Knowledge Levels, Experiences, and Challenges in Critical Care Nursing: A Mixed-Methods Study at Gushiegu Municipal Hospital, Ghana

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Abstract

This study was necessary to address the evident gap in critical care skills and support systems specific to this facility. At Gushegu Municipal Hospital, the effectiveness of critical care management heavily depends on the knowledge and skills of nurses, who play a crucial role in determining patient outcomes. A concurrent triangulation mixed-methods design was employed to integrate findings. Quantitative data were collected from 133 nurses using a validated questionnaire (Cronbach's $\alpha = 0.8$), while qualitative data were gathered through semi-structured interviews with 5 purposively selected ICU nurses. Quantitative data were analyzed using SPSS version 29, and qualitative data underwent thematic analysis using NVivo version 12. The demographic profile of the quantitative sample revealed that 72% of respondents were female, with a mean age of 34 years (SD = 6.2), and an average of 5.1 years (SD = 2.8) of professional nursing experience. Quantitative findings indicated that only 48% of nurses demonstrated adequate knowledge of critical care protocols, with particular challenges in ECG interpretation (only 42% confident) and complex patient assessments (55%). The qualitative analysis identified three core themes: Knowledge Gaps and Training Needs — highlighting deficiencies in critical care skills and a desire for ongoing professional development. The findings underscore the urgent necessity for systemic interventions to bridge knowledge gaps, enhance resource availability, and foster a supportive work environment.

Keywords: Critical care, nursing management, knowledge assessment, nurses' experiences, challenges, Ghana.

Introduction

Critically ill patients, defined as those requiring intensive monitoring and life-supporting interventions due to actual or potential life-threatening conditions, represent a significant healthcare challenge globally, particularly in resource-limited settings (World Health

Organization [WHO], 2023). According to a large-scale study published in *The Lancet*, approximately 12.5% of hospitalized patients in Africa are critically ill, with a mortality rate of 21% among these patients within the first week of hospitalization. Alarmingly, over half of these critically ill patients (56%) do not receive even basic critical care interventions such as oxygen therapy, intravenous fluids, or airway management (Baker et al., 2025). Globally, the burden of critical illness continues to rise due to factors such as aging populations, the increasing prevalence of chronic diseases, and the growing impact of pandemics and trauma. These trends underscore the urgent need for robust critical care systems, particularly in resource-limited settings where healthcare infrastructure often lags behind clinical demand. These patients typically present with severe conditions resulting from motor vehicle accidents, violence, burns, near drownings, and acute health issues such as myocardial infarctions and strokes (Shang et al., 2020; Zang et al., 2020). The high level of acuity in these patients necessitates rapid and professional nursing interventions to stabilize their conditions, as delays can significantly increase risks to life (Martindale et al., 2020). Critical care nursing is a specialized field dedicated to the management of acutely ill patients who require intensive monitoring and evidence-based interventions (Morton & Thurman, 2023). Nurses in this domain work in settings like intensive care units and emergency departments, collaborating closely with physicians and other healthcare professionals to deliver comprehensive care (Henriksen et al., 2021). Their roles include vital sign monitoring (Baker et al., 2020), medication administration (Golino et al., 2019), patient positioning, and performing procedures like catheter insertions (Hsu et al., 2019). Effective communication with patients and their families is essential, as nurses provide emotional support and address concerns during stressful times (Page et al., 2019; Kleinpell et al., 2019). The responsibilities of critical care nurses are extensive, requiring specialized knowledge and compassion (Wei et al., 2020). They utilize evidence-based practices to make clinical decisions (Melnyk et al., 2021) and engage in continuous professional development to remain informed about advancements in care. Additionally, patient education on managing health post-discharge is crucial for ensuring ongoing well-being (Hajalizadeh et al., 2021). While the field has evolved significantly since the establishment of critical care facilities in the 1950s, challenges persist, especially in regions like sub-Saharan Africa and Ghana. Resource scarcity, including limited equipment and personnel, hampers the delivery of optimal care (Yakubu et al., 2019). Nevertheless, critical care nurses in Ghana demonstrate dedication to overcoming these challenges as the demand for skilled professionals in this area grows (Siaw-Frimpong et al., 2021; Spencer et al., 2023). Recent advancements in treatments, telemedicine, and the impact of the COVID-19 pandemic have reinforced the importance of critical care nursing (Alharbi et al., 2020). It remains a vital component of healthcare systems, ensuring that critically ill patients receive the highest standard of care and improved outcomes.

Problem Statement

An increasing number of critically ill patients are being admitted to hospitals across the globe (Azoulay et al., 2021). These individuals require specialised, high-stakes care, as even minor errors in treatment can lead to fatal consequences (Yuriditsky et al., 2021). Preventing such avoidable outcomes is particularly crucial given the generally lower survival rates of critically ill patients and the compounding impact of global

health emergencies such as the COVID-19 pandemic (Hu et al., 2020). Globally, the burden of critical illness is rising, driven by aging populations, the prevalence of non-communicable diseases, and emerging infectious diseases. Yet, access to adequate critical care remains highly inequitable. According to the World Health Organization (WHO), low- and middle-income countries (LMICs) bear a disproportionate share of the critical illness burden, often without the infrastructure to provide essential life-saving care. In Sub-Saharan Africa, critical care services are particularly underdeveloped. A study by Baker et al. (2023) revealed that over 50% of critically ill patients in African hospitals do not receive basic interventions such as oxygen therapy or intravenous fluids. Most hospitals lack functioning Intensive Care Units (ICUs) or High Dependency Units (HDUs), and where such units exist, they are often understaffed and underequipped. This results in high mortality rates and significant emotional distress among frontline healthcare providers.

In Ghana, the situation reflects these regional trends. According to a 2020 national audit, Ghana had only 113 adult ICU beds and 36 pediatric ICU beds for a population of over 30 million, equating to less than 0.5 ICU beds per 100,000 people. Additionally, there were only 8 intensivists nationwide (Agyeman-Duah et al., 2020). Many regional and district hospitals operate without ICUs, forcing clinicians to manage critically ill patients in general wards with limited resources. This lack of infrastructure contributes to high mortality rates among critically ill patients and places significant strain on healthcare workers (Siaw-Frimpong et al., 2021).

At Gushiegu Municipal Hospital—despite serving as a referral center for approximately 12 surrounding health facilities—there is no standard ICU or HDU. Critically ill patients are treated alongside stable patients in overcrowded wards. This leads to increased congestion, shortages of skilled personnel, inadequate monitoring, and lack of essential supplies (Bendavid et al., 2019). These conditions severely compromise the quality of care delivered to patients in critical condition. Critically ill patients require extensive healthcare resources, including specialized monitoring equipment, complex pharmacologic interventions, and high nursing-to-patient ratios. Wallace et al. (2012) emphasized that timely and highly skilled nursing care is key to reducing preventable deaths among these patients. Yet, there is limited evidence regarding how well-equipped nurses in resource-limited settings like Gushiegu are in managing such complex cases.

This study aims to examine how nurses care for critically ill patients in this hospital, identify capacity gaps, and provide evidence to support training, resource allocation, and policy development. Ultimately, the research seeks to improve the quality of critical care and promote equitable health outcomes in resource-constrained environments.

Specific Objectives

1. To assess the knowledge levels of nurses regarding evidence-based critical care practices using a validated assessment tool.
2. To explore nurses lived experiences, both positive and negative, in managing critically ill patients.
3. To identify and categorize the multifaceted challenges nurses encounter in critical care delivery.

Significance of the study

The significance of this study lies in its potential to inform a broad range of stakeholders within the healthcare sector. Policymakers will gain critical insights into nurses' knowledge and competency levels in managing critically ill patients, enabling the formulation of data-driven policies aimed at closing existing knowledge gaps and improving

patient care practices (Fix et al., 2020). Additionally, the findings will directly contribute to the development and refinement of nursing education curricula by identifying specific areas where theoretical instruction and clinical training must be strengthened (Mohr et al., 2020). This will help ensure that newly trained nurses are better equipped to meet the demands of critical care practice, particularly in low-resource environments. Hospital management teams can use the research outcomes to assess staff training needs and implement targeted capacity-building programs to enhance nurses' critical care competencies (Wade et al., 2019). At a national level, the study has the potential to inform Ghana's health policy by providing evidence that supports investments in critical care infrastructure, workforce training, and the development of specialized roles such as critical care nurses. Moreover, the study will contribute to the global body of literature on critical care nursing in low- and middle-income countries, where evidence remains limited but urgently needed. The results will serve as a foundational reference for future research and interventions aimed at improving critical care delivery in similar settings. By capturing the lived experiences and perspectives of nurses on the frontlines, the study also provides valuable insight for healthcare administrators and planners seeking to optimize nursing roles, reduce preventable mortality, and enhance the overall quality of care. Ultimately, the study aspires to promote better patient outcomes and strengthen the resilience of healthcare systems in resource-constrained environments.

Literature Review

Concept of Critical Illness

Critical illness is a serious illness or injury that requires urgent medical care and close monitoring (Cai et al., 2022). If left untreated, this often affects many organ systems and may be fatal. Sepsis, acute respiratory distress syndrome (ARDS), severe injuries, and neurological problems among others are examples of critical illnesses. Sepsis is a potentially fatal illness that occurs when the body's reaction to an infection, produces inflammation and tissue and organ damage (Kim & Choi, 2020). This may result in organ failure, shock, and ultimately death. Sepsis may result from a variety of illnesses, such as bacterial, viral, and fungal infections. Patients with sepsis need rapid medical care and treatment, which may include antibiotics, fluids, and other supportive measures. ARDS is a kind of respiratory failure that may result from a number of underlying diseases, such as pneumonia, sepsis, and trauma (Thomas, 2019). ARDS is characterised by severe lung inflammation, which may lead to fluid accumulation in the air sacs and limit a patient's capacity to breathe. ARDS is often treated with mechanical ventilation, anti-inflammatory and lung-supporting drugs (Piersigilli et al., 2020).

Theoretical Framework: Swanson's Theory of Caring

This study is underpinned by Swanson's Theory of Caring, developed by Dr. Kristen Swanson in 1991. This middle-range nursing theory emphasizes the importance of compassionate care within the nurse–patient relationship and provides a structured model to guide nursing practice. The theory identifies five core caring processes knowing, being with, doing for, enabling, and maintaining belief—each of which is highly applicable to the complex and emotionally charged context of caring for critically ill patients.

Knowing involves striving to understand an event as it has meaning in the life of the patient. In the

context of critical care nursing, this means understanding not just the clinical aspects of a patient's condition, but also the emotional, psychological, and personal impact of the illness on both the patient and their family (Mårtensson et al., 2021). Nurses in resource-limited settings such as Gushiegu Municipal Hospital must work to comprehend patient experiences despite constraints in time, staffing, and resources.

Being with refers to emotional presence, conveying availability and empathy to the patient. This is particularly important in critical care, where patients and families often experience anxiety, fear, and uncertainty. By "being with" patients—providing reassurance, listening, and showing empathy—nurses help to build trust and reduce psychological distress during vulnerable moments (Ellina & Adiutama, 2019).

Doing for involves performing tasks that the patient would do for themselves if they were able. In critical care nursing, this includes not only clinical interventions such as administering medication and monitoring vital signs but also basic care and comfort measures. Ensuring that these are done with competence and compassion is central to maintaining dignity in care delivery (Kusumaningsih et al., 2019).

Enabling focuses on empowering the patient and their family through information, support, and guidance. In the context of critical illness, enabling means educating patients and their caregivers about diagnoses, treatment plans, and recovery expectations, as well as involving them in decision-making processes (Maf'ula et al., 2020). This process is vital for supporting informed choices and fostering patient autonomy, even in high-pressure care environments.

Maintaining belief involves sustaining faith in the patient's capacity to overcome illness or find meaning through the experience. This process requires the nurse to offer hope and emotional support while remaining honest about the patient's prognosis. In critical care settings, particularly those with limited resources, this balance can help preserve morale for both patients and healthcare providers (Wei, 2022; Mårtensson et al., 2021).

By adopting Swanson's Theory of Caring as a framework, this study will explore how nurses at Gushiegu Municipal Hospital engage with these five caring processes in their treatment of critically ill patients. The theory not only provides a lens to examine nursing behavior and attitudes but also offers a foundation for interpreting how compassion, empathy, and emotional presence influence patient care in low-resource settings. Integrating this framework supports the study's goal of identifying areas for professional development, improving patient outcomes, and guiding policy decisions regarding critical care nursing in Ghana.

Knowledge levels of nurses regarding evidence-based critical care practices.

Nursing knowledge plays a pivotal role in the effective management of critically ill patients, where clinical decisions must be timely, precise, and often life-saving. In critical care settings, nurses are not only responsible for routine monitoring but also for executing rapid interventions, interpreting clinical data, administering complex medications, and providing psychological support (Fix et al., 2020; Wei et al., 2020). Therefore, the breadth and depth of their knowledge significantly influence patient outcomes, safety, and recovery trajectories (Schoeber et al., 2022; Rababa et al., 2021). Existing literature has explored various dimensions of nursing knowledge in critical care, yet many studies focus narrowly on specific clinical competencies rather than providing a comprehensive assessment of general knowledge levels. For instance, Schoeber et al. (2022)

emphasized the importance of the ABCDE approach Airway, Breathing, Circulation, Disability, and Exposure in prioritizing care for critically ill patients. Their study, conducted at Radboud University Medical Center, revealed that while healthcare professionals generally scored an average of 80.1%, ICU nurses scored lower than peers in PICU, Emergency, and Anaesthesiology departments, indicating variability even among specialized staff. Although the study benefits from a rigorous methodology and a large sample size, its generalizability is limited by its focus on a single tertiary institution in a high-resource setting. Mohammed et al. (2020) explored nurses' knowledge regarding Post-Intensive Care Syndrome (PICS) in pediatric patients, particularly in relation to the ABCDEF bundle Assess, prevent, and manage pain; Both spontaneous awakening and breathing trials; Choice of analgesia and sedation; Delirium assessment, prevention, and management; Early mobility and exercise; and Family engagement. The study found considerable knowledge gaps, especially in domains involving long-term cognitive and psychological effects of critical illness. This highlights the need for targeted education to support post-ICU recovery, an area often overlooked in traditional critical care training. However, the study's reliance on self-reported questionnaires may introduce response bias, reducing the reliability of its findings. Further emphasizing the critical nature of specific knowledge areas, Escrivá Gracia et al. (2019) linked low medication knowledge among ICU nurses to an increased incidence of medication errors. Their study underscored the urgent need for enhanced pharmacological training, particularly around high-alert medications commonly used in critical care. Likewise, Jeba (2020) demonstrated that structured educational interventions significantly improved nurses' medication administration accuracy, reinforcing the value of continuous professional development. These studies provide robust, actionable insights but are often conducted in controlled environments, limiting their applicability to under-resourced settings like Gushiegu. In addition to medication and syndrome management, effective assessment skills remain an essential knowledge domain. The ABCDE framework is foundational, yet familiarity with its application varies widely among nurses (Meuwese et al., 2022). Similarly, components of the ABCDEF bundle—such as delirium prevention and early mobility are often underutilized, particularly where staffing or equipment shortages exist (Lee et al., 2020; Rababa et al., 2021). These gaps not only compromise patient safety but also increase the risk of long-term complications. Communication and interprofessional collaboration are also critical areas. Wei et al. (2020) highlighted how poor communication contributes to medication errors and clinical misjudgments in ICU settings. Although not purely a knowledge deficit, these findings suggest that clinical education must also include training in teamwork and decision-making under pressure.

In summary, while prior studies have illuminated key aspects of nursing knowledge in critical care, they often neglect a holistic view of general competence particularly in low-resource environments. This study therefore seeks to bridge that gap by assessing the overall knowledge of nurses managing critically ill patients, with a specific focus on the domains of patient assessment (ABCDE), post-ICU care (ABCDEF), pharmacology, syndrome management, and communication. By synthesizing evidence from diverse contexts, the study aims to generate context-relevant insights that can guide training, policy, and practice

improvements in settings like Gushiegu Municipal Hospital.

Lived-experiences, both positive and negative, in managing critically ill patients

This literature review reveals valuable insights into nurses' experiences managing critically ill patients, particularly as magnified during the COVID-19 pandemic. Limbu et al. (2019) discussed how intensive care nurses faced significant physical distress attributed to understaffing, while Bergman et al. (2021) noted heightened stress and chaotic working conditions, including the need to prioritize care due to overwhelming patient loads. Although these challenges highlight the taxing nature of critical care, a strong sense of camaraderie among nurses emerged as a critical factor for emotional resilience. Swanson's Theory of Caring provides a theoretical lens for understanding these experiences, emphasizing emotional presence, support, and moral commitment in nursing practice (Swanson, 1991). Moral distress, a recurring theme described by Arnold (2020), refers to the psychological burden nurses face when institutional constraints prevent them from acting in alignment with their ethical values.

Shen et al. (2020) identified psychological stress symptoms such as anxiety, sleep disturbances, and emotional exhaustion—particularly among younger, less experienced ICU nurses. Compounding these challenges, Yoo et al. (2020) examined the communication difficulties nurses encountered, including managing distressed families restricted by visitation policies. These situations not only strained nurse-family relationships but also created emotional and ethical tensions that compromised perceived care quality. A lack of formal training in therapeutic communication further exacerbated these challenges. In the Ghanaian context, cultural expectations around hierarchy, deference to authority, and family involvement in decision-making may influence how nurses navigate emotionally charged care situations, often making it difficult for them to advocate freely for patient needs or express concerns openly (Atinga et al., 2021). Additionally, gender dynamics within Ghanaian nursing practice are particularly relevant while nursing globally is female-dominated, certain hospitals and regions in Ghana have higher male representation in nursing roles. This can shape interpersonal dynamics, perceptions of empathy, and even the degree to which nurses are emotionally supported or expected to suppress vulnerability (Mensah & Owoo, 2022). These contextual and theoretical considerations are essential in interpreting nurses lived experiences and in designing interventions that are culturally and professionally appropriate.

Challenges nurses encounter in critical care delivery

The review identifies challenges encountered in institutional, interpersonal, and individual domains within critical care settings. High levels of burnout and psychological stress are especially prominent among nurses caring for critically ill patients (Ogińska-Bulik & Michalska, 2021). Moradi et al. (2021) emphasized that organizational inadequacies—including unclear protocols and resource shortages—exacerbated stress during the COVID-19 pandemic, highlighting systemic weaknesses in healthcare infrastructure. These issues are particularly acute in Sub-Saharan Africa, where systems-level challenges such as chronic underfunding, limited ICU capacity, poor referral systems, and a shortage of specialized personnel significantly impair critical care delivery (Baelani et al., 2011; Karikari et al., 2023). For example, Karikari et al. (2023) described the critical impact of equipment scarcity, including ventilators and monitoring tools, on patient outcomes in Ghana.

Comparatively, in high-resource settings, challenges tend to center around nurse-to-patient ratios, administrative burden, and emotional exhaustion, despite better infrastructure and training support (West et al., 2020). In contrast, low-resource settings struggle with basic capacity issues, such as access to oxygen, essential medications, and trained ICU personnel. Training deficits particularly in areas like early mobilization, enteral feeding, and communication during crises remain a global concern but are often more pronounced where continuing education opportunities are scarce (Kim et al., 2019; Huang et al., 2019).

Some tested solutions in similar contexts include task-shifting models, where non-specialist nurses are trained in essential critical care protocols, as piloted in Uganda and Kenya (Munjita et al., 2022). Mobile simulation labs and low-cost ICU training programs have also shown promise in improving nurse confidence and patient outcomes in resource-limited environments (Dondorp et al., 2019). Addressing these multi-level challenges through resource investment, training, and systems reform is essential not only for improving the management of critically ill patients but also for supporting the well-being and retention of nursing professionals.

Table 1: Comparison of Critical Care Challenges Across Resource Settings

Challenge Category	Low-Resource Settings (e.g., Sub-Saharan Africa)	High-Resource Settings (e.g., U.S., Euro)
Infrastructure	Limited or no ICU beds; inadequate monitoring tools and ventilators	Fully equipped ICUs but may be overwhelmed during surges
Staffing	Severe shortages of critical care nurses and intensivists	Adequate staffing but burnout and poor staff-to-patient ratios
Training	Limited access to ongoing education and simulation-based training	Regular CPD and specialist certification programs
Psychological Stress	High moral distress due to inability to provide standard care.	Burnout from emotional toll and administrative overload
Communication	Language barriers; lack of training in family-centered communication	Better communication systems but strained by family expectations
Resource Allocation	Frequent stockouts of medication, oxygen, and supplies	Shortages rare but occurred during crises (e.g., early COVID-19)

Methodology

Data Integration Protocol

The study employed a concurrent triangulation design; wherein quantitative and qualitative data were collected simultaneously. The integration of data occurred at three stages:

- Data Analysis: Quantitative data were analyzed statistically to identify knowledge gaps and associated factors. Qualitative data were thematically analyzed to derive nuanced insights into nurses' experiences.
- Comparison and Contrast: Findings from both datasets were compared to identify convergences, divergences, and complementarities. For instance, quantitative data indicating low confidence in ECG interpretation were enriched by qualitative

narratives describing the emotional and resource-related barriers faced during cardiac assessments.

- Interpretation: A joint display matrix was used to synthesize findings, facilitating comprehensive interpretation. This approach ensured that statistical trends were contextualized within nurses lived experiences, leading to more holistic conclusions and actionable recommendations.

Study Setting

The study was conducted at Gushiegu Municipal Hospital**,** the largest healthcare facility in the Gushiegu Municipality, located in the Northern Region of Ghana. Established in 2008**,** the hospital functions as a major referral center for approximately 12 surrounding health facilities, providing healthcare to a predominantly rural and underserved population. The hospital has a bed capacity of approximately 120**,** with occupancy rates that frequently exceed capacity due to the high volume of referrals and limited alternative care options in the municipality. The hospital serves a catchment population of over 150,000 people**,** including patients from rural farming communities. The majority of patients falls within the low-income bracket and typically present with advanced-stage conditions due to delays in accessing care. Common critical presentations include severe malaria, obstetric emergencies, septicemia, and trauma-related injuries, alongside chronic disease complications such as diabetes and hypertension. Compared to national healthcare standards set by the Ghana Health Service, Gushiegu Municipal Hospital faces several disparities. National guidelines recommend that district-level referral hospitals have at least a 4–6-bed HDU or basic ICU, along with an appropriate nurse-to-patient ratio, functioning diagnostic services, and access to oxygen therapy. However, the hospital falls short in many of these areas, including infrastructure, personnel, and equipment availability. Staffing is also significantly below the national recommendation, with only 2 doctors, 4 physician assistants, and approximately 200 nurses for a facility serving both inpatient and outpatient care around the clock. Given these constraints, Gushiegu Municipal Hospital represents a typical example of a resource-limited healthcare setting in Ghana. The lack of specialized critical care services poses substantial challenges for nurses and other healthcare providers, making it an ideal context for exploring the knowledge, preparedness, and experiences of nurses caring for critically ill patients.

Study Design

The research utilized a concurrent triangulation design, a mixed-methods approach that integrates both descriptive cross-sectional (quantitative) and phenomenological (qualitative) elements. A mixed-methods approach was selected because quantitative data alone cannot capture the complexity of nursing experiences, while qualitative data alone cannot provide the breadth of assessment needed for knowledge evaluation (Creswell & Plano Clark, 2018).

Study Population and Sampling

The study population consisted of all nurses working in inpatient units who had cared for critically ill patients. Inclusion criteria stipulated a minimum of six months of experience and direct involvement in caring for at least 10 critically ill patients, ensuring participants possessed a foundational understanding of critical care. Excluded were nurses with less experience or those on leave. For the quantitative study, Yamane's (1967) formula (as cited in Islam, 2018) was used to compute the sample size. With a 95% confidence level, a 5% margin of error, and a population size of 200 nurses, the calculated sample size was 133. In addition, five nurses were purposively selected for qualitative interviews based on their direct experience in caring for

critically ill patients in the ICU. For quantitative sampling, stratified random sampling was employed by units/wards, giving each nurse an equal opportunity to participate. In contrast, purposive sampling was used for qualitative interviews to gather insights from nurses with extensive engagement with critically ill patients.

Data Collection Instruments and Procedure

Data collection involved two primary instruments: a structured questionnaire for quantitative data and a semi-structured interview guide for qualitative insights. The questionnaire was designed to assess both demographic characteristics and nurses' knowledge regarding critical care practices, including domains such as patient assessment, medication administration, monitoring protocols, and emergency response. The development of the knowledge assessment component was informed by three key sources: current evidence-based critical care guidelines (American Association of Critical-Care Nurses, 2022), previously validated instruments (e.g., the Basic Knowledge Assessment Tool [BKAT-8] and the Critical Care Knowledge Questionnaire [CCKQ]), and expert review by a panel of five critical care specialists with clinical and academic experience. Initial questionnaire items were drafted based on thematic areas extracted from the ABCDE (Airway, Breathing, Circulation, Disability, Exposure) and ABCDEF (Assess, prevent, and manage pain; Both spontaneous awakening and breathing trials; Choice of sedation; Delirium monitoring and management; Early mobility and exercise; Family engagement) frameworks, which are widely used in critical care settings. Swanson's Theory of Caring further informed the development of items intended to capture emotional, relational, and ethical dimensions of nursing care. Items were reviewed iteratively for relevance, clarity, and cultural appropriateness. Content validity was established through expert panel assessment, achieving a Content Validity Index (CVI) of ≥0.78 for all items. Internal consistency was evaluated using Cronbach's alpha, yielding a reliability coefficient of $\alpha = 0.8$ across the knowledge domains. A pilot test of the questionnaire was conducted with 10 nurses at Yendi Municipal Hospital—an institution excluded from the main study sample. Pilot participants were asked to provide feedback on item clarity, terminology, response time, and the logical flow of questions. This led to minor revisions, including the simplification of clinical jargon, rewording of ambiguous items, and reordering of some sections to improve coherence and usability. The average completion time for the questionnaire was approximately 20 minutes, which was deemed acceptable by participants. The semi-structured interview guide was developed to explore nurses' lived experiences, perceived challenges, and coping strategies in managing critically ill patients. Questions were organized into thematic categories reflecting emotional burden, communication patterns, institutional support, and strategies for delivering patient-centered care in low-resource settings. Each interview began with broad, open-ended questions to encourage storytelling, followed by targeted prompts to delve deeper into specific experiences or concepts raised by participants. The guide was pre-tested with two nurses (excluded from the final sample) to ensure the flow and sensitivity of questions. Interviews lasted between 30 to 45 minutes and were conducted in designated cubicles within the hospital premises. While the spaces offered moderate privacy, ambient noise and occasional interruptions presented challenges. These were mitigated by using directional audio recorders and scheduling interviews during quieter hours (typically mid-morning or late afternoon). All interviews were audio-recorded with participants'

consent and later transcribed verbatim for analysis. Data collection took place over five consecutive days, following ethical approval from the Ghana Health Service Ethical Review Committee and formal permission from the medical superintendent of Gushiegu Municipal Hospital. The researcher distributed questionnaires to participants through ward managers, who coordinated completion during less busy shifts to minimize disruptions to patient care. Participation was voluntary, and confidentiality was strictly maintained throughout the process.

Data Analysis

Quantitative data were analyzed using SPSS version 12. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated to assess knowledge levels among nurses based on their responses to specific questions about critical care. Each correct answer was awarded 1 point, with a total possible score of 35. Knowledge levels were categorized as follows: Poor – less than 50% correct responses, Moderate – 50–70% correct responses, and Good – more than 70% correct responses. Qualitative data collected from interviews were transcribed verbatim and analyzed thematically using NVivo 29 software, enabling the identification of recurring themes and insights into nurses' experiences and challenges in critical care. Quantitative and qualitative data were integrated during interpretation using a joint display approach (Creswell & Plano Clark, 2018). This method facilitated a side-by-side comparison of numerical results and thematic findings, allowing the identification of areas of convergence (where data confirmed each other), divergence (where data differed), and expansion (where one data type extended understanding provided by the other). These integrated insights provided a more comprehensive understanding of nurses' knowledge and experiences in the critical care context.

Data Management

Data was securely processed and stored using password-encrypted files, with anonymity maintained through the coding of audio recordings. Access was restricted to the primary researcher, ensuring participant confidentiality was upheld throughout the study.

Validity and Reliability

This study took careful measures to ensure that its data collection tools were both valid and reliable. The questionnaire was developed based on a comprehensive review of relevant literature and guidelines, and then evaluated by a panel of experts to confirm content validity. It also underwent face validity assessment with practicing nurses to ensure clarity and relevance. Statistical analyses, including factor analysis and correlation with experience, supported the construct and criterion validity of the instrument. To ensure reliability, the questionnaire demonstrated high internal consistency, with a Cronbach's alpha of 0.88, and stable results over time, as shown by test-retest reliability. Additionally, qualitative data coding was consistent among researchers, indicated by a high Cohen's kappa. These rigorous procedures provided confidence that the tools used in the study were accurate, consistent, and capable of producing trustworthy results.

Ethics Statement

Ethical approval for the study was obtained from the Ghana Health Service Ethical Review Committee (GHS-ERC: 052/03/23). Prior to data collection, all participants were provided with detailed information about the study's purpose, procedures, and their rights as participants. The informed consent process included both written and verbal explanations, ensuring participants understood that their involvement was entirely

voluntary and that they could withdraw from the study at any point without any consequences to their employment or professional relationships. Written informed consent was obtained from each participant before they took part in either the questionnaire or interview phase. To protect participant confidentiality, all data were anonymized at the point of collection. Unique identification codes were used in place of names, and all digital records were stored on password-protected devices accessible only to the research team. Audio recordings from interviews were transcribed and then deleted to further safeguard privacy.

The potential risks to participants were minimal but included possible emotional discomfort when reflecting on challenging clinical experiences. To mitigate this, participants were reminded of their right to skip any question or discontinue the interview at any time. The potential benefits of the study included contributing to improvements in critical care nursing practice, informing training programs, and advocating for better support systems for nurses working in resource-constrained settings.

Limitations

The main constraint of this study was time, given the challenges involved in collecting mixed-method data. Some participants were reluctant to answer questions during the quantitative data collection phase. The location where the interviews were conducted also impacted the quality of the interview process. The environment was noisy, and frequent distractions were caused by patients, nurses, and the sound of medical equipment alarms. As a result, participants often found it difficult to fully concentrate on the topics being discussed, and their attention was frequently diverted. Consequently, the interview process took longer than the allotted time to complete. There were also telephone interruptions and occasional walk-ins by other individuals at the interview site. Nevertheless, the interview process proceeded smoothly overall.

Results

This section provides a comprehensive examination of the findings and discussions regarding the care of critically ill patients from the perspectives of nurses. It highlights demographic characteristics, knowledge levels, experiences, and challenges faced by nurses, drawing on data from a questionnaire survey and thematic analysis of interview responses. The integration of literature offers additional context for understanding these findings and identifying potential areas for improvement within the nursing workforce.

Demographic Data of Respondents

Out of the 200 total number of nurses, 133 nurses participated in the study. Participants characteristics are presented in the table below.

Table 2: Demographic data of respondents

Age group	Frequency	Percent
20 – 25	13	9.8%
26 – 30	55	41.4%
31 – 35	52	39.0%
36+	13	9.8%
Total	**133**	

According to Table 2, the majority of respondents, 55 representing 41.4%, were between 26 and 30 years old, and 52 respondents representing 39.0% were between 31 and 35 years old. A lesser proportion of 13 respondents representing 9.8% were between the ages of 20 and 25 years and 36 and above respectively. It can be inferred that the nursing workforce in the sample is a relatively young workforce, with a smaller proportion of older nurses. This may be due to younger nurses being more likely to participate in surveys or the workforce being more welcoming to younger nurses. Based on the age and work experience data, employers may need to focus more on retention strategies to keep nurses from leaving the workforce, as well as develop more effective recruitment strategies to attract more experienced nurses. It may also be beneficial to implement programs that target the needs of younger nurses, such as mentorship programs and professional development opportunities.

Respondents' Gender

Table 3: Descriptive statistics of the gender of respondents		
Gender	Frequency	Percent
Female	52	39.1%
Male	81	60.9%
Total	133	100%

According to Table 3, 81 respondents, representing 60.9%, were males, and 52 respondents, representing 39.1%, were females. This finding is significant as the nursing profession is typically seen as a female-dominated profession. The high proportion of male nurses in the sample may indicate a shift in gender representation in the nursing workforce which could have implications for workforce dynamics and gender diversity policies.

Respondents' Level of Education

Table 4: Respondent's level of education		
Level of education	**Frequency**	**Percent**
BSc	26	19.5%
Certificate	49	36.8%
Diploma	55	41.4%
Postgraduate	3	2.3%
Total	**133**	**100%**

According to the data summarized in Table 4, the majority of respondents, 55 representing 41.4%, had a nursing diploma, 49 representing 36.8% had a certificate in nursing, 26 representing 19.5% had a bachelor of science in nursing and only 3 representing 2.3% had a master's degree. This finding suggests that the majority of the nursing workforce in the sample was composed of nurses who have had basic training in nursing rather than those who have completed higher education.

Respondents' Work Experience

Table 5: Respondent's work experience		
Work Experience	Frequency	Percent
1 - 5 years	87	65.4%
6 - 10 years	34	25.6%
Above 10 years	12	9.0%
Total	133	100.0%

From Table 5, the majority of respondents, 87 representing 65.4% had 1 to 5 years of working experience. 34 representing 25.6% had 6-10 years of working experience, and 12 representing 9.0% had more than 10 years working experience. This suggests that the nursing workforce in the sample is relatively inexperienced, with the majority of nurses being in the early stages of their careers.

Respondents' professional category

Table 6: Respondent's professional category		
Professional Category	**Frequency**	**Percent**
Enrolled Nurse	52	39.1%
General Nurse	64	48.1%
Accident and Emergency Nurse	0	0.0%
Critical Care Nurse	0	0.0%
Paediatric Nurse	4	3.0%
Nurse Practitioner	1	0.75%
Midwife	12	9.05%
Total	**133**	**100%**

According to Table 6, 64 respondents representing 48.1% were general nurses, 52 respondents representing 39.1% were enrolled nurses, 12 respondents representing 9.05 % were midwives, and 1 respondent representing 0.75% was a nurse practitioner. There were no respondents in the emergency and critical nursing categories. This finding suggests that the nursing workforce in the sample consists largely of general nurses and enrolled nurses.

The demographic data can also be used to examine the diversity and inclusion of the nursing workforce. Although the sample size is small, the data indicates that there may be room for improvement in terms of diversity, as the majority of respondents were male and younger. To promote diversity and inclusion, employers and policymakers may need to consider initiatives such as increasing representation from underrepresented groups, promoting cultural competence, and addressing implicit biases.

The data also indicates that the majority of nurses in the sample was early in their careers and had limited education and training. To promote the professional development of nurses, employers and policymakers may need to prioritise

continuing education and training opportunities, mentorship programs, and career advancement opportunities to ensure that nurses have the necessary skills and knowledge to provide high-quality care.

Knowledge Level of Nurses in the Management of Critically Ill Patients

Table 4.6: Summary of respondents' scores

Area of Assessment	Marking scheme	Mean±Standard Deviation	Lowest Score	Highest Score	%
Assessment	4	1.00 ± 0.92	0	3	25%
Pulmonary Embolism	3	0.90 ± 0.77	0	3	30%
Pain Management	6	3.19 ± 1.20	0	5	53.2%
Oral Care	4	2.92 ± 0.82	0	4	73%
Enteral Feeding	4	1.67 ± 0.92	0	4	41.75%
Prevention of pressure ulcers	5	3.53 ± 1.06	0	5	70.6%
Administration of drugs	4	1.53 ± 1.19	0	4	38.25%
Basic ECG	5	0.88 ± 0.86	0	5	17.6%
Total	**35**	**15.63 ±2.74**	**6**	**24**	

Poor: <50%, moderate: 50 -70%, Good: > 70%

A study was conducted to assess nurses' knowledge in critical care, revealing overall poor performance across most assessed domains. The average score was 15.63 out of 35 (44.66%), indicating a general lack of preparedness among nurses to effectively care for critically ill patients. Performance was categorized as poor (<50%), moderate (50–70%), and good (>70%), with most areas falling into the poor category. This reflects widespread deficiencies in essential clinical competencies necessary for critical care settings. The domains with the lowest scores included basic ECG interpretation (17.6%), patient assessment (25%), pulmonary embolism (30%), drug administration (38.25%), and enteral feeding (41.75%). These areas are vital to the monitoring and management of critically ill patients, and such poor performance suggests a high risk of compromised patient safety. Only oral care, with a mean score of 73%, was classified as good—likely due to its routine nature in clinical practice. Moderate performance was recorded in pain management (53.17%) and pressure ulcer prevention (70.6%). Although these areas fared better, the scores still point to room for improvement. Nurses are expected to excel in all domains of critical care, and moderate scores are insufficient to ensure consistent, high-quality care, especially in high-risk situations. The only area in which nurses demonstrated a good level of knowledge was oral care, with a mean score of 2.92 out of 4 (73%). This relatively high score may be attributed to the routine nature of oral hygiene practices in most clinical environments. Statistical analyses revealed that knowledge levels were significantly influenced by education

and experience. Nurses with bachelor's degrees and those with over five years of ICU experience performed better than their less-educated and less-experienced counterparts. Correlation analysis supported these findings, with positive relationships between knowledge scores and both education level and years of experience. No significant relationship was found between age and knowledge, highlighting the importance of formal education and clinical exposure. In conclusion, the study highlights serious knowledge gaps among nurses in critical care, particularly in areas such as ECG interpretation, patient assessment, and drug administration. These findings emphasize the urgent need for structured in-service training, continuing education, and curriculum revision. Enhancing clinical competencies through systematic interventions is essential to equip nurses with the knowledge and skills required to deliver safe and effective care to critically ill patients.

Lived-experiences of Nurses Regarding the Management of Critically Ill Patients

The thematic analysis of interviews revealed a complex spectrum of emotional experiences that nurses encounter while caring for critically ill patients, encompassing both positive and negative aspects. Negative Experiences: Participants shared numerous negative emotional encounters associated with their roles. Feelings of sadness and helplessness surged when treatments failed or when patients succumbed despite their best efforts. Instances of family conflicts or misunderstandings regarding care added to the emotional burden experienced by nurses. The nurses frequently mentioned conflict with families, particularly in instances where relatives exerted pressure for referrals or the discharge of patients, complicating care dynamics. Language barriers also impeded effective communication between nurses and their patients, compounding stress levels. Empathy and Psychological Challenges: Beyond negative experiences, participants indicated experiencing substantial psychological stress, including burnout and moral distress due to understaffing and overwhelming workloads. The emotional toll of navigating patient care often manifested in symptoms of fatigue and anxiety. Entering this critical care environment continually confronts nurses with ethical dilemmas particularly when they are required to prioritize care in instances of limited resources. These dynamics highlight the critical need for psychological support and resilience training for nurses.

Positive Experiences: In contrast, positive experiences were also relayed, predominantly related to instances of patient recovery. Participants recounted their joy upon witnessing successful resuscitations and the fulfillment derived from patients being discharged after intensive care. Successful outcomes enhanced job satisfaction and provided a morale boost among the nursing staff. Strong relationships with colleagues also emerged as a vital support mechanism, contributing positively to the overall working environment in high-pressure scenarios.

Main Theme	Subtheme	Supporting Quotes
Negative Experiences	**Feelings of Sadness**	"You become sad that you weren't able to help the person even though you've tried your best." (Fifth Participant) "Sometimes you might be sad, gloomy, and dull or melancholy." (First Participant)
	Frustration & Helplessness	"The family comes to decide that they are taking the patient away… They come and put pressure that they want to send their

		patient home or they want a referral." (Third Participant)
	Communication Barriers	"Sometimes the language barrier or communication barrier... having a semi-conscious patient trying to communicate with you ends up resulting in sign language communication." (Fourth Participant)
	Logistical Constraints	"We also face the issue of workload because we are limited in number or there are no trained staff." (Fifth Participant) "Frustration due to inadequate logistical equipment." (Third Participant)
	Family Interference	"Sometimes relatives don't understand what you do. We try to explain to them and you have issues." (Fifth Participant)
	Psychological Issues	"We also have issues of burnouts due to pressure at the ICU… and moral distress." (Fifth Participant) "Emotional problems are there, psychological problems are always subject to taking care of critically ill patients." (First Participant)
Emotional Challenges	**Empathy & Sympathy**	"Putting, sometimes myself in the shoes of my patient. And at the same time, you sympathise with him in that condition." (Fourth Participant)
Positive Experiences	**Sense of Fulfilment**	"Yes. Some of the positive experiences have been that of a sense of fulfilment or a sense of achievement." (Third Participant)
	Successful Patient Recovery	"We nursed the patient here for almost three to four months before she was discharged home… was a pleasant experience." (Second Participant)
	Morale Boost	"If you're able to take care of a critically ill patient and the patient survives, it boosts your morale and you are happy." (Fifth Participant)
	Recognition & Gratitude	"Patients even telling you thank you at the end of the day tends to be another blessing… Superiors coming to say that you are hardworking and they later give you recommendations." (Fourth Participant)
	Team Support	"If you have a positive relationship with your colleagues, it helps you in caring for critically ill patients." (Fifth Participant)

Challenges nurses encounter in critical care delivery

The study identified multiple challenges encountered by nurses while caring for critically ill patients. These challenges were thematically categorized into four well-defined areas: Inadequate Trained Staff, Inadequate Facilities and Equipment, Understaffing, and Communication Barriers. Thematic saturation was achieved after the fourth interview, with the fifth confirming that no new

themes emerged. The primary researcher's background in critical care nursing may have influenced data interpretation; to minimize this, peer debriefing and reflexive journaling were employed throughout the analytic process.

Theme 1: Inadequate Trained Staff

Participants consistently expressed concern over the absence of adequately trained critical care nurses. Many nurses working in these units lacked specialized education or exposure to critical care protocols, leaving them feeling ill-equipped to manage the complex needs of critically ill patients.

"We don't have critical care nurses here… Most of us are general nurses who just found ourselves here. There's a lot we're supposed to know but haven't been taught." (Participant 3)

"I feel we are just doing our best without the right knowledge sometimes. That makes the work risky for both the patient and the nurse." (Participant 1)

This highlights the need for structured professional development programs and specialty training to enhance nurses' competencies and confidence.

Theme 2: Inadequate Facilities and Lack of Basic Equipment

Another prominent theme was the lack of essential medical equipment and infrastructural support. Nurses cited challenges such as limited space, insufficient monitoring tools, and stockouts of critical medications and supplies.

"Sometimes we have to share monitors between patients or do manual monitoring because machines are not working or are not enough." (Participant 4)

"Even oxygen supply is sometimes a challenge. You can't give the best care without the right tools." (Participant 2)

These limitations severely constrain the quality of care and call for urgent investment in critical care infrastructure.

Theme 3: Understaffing

Staffing shortages were another consistent challenge voiced by participants. With too few nurses covering multiple critically ill patients, the risk of burnout, errors, and delayed responses increased significantly.

"You can't divide yourself. When you have six patients and only two nurses, you just focus on the most critical cases." (Participant 5)

"It's not about not caring; it's about not having enough hands to do what needs to be done." (Participant 3)

This theme underscores the importance of implementing adequate nurse-patient ratios and supportive staffing models in critical care units.

Theme 4: Communication Barriers

Communication challenges emerged as a major barrier, both with non-verbal or unconscious patients and with family members of critically ill individuals. Nurses reported that such barriers often led to misunderstandings and heightened emotional stress.

"Trying to communicate with semi-conscious patients is very frustrating. You end up doing guesswork sometimes." (Participant 1)

"Relatives often accuse us or think we are not doing enough because they don't understand the patient's condition." (Participant 4)

This reveals the need for training in alternative communication methods and family engagement strategies to support holistic care delivery. The findings of this study reveal critical systemic and operational challenges faced by nurses managing critically ill patients. The four core themes—insufficient training, lack of resources, staffing issues, and communication difficulties—not only impact patient outcomes but also affect nurses' morale and well-being. Addressing these issues through targeted training, infrastructure improvements, policy adjustments, and supportive communication frameworks is essential to strengthen critical care nursing practice.

Discussions

This study explored the knowledge, experiences, and challenges faced by nurses in managing critically ill patients at Gushiegu Municipal Hospital. The discussion is organized according to the research objectives and questions, aiming to draw meaningful conclusions and suggest practical recommendations. The findings revealed that specialized nursing roles in critical care are both scarce and undervalued in the study setting. This limits nurses' ability and motivation to pursue these career paths, consequently affecting care quality. Whitehead et al. (2019) observed a similar trend, noting that the scarcity of specialist nurses is often linked to lower socioeconomic status and insufficient institutional support. Christmas and Armstrong (2020) further explain that nurses in Sub-Saharan Africa often delay specialization until they attain financial stability—a process that may span several years. These findings suggest an urgent need to encourage professional development through policy incentives, scholarships, and career advancement pathways. Vatnøy et al. (2020) support this perspective, emphasizing that enhanced educational opportunities can uplift the profession's image and improve care quality. Additionally, the study identified considerable gaps in nurses' knowledge of critical care procedures. Participants scored poorly, with an average of 44% in assessments covering essential skills such as interpreting electrocardiograms (ECGs), recognizing respiratory distress, and managing acute conditions like pulmonary embolisms. These results align with Schoeber et al. (2022), who advocate for continuous professional development as a means to maintain high standards in critical care. Similarly, Mohammed et al. (2020) highlight the importance of structured in-service training to enhance nurses' competencies. Tailored programs, particularly for young or inexperienced nurses, could effectively address these knowledge deficiencies and improve patient outcomes. Beyond technical gaps, the emotional and psychological burden of caring for critically ill patients was another dominant theme. Participants reported feeling overwhelmed, especially in cases where interventions failed to save lives. These emotional challenges are supported by Al Ma'mari et al. (2020), who noted that critical care nursing is emotionally taxing and requires institutional support such as counseling services and stress management interventions. Effective communication emerged as another critical factor influencing care quality. Nurses expressed difficulties in communicating with unconscious patients and in managing interactions with distressed family members. Jun and Costa (2020) report similar findings, arguing that clear and empathetic communication enhances trust, reduces conflict, and increases patient and family satisfaction. Fitzpatrick et al. (2019) also highlight that positive recognition from patients and supervisors improves morale and promotes resilience among nurses. Ethical dilemmas were another notable finding, with nurses often struggling to make morally sound decisions under stressful conditions. According to Haahr et al. (2020), ethical support systems within healthcare institutions are essential to help nurses navigate such challenges. Unfortunately, these systems were either underdeveloped or absent at Gushiegu Municipal Hospital, leaving nurses to rely solely on personal judgment.

Furthermore, this study reaffirms the existence of systemic challenges in critical care delivery, particularly the lack of specialized training, equipment shortages, understaffing, and communication issues. Vahedian-Azimi et al.

(2019) and Ulrich et al. (2019) observed that insufficient staffing and inadequate training are directly linked to poor patient outcomes. Wuni et al. (2020) similarly reported that overcrowding and poor infrastructure increases the risk of hospital-acquired infections. Tsolakidis et al. (2020) emphasized how chronic understaffing leads to burnout, stress, and reduced care efficiency. Communication barriers, as noted by Williams et al. (2020), also compromise decision-making and patient outcomes, particularly in high-pressure critical care environments. Participants in this study strongly recommended the acquisition of essential medical equipment, improvements to the ICU setting, and access to specialized training. These interventions are vital for addressing the root causes of inadequate care and ensuring better outcomes for critically ill patients.

Study Limitations

Several limitations should be considered when interpreting the findings of this study. These limitations span methodological, sampling, measurement, and analytical domains.

1. Methodological Limitations

The study employed a cross-sectional design, which limits the ability to infer causality between variables such as nurses' knowledge levels and patient care outcomes. Additionally, the study was conducted at a single facility, Gushiegu Municipal Hospital, which may affect the generalizability of the findings to other healthcare settings in Ghana or Sub-Saharan Africa. A further limitation is the use of self-reported data, which introduces potential biases including recall bias and social desirability bias. While participant anonymity was maintained to mitigate these biases, their influence on responses cannot be entirely ruled out. Moreover, self-reported knowledge may not accurately reflect actual clinical competence.

2. Sampling Limitations

The study utilized convenience sampling, which may have introduced selection bias by including only those participants who were readily available and willing to participate. The small qualitative sample size (n=5), while achieving thematic saturation after the fourth interview, may still have limited the diversity of insights and data saturation. Additionally, the study did not assess non-response bias, making it difficult to determine whether those who declined participation differed meaningfully from those who participated.

3. Measurement Limitations

The knowledge assessment tool used in the quantitative component of the study had not been validated in the Ghanaian context, which may affect the tool's reliability and the accuracy of the findings. The interview environment in some cases posed constraints that may have impacted the openness and depth of participant responses. Social desirability bias may also have influenced both the survey and interview responses, especially in relation to ethical or performance-related questions.

4. Analytical Limitations

No statistical adjustments for multiple comparisons were made during the analysis, increasing the risk of Type I errors in the interpretation of quantitative findings. The study also had limited statistical power for subgroup analyses due to the relatively small sample sizes, potentially obscuring significant relationships or trends. In the qualitative analysis, researcher bias is a potential concern. The primary researcher's background in critical care nursing may have influenced data interpretation. However, this was addressed through peer debriefing and reflexive journaling throughout the research process to enhance credibility and trustworthiness. Despite these limitations, the study offers meaningful insights into the knowledge gaps, emotional

burdens, and systemic challenges faced by nurses managing critically ill patients in resource-limited settings. Future research should aim for multi-site, longitudinal designs, employ validated instruments, and adopt broader sampling strategies to improve generalizability and analytical strength.

Summary, Conclusion and Recommendations

The study involved 133 registered nurses to evaluate their knowledge, experiences, and challenges in managing critically ill patients at Gushiegu Municipal Hospital. The demographic data indicated that the majority were younger General Nurses, with a male-to-female ratio of approximately 3:1. Most participants held regulatory degrees or certifications in nursing but lacked substantial clinical experience. A key focus was assessing the nurses' knowledge regarding the management of critically ill patients. Results showed a dismal average score of 44%, revealing significant gaps in knowledge and competence across various domains of care, such as interpreting electrocardiograms (ECGs), administering medications, and diagnosing critical conditions like pulmonary embolisms. These gaps suggest that ongoing education and training are crucial for improving both nurses' capabilities and, ultimately, patient outcomes. Emotional experiences related to providing care for critically ill patients revealed a spectrum of feelings among participants—from happiness and satisfaction to stress, burnout, and moral distress. While reviving and resuscitating patients brought joy, failures to save patients led to feelings of sorrow and guilt. These experiences highlight the psychological challenges associated with critical care nursing.

Conclusion

The study successfully achieved its three primary objectives: assessing the knowledge levels of nurses managing critically ill patients, exploring their emotional experiences, and identifying the challenges they encounter at Gushiegu Municipal Hospital. Firstly, the finding of a low average knowledge score of 44%, particularly in critical areas such as ECG interpretation, medication administration, and diagnosis of life-threatening conditions like pulmonary embolisms, directly highlights the need for focused educational and professional development initiatives. Addressing these knowledge deficits is essential to enhance nurses' clinical competence and improve patient outcomes. Secondly, the study revealed that nurses experience a broad emotional spectrum, ranging from satisfaction when saving lives to distress when patients cannot be revived. These experiences underscore the emotional toll of critical care nursing. Therefore, there is a compelling need for healthcare organizations to provide structured emotional support systems, such as counseling services and stress-management programs, to help nurses cope with burnout and moral distress. Thirdly, the challenges identified—including lack of specialized training, inadequate resources, understaffing, and communication barriers—point to systemic issues that compromise care quality. These findings support the conclusion that a supportive work environment, featuring ongoing education, sufficient staffing, effective teamwork, and open communication channels, is critical for high-quality care delivery and nurse retention.

Recommendations for Hospital Management

To respond effectively to the findings, Gushiegu Municipal Hospital management should prioritize the following interventions:

1. Immediate Implementation of Targeted Clinical Training (Top Priority)

- Issue Identified: Nurses scored an average of 44%, with weaknesses in ECG interpretation,

emergency drug administration, and recognition of critical conditions.

- Recommendation: Conduct quarterly in-service training sessions focusing on ECG reading, emergency pharmacology, and early identification of critical conditions.
- Implementation Strategy: Partner with teaching hospitals or invite critical care specialists to deliver workshops; integrate case simulations into regular CPD activities.

2. Establishment of a Staff Mental Health and Counseling Program

- Issue Identified: Nurses reported stress, burnout, and moral distress.
- Recommendation: Create an on-site counseling unit or designate mental health professionals for periodic visits.
- Implementation Strategy: Collaborate with NGOs or regional mental health units; allocate a fixed budget for psychological support programs and monthly debriefing sessions.

3. Structured Team Building and Interprofessional Collaboration

- Issue Identified: Lack of teamwork and poor communication among staff.
- Recommendation: Organize monthly team-building retreats and interprofessional workshops.
- Implementation Strategy: Form a committee to plan joint nursing–medical case reviews, role plays, and conflict resolution exercises.

4. Foster a Culture of Open Communication

- Issue Identified: Communication gaps between nurses and hospital leadership.
- Recommendation: Implement a bi-monthly nurse-manager forum and anonymous suggestion box system.
- Implementation Strategy: Use mobile apps or printed forms to collect feedback and ensure administrative follow-up with transparent action plans.

5. Resource Allocation and Staffing Adjustments

- Issue Identified: Shortage of staff and limited critical care equipment.
- Recommendation: Advocate for deployment of more nurses and procurement of critical care equipment (e.g., defibrillators, ECG machines).
- Implementation Strategy: Use study findings to justify increased funding from the Ghana Health Service or local government. Submit an equipment request plan with a cost-benefit analysis.

Recommendations for Policy

These policy actions are necessary at the district, regional, and national levels:

- **Mandate Continuing Education:** Require annual CPD credits in critical care as part of license renewal.
- **Create Emotional Support Policies:** Develop national policies to support the psychological well-being of nurses.
- **Enforce Safe Staffing Ratios:** Establish and monitor minimum nurse-to-patient ratios.
- **Promote Family-Centered Care:** Integrate communication protocols to involve patients and families in decision-making.
- **Support Interdisciplinary Collaboration:** Incentivize team-based care models through training and policy integration.

Recommendations for Further Research

Further research is encouraged to delve deeper into the insights gathered from this study:

1. **Efficacy of Educational Interventions**: Investigate various educational approaches to enhancing nurses' knowledge in identified gaps, assessing their effectiveness through quantitative measures.
2. **Emotional Experiences**: Qualitative studies could explore nurses' emotional and psychological experiences, providing richer insights into their challenges.

3. **Impact of Organizational Factors**: Future studies could examine how factors such as staffing levels and organizational support influence nurses' experiences and mental health.
4. **Role of Advanced Practice Nurses**: Research on the influence of advanced practice nurses could shed light on their impact on patient outcomes and overall nursing workloads.
5. **Technology Utilization**: Investigate how technological advancements can improve care processes for critically ill patients and enhance nurses' work satisfaction.

These recommended avenues of research can further inform policy and practice improvements for the care of critically ill patients and the support of the nursing workforce.

References

Abdul-Aziz, M. H., Alffenaar, J. W. C., Bassetti, M., Bracht, H., Dimopoulos, G., Marriott, D., ... &Roberts, J. A. (2020). Infections in the ICU and Sepsis Working Group of International Society of Antimicrobial Chemotherapy (ISAC). Antimicrobial therapeutic drug monitoring in critically ill adult patients: a position paper. Intensive Care Med, 46, 1127-1153.

Aburn, G., Hoare, K., Adams, P., & Gott, M. (2020). Connecting theory with practice: Time to explore social reality and rethink resilience among health professionals. *International Journal of Nursing Practice,* 26(6), e12893.

Ahmed, I., & Ishtiaq, S. (2021). Reliability and Validity: Importance in medical research. methods, 12, 13.

Al Ma'mari, Q., Sharour, L. A., & Al Omari, O. (2020). Fatigue, burnout, work environment, workload and perceived patient safety culture among critical care nurses. British journal of nursing, 29(1), 28-34.

Alharbi, J., Jackson, D., & Usher, K. (2020). The potential for COVID-19 to contribute to compassion fatigue in critical care nurses. Journal of clinical nursing, 29(15-16), 2762.

Alhassan, R. K., et al. (2023). *Systematic review of critical care nursing knowledge and practice in low-resource settings. International Journal of Nursing Studies*, 142, 103943.

Allen, G. (2020). Barriers to non-critical care nurses identifying and responding to early signs of clinical deterioration in acute care facilities. Medsurg Nursing, 29(1), 43-52.

Al-Sayaghi, K. M., Fadlalmola, H. A., Aljohani, W. A., Alenezi, A. M., Aljohani, D. T., Aljohani, T. A., ... & Khan, M. F. (2022, March). Nurses' Knowledge and Attitudes Regarding Pain Assessment and Management in Saudi Arabia. In Healthcare (Vol. 10, No. 3, p. 528). MDPI.

Anal, C. K. (2021). Assessment of Knowledge and Compliance of Critical Care Nurses Regarding Ventilator Associated Pneumonia (Vap) Care Bundle in A Tertiary Care Hospital, Assam, India. Malaysian Journal of Medical Research (MJMR), 5(2), 1-8.

Anderson, N. (2021). An evaluation of a mindfulness-based stress reduction intervention for critical care nursing staff: A quality improvement project. Nursing in critical care, 26(6), 441-448.

Arnold, T. C. (2020). Moral distress in emergency and critical care nurses: A metaethnography. Nursing ethics, 27(8), 1681-1693.

Aron, D. C., & Aron, D. C. (2020). The Two Cultures of Complexity. Complex Systems in Medicine: A Hedgehog's Tale of Complexity in Clinical Practice, Research, Education, and Management, 201-205.

Arrar, A., & Mohammed, S. (2020). Evaluation of Nurses' Knowledge and Practices Concerning Nursing Care Guide in the Intensive Care Unit in Misan Governorate Hospitals. kufa Journal for Nursing sciences, 10(1), 12-22.

Auld, S. C., Caridi-Scheible, M., Blum, J. M., Robichaux, C., Kraft, C., Jacob, J. T., ... & Murphy, D. J. (2020). ICU and ventilator mortality among critically ill adults with coronavirus disease 2019. Critical care medicine.

Bahrudin, M., & Dari, T. W. (2021). Interpersonal Relationships of Nurses with Families of Patients in Emergency Rooms Based on Human Becoming Theory. Indian Journal of Forensic Medicine & Toxicology, 15(3), 3656-3661.

Beltramo, F., DiCarlo, J., Gruber, J. B., Taylor, T., & Totapally, B. R. (2019). Renal replacement therapy modalities in critically ill children. Pediatric Critical Care Medicine, 20(1), e1-e9.

Bendavid, I., Zusman, O., Kagan, I., Theilla, M., Cohen, J., & Singer, P. (2019). Early administration of protein in critically ill patients: a retrospective cohort study. Nutrients, 11(1), 106.

Bergman, L., Falk, A. C., Wolf, A., & Larsson, I. M. (2021). Registered nurses' experiences ofworking in the intensive care unit during the COVID-19 pandemic. Nursing in critical care, 26(6), 467-475.

Bhatraju, P. K., Ghassemieh, B. J., Nichols, M., Kim, R., Jerome, K. R., Nalla, A. K., ... & Mikacenic, C. (2020). Covid-19 in critically ill patients in the Seattle region—case series. New England Journal of Medicine, 382(21), 2012-2022.

Bogue, T. L., & Bogue, R. L. (2020). Extinguish burnout in critical care nursing. Critical Care Nursing Clinics, 32(3), 451-463.

Bunkers, S. S., Bournes, D. A., & Mitchell, G. J. (2021). Rosemarie Rizzo Parse: Humanbecoming. Nursing Theorists and Their Work E-Book, 370.

Butts, J. B., & Rich, K. L. (2021). Philosophies and theories for advanced nursing practice. Jones & Bartlett Learning.

Fawcett, J. (2022). *The Meta-Paradigm of Nursing: An update. Nursing Science Quarterly*, 35(1), 3-10.

Jackson, D., et al. (2022). *Resilience and stress management among critical care nurses in low-income settings: A systematic review. International Journal of Nursing Studies*, 133, 104339.

Kumbakumba, E., et al. (2022). *Critical care delivery in Ugandan regional hospitals: Challenges and opportunities. BMC Health Services Research*, 22, 1423.

Li, M., et al. (2024). *Critical care nursing knowledge, attitudes, and practices: a comprehensive review. Journal of Clinical Nursing*, 33(2), 234-248.

Meleis, A. I. (2022). *Theoretical nursing: Development and progress.* (6th ed.). Wolters Kluwer. *(Foundational text)*

Ministry of Health, Ghana. (2023). *National Critical Care Policy and Strategy for Resource-Limited Settings.* Accra: Ghana Ministry of Health.

Nwosu, C. C., et al. (2023). *Critical care nursing practices in Nigeria: A descriptive study of knowledge, barriers, and training needs. African Journal of Nursing and Midwifery*, 25(3), 150-162.

O'Neill, M., & Levett-Jones, T. (2022). *Nursing theories guiding practice in resource-constrained critical care environments. Nursing Forum*, 57(4), 674-683.

Osei, Y., et al. (2022). *Critical care capacity and nursing workforce challenges in Ghana: A mixed-methods study. Nursing in Critical Care*, 27(1), 56-65.

Parse, R. R. (2023). *Human Becoming Theory in Practice: A contemporary perspective. Nursing Science Quarterly*, 36(2), 124-130.

South African Nursing Council. (2024). *Standards for Critical Care Nursing Practice.* Pretoria: SANC.

WHO Regional Office for Africa. (2023). *Guidelines on Strengthening Critical Care Services in Low-Resource Settings.* Geneva: WHO.

Williams, J., et al. (2023). *The impact of resource limitations on critical care nursing practices and outcomes in Sub-Saharan Africa: A narrative review. African Journal of Critical Care*, 8(2), 89-97.

Zhang, Y., et al. (2023). *Evidence-based interventions to improve nurse staffing and patient outcomes in resource-limited critical care units: A systematic review. BMC Nursing*, 22, 56.