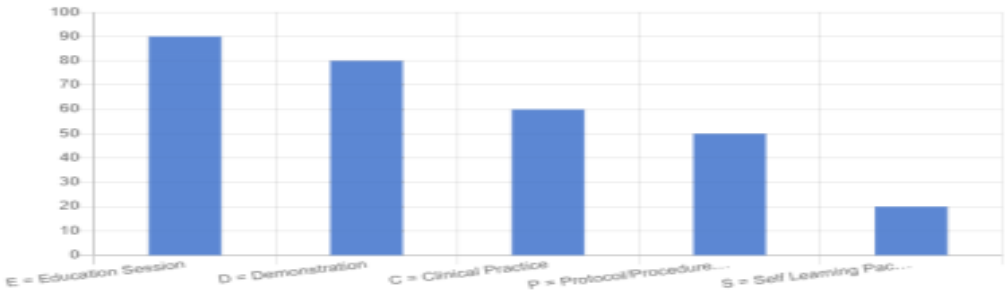
The results below represent the checklist skills level of assessment. The nurses voluntarily participated in this competence self-assessment using the UHI/ICU critical care nurse competence checklist tool (Appendix III). The nurses were asked to indicate at which level they could handle emergencies, care for invasive lines and Drug calculations. The assessment

helped the trainees to identify their training gaps/needs. In addition, which method of learning led them to become competent?



Value	Frequency	Percentage
Needs review	5	50
Competent	5	50

Figure 14: Showing ICU trainees level of competence and method of instruction



Value	Frequency	Percentage
E = Education Session	9	90
D = Demonstration	8	80
C = Clinical Practice	6	60
P = Protocol/Procedure Review	5	50
S = Self Learning Package	2	20

Figure 15: ***Showing ICU trainees level of competence and method of instruction***
Source: Primary data from assessment checklist

The study revealed that on average 5/10 (50%) nursing trainees needed more practice to improve their competences while 5/10 (50%) had the skills and knowledge to handle emergencies, care for invasive lines and carry out drug calculations during patient care following assessment while 90% gained competences through ICU educational sessions.

4.2.3: Reflective learning

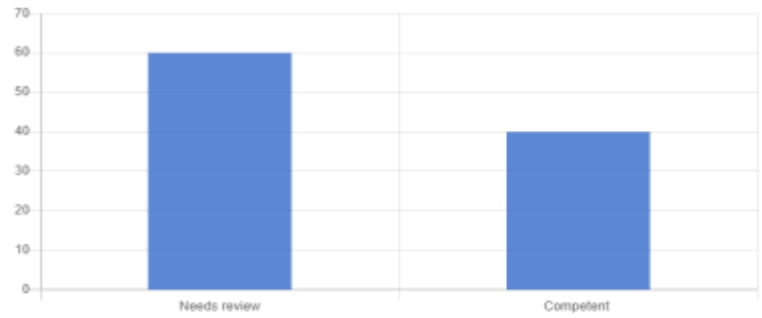
This is a valuable tool, which assists nursing students in learning from practice. It involves reflection-before-action, reflection-in-action, reflection-on-action and reflection-beyond-action, (Galutira, 2018)**.** This pedagogical approach was employed and assessed. There were several examples of trainees reflecting on previous experiences, especially the bad ones, and then trying to figure out what they did not do right. For example, one trainee shared that she had to read more about replacing a pressure bag following an earlier mistake. **Participant 3** said that;

"Yes, I didn't have any good idea about how to put up the pressure bag. In the process, the patient's arterial line was blocked because I applied little pressure and did not put the systolic pressure to merge with the transducer. So, I felt so bad because I just knew that it was me who caused the arterial line to block. It was not good but it was a learning point for me. I read about it and I now know that I have to correlate with the systolic and diastolic pressures of the patient as I replace the pressure bag."

Participant 2 shared that;

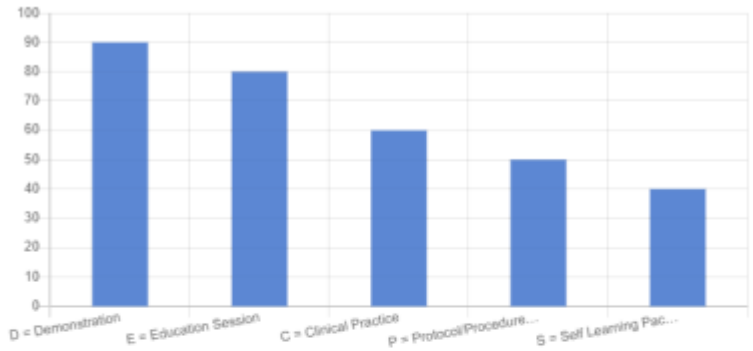
"Sometimes we had issues with patients with MIs (myocardial infarction) and the patients were dying. Therefore, we sat down and asked ourselves, "What is happening to us?" So, we reflected, read ahead and realized that there was a gap in contacting the CATH LAB team, so we worked hard to reduce that gap."

The figures below show results of nursing trainees who were assessed on, in-depth theoretical and practical knowledge on CPR, Pain management, chest care and ventilator management. The study revealed that 6/10 (60%) of the trainees needed more hands on training and practice in order to provide CPR, and the other critical care competences while 4/10 (40%) were able to provide patient-centred critical care to the patients. The learners were involved in educational sessions and self-directed learning in order to enhance their knowledge and competences. This indicates an existing CPR education and practice gap among nurses; quality resuscitation and chest care is relevant to save lives of cardiac arrest patients.(Munezero et al., 2018).



Value	Frequency	Percentage
Needs review	6	60
Competent	4	40

Figure 16: Nursing assessment and method of learning on critical care competences



Value	Frequency	Percentage
D = Demonstration	9	90
E = Education Session	8	80
C = Clinical Practice	6	60
P = Protocol/Procedure Review	5	50
S = Self Learning Package	4	40

Figure 17: Showing Nursing assessment and method of learning on critical care competences

Source: Primary data from assessment checklist, 2022

4.2.4 Inquiry-based learning

This is a pedagogical approach, which combines learning and practice; it develops learners' problem-solving skills and evaluation of findings. It increases learner's knowledge and skills through learner's engagement. In addition to reflective learning, inquiry-based learning is another approach used in the department. The nurse educators mentioned that their trainees are frequently tasked to question their judgment and reasoning as a way of learning.

Participant 2 shared that;

> *"In case there's an incident or scenario that has happened in the department, we go ahead and ask the learners, "When this happened, what did you do about it?" For example, if there was a patient with a cardiac arrest, we can tell them, "What did you do about it? How did you feel about the scenario and how do you rate yourself? Did you perform well or were you not competent enough? And, how do you think you can do better?" Then we discuss inquiries."*

Participant 4 shared that:

> *"That's why we offer these user manuals such that we encourage them to read on their own. Because, when somebody discovers something on their own, they will definitely remember it for a longer time than the one who has just been told how everything works."*

4.3 The implemented pedagogical approaches to enhance critical care competencies.

4.3.1 Competency Assessment

The table below shows the different results of assessments during the clinical placements in the Critical Care department. The ICU nursing trainees voluntarily participated in the skills level assessment using the UHI ICU/Critical Care Nurse Competency checklist tool

(Appendix 3). The assessment process helped the trainees to identify their knowledge gaps and training requirements.

The methods of instruction where: P- Protocol/procedure Review, E-Education Session, S-Self Learning Package, C-Clinical Practice & D- Demonstration; meanwhile the methods of evaluation where: O-Observation in clinical setting, RD- Return Demonstration, T-Written Test and V- verbal Review. In the Critical care department, different methods of learning are applied; therefore, the trainees underwent more than one instruction and one evaluation method.

GETTING INTO THE SYSTEM

Table 5: Nursing Trainees getting into the system of various critical care units.

No	Competencies assessed	Never done n (%)	Need practice n (%)	Competent n (%)	Method of instruction n (%)	Method of evaluation n (%)
1	Introduce nurse trainees &conduct tour	2(20%)	1(10%)	7(70%)	60% E, 30% P, 10% C,10% D	100% V, 20% O
2	Orient, assess competencies, document	3(30%)	4(40%)	3(30%)	60% E, 20% D, 20% P, 10% C,10% S	100% V,50% O, 10% T
3	Basic principles in cardiac nursing, handling of emergencies	0	5(50%)	5(50%)	90% E, 80% D,60% C, 50% P 20% S	100% V,60% RD, 60% O, 60% T
4	Receive and provide post-operative care		3(30%)	7(70%)	90%D, 80%C, 60%E, 50%P	100%RD, 90%V,80%O, 10%T
5	Handling of ICU equipment		4(40%)	6(60%)	80%E, 80%D, 50%P, 40%C, 10%S	80%RD, 70%O, 60%V
6	In-depth instructions on CPR, pain, chest tubes and chest care		6(60%)	4(40%)	90%D, 80%E, 60%C, 50%P, 40%S	100%V, 90%O, 70%RD
7	Ability to do CPR, intravenous therapy &medication errors		6(60%)	4(40%)	70%D, 50%E, C, P, S	90%O, 90%RD, 80%V

Introduce nurse trainees to colleagues then conduct a brief unit tour

Seven nurse trainees were introduced to colleagues and the workplace environment; was therefore knowledgeable and competent; one nurse trainee never did (had no introduction) while one needed extra practice and exposure.

The method of instruction:

Most used method of instruction was education session by six (6) trainees representing sixty percent (60%) of the trainees, followed by protocol/ procedure review used by three (3) trainees representing thirty percent (30%) while clinical practice and demonstration were used by one (1) trainee representing ten percent (10%) each.

The method of evaluation:

All trainees were evaluated by verbal reviews representing one hundred percent (100%) while two (20%) of the trainee were evaluated by observation in clinical setting.

Orient and assess the competencies of the trainees then document

There was need for more orientation, and assessments among four trainees representing forty percent (40%), three trainees (30%) had never been oriented on trainee competencies; and three trainees (30%) were competent.

Method of instruction:

Six trainees (60%) used education session, two trainees (20%) used demonstration, two (20%) used protocol/procedure review while clinical practice and self-learning package was used by one trainee (10%) each

Method of evaluation:

One hundred percent (100%) of the trainees were evaluated using verbal review, five trainees (50%) of the trainees were evaluated by observation in clinical setting while one trainee (10%) was evaluated using a written test.

Provide basic principles in cardiac nursing, handling of emergencies, care of Invasive lines, Drug Calculations

Five (50%) of the trainees needed more practice during placement while five (50%) were competent. Compared to (Namukwaya et al., 2022),50% of nurses did not have the ability to receive emergency patients and ensure the patients receive immediate care.

Method of instruction:

Ninety percent of the trainees were instructed through education session, eighty percent by demonstration, sixty percent by clinical practice, fifty percent by protocol/procedure review and twenty percent by self-learning package.

Method of evaluation:

Ten (100%) of the trainees were evaluated by verbal review, six (60%) trainees were evaluated by return demonstration, six (60%) trainees were evaluated by observation in clinical setting and six trainees were evaluated by written test.

How to receive and provide post-operative critical care to patients

Seven (70%) of the trainees were competent while three (30%) needed more practice. Majority of the nurses had the ability to carry out the ABCDE method during post-operative care.

Method of instruction:

Demonstration was used by nine (90%) of trainees, clinical practice was used by eight (80%) of trainees, education session was used by six (60%) of the trainees and protocol was used by five (50%) of the trainees.

Method of evaluation:

Return demonstration was used by ten (100%) of the trainees, verbal review was used by nine (90%) of the trainees, observation in clinical setting was used by eight (80%) of trainees and written test was used on one (10%) of the trainees.

Proper handling of ICU equipment

Sixty percent of the trainees were competent and more knowledgeable about the equipment, while forty percent needed practice.

Method of instruction:

Education session and demonstration was used for eighty percent of the trainees, protocol/ procedure review was used for fifty percent, clinical practice was used for forty percent and self –learning package was used for ten percent of the trainees.

Method of evaluation:

Return demonstration was used for eighty percent of the trainees, observation was used on seventy percent and verbal review was used for sixty percentage of the trainees.

In-depth theoretical and practical instructions on CPR, Pain, chest tubes and chest care, ventilator management

The nurses had limited knowledge and skills to carry out these procedures, therefore these competencies needed extra practice among sixty (60%) of the trainees while forty percent (40%) of the trainees were competent.

Method of instruction:

Ninety percent of the trainees were instructed by demonstration, eighty percent by education session. Sixty percent by clinical practice, fifty percent by protocol/ procedure review and forty percent by self-learning package.

Method of evaluation:

One hundred percent of the trainees evaluated through verbal review. Ninety percent observed in a clinical setting and seventy percent evaluated through return demonstration.

Provide Cardiac/Pulmonary arrest management, Intravenous therapy and medication errors reductions. Nurses understanding of critical responsibility and accountability of patient care.

Sixty percent of the trainees needed more practice and session review while forty percent were competent to carry out tasks.

Method of instruction:

Seventy percent of the trainees instructed using demonstration; fifty percent instructed using education session, clinical practice, protocol/procedure review and self-learning package.

Method of evaluation:

Ninety percent of trainees were observed in a clinical setting, as well as evaluated through return demonstration and eighty percent evaluated through verbal review.

SAFETY /INFECTION CONROL

Table 6: Competencies about infection prevention, control and patient safety.

No	Competencies assessed	Never done n (%)	Need practice n (%)	Competent n (%)	Method of instruction n (%)	Method of evaluation n (%)
1	Prevent the spread & transmission of hospital infections			9(90%)	80%E, 70%C, P, 50%D,10%S	90%O, 80%V, 30%RD
2	Identify & carryout SOPS like hand washing, decontamination, PPE, proper waste disposal		1(10%)	9(90%)	70%E, 60%P,C, 10%S, D	90%V, 80%O, 50%D
3	Safe handling of sharps, ensure disinfection and sterilization procedures		3(30%)	7(70%)	90%E,70%C, 50%D, 40%P, 30%S	90%O, 70%RD, 60%V
4	Locate fire alarms, extinguishers &exits	9(90%)	1(10%)		10%P,E	80%V, 10%O

Prevent the spread, transmission and acquisition of Health-care associated infections

Ninety percent of trainees were competent and had the ability to prevent hospital-acquired infections through infection prevention protocols.

Method of instruction:

Eighty percent of trainees instructed through education session, seventy percent instructed through clinical practice and procedure review, fifty percent through demonstration and ten percent through self-learning package

Method of evaluation:

Ninety percent of the trainees evaluated through observation in clinical setting, eighty percent through verbal review and thirty percent through return demonstration**.**

Identify and carry out standard precautions like hand washing, Decontamination, PPEs, proper waste disposal

Ninety percent of the trainees were competent while ten percent needed reskilling in decontamination and infection prevention.

Method of instruction:

Seventy percent of the trainees instructed through education session, sixty percent instructed through procedure review, clinical practice, demonstration, and ten percent through self-learning package.

Method of evaluation:

Verbal reviews were used on ninety percent of the trainees, observations on eighty percent and return demonstrations on fifty percent.

Safe handling of sharps, Ensure disinfection and sterilization procedures

Seventy of the trainees were competent and had the ability to practice without supervision, while thirty percent needed more practice.

Method of instruction:

Ninety percent of the trainees instructed through education session, seventy percent through clinical practice, fifty percent through demonstration, forty percent through procedure review and thirty percent through self-learning package.

Method of evaluation:

Ninety of the trainees observed in a clinical setting, seventy percent evaluated through return demonstration and sixty percent through verbal review.

Locates fire alarms, extinguishers and exits

Ninety percent of the trainees had never done this procedure and ten percent needed training and practice. Most of the nursing trainees had never received training in performing safety checks, they could not locate where the fire alarms, fire extinguishers and exit doors are in emergencies. While 100% of nurses did not have the ability to perform safety checks.(Namukwaya et al., 2022).

Method of instruction:

Ten percent of the trainees were instructed through protocol/ procedure review**.**

Method of evaluation:

Ten percent evaluated through observations in a clinical setting.

EQUIPMENT

Table 7: ***Specific competencies –operates the following according to biomedical instructions.***

No	Competencies assessed	Never done n (%)	Need practice n (%)	Competent n (%)	Method of instruction n n (%)	Method of evaluation n n (%)
1	Wall monitors		5(50%)	5(50%)	90%E, 70%D, 60%C, 40%S, 10%P	90%O, 80%RD, 70%V
2	Defibrillator	4(40%)	5(50%)	1(10%)	40%E, D, 20%C, 10%S	70%V, 50%O, 10%RD
3	Syringe pumps		1(10%)	9(90%)	90%C, D, 80%E, 30%S, 10%P	100%RD, 80%O, 60%V
4	Infusion pumps: single & double chamber	1(10%)	7(70%)	2(20%)	70%E,D 30%C, 10%P,S	70%O,RD, 50%V, 10%T
5	Infusion pumps: syringe			10(100%)	100%D, 80%C, 70%E, 20%S,P	80%RD, 70%O,60%V, 10%T
6	Oxygen delivery: flow meter, cannulas, NRM			10(100%)	100%D,80%C, 70%E, 50%P, 20%	80%O,RD, 70%V
7	Pulse oximeter		1(10%)	9(90%)	80%D,70%C, 40%E,S, 10%P	80%RD, 70%O,60%V
8	ABG machine		3(30%)	7(70%)	90%D,E, 60%C, 20%P,S	80%RD,O, 60%V
9	Suction: continuous /intermittent		1(10%)	9(90%)	90%C, 80%D, 50%E, 20%P, 10%S	90%O,RD, 10%V
10	Twelve lead ECG Machine		4(40%)	6(60%)	100%D, 80%E, 70%C, 30%P,S	90%RD, 80%O, 50%V

Wall monitors

Fifty percent of the trainees were competent and where able to use the patient monitors while fifty percent-needed extra practice in the ICU.

Method of instruction:

Ninety percent of trainees instructed through education, seventy percent through demonstration, sixty percent through clinical practice, forty percent through self-learning package and ten percent through procedure review.

Method of evaluation:

Ninety percent of trainees evaluated through observation in a clinical setting, eighty percent through return demonstration and seventy percent through verbal review.

Defibrillator

Fifty percent of the trainees needed practice, they knew the defibrillator; and had seen it used but they had never applied it in practice, forty percent had never operated a defibrillator and ten percent were competent and had the ability to use it during CPR.

Method of instruction:

Forty percent of trainees instructed through education session, forty percent through demonstration, twenty percent through clinical procedure review and ten percent through self-learning package.

Method of evaluation:

Verbal review was used for seventy percent of the trainees; observation in clinical setting was used for fifty percent and return demonstration used for ten percent of the trainees.

Syringe pumps

Ninety percent of the trainees where competent and often used the syringe pumps during patient care while the ten percent needed more practice.

Method of instruction:

Ninety percent instructed through clinical practice and demonstration, eighty percent through education session, thirty percent through self-learning package and ten percent through procedure review.

Method of evaluation:

One hundred percent evaluated through return demonstration, eighty percent through observation in a clinical setting, and sixty percent through verbal review.

Infusion pumps: single- & double-chamber, primary & secondary tubing

Seventy percent needed extra practice, the ten percent had never done or used them and ten percent were competent in practice.

Method of instruction:

Seventy percent instructed through education session and demonstration, thirty percent through clinical practice, ten percent through procedure review and self-learning package.

Method of evaluation:

Seventy percent of trainees evaluated through observation in a clinical setting and return demonstration, fifty percent through verbal review and ten percent through written test.

Infusion pumps: syringe

All trainees, one hundred percent were competent.

Method of instruction:

One hundred percent of the trainees instructed through demonstration, eighty percent through clinical practice, seventy percent through education session, twenty percent through self-learning package and twenty percent through procedure review.

Method of evaluation:

Eighty percent of the trainees evaluated through return demonstration, seventy percent through observation in clinical setting, sixty percent through verbal review and ten percent

through written test.

Oxygen delivery: cannula, flow meter, mask, re-breather,oxygen flow meter

All trainees (one hundred percent) were competent

Method of instruction:

All trainees, one hundred percent instructed through demonstration, eighty percent through clinical practice, seventy percent through education session, fifty percent through protocol/ procedure review and twenty percent through self-learning package.

Method of evaluation:

Eighty percent of trainees evaluated through observation in clinical setting and return demonstration and seventy percent through verbal review.

Pulse Oximeter

Ninety percent of trainees were competent and ten percent needed more practice.

Method of instruction:

Eighty percent instructed through demonstration, seventy percent through clinical practice, forty percent through education session and self-learning package and ten percent through protocol/ procedure review.

Method of evaluation:

Eighty percent of trainees evaluated through return demonstration, seventy percent through observation in clinical setting and sixty percent through verbal review.

ABG machine

Seventy percent of trainees were competent while thirty percent needed training and practice.

Method of instruction:

Ninety percent of trainees instructed through demonstration and education session, sixty percent through clinical practice, twenty percent through protocol/ procedure review and self-learning package.

Method of evaluation:

Eighty percent of trainees evaluated through return demonstration and observation in clinical setting and sixty percent through verbal review.

Suction: Continuous/Intermittent

There was ninety percent competence level and ten percent needed review among the trainees.

Method of instruction:

Ninety percent instructed through clinical practice, eighty percent through demonstration, fifty percent through education session, twenty percent through protocol/ procedure review and ten percent through self –learning package.

Method of evaluation:

Ninety percent of trainees evaluated through observation in clinical setting and return demonstration and ten percent through verbal review.

Twelve Lead ECG Machine

There was sixty percent competence level and forty percent needed more demonstration, training and practice among the trainees.

Method of instruction:

All trainees (one hundred percent) instructed through demonstration, eighty percent through education session, and seventy percent through clinical practice, thirty percent through protocol / procedure review and self-learning package.

Method of evaluation:

Ninety percent of trainees evaluated through return demonstration, eighty percent through observation in clinical setting and fifty percent through verbal review.

Table 8: Specific Competencies - Operates the following according to the operator's manual

No	Competencies assessed	Never done n (%)	Need practice n (%)	Competent n (%)	Method of instruction n (%)	Method of evaluation n (%)
1	Bear hugger		2(20%)	8(80%)	80%D, 50%E, 30%C	80%O, 70%RD, 30%V
2	Emergency drug chart		4(40%)	6(60%)	60%C,E,D, 20%S,P	80%O, 60%V, 20%RD
3	Hemodynamic monitoring: arterial line		6(60%)	4(40%)	100%C, 70%E,D, 30%P	90%O, 80%V, 60%RD
4	Hemodynamic monitoring: CVP		6(60%)	4(40%)	100%C,90%E, 70%D, 30%P, 10%S	80%V,O,70%RD
5	Intubation box		6(60%)	4(40%)	70%C,60%D, 50%E, 30%P, 20%S	80%V, 70%O, 20%RD
6	Medication trolley	1(10%)	2(20%)	7(70%)	90%C, 70%D, 5O%E, 20%S, P	100%V,70%O, 60%RD
7	GE Carescape ventilators	4(40%)	5(50%)	1(10%)	50%E,40%D, 30%C, 20%P	70%V, 50%O, 10%RD

Bair Hugger

There was eighty percent competence level and twenty percent needed review.

Method of instruction:

Eighty percent of the trainees instructed through demonstration, fifty percent through education session and thirty percent through clinical practice.

Method of evaluation:

Eighty percent evaluated through observation in clinical setting, seventy percent through return demonstration and thirty percent through verbal review.

Emergency drug Cart

There was sixty percent competence level; and forty percent need for practical and session reviews among the trainees.

Method of instruction:

Sixty percent of the trainees instructed through clinical practice, education session and demonstration, twenty percent through self-learning package and protocol/ procedure review.

Method of evaluation:

Eighty percent evaluated through observation in clinical setting, sixty percent through verbal review and twenty percent through return demonstration.

Hemodynamic monitoring: arterial line

Forty percent of the trainees were competent and had the ability to carry out invasive monitoring while sixty percent had little knowledge about invasive monitoring; they needed more knowledge and practice with arterial lines.

Method of instruction:

All trainees (one hundred percent) instructed through clinical practice, seventy percent through education session and demonstration and thirty percent through protocol/ procedure review.

Method of evaluation:

Ninety percent evaluated through observation in clinical setting, eighty percent through verbal review and sixty percent through return demonstration.

Hemodynamic monitoring: central venous pressure

There was forty percent competence in central venous pressure monitoring and practice while sixty percent needed knowledge and practice to develop the competency**.**

Method of instruction:

All trainees (one hundred percent) instructed through clinical practice, ninety percent through education session, seventy percent through demonstration, thirty percent through protocol/ procedure review and ten percent through self-learning package.

Method of evaluation:

Eighty percent evaluated through verbal review and observation in clinical setting and seventy percent through return demonstration.

Intubation Box

There was forty percent competence and knowledge about the intubation box utilization, while sixty percent needed training about handling cardiac emergencies, cardiopulmonary resuscitation and the ability to use the intubation box during cardiac arrests.

Method of instruction:

Seventy percent of trainees instructed through clinical practice, sixty percent through demonstration, fifty percent through education session, thirty percent through protocol/ procedure review and twenty percent through self-learning package.

Method of evaluation:

Eighty percent of the trainees evaluated through verbal review, seventy percent through observation in clinical setting and twenty percent through return demonstration.

Medication trolley

There was seventy percent competence level, and twenty percent needed more practice and knowledge about medication trolley handling and preparation, ten percent never done or used the emergency medication trolley.

Method of instruction:

Ninety percent of trainees instructed through clinical practice, seventy percent through Demonstration, fifty percent through education session, and twenty percent through self-learning and protocol/procedure review.

Method of evaluation:

All trainees (one hundred percent) of trainees were evaluated through verbal review, seventy percent through observation in clinical setting and sixty percent through return demonstration.

GE Carescape Ventilators

There was fifty percent need for educational sessions and demonstrations about ventilator use and practice, forty percent had never done or used the ventilators and ten percent competence among the trainees.

Method of instruction:

Fifty percent of the trainees instructed through education session, forty percent through demonstration, thirty percent through clinical practice and twenty percent through protocol/ procedure review.

Method of evaluation:

Seventy percent of trainees evaluated through verbal review, fifty percent through observation in clinical setting and ten percent through return demonstration.

DOCUMENTATION/ COMMUNICATION

Table 9: Specific ICU departmental competencies

No	Competencies assessed	Never done n (%)	Need practice n (%)	Competent n (%)	Method of instruction n (%)	Method of evaluation n (%)
1	Cardiac ICU practices and standards	1(10%)	6(60%)	3(30%)	60%P,E, 50%C, 40%D, 20%S	80%V, 50%O, 20%RD
2	Post-Operative documentation, fluid balance charts		5(50%)	5(50%)	90%C,D, 70%E, 30%S,P	90%O, 70%RD, 60%V, 20%T
3	Patient assessment forms, ICU progress notes	1(10%)	4(40%)	5(50%)	70%E,D,C, 30%P, 10%S	100%O, 90%V, 60%RD
4	ICU post-op admission sheet		6(60%)	4(40%)	90%C,70%E, 60%D,50%P, 10%S	90%O,RD, 50%V
5	ICU Nursing notes		1(10%)	9(90%)	100%C, 80%D, 50%E, 10%P,S	100%O, 80%V, 60%RD, 10%T

Cardiac Intensive Care Unit practices and standards

Sixty percent needed more exposure, knowledge and training in ICU practices and standards,, thirty percent had the required competence level while ten percent had never done or been exposed to a cardiac ICU before, therefore they needed extra training**.**

Method of instruction:

Sixty percent of the trainees instructed through protocol/ procedure review and education session, fifty percent through clinical practice, forty percent through demonstration and twenty percent through self-learning package.

Method of evaluation:

Eighty percent of trainees evaluated through verbal review, fifty percent through observation in clinical setting and twenty percent through return demonstration.

Post-operative ICU documentation and monitoring, Fluid balance charts

Fifty percent needed more training and practice in carrying out proper documentation and monitoring while the fifty percent had the necessary competences in ICU documentation.

Method of instruction:

Ninety percent of the trainees instructed through clinical practice and demonstration,

Seventy percent through education session and thirty percent through self-learning package and protocol/procedure review.

Method of evaluation:

Ninety percent of the trainees evaluated through observation, seventy percent through return demonstration, sixty percent through verbal review and twenty percent through written test.

Patient assessment forms and ICU progress Notes

There was fifty percent competence level in assessments and writing patients progress reports, while the forty percent needed more practice..

Method of instruction:

Seventy percent of trainees instructed through education session, demonstration and clinical practice, thirty percent through protocol/procedure review and ten percent through self-learning package.

Method of evaluation: One hundred percent of trainees evaluated through observation in clinical setting, ninety percent through verbal review and sixty percent through return demonstration.

ICU post-operative Nursing Admission sheet

Forty percent of the trainees had the ability and competences to admit a post-operative patient using the ICU admission sheet while the sixty percent needed more practice to be able to admit patients.

Method of instruction:

Ninety percent of trainees instructed through clinical practice. Seventy percent through education session, sixty percent through demonstration, fifty percent through protocol/ procedure review and ten percent through self-learning package.

Method of evaluation:

Ninety percent of the trainees evaluated through observation in a clinical setting and return demonstration and fifty percent through verbal review.

Nursing Notes

There was ninety percent competence level and ten percent needed more reviews and practice**.**

Method of instruction:

All trainees (one hundred percent) instructed through clinical practice, eighty percent through demonstration, fifty percent through education session, and ten percent through protocol/ procedure review and self-learning package.

Method of evaluation:

All trainees evaluated through observation in clinical setting, eighty percent through verbal review, sixty percent through return demonstration and ten percent through written test.

Table 10: Unit specific competencies

No	Competencies assessed	Never done n (%)	Need practice n (%)	Competent n (%)	Method of instruction n (%)	Method of evaluation n (%)
1	Assess and understand Intensivist post-op orders		5(50%)	5(50%)	90%E,70%P, 40%C,D, 30%S	80%O, 50%V, 30%RD
2	Completes ICU monitoring &observation charts		3(30%)	7(70%)	90%C,D, 70%E, 40%P, 20%S	90%O,80%RD, 60%V, 10%T
3	Systemic patient assessment		5(50%)	5(50%)	80%E,C, 70%D, 30%P, 20%S	70%O, RD, 60%V
4	Ability to administer CPR, recognize life threatening conditions		7(70%)	3(30%)	100%E, 70%D, 60%C, 40%P, 20%S	80%O, 50%V, 40%RD
5	Handling stressful medical and surgical emergencies		8(80%)	2(20%)	80%C, 70%E, 40%P,D, 20%S	80%O,V, 30%RD,10%T
6	Knowledge& Proficiency in performing diagnostics and testing	1(10%)	6(60%)	3(30%)	80%E, 70%C, 50%S, 40%P,D	90%V, 40%RD,O, 20%T
7	Quick, adaptable, clear headed decision making skills		5(50%)	5(50%)	70%C, 60%E, 30%P,D, 20%S	90%V, 70%O, 20%RD,T
8	Provide quality medical care with a high level of cultural competency		5(50%)	5(50%)	70%E, 60%C, 40%S, 20%P,D	70%O,V
9	Locates face sheet & admission file			10(100%)	90%C,D, 50%E, 20%P	100%O, 60%V, 50%RD
10	Recognizes printed orders	3(30%)	1(10%)	6(60%)	50%D,E, 40%C, 30%P	80%V,50%O, 20%RD
11	Refers to ICU patient admission requirement checklist		1(10%)	8(80%)	90%C, 80%D, 70%E, 50%P	80%O,V, 50%RD
12	States proper time frames for completion of ICU documentation	1(10%)	4(40%)	4(40%)	90%C, 70%D, 40%E	80%O, 70%V, 20%RD

Assesses and understands intensivist postoperative notes/orders & progress Notes

There was fifty percent competence level in understanding the post-operative instructions and orders with effective execution while the fifty percent needed more training and practice.

Method of instruction:

Ninety percent of the trainees instructed through education session, seventy percent through protocol/ procedure review, forty percent through clinical practice and demonstration and thirty percent through self-learning package.

Method of evaluation:

Eighty percent of the trainees evaluated through observation in clinical setting, fifty percent through verbal review and thirty percent through return demonstration.

Completes ICU monitoring and observation charts.

Seventy percent of the trainees were competent while thirty percent needed more exposure, practice and review.

Method of instruction:

Ninety percent of trainees instructed through clinical practice and demonstration, seventy percent through education session, forty percent through protocol/procedure review and twenty percent through self-learning package.

Method of evaluation:

Ninety percent evaluated through observation in clinical setting, eighty percent through return demonstration, sixty percent through verbal review and ten percent through written test.

Systemic patient assessment:

Fifty percent of trainees were competent and able to carry out systemic patient assessments while the fifty percent needed more training and practice in patient assessments.

Method of instruction:

Eighty percent of trainees instructed through education session and clinical practice, seventy percent through demonstration, thirty percent through procedure review and twenty percent through self-learning package.

Method of evaluation:

Seventy percent of the trainees evaluated through observation in clinical setting and return demonstration and sixty percent through verbal review.

Ability to administer CPR and recognize life-threatening conditions

Thirty percent of trainees were competent while seventy percent needed more knowledge and skills in CPR training and recognizing life-threatening conditions. (Munezero et al., 2018), elaborates that there no established CPR training schedules for hospital-based health workers in Uganda and other developing countries.

Method of instruction

All trainees (one hundred percent) were instructed through education session, seventy percent through demonstration, sixty percent through clinical practice, forty percent through protocol/procedure review and twenty percent through self-learning package.

Method of evaluation:

Eighty percent of trainees were observed through observation, fifty percent through verbal review and forty percent through return demonstration.

Handling stressful medical and surgical emergencies

Twenty percent of trainees were competent while eighty percent were not prepared and trained to handle these cardiac emergencies, therefore more exposure and training needed to improve performance.

Method of instruction:

Eighty percent of the trainees are instructed through clinical practice, seventy percent through education session, forty percent through protocol/ procedure review and demonstration and twenty percent through self-learning package.

Method of evaluation:

Eighty percent of the trainees evaluated through observation and verbal review, thirty percent through return demonstration and ten percent through written test.

Knowledge and Proficiency in performing diagnostics and testing

Thirty percent of the trainees were competent while sixty percent needed more practice, knowledge and skills to enhance proficiency in performing patient's diagnostics, while ten percent had never done them.

Method of instruction:

Eighty percent of the trainees were instructed through education session, seventy percent through clinical practice, and fifty percent through self-learning package, forty percent through protocol / procedure review and demonstration.

Method of evaluation:

Ninety percent of trainees evaluated through verbal review, forty percent through return demonstration and observation in clinical setting and twenty percent through written test.

Having quick, adaptable and clear-headed decision making skills

There was fifty percent competence and fifty percent needed more exposure.

Method of instruction:

Seventy percent of trainees were instructed through clinical practice, sixty percent through education session, thirty percent through protocol/ procedure review and demonstration and

twenty percent through self-learning package.

Method of evaluation:

Ninety percent of trainees evaluated through verbal review, seventy percent through observation in clinical setting, twenty percent through return demonstration and written test.

Ability to provide quality medical care with a high level of cultural competency

There were fifty percent competence in quality medical care provision and the fifty percent needed extra practice and learning.

Method of instruction:

Seventy percent instructed through education session, sixty percent clinical practice, forty percent through self -learning package and twenty percent through protocol/procedure review and demonstration

Method of evaluation:

Seventy percent of trainees were evaluated through observation in clinical setting and verbal review.

Locates Face Sheet and admission file

All trainees (one hundred percent) were competent.

Method of instruction:

Ninety percent of trainees instructed through clinical practice and demonstration, fifty percent through education session and twenty percent through protocol/procedure Review.

Method of evaluation:

All trainees evaluated through observation in clinical setting, sixty percent through verbal review and fifty percent through return demonstration.

Recognizes printed orders

There was sixty percent competence, thirty percent had never done or used the printed orders and ten percent needed more practice/review.

Method of instruction:

Seven out of the ten respondents who answered this question, three were without data. Out of the seven responses, fifty percent instructed through demonstration and education session, forty percent through clinical practice and thirty percent through protocol/procedure review.

Method of evaluation:

Eighty percent of the trainees evaluated through verbal review, fifty percent through observation in clinical setting and twenty percent through return demonstration.

Refers to ICU Patient admission requirements Checklist

Nine of the ten respondents who answered this question, one was without data. Out of the eight responses, seventy percent were competent and ten percent needed more practice/review.

Method of instruction:

Ninety percent instructed through clinical practice, eighty percent through demonstration, seventy percent through education session and fifty percent through protocol/procedure review.

Method of evaluation:

Eighty percent of the trainees evaluated through observation in clinical setting and verbal review and fifty percent through return demonstration.

States proper time frames for completion of various documentations

Nine out of ten respondents answered this question, one was without data, out of the nine responses, forty percent were competent, and forty percent needed more training to ensure timely patients' documentations, while review and ten percent had never done or completed any timely documentations that necessitates clinical training and support.

Method of instruction:

Nine out of 10 respondents answered this question, one was without data, out of the nine responses, and ninety percent instructed through clinical practice, seventy percent through demonstration and forty percent through education session.

Method of evaluation:

Eighty percent of the trainees evaluated through observation in clinical setting, seventy percent through verbal review and twenty percent through return demonstration.

PROVISION OF CARE

Table 11: Patient safety and ethics

No	Competencies assessed	Never done n (%)	Need practice n (%)	Competent n (%)	Method of instruction n (%)	Method of evaluation n (%)
1	Informed consent-procedure	1(10%)	3(30%)	6(60%)	50%C,D, 40%E, 10%P	60%O,V, 20%RD
2	Consent/Refusal of Blood/blood products	2(20%)	7(70%)	1(10%)	50%E, 40%D, 30%C, 20%S	60%O, 50%V, 30%RD

Informed Consent – Procedure

Sixty percent of the trainees were competent in the procedure of getting informed consent from patients; thirty percent needed practice in obtaining patients informed consent while ten percent had never done the procedure.

Method of instruction:

Nine out of 10 respondents answered this question and one was without data. Out of the nine responses, fifty percent instructed through clinical practice and demonstration, forty percent through education session and ten percent through protocol/procedure review.

Method of evaluation:

Sixty percent of the trainees evaluated through observation in clinical setting and verbal review and twenty percent through return demonstration.

Consent / Refusal of Blood and/or Blood Products

Seventy percent of the trainees needed practice in obtaining consents for blood products, , twenty percent had never done the procedure and ten percent were competent

Method of instruction:

Eight out of ten respondents, answered this question, two were without data. Out of the eight responses, fifty instructed through education session, forty percent through demonstration, thirty percent through clinical practice and twenty percent through self- learning package.

Method of evaluation:

Sixty percent of the trainees evaluated through observation in clinical setting, fifty percent through verbal review and thirty percent through return demonstration.

Table 12: ***Nursing practice manual provides care according to the following protocols/procedure.***

No	Competencies assessed	Never done n (%)	Need practice n (%)	Competent n (%)	Method of instruction n (%)	Method of evaluation n (%)
1	Blanket/Bear hugger	1(10%)	2(20%)	7(70%)	80%C,D, 40%E	70%O,RD, 40%V
2	Central lines (blood draws, flush, IV fluid administration, dressing care)		3(30%)	7(70%)	100%C, 90%D, 80%E,P	100%O,V, 70%RD
3	Chest tube care		2(20%)	8(80%)	100%D, 90%C, 70%E, 20%P, 10%S	100%D, 80%O, 70%V
4	CPAP & BiPAP units: for use during Hospital Stay		8(80%)	2(20%)	90%D, 80%E, 50%C, 30%P	80%O, 60%V, 40%RD
5	Diabetes Mellitus management		2(20%)	8(80%)	90%E,C, 80%P, 30%P, 10%S	80%RD, 70%O,V
6	Hemodynamic Monitoring			10(100%)	100%E,C, 90%D, 40%P	100%RD, 90%O,V
7	IV Therapy: Peripheral			10(100%)	100%C,D, 20%E, 10%P	90%RD, 80%O, 50%V
8	IV Push Medications			10(100%)	100%C, 90%D, 10%E	90%RD, 80%O, 50%V
9	Jewelry: Wearing of jewelry	1(10%)	4(40%)	3(30%)	30%C, S, E, P, 20%D	60%V, 40%O, 10%
10	Medications: Double check		3(30%)	7(70%)	90%C, 80%E,D, 70%P, 10%S	100%O, RD,V
11	Neurologic assessment of the adult inpatient		9(90%)	1(10%)	90%C, 80%E, 60%D	100%O, 80%V,40% RD

12	Pain: Care of the Adult		1(10%)	9(90%)	100%D, 80%C,E, 50%P, 20%S	90%O, 80%RD, 50%V
13	Pain: Continuous Narcotic infusion		6(60%)	4(40%)	20%E, 10%S,D,C	90%V, 20%O, 10%RD
14	Pain: Epidural infusion Narcotic &Patient controlled epidural analgesia	7(70%)	2(20%)	1(10%)	100%E, 90%D, 80%C, 50%P	90%RD, 80%O, 60%V, 10%T

Blanket / Bear hugger

Seventy percent of the trainees were competent, twenty percent needed more practice with bear hugger use and ten percent had never done or used it.

Method of instruction:

Nine out of ten respondents answered this question and one was without data. Out of the nine responses, eighty percent instructed through clinical Practice, demonstration, and forty percent through education Session.

Method of evaluation:

Seventy percent of the trainees evaluated through observation in clinical setting and return demonstration, forty percent through verbal review.

Central Venous Lines – (Blood Draws, Flush, IV Fluid Administration, & Dressing Care)

Seventy percent of the trainees were competent while thirty percent needed more practice.

Method of instruction:

All trainees (one hundred percent) instructed through clinical practice, ninety percent through demonstration, and eighty percent through education session and protocol/procedure view.

Method of evaluation:

All trainees (one hundred percent) were evaluated through observation in clinical setting and verbal review and seventy percent through return demonstration.

Chest Tube

Eighty percent of the trainees were competent while twenty percent needed more practice/review.

Method of instruction:

All trainees instructed through demonstration, ninety percent through clinical Practice, seventy percent through education session, twenty percent through protocol/procedure review and ten percent through self -learning package.

Method of evaluation:

All trainees evaluated through return demonstration, eighty percent through observation in clinical setting and seventy percent through verbal review.

CPAP and BiPAP Units: for use during Hospital Stay

Eighty percent of the trainees needed more training and practice on these ventilation modes and twenty percent were competent.

Method of instruction:

Ninety percent of the trainees instructed through demonstration, eighty percent through education session, fifty percent through clinical practice and thirty percent through protocol/procedure review.

Method of evaluation:

Eighty percent of the trainees evaluated through observation in clinical setting, sixty percent through verbal review and forty percent through return demonstration.

Diabetes Mellitus Management:

Eighty percent of the trainees were competent and twenty percent needed extra educational sessions about diabetic management.

Method of instruction:

Ninety percent of the trainees instructed through education session and clinical practice, eighty

percent through protocol/procedure review, thirty percent through demonstration and ten percent through self-learning package.

Method of evaluation:

Eighty percent of the trainees evaluated through return demonstration, seventy percent through observation in clinical setting and verbal review.

Hemodynamic Monitoring

All trainees (one hundred percent) were competent.

Method of instruction:

All trainees (one hundred percent) instructed through education session and clinical practice, ninety percent through demonstration and forty percent through protocol/procedure review.

Method of evaluation

All trainees evaluated through return demonstration, ninety percent through observation in clinical setting and verbal review.

IV Therapy: Peripheral lines

All trainees where competent, (one hundred percent).

Method of instruction:

All trainees instructed through clinical practice and demonstration, twenty percent through education session and ten percent through protocol/procedure review.

Method of evaluation:

Ninety percent of the trainees evaluated through return demonstration, eighty percent through observation (in clinical setting) and fifty percent through verbal review.

IV Push Medications

All trainees (one hundred percent) were competent.

Method of instruction:

All trainees (one hundred percent) instructed through clinical practice, ninety percent through demonstration and ten percent through education session.

Method of evaluation:

Ninety percent of the trainees were evaluated through return demonstration, eighty percent through observation in clinical setting) and fifty percent through verbal review.

Jewelry: Wearing of Jewelry and Body Piercings during … Procedures

Eight of ten respondents answered this question, two were without data. Out of the eight responses, forty percent needed more demonstration sessions and review. Thirty percent were competent and ten percent had never done or observed the procedures.

Method of instruction:

Eight out of ten respondents answered this question and two were without data. Out of the eight response, thirty percent instructed through clinical practice and self-learning package, education session and protocol/procedure review and twenty percent through demonstration.

Method of evaluation:

Sixty percent of the trainees evaluated through verbal review, forty percent through observation in clinical setting and ten percent through return demonstration.

Medications: Double Check

Seventy percent of the trainees were competent and thirty percent needed practical reviews.

Method of instruction:

Ninety percent of the trainees instructed through clinical practice eighty percent through education session and demonstration, seventy percent through protocol/procedure review and ten percent through self-learning package.

Method of evaluation:

All trainees (one hundred percent) evaluated through observation in clinical setting, return demonstration and verbal Review.

Neurologic Assessment of the Adult Inpatient

Ninety percent of the trainees needed training and demonstrations in neurological assessments of patients, and ten percent were competent

Method of instruction:

Ninety percent of the trainees instructed through clinical practice eighty percent through education session and sixty percent through demonstration.

Method of evaluation:

All trainees (one hundred percent) evaluated through observation in clinical setting, eighty percent through verbal review and forty percent through return demonstration.

Pain: Care of the Adult

Ninety percent of the trainees were competent and ten percent needed review

Method of instruction:

All trainees instructed through demonstration, eighty percent through clinical practice and education session, fifty percent through protocol/procedure review and twenty percent through self-learning package.

Method of evaluation:

Ninety percent of the trainees evaluated through observation in clinical setting, eighty percent through return demonstration and fifty through verbal review

Pain: Epidural Narcotic Infusion and Patient Controlled Epidural Analgesia

Seventy percent of the trainees had never done, observed or used an epidural narcotic infusion and needed training; twenty percent needed more practice, while ten percent were competent.

Method of instruction:

Three out of ten respondents answered this question and seven were without data. Out of the three responses, twenty percent instructed through education session, ten percent through self-learning package, demonstration and clinical practice.

Method of evaluation:

Ninety percent of the trainees evaluated through verbal review, twenty percent through observation (in clinical setting and ten percent through return demonstration.

Continuous Narcotic Infusion

Sixty percent of the trainees needed practice, while forty percent were competent.

Method of instruction:

All trainees (one hundred percent) instructed through education session, ninety percent through demonstration, eighty percent through clinical practice and fifty percent through protocol/procedure review.

Method of evaluation: Ninety percent of the trainees evaluated through return demonstration, eighty percent through observation in clinical setting, sixty percent through verbal review and ten percent through written test.

The ICU nursing trainees were assessed and observed for a period of four weeks by the entire critical care team. The stakeholders' participation in critical care competency assessment improved competence acquisition.

4.4: Evaluation of the outcomes of the implemented strategies

The assessment and evaluation of the implementation process of strategies cited by the stakeholders was carried out from inception to completion of the study. The tools used included; competency assessment checklists, assessment documents, camera, interview guides and a computer. The skills assessment was essential to maximize the attainment of the

objectives and transform the identified problem into a learning objective accomplished through appropriate trainings.

Figure 18: Evaluation meeting of competencies by nursing educators

Photo by A team player, August 2022

Barriers to implementing the pedagogical approaches in the ICU

The study found out the various learning challenges. However, the dominant themes were competing responsibilities, inadequate teaching/learning space and resour ces, and short clinical placement periods.

Competing responsibilities

In many cases, the participants mentioned that they face challenges in balancing supervising nurse trainees and attending to patients. In situations where they have to choose, the nurse educators opted for the patients than the nurse trainees. One nurse educator shared;

> *"Sometimes when the schedule is too busy, we may not get time to work along with them."* A nurse trainee also shared; *"We are too busy, the work is too much, so you want to learn more into details, but again, the patient needs your care. So, you find that you have limited time."*

Some participants mentioned that understaffing was the root cause of the competing responsibilities' between serving the patients and supporting the nurse trainees. For instance, a nurse educator mentioned;

> *"[…] one of the teaching gaps was the chronic understaffing of nurses. Being understaffed meant that, there was limited time for those trainings to take place due to the busy schedules, heavy work load and burnout."*

Another nurse educator shared;

> *"The critical bit is that sometimes you are 2 nurses running the 12 hours shift with very sick patients, and so the time dedicated to these students can never be enough because you want to teach them in bits and also do what brought you here which is bedside nursing"*

Inadequate teaching and learning resources and space

In addition to the competing responsibilities, the participants also frequently mentioned that the ICU lacked enabling resources for teaching and learning ranging from teaching space, critical care teaching material like text books, computers, with on and off internet connection. They further mentioned that the learning approaches would be adaptable and easily applied if they had resources like gadgets and dummies. For example, **participant 9** mentioned that; *"Actually, we don't have a simulation laboratory"*

A nurse educator also shared;

> *"We are not empowered here as a ward/CCU, because we don't even have a computer on this unit. Therefore, the best thing you can do is to go to the patient's bedside, and then teach the trainees. For example, if you are teaching them about ECG interpretation, you will use a piece of ECG printout to show them, but we don't have that technology bit here on the CCU."*

Short clinical placement period

The participants frequently mentioned that the training period for the trainees in the critical care department was so short and limited that the latter do not gain adequate knowledge and competences. For example, **one nurse educator** commented,

"[…] with this little time that they are given, they can't learn much. It's just a tip."

The short clinical training period also does not allow assessment of the gained competences. For instance, **a nurse educator** shared; *"We have learners from different categories ranging from nurses, doctors, and all types of disciplines but we find that these students come and they are given very little time to learn in the department. Whereby it is not practical for one to get real competences or to be followed up and ascertain how competent they are."*

CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS, RECOMMENDATIONS

5.0 Introduction

The study set out to enhance critical care competencies among ICU nursing trainees through clinical placement support at the Uganda Heart Institute, Mulago. The discussion depended on personal interpretation and description, based on my experiences, observations and reflection upon the situation as it unfolded in the process of action research and the views from the stakeholders. In the discussion, the researcher incorporated detailed views, theories and concepts from various scholars to back up the discussions. In this chapter I have made my conclusions acquired through this action research process and recommendations which have outlined the way forward of this action research.

5.1 Discussion of findings

Under the set objectives, the stakeholders democratically accepted to participate in the identification of possible solutions to enhance critical care competencies. The sustainable, adaptable and implementable solutions were grounded on the stakeholders' views, observations, interpretation of the implementation and evaluation process of action points.

5.1.1 The existing teaching and learning methods in nursing education.

The first objective was to establish the existing teaching and learning methods in nursing education in the critical care department. The study found out that there was an assortment of learning methods that were efficiently used by students, trainees and nursing educators to improve critical care competencies and these included; observational learning, demonstrations and return-demonstrations, discussions, protocol and procedure reviews, self-directed learning and educational sessions with the supervisors. Other methods included lecture-based learning, group learning, problem-based learning and student-centered learning. Some trainees accessed drug calculation tests and the ICU wall protocols and instructions that helped them carry out the nursing tasks and procedures assigned to them. Through the

instruction method of demonstration and return-demonstration, the learners where able to show how the ICU equipment was utilized in the care of critical patients. They practice under supervision, then later practice independently to the point of proficiency. For example, during the training of Continuous Renal Replacement Therapy (CRRT), the learners where able to demonstrate the knowledge and skills learnt. The researcher supports this as it involves and entails active learning that is learner centred and enables trainees develop practical critical care skills.

However, the trainees acknowledged that balancing supervising and teaching nursing trainees, while attending to patients was a challenge, as priority was given to the patients. Limited time assigned to practice, the busy schedules together with patient workload was a deterrent to enhancing competencies and skills. Sometimes as trainings are ongoing, the nurses have to stay at the patient's bedside thus missing learning opportunities.

5.1.2 The pedagogical approaches for enhancing critical care competencies

The second objective was to establish approaches for enhancing critical care competencies in the critical care department at UHI cited by the stakeholders during the future workshop. The study found out that, there was need for nursing trainees to undergo pre and post training assessments and evaluations during the clinical placements, interactive discussions and hands-on activities among trainers and trainees, establish a feedback mechanism between clinical instructors and the training institutions, have skills review sessions and progressive orientation during bedside teaching. As critical care nurses regularly communicate with a range of people, including, cardiac intensivists, cardio-thoracic surgeons and cardiologists, other critical care specialties, other nurses, ICU patients and their families; it was observed that there was need to improve the communication skills, interpersonal skills, decision-making skills and critical thinking skills of nursing trainees. The key informant interviews

revealed that the majority of team players believed that their involvement in teaching ICU nursing trainees, contributed to the success of enhancing critical care competencies. The main attributes for this achievement entailed a process of imparting skills through demonstration and return-demonstration, supervised hands-on practice, observation in the clinical setting and verbal reviews to learners during patient care. Concisely, these clinical assessments, demonstrations and evaluations have promoted teamwork skills, nursing assessment skills and time management skills because these patient assessments are conducted collaboratively with learners in a timely manner.

In the study, the stakeholders had high expectations of a simulation laboratory and library, as they perceived it to be similar to a hospital setting. Students did not get to practice their clinical skills in a simulation laboratory because it had not been set up yet.

5.1.3 Implementation of pedagogical approaches for enhancing critical care competencies.

The study findings of the competence level assessments established that the majority of the ICU nursing trainees where competent enough to receive post-operative patients in the ICU and provide the post-operative critical care needed through demonstration and clinical practice. A notable number of trainees admitted that they could perform efficiently the tasks assigned if they were given more time to practice and review of protocols and procedures. This deficit in the knowledge and skills implied that there was need to devise measures of imparting critical skills to the extent of being ready for the world of work.

The procedure of exposing, orienting and assessing nursing trainees to the different units in the critical care department before they interface with patients and other medical staffs improved confidence, communication skills, clinical knowledge and skills in integrating the theoretical and practical information. This adaptation process helped trainees develop critical

thinking skills needed to evaluate, analyze and synthesize information and create effective action plans during placements, (Shwaihet et al., 2010).

Scholarly findings reveal that critical care nursing skills are technical abilities that help critical care nurses undertake their duties and work well in the high-pressure environment of an ICU, (Indeed, 2023).

Most critical care nursing educators believed that their involvement in the training of ICU nursing trainees as they worked hand in hand through carrying out assigned tasks and procedures was among the leading approaches in skills development. It was accepted that the key aspects of transferring and passing on skills and knowledge involved; competence assessments during orientation and after the clinical placement; supervised hands-on critical care procedures and activities, observation and verbal reviews of learners as they carried out assigned tasks, education sessions, and demonstration and return demonstrations of critical competencies. Largely, the stakeholders' desire was to impart change through acquisition of critical care competencies in the ICU as a key factor.

Anesthesiologists and intensive care specialists in Uganda during the Covid pandemic undertook a new training program at regional referral hospitals that blended both online and on-site training. And it enabled health care providers to learn during shifts while ensuring patient care coverage in the wards; this training explored other ways of supporting critical care capacity building efforts in the hospitals, (Bulamba, 2020).

The implementation of practical knowledge and skills acquired during clinical placements are essential for successful critical care practice.

5.1.4: Evaluation of the outcomes of the implemented established pedagogical approaches for enhancing critical care competencies.

The study found out that the outcomes of ICU nursing trainees who received training through clinical demonstrations, clinical practice and education sessions performed better and where seventy percent (70%) were competent and had the ability to receive and provide post-operative care to admitted patients than those who did not receive that form of training. The critical care competence checklist given to ICU nursing trainees during in-depth theoretical and practical instructions on cardiopulmonary resuscitation, ventilator management and chest care, chest tube and pain management. It showed that they did not have the skills to carry out the named procedures; majority of the trainees needed more practice and review of competencies while the few were competent through clinical education sessions and demonstration of procedures.

The study also revealed that during the provision of pulmonary arrest management, invasive intravenous therapies, reduction of medication errors, understanding of critical responsibilities and accountability of patient care, sixty percent of the nursing trainees needed more practical reviews and return demonstration in order to perform better and be ready for the world of work. Through observations in the clinical area, return demonstrations and verbal reviews, the trainees were able to improve their competences and attain outstanding results. The findings were in agreement with, (Aukrust et al., 2021). Whose report suggests that collaborating clinical competencies and knowledge can diminish inequalities within health care and education?

At the conclusion of the action research cycle, all the team players appreciated the collaboration and timely feedback from the other stakeholders and were of the view that

regular nursing assessments, evaluations and reflection during practice would quicken the realization of desired competencies.

Continued workshopping should go a long way in addressing the institutional problems including clinical placement support in Uganda's fragile health care system.

5.2 Conclusions

Work-based training in the critical care department using the applicable teaching methods and available resources greatly improved critical care competencies among ICU nursing trainees.

Competency-based education is very essential in bridging the gaps between classroom education and clinical practice. It involves the application of skills in all critical care practice roles, clinical instructions that focus on specific competencies, learner accountability, self-assessments and an allowance for increasing competency levels.

The ICU workplace or learning environment incorporates competency-based training that involves learner assessments, accountability and opportunities for individualized learning experiences that improve skills.

This means that if the department were ably equipped with specified nursing educators for trainees on specified days not involved in clinical work; adequate learning space and equipment; longer clinical placement periods and adequate staffing of the critical care team players, the acquisition of critical care competencies would clearly improve patient safety and care.

Practice-based learning promotes effective work place learning and helps nurses to develop, enhance and reflect on their practice and concepts of mentoring, facilitating, and supervision of learners. The implication of the study was to encourage dialogue and action among stakeholders from nursing practice and education.

The availability of enabling resources for teaching and learning ranging from a simulation laboratory and a functional and accessible library, teaching space, critical care teaching material like textbooks, computers, internet connection and dummies were needed to improve competencies and motivate learners. Nevertheless, the skilled critical care nurses used the available resources and applied proficient physical assessment and examination skills in patient care that helped improve confidence and knowledge among the nursing trainees.

The skills assessments, evaluation and feedback among stakeholders was essential in maximizing the attainment of learning objectives. In addition, equip learners with applicable skills in the world of work. Never the less, the learners' exposure in the critical care department was short and limited that they needed to gain more knowledge and competences during the placement. Moreover, the short clinical training period did not allow adequate assessment and evaluation of the gained competences which clearly necessitated that specified time durations; set training goals, objectives, timely assessments and evaluations, timely coordination of trainees and a feedback mechanism be instituted to improve overall students' performance.

5.3 Recommendations to enhance teaching and learning for ICU nurse trainees in the critical care department of the Uganda Heart Institute.

The various recommendations for improving critical care competencies where based on the study findings of the implemented strategies:

In as much as this was an action-based study, a portion of the ICU nursing staff participated in the research study to give me a clear position of what happens during ICU skills acquisition to effect change. Therefore, the study findings be disseminated to the rest of the nursing team to ensure that change be realized; and make an impact assessment of the intervention after involving the whole unit at a broader perspective.

Training resources

The critical care department already has an enabling environment for specialized training of nurse trainees. For instance, the UHI management provided infusion and syringe pumps, resuscitation equipment, mechanical ventilators and the heart-lung machine used in theatre, a computer and internet in the ICU and many more equipment, however, the department needs more resources such as training spaces, dummies, and a simulation laboratory where you can enter any time with a supervisor around and learn.

There is need for more tutorial spaces and well-equipped teaching rooms assigned to nurses for continued learning by the UHI management and nursing leadership to enhance learning.

The Biomedical engineers also suggested that, they should be availed with enough space like, workshop space so that demonstrations and practical hands-on learning can be easily conducted for the nurses on the ICU equipment."

Staff competence and motivation

The Nurse educators need to acquire more skills that are educational. To be able to improve their teaching practices among the nursing trainees at the institute.

Effective and proper educational skilling of the nursing educators and faculty. Re-skilling and re-tooling of trainers should be ensured.

Clinical placement departments should be established in hospitals to ensure follow up of trainees and timely feedback between the education institutions and hospitals.

A cardio-pulmonary therapist and educator in the department recommended that the educators should be skilled enough and the institute should facilitate them to go for further skilling that will help better equip them to disseminate out the right information to trainees.

The nursing trainees should be allocated specific clinical staff different from the ones carrying out assigned clinical responsibilities**,** the institute should have some people assigned for the teaching and following up of students closely, so that when they miss, dodge, or make a mistake, and someone is responsible for them.

Assessments

The stakeholders expressed a need for pre-and-post training assessments and evaluations of the nurse trainees before and after the training, respectively.

Mandatory drug calculation tests about the drugs for the different conditions, when and how to administer them, the dosages and dosing should be given to all ICU nursing trainees.

Longer durations for clinical placements

The stakeholders recommended that there should be restoration and coordination between the MOES educational institutions and the MOH clinical hospitals to have longer clinical placements for the trainees.

The overwhelming numbers of enrolled nursing students in the nursing schools regulated by the MOES in order to have quality competent nurses.

The Uganda Heart Institute as a specialized institution should have minimum acceptable standards and baseline entry education levels in the critical care department.

A cardio-pulmonary therapist recommended that the management of the critical care department should set a minimum rotation duration that all nursing trainees should undergo and adhere too.

The set objectives and standards when put in place are going to enable competency-based skilling to take place.

Their should be an integration of practical examinations with OSPE assessments and all nursing examinations should be returned to the clinical area (hospital).

The stakeholders should be facilitated for another future workshop to re-evaluate the action points that were not done to improve the existing situation.

AREAS FOR FURTHER RESEARCH

Re-skilling and re-tooling of trainers to improve teaching practices.

Ministry of Education and Sports, and the Nursing council to start regulating the student numbers in nursing schools vis-a-vis the quality of competent nurses.

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APPENDIX I: CONSENT FORM

Consent Form

Part 1: Consent

Consent form for the study participants involved in Clinical Placement Support as a means of Enhancing Competence Development among Nurse Trainees at Uganda Heart Institute.

I am Mwima Rachel Joan, a second year student of Kyambogo University pursuing a Master's Degree in Vocational Pedagogy. I am carrying out an action research on clinical placement support as a means of enhancing competence development among nurse trainees at Uganda Heart Institute.

This participatory study is trying to improve specialized critical care competencies among ICU nurse trainees at Uganda Heart Institute, Mulago Hospital. The study will improve knowledge, critical care skills and competencies in handling cardiac emergencies and critical patients.

I will be very grateful if you spare time to voluntarily participate in this study, as we work together to identify the root cause of the problem, agree on implementable interventions or strategies, evaluate the implemented interventions, then reflect on the emerging issues for the purpose of re-planning and improving critical competencies.

You are kindly requested to be part of this democratic life-changing project as you demonstrate your capabilities as an agent of change. Please answer the interview guide with honesty and confidentiality without revealing your name.

Thank you for your participation.

Part II: Participant's Rights

Your participation in this participatory action research is purely voluntary and refusal to participate will not carry any penalty. In case you have any questions or problems relating to the study, you are free to ask me at any time during the study period, you may contact Mwima Rachel Joan on +256 782 729 852/ +256 703 932 888.

Confidentiality

The information obtained it will be treated with confidence and code numbers will be used on the interview guides. The information obtained will be kept under lock and key.

Statement of consent

The purpose and nature of this study has been explained to me, understanding that my participation in this study is voluntary and that no consequence will result if I refuse to participate in the study. I am free to withdraw from this study at any time.

.....	.....	.....
Participant's name	**Signature**	**Date**
.....	.....	.....
Name of Researcher	**Signature**	**Date**

APPENDIX II: INTERVIEW GUIDE

Dear Sir/Madam,

I am **Mwima Rachel Joan, a** 2nd year student of Masters in Vocational Pedagogy at Kyambogo University. I am conducting a study titled ***"Clinical Placement Support as a Means of Enhancing Competence Development among Nurse Trainees at Uganda Heart Institute".***

You are kindly requested to participate in this study interview which is intended to help in Enhancing Competence Development among ICU Nurse Trainees and other Health Workers at Uganda Heart Institute. This study is purely academic and I do encourage you to respond to these questions honestly, your responses together with those of other participants will be audio recorded but without mentioning your names, and later the information you give will be transcribed, analyzed and findings shared at a stakeholder's meeting to help in improving the clinical placement program for nurses.

SECTION A: BIOGRAPHIC DATA OF THE RESPONDENT

1. **Gender (sex)**
   a) Male ☐
   b) Female ☐

2. **Age group**
   a) 20 – 29 ☐
   b) 30 – 39 ☐
   c) 40 – 49 ☐

3. **Level of education**
   a) Certificate ☐
   b) Diploma ☐
   c) Bachelors ☐
   d) Master's Degrees ☐

APPENDIX III: CRITICAL CARE NURSE COMPETENCE CHECKLIST

UHI ICU/Critical Care Nurse Competency Checklist: CLINICAL PLACEMENT: RN

Position Title:_____ Nurse Trainee: Name: _____ Unit:_____

Cluster Area: Critical Care: ICU, CATH LAB, OR, CCU, Float Cluster: Peri-anaethesia Start Date: End Date:

Method of Instruction Key:	Method of Evaluation Key:	Self-Assessment by Nurse Trainee				Validation of Competency		
P = Protocol/Procedure Review E = Education Session S = Self Learning Package C = Clinical Practice D = Demonstration	O = Observation (in clinical setting) RD = Return Demonstration T = Written Test V = Verbal Review	Never Done	Needs Review/ Practice	Competent	Method of Instruction (Use Instruction Key on Left)	Date	Initials	Evaluation Method (Use Evaluation Key on Left)
All Level 1 Competencies reviewed and documented in Central Orientation								
A. GETTING INTO THE SYSTEM								
Introduce nurse trainees to colleagues then conduct a brief unit tour					E			V
Orient and assess the competencies of the trainees then document					E			V
Provide basic principles in cardiac nursing, handling of emergencies, care of Invasive lines, Drug Calculations					E			V
How to receive and provide post-operative critical care to patients					E			V
Proper handling of ICU equipment					E			V
In-depth theoretical and practical instructions on CPR, Pain, chest tubes and chest care, ventilator management					E			V
Provide Cardiac/Pulmonary arrest management, Intravenous therapy and medication errors reductions. Nurses Understanding of critical responsibility and accountability of patient care.					E			V
B. SAFETY/INFECTION CONTROL								
Prevent the spread, transmission and acquisition of Health-care associated infections					E			V
Identify and carry out standard precautions like hand washing, Decontamination, PPEs, proper waste disposal					E			V
Safe handling of sharps, Ensure disinfection and sterilization procedures					E			
Locates fire alarms, extinguishers and exits					E			
C. EQUIPMENT								
LEVEL 1: CLUSTER SPECIFIC COMPETENCIES –operates the following according to Biomedical instructions								
Wall monitors								
Defibrillator								
Syringe pumps								
Infusion pumps: single- & double-chamber, primary & secondary tubing								

Initials	Signature	Initials	Signature	Initials	Signature

Revised 4/07, 5/07, 3/10, 3/11, 11/12

UHI ICU/Critical Care Nurse Competency Checklist: CLINICAL PLACEMENT: RN

Position Title:_____ Nurse Trainee: Name: _____ Unit:_____

Cluster Area: Critical Care: ICU, CATH LAB, OR, CCU, Float Cluster: Peri-anaethesia Start Date: End Date:

Method of Instruction Key:	Method of Evaluation Key:	Self-Assessment by Employee				Validation of Competency		
P = Protocol/Procedure Review E = Education Session S = Self Learning Package C = Clinical Practice D = Demonstration	O = Observation (in clinical setting) RD = Return Demonstration T = Written Test V = Verbal Review	Never Done	Needs Review/ Practice	Competent	Method of Instruction (Use Instruction Key on Left)	Date	Initials	Evaluation Method (Use Evaluation Key on Left)
Infusion pumps: syringe								
Oxygen delivery: cannula, flow meter, mask, re-breather, oxygen flow meter								
Pulse Oximeter								
ABG machine								
Suction: Continuous/Intermittent								
Twelve Lead ECG Machine								
LEVEL 3: SPECIFIC COMPETENCIES - Operates the following according to the operator's manual:								
Bear Hugger								
Emergency drug Cart								
Heamodynamic monitoring: arterial line								
Heamodynamic monitoring: central venous pressure								
Intubation Box								
Medication trolley								
GE Carescape Ventilators								

Initials	Signature	Initials	Signature	Initials	Signature

UHI ICU/Critical Care Nurse Competency Checklist: CLINICAL PLACEMENT: RN
Position Title:_____ Nurse Trainee: Name: _____ Unit:_____
Cluster Area: Critical Care: ICU, CATH LAB, OR, CCU, Float Cluster: Peri-anaethesia Start Date: End Date:

Method of Instruction Key: P = Protocol/Procedure Review E = Education Session S = Self Learning Package C = Clinical Practice D = Demonstration	Method of Evaluation Key: O = Observation (in clinical setting) RD = Return Demonstration T = Written Test V = Verbal Review	Self-Assessment by Employee				Validation of Competency		
		Never Done	Needs Review/ Practice	Competent	Method of Instruction (Use Instruction Key on Left)	Date	Initials	Evaluation Method (Use Evaluation Key on Left)
D. DOCUMENTATION/COMMUNICATION								
LEVEL 1: DEPARTMENTAL COMPETENCIES								
Cardiac Intensive Care Unit practices and standards								
Post-operative ICU documentation and monitoring. Fluid balance charts								
Patient assessment forms and ICU progress Notes								
ICU post-operative Nursing Admission sheet								
Nursing Notes								
LEVEL 3: UNIT SPECIFIC COMPETENCIES								
Assesses and understands Intensivist Post-Op Notes/Orders & Progress Notes								
Completes ICU monitoring and observation charts.								
Systemic patient assessment								
Ability to administer CPR and recognize life threatening conditions								
Handling stressful medical and surgical emergencies								
Knowledge and Proficiency in performing diagnostics and testing								
Having Quick, adaptable and clear-headed decision making skills								
Ability to provide quality medical care with a high level of cultural competency								

Initials	Signature	Initials	Signature	Initials	Signature

UHI ICU/Critical Care Nurse Competency Checklist: CLINICAL PLACEMENT: RN
Position Title:_____ Nurse Trainee: Name: _____ Unit:_____
Cluster Area: Critical Care: ICU, CATH LAB, OR, CCU, Float Cluster: Peri-anaethesia Start Date: End Date:

Method of Instruction Key: P = Protocol/Procedure Review E = Education Session S = Self Learning Package C = Clinical Practice D = Demonstration	Method of Evaluation Key: O = Observation (in clinical setting) RD = Return Demonstration T = Written Test V = Verbal Review	Self-Assessment by Employee				Validation of Competency		
		Never Done	Needs Review/ Practice	Competent	Method of Instruction (Use Instruction Key on Left)	Date	Initials	Evaluation Method (Use Evaluation Key on Left)
Locates Face Sheet and admission file					V / O			
Recognizes printed orders					V / O			
Refers to ICU Patient admission requirements Checklist					V / O			
States proper time frames for completion of various documentation					V / O			
E. PROVISION OF CARE								
PATIENT SAFETY AND ETHICS								
Informed Consent – Procedure								
Consent / Refusal of Blood and/or Blood Products								
NURSING PRACTICE MANUAL – aware of content and/or provides care according to the following protocols/procedures:								
Blanket / Bear huggers								
Central Lines – (Blood Draws, Flush, IV Fluid Administration, & Dressing Care)								
Chest Tube								
CPAP and BiPAP Units: for use during Hospital Stay								
Diabetes Mellitus Management:								
Heamodynamic Monitoring								
IV Therapy: Peripheral								
IV Push Medications								
Jewelry: Wearing of Jewelry								
Medications: Double Check								
Neurologic Assessment of the Adult Inpatient								

Initials	Signature	Initials	Signature	Initials	Signature

UHI ICU/Critical Care Nurse Competency Checklist: CLINICAL PLACEMENT: RN

Position Title:_____ Nurse Trainee: Name: _____ Unit:_____

Cluster Area: Critical Care: ICU, CATH LAB, OR, CCU, Float Cluster: Peri-anaethesia Start Date: End Date:

Method of Instruction Key: P = Protocol/Procedure Review E = Education Session S = Self Learning Package C = Clinical Practice D = Demonstration	Method of Evaluation Key: O = Observation (in clinical setting) RD = Return Demonstration T = Written Test V = Verbal Review	Self-Assessment by Employee				Validation of Competency		
		Never Done	Needs Review/ Practice	Competent	Method of Instruction (Use Instruction Key on Left)	Date	Initials	Evaluation Method (Use Evaluation Key on Left)
Pain: Care of the Adult								
Pain: Continuous Narcotic Infusion								
Pain: Epidural Narcotic Infusion and Patient Controlled Epidural Analgesia								

Initials	Signature	Initials	Signature	Initials	Signature

APPENDIX IV: INTERNAL MEMOS

INTERNAL MEMO

To: Senior Hospital Administrator

From: .....

Date: 1st March 2022

RE: REQUEST TO USE THE BOARDROOM ON THURSDAY 3.03.2022 AT 9AM

This is to request you madam to be allowed to use the Boardroom on the above mentioned date.

Please find attached invitation of the above meeting.

Internal memo

To: Head Critical Care, UHI

Head Adult Cardiology

Head Nursing

Head Anaesthesia

Head Adult Surgery

Head Biomedical Engineering

Cc: Senior Hospital Administrator

FROM: Mwima Rachael

Date 1st/03/2022

REF: INVITATION FOR A FUTURE WORKSHOP/STAKEHOLDER MEETING ON ACTION RESEARCH IN THE CRITICAL CARE DEPARTMENT (ICU, CATH LAB AND THEATRE AT UGANDA HEART INSTITUTE)

This is to invite you for the above meeting on Thursday 3rd March 2022 at 9 am in UHI Boardroom.

1. Opening prayer
2. Introduction of participants
3. Research introduction
4. Explanation method
5. Formulation of the critical questions
6. Problem statement
7. Brainstorming
8. Clustering/ finding solutions
9. Prioritization
10. Fantasy
11. Reality

NB. Breakfast will be available

INTERNAL MEMO

To: ....Therese..........Ulwan..........

Cc: SHA

Head Critical Care

Head Adult Cardiology

Head Nursing

Head Ana

Head Adult Surgery

From: ....Kyambogo..........university..........

RE: **INVITATION FOR A FUTURE WORKSHOP/ STAKEHOLDERS MEETINGS ON ACTION RESEARCH IN THE CRITICAL CASE DEPARTMENT (ICU, CATH LAB AND THEATRE AT UHI)**

This is to invite for the above meeting on Thursday 3rd March 2022 at 9am in UHI Boardroom.

Agenda:

1. Opening Prayer.
2. Introduction of participants
3. Research Introduction.
4. Explanation of method.
5. Formulation of the critical questions.
6. Problem statement
7. Brainstorming.
8. Clustering / Finding solutions.
9. Prioritization.
10. Fantasy.
11. Reality

NB: Breakfast will be available

Internal memo

To: Head Critical Care, UHI

Head Adult Cardiology

Head Nursing

Head Anaesthesia

Head Adult Surgery

Head Biomedical Engineering

Cc: Senior Hospital Administrator

FROM: Mwima Rachael

Date 1st/03/2022

REF: INVITATION FOR A FUTURE WORKSHOP/STAKEHOLDER MEETING ON ACTION RESEARCH IN THE CRITICAL CARE DEPARTMENT (ICU, CATH LAB AND THEATRE AT UGANDA HEART INSTITUTE)

This is to invite you for the above meeting on Thursday 3rd March 2022 at 9 am in UHI Boardroom.

1. Opening prayer
2. Introduction of participants
3. Research introduction
4. Explanation method
5. Formulation of the critical questions
6. Problem statement
7. Brainstorming
8. Clustering/ finding solutions
9. Prioritization
10. Fantasy
11. Reality

NB. Breakfast will be available

APPENDIX V: INTRODUCTION LETTER

KYAMBOGO UNIVERSITY

P. O. Box 1 Kyambogo, Phone: 041-285001/2 Fax: 041-220464
www.kyambogo.ac.ug

SCHOOL OF ART AND INDUSTRIAL DESIGN

DEPARTMENT OF VISUAL COMMUNICATION

MASTERS IN VOCATIONAL PEDAGOGY

...../...../2022

THE EXECUTIVE DIRECTOR.
UGANDA HEART INSTITUTE

Dear Sir,

TO WHOM IT MAY CONCERN

This letter introduces MWIMA RACHEL JOAN ..... a final student of Masters in Vocational Pedagogy (MVP) Programme at Kyambogo University.

Registered under number 19/U/GMVP/19018/PD

In partial fulfillment for the ward of a MVP Programme at Kyambogo University, he/she is expected to conduct a research study in a specialized area as approved by the school graduate board.

The purpose of this letter therefore, is to request you to allow him / her to conduct Research at/ in CRTICAL CARE DEPT/ICU ..... and accord him/her the necessary support for the study.

Looking forward to your kind cooperation.

Yours Sincerely,

PP Dr.Sserunjogi Patrick
Coordinator, Graduate Studies

KYAMBOGO UNIVERSITY

P. O. Box 1 Kyambogo. Phone: 041-285001/2 Fax: 041-220464
www.kyambogo.ac.ug
SCHOOL OF ART AND INDUSTRIAL DESIGN
DEPARTMENT OF VISUAL COMMUNICATION
MASTERS IN VOCATIONAL PEDAGOGY

22/12/2022

THE EXECUTIVE DIRECTOR
UGANDA HEART INSTITUTE

Chair Research Committee
Please handle
24/12/2022

Dear Sir,

TO WHOM IT MAY CONCERN

This letter introduces [illegible] a final student of Masters in Vocational Pedagogy (MVP) Programme at Kyambogo University.

Registered under number [illegible]

In partial fulfillment for the ward of a MVP Programme at Kyambogo University, he/she is expected to conduct a research study in a specialized area as approved by the school graduate board.

The purpose of this letter therefore, is to request you, to allow him / her to conduct Research at/ in [illegible] and accord him/her the necessary support for the study.

Looking forward to your kind cooperation.

Yours Sincerely,

PP Dr.Sserunjogi Patrick
Coordinator, Graduate Studies

KYAMBOGO UNIVERSITY

P. O. Box 1 Kyambogo, Phone: 041-285001/2 Fax: 041-220464

www.kyambogo.ac.ug

SCHOOL OF ART AND INDUSTRIAL DESIGN

DEPARTMENT OF VISUAL COMMUNICATION

MASTERS IN VOCATIONAL PEDAGOGY

22/02/2022

THE EXECUTIVE DIRECTOR
UGANDA HEART INSTITUTE,

Dear Sir,

TO WHOM IT MAY CONCERN

This letter introduces [illegible] a final student of Masters in Vocational Pedagogy (MVP) Programme at Kyambogo University.

Registered under number [illegible]

In partial fulfillment for the ward of a MVP Programme at Kyambogo University, he/she is expected to conduct a research study in a specialized area as approved by the school graduate board.

The purpose of this letter therefore, is to request you, to allow him / her to conduct Research at/ in CRITICAL CARE [illegible] and accord him/her the necessary support for the study.

Looking forward to your kind cooperation.

Yours Sincerely,

PP Dr.Sserunjogi Patrick
Coordinator, Graduate Studies

[illegible]

APPENDIX VI: ATTENDANCE LIST

FUTURE WORKSHOP AT UHI 03/03/2022

BY RACHEL JOAN MWIMA

ATTENDANCE LIST

Nº	NAME	DESIGNATION	SIGNATURE
(1)	Nankya Prossy Luwanga	Pedagogue	
(2)	Harrison Uchungi	CR PT.	
(3)	Dr Isaac Ssinabulya	Cons. Cardiologist	
(4)	Okefoyot Anna Noland	PND	
(4)	Tuhaise Lilian	Administrator mvp programme	
6.	OMIRAMBE KILLION	Yr. I MVP KYU	
7.	LUBOWA M. SOPHIA	ICU Trainee (MSWMH)	
8.	NAKIBIRIGE ANNET	ICU Trainee (MNRH)	
9.	Namale Annet	ICU trainee (Kasoolo Hospital)	
10	Ayebare Immaculate	ICU trainee (Hoima RRH)	
11.	RWAMUKURA David	ICU Trainee (Kawempe NRH)	
12.	Nabude Gaudencia	ICU trainee (MSWNH)	
13.	Namirembe Lydia	(MVP)	
14	Rachel Joan Mwima	(MVP)	
15	[illegible] MT Serwaniko Chris		

ATTENDENCE LIST

24. DENIS JJUUKO

25.

26.

APPENDIX VII: ACCEPTANCE LETTER

UGANDA HEART INSTITUTE

First Floor, Block C, Mulago Hospital Complex P.O. Box 37392 Kampala, Uganda
Telephone: 0417720350 E-mail: info@uhi.go.ug; website: https://www.uhi.go.ug

Our Ref: ...**ADM/100/110/01**

Your Ref: .....

24th February, 2022

Mwima Rachel Joan,
Uganda Heart Institute
P O Box 37392
KAMPALA

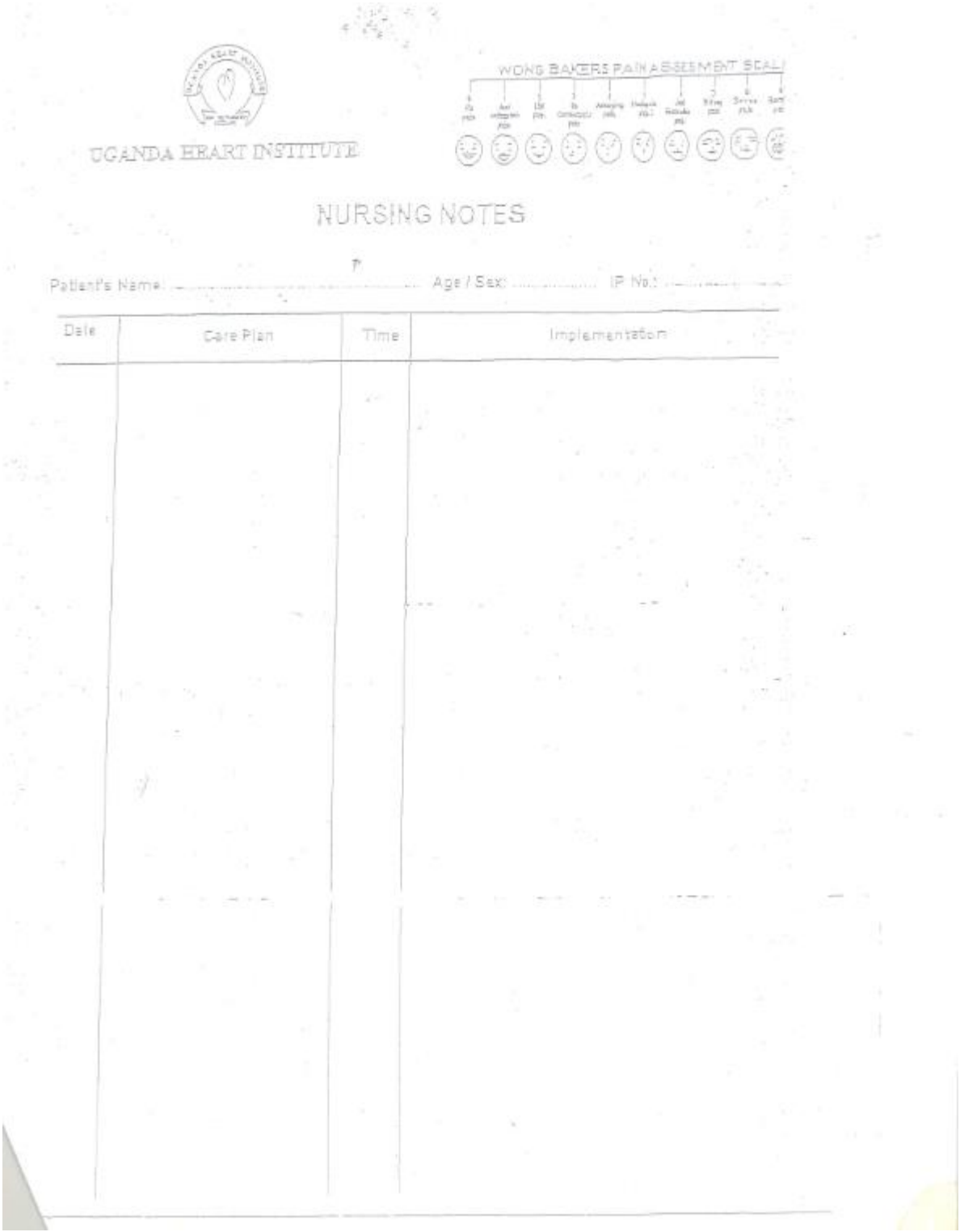
RE: PERMISSION TO CONDUCT ACTION RESEARCH IN CRITICAL CARE DEPARTMENT (ICU) AT UGANDA HEART INSTITUTE

Reference is made to your letter dated **22nd February 2022** seeking for permission to carry out a study at Uganda Heart Institute (**The study titled: "Action Research in Critical Care Department (ICU) at Uganda Heart Institute"**).

Following approval of your proposal by the Research Committee, you are hereby granted permission to carry out the study at **UHI**.

Dr. Sebatta Elias
CHAIRMAN RESEARCH COMMITTEE
Cc: Senior Hospital Administrator

APPENDIX VIII: NURSING NOTES



UGANDA HEART INSTITUTE

WONG BAKERS PAIN ASSESSMENT SCALE

NURSING NOTES

Patient's Name: ..... Age / Sex: ..... IP No.: .....

Date	Care Plan	Time	Implementation

APPENDIX IX: ICU POST-OPERATIVE ADMISSION SHEET

UGANDA HEART INSTITUTE
FOR YOUR HEART YOUR LIFE

ICU Postoperative Nursing

Admission sheet

Label

	DATE			TIME		IP No.		
NAME		ABO+		AGE		Wt.		

Diagnosis			
Surgery		*Surgeon*	
		Anesthetist	
History		ECG	
		EF	
Preoperative Medications			

Handover

x-clamp time	*Time in minutes*	Circ. Arrest	*Time if occurred*	CPR	*Check if occurred*
Bypass time	*Time in minutes*	Arrhythmias	*Check if occurred*	DC	*Check if occurred*

Intubation & Ventilation		Transfusion		Came to ICU with	Blood @Bl. Bank
Difficulty	*Easy/difficult*	Fresh Blood	#	#	
Size/type	*#/cuffed*	P. RBCs	#	#	
Fixed @	*#cm*	FFPs	#	#	
Tidal volume	#	Platelets	#	#	
Chest sound		Cyro	#	#	

Drains		Skin & Pressure Areas
Rt Pleural	#	*Ex: clean, warm, moist, intact, no pressure ulcers*
Lt Pleural	#	
Mediastinal	#	

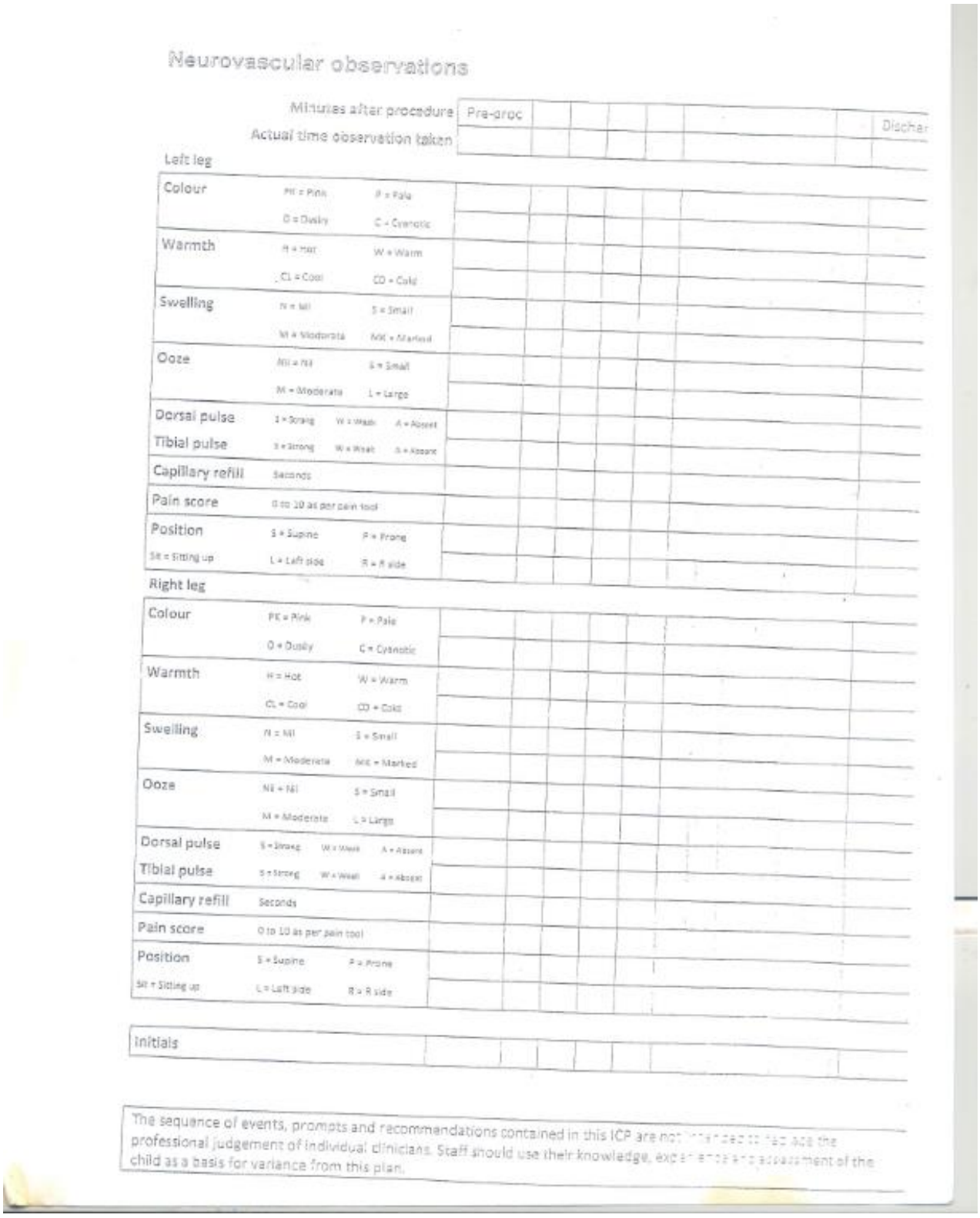
Pacing		Lines		Infusions
Atrial	*Check if Present*	CVL		
Ventricular	*Check if Present*	A Line		
Mode		PC		
A. rate		U. Cath		
V. Rate		Other		

Initial Checks

NURSE (A)		NURSE (B)	
Secure airway		Monitor connect/ parameters/ alarms	
Ventilator Settings		Labs/ Cardiac Enz	
Ventilator Connected		ABG	
Chest Auscultation		ECG	
Connect low sunction/ zero		Chest X-ray	
Zero Pressures		Temperature & Warming	
Pumps Checked		Order routine & Call Porters	
Perform Sunction if Needed		Elevate Head of the Bed	
Urine bag emptied			

Signature:

APPENDIX X: NEUROVASCULAR OBSERVATION



Neurovascular observations

Minutes after procedure	Pre-proc							Discher
Actual time observation taken								
Left leg								
Colour	PK = Pink	P = Pale						
	D = Dusky	C = Cyanotic						
Warmth	H = Hot	W = Warm						
	CL = Cool	CD = Cold						
Swelling	N = Nil	S = Small						
	M = Moderate	MK = Marked						
Ooze	Nil = Nil	S = Small						
	M = Moderate	L = Large						
Dorsal pulse	S = Strong	W = Weak	A = Absent					
Tibial pulse	S = Strong	W = Weak	A = Absent					
Capillary refill	Seconds							
Pain score	0 to 10 as per pain tool							
Position	S = Supine	P = Prone						
Sit = Sitting up	L = Left side	R = R side						
Right leg								
Colour	PK = Pink	P = Pale						
	D = Dusky	C = Cyanotic						
Warmth	H = Hot	W = Warm						
	CL = Cool	CD = Cold						
Swelling	N = Nil	S = Small						
	M = Moderate	MK = Marked						
Ooze	Nil = Nil	S = Small						
	M = Moderate	L = Large						
Dorsal pulse	S = Strong	W = Weak	A = Absent					
Tibial pulse	S = Strong	W = Weak	A = Absent					
Capillary refill	Seconds							
Pain score	0 to 10 as per pain tool							
Position	S = Supine	P = Prone						
Sit = Sitting up	L = Left side	R = R side						
Initials								

The sequence of events, prompts and recommendations contained in this ICP are not intended to replace the professional judgement of individual clinicians. Staff should use their knowledge, experience and assessment of the child as a basis for variance from this plan.

APPENDIX XI: ICU PROGRESS REPORT

Logo

INTENSIVE CARE UNIT

Specialty unit:

Progress Notes

Patient details

Name:
IP Number:
Age: Sex:
DOR: / / TOR: : HRS

ICU Day: # _____

Events:

Subjective

Vitals: Temp: °C HR: bpm Rhythm: BP: / MAP:
CVP: RR: bpm SpO_2: % ICP: $ETCO_2$:

Current Medications

General exam:

Neuro

☐ Not Sedated; GCS _____ ☐ Sedated: RASS _____ ☐ CPOT Pain scale _____
FNDs: ☐ No ☐ Yes Analgesia: ☐ No ☐ Yes Paralytics: ☐ No ☐ Yes

Pulmonary

☐ Spontaneous breathing ☐ IPPV: ☐ ETT ☐ Trach Secretions: _____
RA / NP / FM / NRM / HFNC / CPAP / NIV / AC-VC / PC-AC / SIMV / PSV
Vt _____ Pinsp _____ RR _____ PS _____ Ti _____ PEEP _____ FiO_2 _____
Pplat _____ Cstat _____ Clinical findings: _____
ABG (Time HH MM hrs): $pH/PCO_2/PO_2/HCO_3$ _____/_____/_____/_____ (Time: hrs)

Cardiovascular

Peripheries: ☐ Warm ☐ Cold Capillary Refill Time: ___s Pulse character: _____
JVP: _____ HS _____ Cardiovascular support: ☐ No ☐ Yes

Renal

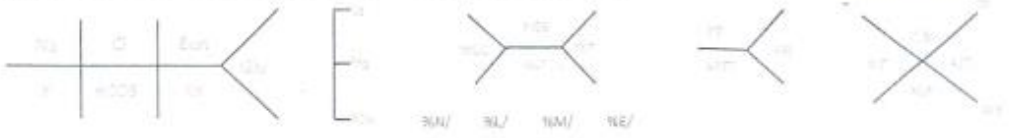
Urethral catheter: ☐ No ☐ Yes Urine output: _____ in _____ hrs
Urine macro: _____ I/O: _____/_____
Volume status: ☐ Hypervolemia ☐ Euvolemia ☐ Hypovolemia. (Review RFTs & Electrolytes)

GIT

Abdomen: _____ Organomegaly: _____
Bowel Sounds: _____ Bowel opening: _____

Skin

Rashes: ☐ No ☐ Yes Petechiae: ☐ No ☐ Yes Pressure ulcers: ☐ No ☐ Yes



Imaging:

Cultures:

APPENDIX XII: PERITONEAL DIALYSIS PRESCRIPTION

Peritoneal Dialysis Prescription

Patient name: _____ Age: _____ Sex: M F

Date: _____ Time: _____ ICU Day: ___ Dialysis day: _____

Fluid overload (FO) percentage: _____ Kt/Vurea: _____

Session duration	
Number of cycles	
Dialysate solution	☐ Commercially prepared; specify: _____ ☐ Ringers Lactate ☐ 0.45% Saline ☐ 1.5% ☐ 2.5% ☐ 4.25% ☐ >4.25%; Specify: _____
Additives to dialysate	☐ 8.4% NaHCO3 ☐ KCl ☐ 50% MgSO4 ☐ 3% NaCl ☐ UF Heparin; dose: _____ ☐ Insulin: _____ ☐ Antibiotic, Specify dose: _____
Fill volume (ml/kg)	☐ 10 ☐ 20 ☐ 30 ☐ 40
Inflow time (min)	☐ 5 ☐ 10 ☐ 15
Indwelling time (min)	☐ 15 ☐ 30 ☐ 40 ☐ 60 ☐ >60; Specify: _____
Draining time (min)	☐ 10 ☐ 20 ☐ 30
Total dialysate volume	

Prescriber name: _____

Prescribers signature: _____