

**DETERMINANTS OF PATIENT-CENTRED EMERGENCY NURSING CARE IN  
PRIMARY HOSPITALS AT TUTUME AND NORTH-EAST DISTRICTS,  
BOTSWANA**

BY  
UBEPO JOSEPH MAFOLO  
COMPUTER NO: 2022006747

A DISSERTATION SUBMITTED TO THE UNIVERSITY OF ZAMBIA IN PARTIAL  
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### **HEAD OF DEPARTMENT**

Department of Emergency and Trauma, School of Nursing Sciences, University of Zambia

Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## CERTIFICATE OF APPROVAL

The University of Zambia approves this Dissertation by UBEPO JOSEPHER MAFOLO on “DETERMINANTS OF PATIENT-CENTRED EMERGENCY NURSING CARE IN PRIMARY HOSPITALS AT TUTUME AND NORTH-EAST DISTRICTS, BOTSWANA” in partial fulfilment for the requirements for the award of the Degree of Master of Science in Emergency and Trauma Nursing.

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## ABSTRACT

Patient-centred emergency nursing care is a holistic approach to emergency medical services that prioritizes the unique needs and values of each patient. This study assesses the determinants of patient-centred emergency nursing care (ENC) among emergency nurses in primary hospitals in Tutume and North-East districts, Botswana. Primary hospitals, often are the first referral point for patients in rural and semi-rural areas, play a vital role in delivering timely and appropriate ENC. Patient centred ENC is crucial for patient survival rates, morbidity, and overall healthcare outcomes. It involves rapid assessment, prioritizing life-threatening conditions, coordination with healthcare teams, and addressing emotional, psychological, and social needs. It involves clear explanations, active listening, patient education, pain management, comfort, best practices, reassurance, and advocacy for patient rights.

The study employed descriptive cross-sectional design, conducted on a total of 44 emergency nurses from three selected primary hospitals at Tutume and North-East districts, Botswana. Data was collected using a structured pre-tested questionnaire. Data analysis was performed using SPSS version 27. Descriptive statistics were used to summarize the data, and binary logistic regression analysis was used to identify independent predictors of patient-centred ENC. A p-value of <0.05 was considered statistically significant.

The results showed that only 77.3% of the respondents achieved in providing patient-centred ENC. Furthermore, the study revealed that 25% of the respondents had adequate knowledge related to emergency care, only 13.6% of the respondents were aware of the availability of SOPs, and the availability of essential ENC equipment was also observed to be inadequate, with only 59% of essential equipment available at all centres. The multiple logistic regression analysis revealed that only age was a significant predictor of patient-centred ENC (AOR: 45.69; 95% CI: 1.71–1222.39;  $p = 0.023$ ).

This study identifies that while a majority of respondents demonstrated competency in achieving the provision of patient-centred ENC, significant gaps in knowledge and awareness of SOPs were observed. Age was identified as a significant predictor of patient-centred ENC, highlighting the need for staff development opportunities, including training and mentorship programs, to improve ENC skills for younger nurses. The study's results highlight the need for healthcare stakeholders to address the knowledge gaps and inadequate infrastructure in primary hospitals at Tutume and North-East districts, Botswana.

**Keywords:** *Emergency Nursing Care; Primary Hospitals; Botswana; Determinants; patient-centred Care.*

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

|          |   |
|----------|---|
| A&E      | Accident and Emergency                          |
| AFJEM    | African Journal of Emergency Medicine           |
| BEC      | Basic Emergency Care                            |
| BHPC     | Botswana Health Professional Council            |
| BONU     | Botswana Nurses Union                           |
| DHMT     | District Health Management Team                 |
| ECG      | Electrocardiogram                               |
| ED       | Emergency Department                            |
| ENC      | Emergency Nursing Care                          |
| ETN      | Emergency and Trauma Nursing                    |
| HAI      | Hospital Acquired Infections                    |
| IPC      | Infection Prevention and Control                |
| IPV      | Interpersonal Violence                          |
| LMIC     | Low- and Middle-Income Country                  |
| MOH      | Ministry of Health                              |
| NMCB     | Nurses and Midwifery Council of Botswana        |
| PMH      | Princess Marina Hospital                        |
| SATS     | South African Triage Scale                      |
| SDG      | Sustainable Development Goal                    |
| SSA      | Sub-Saharan Africa                              |
| TPH      | Tutume Primary Hospital                         |
| WHO      | World Health Organization                       |
| UNZA     | University of Zambia                            |
| UNZABREC | University of Zambia Biomedical Research Ethics |

## CHAPTER ONE

### INTRODUCTION AND BACKGROUND

#### 1.0 Introduction

In recent times, the burden of traumatic medical emergency conditions has been increasing, making it essential to provide patient-centred emergency care for optimal patient outcomes. This requires quality emergency care at both the community, prehospital, and facility levels (Moresky et al., 2019; Afaya et al., 2021). Nurses as front liners in healthcare, play a critical role in delivering timely and high-quality patient-centred care in the emergency department (ED) (Werner et al., 2020). Nonetheless, a number of factors may have a major influence on the nurses' capacity to function well in this difficult setting. One of the primary contributing factors is the ED's staffing shortage, which results from a rapid rise in the prevalence of diseases and emergent conditions, a lack of qualified candidates or specialized healthcare providers, and a lack of personnel to meet demand. These factors not only negatively affect patient satisfaction but also increase workload, burnout, and work-related stress (Mamalelala et al., 2022; Smith et al., 2022; Barnard et al., 2023). Other determinants may include competence, knowledge, skills and experience. Professional knowledge is crucial in the well-functioning of ED nurses to provide patient-centred emergency nursing care (ENC), which is a highly specialized field requiring strong clinical judgement, decision-making skills, ability to prioritize life threatening conditions, perform complex procedures, manage various machinery, being flexible and assertive (Abu Arra et al., 2023; Kimin et al., 2022). This knowledge can be gained through observation, experience, training, and theoretical instruction (Abu Arra et al., 2023; Kimin et al., 2022). Understanding such factors is crucial to optimizing patient-centred ENC, to reduce mortality rate and thus the need of this study. Chapter one provided an overview of the study that include an introduction, background, statement of the problem, study justification and conceptual framework. The objectives research questions, hypothesis and variables were also outlined. The conclusion was presented at the end.

#### 1.1 Background

Globally, injuries from accidents, falls, and burns comprise 22%, while emergency conditions like heart attack, stroke, and lung infections account for 17%, 11%, and 22% respectively (Razzak et al., 2019). Other conditions, such as diarrhoea and malaria, exhibit a lower global burden but are more prevalent in low- and middle-income countries (LMICs) (Jin et al., 2023; Kivlehan et al., 2021; Chang et al., 2016), with emergent conditions estimated to cause 90% of

deaths and 84% of disability-adjusted life-years (DALYs). Annually, 50 million individuals are permanently disabled due to injuries, and emergency medical conditions contribute to over 50% of global deaths, with DALYs recorded at 38 per 1,000 in Africa, compared to 27 per 1,000 worldwide (Werner et al., 2020). Estimates indicate that over 90% of injury-related deaths occur in LMICs, where the burden of emergency medical diseases poses significant threats and results in a mortality rate of 1.8%, contrasting with 0.04% in the USA, from acute complications of chronic diseases (Jin et al., 2023; Kivlehan et al., 2021). The incidence of emergencies and acute diseases is six times higher in LMICs than in high-income countries, accounting for nine of the ten leading causes of death and approximately half of the disease burden (Razzak et al., 2019; Werner et al., 2020; Thin et al., 2015). The disproportionate incidence and mortality rates in LMICs underscore the necessity for enhanced emergency medical infrastructure and preventive measures in these regions.

The sub-Saharan Africa, recognized as one of the world's poorest regions, demonstrates a higher mortality rate among younger individuals, at 63% compared to 35% in developed nations. The predominant causes of injury stem from road traffic accidents, falls, and assaults (Abebe et al., 2022). The substantial burden of emergency medical diseases and injuries underscores the imperative to strengthen Emergency Medical Services (EMS) in sub-Saharan Africa, thus justifying the importance of understanding the determinants of patient-centred Emergency Nursing Care (ENC) to facilitate timely health access. This initiative could markedly enhance care quality and mitigate mortality rates in sub-Saharan African communities. Botswana is a landlocked country in the centre of Southern Africa, shares the boarder with South Africa, Zimbabwe, Zambia and Namibia. It has a population approximately to 2.3 million. The country has a paucity information regarding burden of injuries and emergency medical diseases, a study by Lobatse et al. (2024) revealed 25.5% of trauma injuries, 11% increase from study by Chandra et. al. (2014). Furthermore, Motsumi et al. (2021) observed that road traffic collisions are the second leading cause of death after HIV/AIDS complications in Botswana. The mortality rate resulting from this injury annually increases by 10%. The statistics illustrate the magnitude of trauma and emergency conditions which poses to be a public health threat in the midst of improper emergency care set up (pre-hospital and facility-based emergency care), inadequate resources (skilled /specialized emergency nurses and availability of functional equipment) and non-existing emergency nursing scope practice. Therefore, a well-established patient-centred ENC is needed.

Patient-centred ENC is crucial in situations where bodily injuries and emergency conditions manifest themselves through acute symptoms of severity that require immediate attention. In such cases, the absence of immediate patient-centred care could result in death or serious impairments to bodily functions or organs. Emergency care is a service delivery innovation that offers early recognition and life-saving interventions for acute injuries and diseases, according to Werner et al. (2020). A well-established patient-centred ENC will constitute of good physical structure/ space which accommodate easy flow of patients, starting from ambulance bay point (patient receiving) to discharge point. Involving all the activities to enhance quality of care e.g., infection control measures. Also, the human resource factor: which comprises of nurse's knowledge in ENC, qualifications, duration of work, certification and availability of equipment nurses use during emergency care.

High-quality, well-organized emergency care facilities with ED nurse with knowledge in ENC can prevent or even reduce the devastating impact of various conditions, including road trauma, sepsis, stroke, heart attack, lung complications and acute complications of pregnancy and childbirth. The emergency care nurse is essential in identifying and treating patients with life-threatening illnesses. She or he sets priorities for emergency care by triaging patients and administering appropriate management during resuscitation in a supportive medical environment, that's immediate intervention with the patient (Afaya et al., 2021; Bam et al., 2020; Duko et al., 2019; Smith et al., 2022). This is important because treatment delays can lead to disability, complications or deaths, reduce the efficacy of therapies, or both. Availability of essential equipment combined with ED nurse induction in SOPs are also essential components of emergency care. They help ED nurses in ENC to appropriately assess, diagnose and manage patient well in time (Moresky et al., 2019; Global Health 2019).

Understanding the role that emergency care nurses play in the healthcare system is crucial. It is true that nurses account for a sizable share of healthcare professionals and are essential to emergency response and care. It is critical that they possess the abilities, know-how, and readiness needed to handle crises successfully (Afaya et al., 2021; Bam et al., 2020; Smith et al., 2022). According to Kahabi et al. (2023), nurses are essential front-line caregivers for patients experiencing physical, mental, or emotional distress. They also serve as educators in the areas of health promotion and the avoidance of physical disability. Therefore, it's critical that emergency care nurses possess the information, abilities, and readiness needed to handle crises successfully (Afaya et al., 2021; Said and Chiang, 2020).

The researcher has numerous concerns regarding the qualifications needed to work in the ED, the competency and skills of the nurses, availability of SOPs and essential equipment at the three primary hospitals in Tutume and North-East District, Botswana. These elements ultimately inspired the researcher to establish the determinants of patient-centred ENC among ED nurses in Primary Hospital at Tutume and North-East districts, Botswana. These also demonstrates the significance of strengthening and taking into account emergency nursing care. There is a dearth of personnel with expertise in emergency and trauma nursing since normal nursing curriculum provide little exposure to basic care skills and none of the health institutions offer emergency nursing training, conducting this study will help bridge the gap despite the Ministry of Health (MOH), Botswana has recently offered scholarships to qualified nurses to pursue specialization in emergency and trauma nursing of which small numbers benefit from the initiative, a field that has historically gotten little or no attention in the country.

The researcher believes if general nursing at all qualification could be reinforced, expanded to include procedures or live saving skills like intubation, and a module on emergency and trauma care, general nurses should be able to work more broadly. To help address lack of a defined scope of practice for emergency nurse specialists, MOH, the Nursing and Midwifery Council of Botswana (NMCB), and the Botswana Nurse Union (BONU) should work together. Additionally, all health institutes should begin offering emergency and trauma care/nursing programs, working in partnership with other institutions that are already offering the program in the region, such as the University of Zambia. Since then, the MoH Botswana on behalf of the Government of Botswana established Emergency Medicine at the University of Botswana in 2011 and implemented pre-hospital care in some areas in 2013, but these developments have not fully satisfied the needs of nurses providing facility-based emergency care, which has given rise to the study problem: determinants of patient-centred emergency nursing care by nurses.

## **1.2 Statement of the Problem**

The WHO's 72nd World Health Assembly highlights the importance of emergency care in healthcare systems (Kivlehan et al., 2021). Patient-centred ENC is essential, particularly in resource-limited settings such as Botswana. There is a dearth of research on determinants of patient-centred ENC delivery in primary hospitals within Tutume and North-East Districts. Anecdotal evidence reveals inconsistent quality of ENC in specific primary hospitals. Patient-centred ENC is critical for achieving positive patient outcomes and maintaining quality in primary healthcare. Conversely, inadequacies in ENC can negatively impact patient outcomes,

increasing morbidity, mortality, and hospital stays (Smith and Jones, 2020). Increased workload negatively influences job satisfaction and contributes to nurse burnout in the ED. ED nurses endure physical and verbal abuse, with their health compromised by inadequate care practices leading to musculoskeletal issues. Stress-related disorders, including insomnia, are prevalent due to the unpredictable nature of emergency care presenting various trauma levels.

Overcrowding in the ED results in extended wait times and delayed treatment, consequently elevating mortality rates. Insufficient staffing and uneven resource distribution further jeopardize patient safety and foster dissatisfaction among patients and families. Multiple emergencies are addressed across three Primary Hospitals in Tutume and North-East District, Botswana. The lack of patient-centred ENC training in health institutions and the emphasis on basic care within nursing curricula contribute to a deficit of qualified emergency nursing personnel. This study sought to bridge this gap. Hospital management had initiated short training programs for ENC staff and formed a resuscitation committee for training and supply procurement, while the Ministry of Health had begun offering scholarships for specialization in emergency nursing, a previously overlooked area. Nonetheless, these initiatives benefit only a limited number of nurses. Pre-hospital care was introduced in specific regions in 2013, and Emergency Medicine was established in collaboration with the University of Botswana in 2011. However, these advancements have not sufficiently addressed the needs of nurses delivering facility-based emergency care, leading to the study problem: establishing determinants of patient-centred ENC delivery. Thus, despite various efforts, anecdotal reports from the three primary hospital EDs indicate a continuing significant rise in patient deaths. Table one below illustrates the high mortality rate currently experienced in the ED at three selected Primary Hospitals in Tutume and North-East District.

**Table 1.1: Percentage mortality rate in Accident and Emergency Department Three Primary Hospitals in Tutume and North-East districts for 2021-2023 Report**

| Year           | Tutume P. Hospital    |                            |                               |   | Gweta P. Hospital     |                            |                               |   | Masunga P. Hospital   |                            |                               |   |
|----------------|-----------------------|----------------------------|-------------------------------|---|-----------------------|----------------------------|-------------------------------|---|-----------------------|----------------------------|-------------------------------|---|
|                | Total No of OPD cases | Total No of emergency case | Percentage of emergency cases | Percentage mortality rate amongst emergency cases | Total No of OPD cases | Total No of emergency case | Percentage of emergency cases | Percentage mortality rate amongst emergency cases | Total No of OPD cases | Total No of emergency case | Percentage of emergency cases | Percentage mortality rate amongst emergency cases |
| 2021           | 36098                 | 1868                       | 5.2%                          | 8.1%  | 31272                 | 1443                       | 4.6%                          | 7.0%  | 39771                 | 2997                       | 7.5%                          | 4.2%  |
| 2022           | 30994                 | 2413                       | 7.8%                          | 5.2%  | 33991                 | 1664                       | 4.9%                          | 7.5%  | 40112                 | 3354                       | 8.4%                          | 4.7%  |
| 2023           | 18620                 | 1495                       | 8.0%                          | 9.1%  | 34161                 | 1873                       | 5.5%                          | 7.9%  | 43761                 | 4354                       | 9.9%                          | 4.8%  |
| <b>average</b> | <b>28570</b>          | <b>1925</b>                | <b>7.0%</b>                   | <b>7.5%</b>                                       | <b>33141</b>          | <b>1660</b>                | <b>5.0%</b>                   | <b>7.5%</b>                                       | <b>41215</b>          | <b>22616</b>               | <b>8.6%</b>                   | <b>4.6%</b>                                       |

**Source: Three Hospital A&E MH1049 (2021-2023) Registers**

Table 1.1 demonstrates a noticeable rise in emergency conditions treated over the past three years, with percentages increasing from 5.2% in 2021 to 8.0% in 2023. The mortality rate exhibited an initial decline from 8.1% in 2021 to 5.2% in 2022, followed by a significant rise to 9.1% in 2023. In Gweta, trauma emergency conditions reflected increases of 4.6%, 4.9%, and 5.5% from 2021 to 2023, alongside a consistent rise in mortality rates from 7.0% to 7.9%. Masunga Primary Hospital revealed percentages of 7.5%, 8.4%, and 9.9% for trauma and emergency conditions over the same period, with mortality rates advancing from 4.2% to 4.8%. This indicates a marked escalation in trauma and emergency cases, necessitating the identification of patient-centred emergency nursing care determinants, as evidenced by an average mortality rate of 7.5% for TPH and Gweta, and 4.6% for Masunga Primary Hospital. The provision of high-quality, structured emergency care is crucial for early diagnoses, life-saving interventions, and the prevention of avoidable fatalities through patient triage and resuscitation management (Afaya et al., 2021; Bam et al., 2020; Duko et al., 2019; Smith et al., 2022).

The lack of efficient patient-centred ENC can result in high mortality and enduring disabilities due to inadequate patient care, staffing issues, and resource scarcity. The increasing patient demand for ENC had contributed to heightened workloads and mortality rates. Insufficient skills among nurses in providing patient-centred ENC could result in compassion fatigue, stress, and job dissatisfaction. Consequently, there existed a need to investigate the determinants of patient-centred ENC among ED nurses at selected Primary Hospitals in Tutume and the North-East District of Botswana.

### **1.3 Justification**

This study was extremely significant and beneficial to patients, the nursing profession, and administrators because the findings, which point to gaps in knowledge, skill, staffing, and specialization. Additionally, this study has an impact on the identification of core competencies, the necessity of advanced nursing roles, and the acquisition of specialized knowledge and skills by nurses (Jin et al., 2023; Kim et al., 2022; Trisyani et al., 2023). By using data-driven systems approaches and involving hospital leadership in these efforts, the standard of care provided in the ED could be improved and raised when there is little to no information on the standard of care. This could also help policymakers make more informed decisions about resource allocation and maximize the use of medical resources (Sharma and Sharma, 2020). Additionally, the patient could receive high-quality and appropriate nursing

care leading to improved outcomes and decreased mortality from trauma and emergency situations (Schofield et al. 2022). Moreover, this can influence various stakeholders such as (MOH, NMCB, Institutes of health sciences, BHPCH) to collaborate to train more trauma and emergency nurses and create a defined scope of practice for emergency nurses based on their qualifications. It was also envisioned that the MOH and BHPC could recognize the need for community-based Emergency Medical Service rollout. This could contribute to raising the standard of emergency nursing care to those in need both pre-hospital and facility-based emergency care.

This study, directly addresses Sustainable Development Goal (SDG) 3: Good Health and Well-being, with a primary focus on Target 3.8: achieving universal health coverage, including access to quality essential health-care services. The research investigates the determinants influencing patient-centred ENC, a crucial component of essential healthcare, particularly within primary hospitals which often serve as the first point of contact for communities. By examining the determinants of patient-centred care, the study contributes to improving the quality of healthcare services and ultimately, to the overarching goal of ensuring healthy lives and promoting well-being for all. While the study's primary alignment is with SDG 3, it may also have indirect links to other SDGs, such as SDG 5 (Gender Equality) and SDG 10 (Reduced Inequalities).

Little was known about the determinants that influence how well ED nurses provide patient-centred ENC at three Primary Hospitals in Tutume and North-East district, Botswana. The researcher found little information related to this effect. One of the known studies was by Bedada et al. (2021) who examined the features and results of trauma admissions to an adult general surgery ward at Princess Marina Hospital general surgical ward from August 2017 to July 2018. Bedada's study was carried out more than five years ago therefore the conditions may not be the same as they are now. It was also worth noting that the study by Bedada et al. (2021) was a retrospective review of medical records while the current study was prospective. This study concentrated on the features and results of trauma admissions to a PMH rather than examining patient-centred ENC in the ED or the factors that influence the provision of efficient emergency nursing care. Similarly, the study by Mamalelala et al. (2023) examined nurses and emergency nursing in Botswana but did not establish the determinants of patient-centred emergency nursing care by nurses in the ED. Hence the current study assessed the determinants of patient-centred ENC by nurses at EDs at three Primary Hospitals in Tutume and North-East District, Botswana.

## 1.4 Conceptual Framework: The Donabedian Structure, Process and Outcome (SPO) Model

To understand the determinants of patient-centred ENC at TPH, Gweta and Masunga Primary Hospital ED, the Donabedian model (Donabedian, 2005) was used.



**Figure 1.1: The Donabedian A. model for quality of care (2005)**

### 1.4.1 Description of the Donabedian Model

The Donabedian model (Donabedian, 2005) is a theoretical construct that facilitates the analysis and assessment of healthcare quality Fox and Berwick (2016). The structure, process, and outcome areas/components of this model are where health care metrics are placed (McCullough et al., 2023; Binder et al., 2021; Jlassi et al., 2007). These elements directly impact the subsequent one. The delivery of care is the structural component; patient and caregiver participation is the process component; and the influence of care on the patient's or population's health state is the outcome component (Donabedian, 2005; El haj et al., 2013).

The term "Structure" describes the comparatively constant features of the healthcare providers and the environments in which they work. These attributes include those of the staff members and providers (education, training, experience, and certification) and the environments in which the care is delivered (staffing levels, equipment, safety features, and general facility organization). El Haj et al. (2013).

The actions performed when providing patients with treatment and impacting the intended outcome are collectively referred to as the "Process" component. It is concerned with delivering care from two perspectives: the technical one, which is the use of modern medical research and technology to optimize the trade-off between benefits and dangers (early diagnosis and proper treatment, for example). The patient-clinician interaction (communication, waiting time for a medical appointment, decision-making involvement) is the other factors. As a result, the skill component and appropriateness of the process component are important metrics to consider.

The terms "appropriateness" and "skill aspect" refer to the evaluation of how well actions were carried out and completed, respectively, and whether the right actions were taken at the appropriate moment.

Lastly, the Outcome component considers how the service influenced patient health outcomes and if the intended results have been achieved. These results could be lower death rates, fewer hospital admissions, better patient satisfaction, medication and lifestyle compliance, and enhanced patient experiences (El Haj et al., 2013; McCullough et al., 2023). Donabedian's theory that a good framework raises the probability of a good process, and that a good process raises the probability of a good result is also illustrated by the model. However, as the main objective of healthcare is to improve patient health status, outcomes are seen as the most significant indicators of quality

#### **1.4.2 Application of the Donabedian Model to the study**

The Donabedian model, was used in this study because it provided a framework for examining health services and evaluating the quality of health care, with quality of care being drawn from three categories: "structure, process, and outcomes. In the context of ENC, the structure component can be subdivided into infrastructure (space) and resource within the ED.

The physical infrastructure, or space, includes the design and arrangement of the ED. Where the design and arrangement of the ED allows for efficient patient flow, privacy, infection control, and easy access to vital care resources such as emergency nursing is likely to be provided timely, promptly thereby achieving patient-centred ENC. Unorganized spaces can cause mistakes, delays, and more anxiety for patients (Mallick and Amo-Adjei, 2021). Availability of specific working space such as receiving area, triage area, nurses' station, emergency room, utility room (clean and dirty), and consultation room is also likely to promote patient-centred ENC minimizing errors and delays in treatment. Human resource: knowledge such as in the triage process, ENC, and IPC measures by the ED nurse. Having this expertise will enable patients to receive the proper treatment at the right time and location. A high degree of ENC knowledge is crucial for patient diagnosis, timely decision-making regarding relevant therapies that will enhance care quality and lower the death rate. Adequate staffing ratios ensure that nurses have the time to properly assess, plan, intervene, and evaluate care for each patient (accurate triaging) and reduce waiting time. Therefore, these will positively affect provision of patient-centred ENC by improving quality of care, patient safety and satisfaction ultimately reducing mortality rates.

Moreover, an appropriately staffed facility can be able to provide timely interventions, improved patient communication, and better access to care all of which are necessary components of high-quality healthcare. Better patient satisfaction and high-quality health outcomes may result from this (ENC). The exchange of information has a significant impact on patient satisfaction whilst inadequate staffing will lead to burnout, errors, and poorer patient outcomes/patient dissatisfaction. Emergency nursing treatment is heavily influenced by experience. More seasoned employees are usually more equipped to handle challenging circumstances, deliver appropriate care, and have productive conversations with patients. Shortage in any of these might hamper prompt action and significantly patient outcome. Having adequately qualified or specialized ED nurses who are capable of conducting, advanced procedures, such as intubation are a cornerstone in providing ED services. It will prevent the critical ill patients from developing complications such as brain hypoxia and gastric contents aspiration which are less likely to be reversible.

Equipment includes physiological monitoring tools and diagnosing tools to provide timely and appropriate emergency care. Adequate qualified or specialized ED nurses who are capable of conducting advanced procedures, such as intubation are a cornerstone in providing ED services. Having the necessary tools and resources readily available is vital. Essential equipment is crucial as they allow nurses to perform critical interventions for rapid and effective patient management under demanding situations. Additionally, equipment facilitates patient assessment helping in making informed decisions about treatment and interventions. Personal Protective equipment protects the nurses and patients from infections, the defibrillators and airway management equipment address the life-threatening conditions. Availability of all these improves quality of care in relation to provision of patient centred ENC whilst shortage in any of these might hamper prompt action and significantly affect patient outcomes.

The focus changes to the nurses' actual provision of ENC under the process component. This includes patient assessment and triage, the application of evidence-based interventions, efficient communication with members of the interdisciplinary team, and care coordination. Thorough assessment allows the ED nurses to identify life-threatening conditions. Commonly adapted to mnemonics in EDs to thorough assess patients such as c-ABCDE in trauma cases and ABCDE in general EMD are used, through thorough assessment ED nurses develop understanding of patient needs through systemic evaluation. Immediate life threats are recognized enabling timely appropriate interventions. Triage is a critical process that

categorizes or sorting patient based on the urgency of their medical needs. This sorting process is essential in managing patient flow and ensuring that those with the most critical needs receive timely care. Proper triage helps in the efficient use of healthcare resources and to manage workload effectively to provide patient-care ENC.

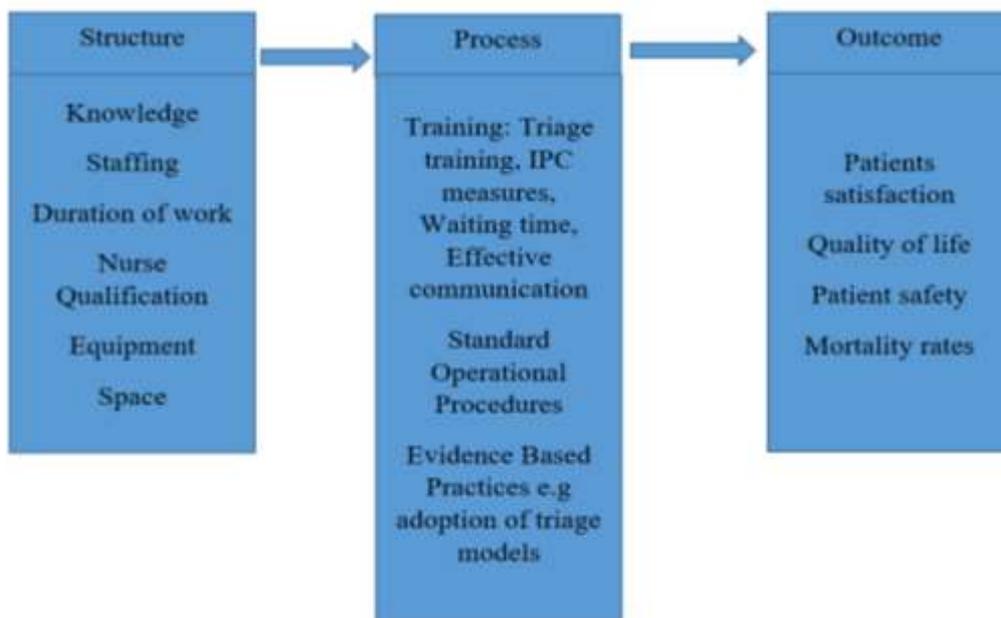
Effective communication between emergency nurses, patients, and the healthcare team leads to better patient outcomes. It enables nurses to gather critical information quickly, make informed decisions, and provide timely interventions. Effective communication is a cornerstone of ENC as it directly impacts the patient outcome, team collaboration, safety and resource utilization. The effective communication by ED nurses is important for delivering high quality effective and safe care in the ED, enables nurses to identify and address potential issues proactively.

In addition, the process component includes the nurses' patient and family education and documentation practices. The processes of health care are all the actions that contribute to or are designed towards the desired quality of care. These actions influence the ED nurses' ability to make decisions to meet patients' needs, such as triage training, which will enable them to identify and prioritize (classify) patients appropriately. A key component of high-quality care is effective communication (Blackburn et al., 2019). The study has ascertained that most ED nurses have not received triage training.

The outcome component assesses how the nursing care given affected the satisfaction and results of the patients. This can involve variables including rates of patient death; an ED with a better structural resources the modern technology and a well-trained staff tends to have lower mortality rates because the nurses in such EDs are able to utilize the available technology enabling them to timely triage, diagnose and provide appropriate treatment. Reduced rates of complications in EDs, adequately staffed EDs with trained nurses can manage and reduce chances of complications occurrence by simple implementing evidence-based SOPs, duration of stay in the emergency room, patient satisfaction with nursing treatment, and compliance with evidence-based recommendations (Gribbons et al., 1995). Several features of the study on determinants of patient-centred ENC can be analyzed using the Donabedian conceptual framework (Alharthy et al., 2016). The end results of the process and structure would be patient satisfaction, reduced mortality rates, and quality of care. Higher staff ratios allow nurses to monitor patients more closely, respond promptly to changes in their condition, and deliver timely interventions, provide adequate attention and care to each patient, enhance the efficiency

of ENC delivery in EDs, reduces waiting times, lower rates of patients leaving without being seen, but on the other hand when nurses are overburdened with too many patients, it can lead to physical and emotional exhaustion, negatively affecting their performance and the quality of care in providing ENC.

Adequate knowledge in emergency nursing is critical for effective patient assessment and the provision of emergency care, directly influencing patient outcomes. The assessment skill using the mnemonic ABCDE allows ED nurses to quickly identify life-threatening condition earlier, helping them in making an informed decision in crucial emergency situations such as triage protocols which ensures that critical patients receive immediate attention which can be life-saving. All this enhance patient safety and reduce mortality (McCoy, 2005). Additionally, training in emergency nursing enhances ED nurse’s ability to provide high quality care and reducing mortality and through learning the latest protocol in managing conditions. Thus, early emergency detection by ED nurses via triage to treatment through several steps (engineering processes) in ENC can result in better patient care, a higher patient satisfaction rate, and a lower death rate. The study's objective was to examine whether ED nurses were capable of providing patient-centred ENC.



**Figure 1.2: The conceptual framework adapted from Donabedian 1997 (Donabedian, 1997; The National Roundtable on Health Care Quality, 1999; Garnerin, 2001)**

In order to relate the study's objectives with the three components structure, process, and outcome Donabedian Model served as a guide. Additionally, the way literature review was framed, a questionnaire developed and created, and the findings were aligned to Donabedian Model three domains.

## **1.5 Research Objectives**

### **1.5.1 General objective**

To establish the determinants of patient-centred ENC at selected primary hospitals in Tutume and North-East Districts of Botswana.

### **1.5.2 Specific objectives**

1. To evaluate the provision of patient-centred ENC at selected primary hospitals in Tutume and North-East Districts.
2. To determine the level of knowledge on emergency care among ED nurses at selected primary hospitals in Tutume and North-East Districts.
3. To determine the availability of SOPs at selected primary hospitals in Tutume and North-East Districts.
4. To evaluate the availability of essential emergency care equipment at selected primary hospitals in Tutume and North-East Districts.

## **1.6 Research questions**

1. What is determinants to provision of patient-centred ENC at selected primary hospitals in Tutume and North-East Districts?
2. What is the level of knowledge on emergency care among nurses at selected primary hospitals in Tutume and North-East Districts?
3. What SOPs available to guide the provision of patient-centred ENC at selected primary hospitals in Tutume and North-East Districts?
4. Which essential emergency care equipment are currently available at selected primary hospitals in Tutume and North-East Districts?

## **1.7 Research Hypothesis**

**Ho:** There is no significant relationship between knowledge level, awareness of availability of SOPs and availability of essential emergency care equipment and the provision of patient-

centred ENC among nurses at selected primary hospitals in Tutume and North–East Districts, Botswana.

### **1.8 Variables**

**Dependent variable:** Provision of patient-centred ENC

**Independent variables:** Knowledge of nurses on ENC; awareness of the availability of SOPs, and availability of essential emergency care equipment.

**Table 1.2: Variables, Indicators and cut-off point and scale of measurement**

| Variables                             | Conceptual definitions  | Operational definition  | Scale of measurement             |   |                  | Question number             |
|---------------------------------------|---|---|----------------------------------|---|------------------|-----------------------------|
|                                       |   |   | Indicator                        | Cut-off point   | Type of variable |                             |
| <b>Dependent Variable</b>             |   |   |                                  |   |                  |                             |
| Provision of patient-centred ENC      | This is the ability of an emergency nurse to provide precise decisions and prioritize care for an individualized patient in order to produce quality health outcome (Johnson et.al.,2021:Azizi et al., 2023; Shin and Yoo, 2023)                  | This refers to the delivery of prompt, individualized emergency nursing interventions that are responsive to the unique clinical needs of patients receiving care in primary hospitals located in the Tutume and North-East Districts of Botswana, with emphasis in timely decision-making, effective communication, and active patient involvement in ENC processes, | Provided patient-centred ENC     | Score of >60 on patient-centred ENC questions           | Nominal (Binary) | 6.1 – 6.14 and 11.1 – 11.13 |
|                                       |   |   | Not provided patient-centred ENC | Score of <60 on patient-centred ENC questions           |                  |                             |
| <b>Independent Variables</b>          |   |   |                                  |   |                  |                             |
| Knowledge of nurses on ENC            | This refers to a broad understanding of familiarity, awareness, or understanding of someone or something, encompassing facts, information, descriptions, or skills acquired through experience or education (Mustika et al., 2022; O'Brien, 2017) | These refers to ability of an ED nurse to demonstrate understanding in trauma care, cardiovascular, neurological, respiratory condition's assessment, management at three hospitals in Tutume and North-East district Botswana.   | Adequate knowledge               | Score of >60 on knowledge questions                     | Nominal (Binary) | 7 – 10                      |
|                                       |   |   | Inadequate knowledge             | Score of <60 on knowledge questions                     |                  |                             |
| Awareness on the availability of SOPs | This refers to an understanding of written set of instructions that outlines the required steps to complete specific tasks within an organization (Freeman et al., 2021)  | These refers to nurses' understanding of the availability of SOPs used in triaging process, patient assessment, diagnosis and management of patients in-order to provide high quality patient care at three hospitals in Tutume and North-East district, Botswana.  | Aware                            | Nurses knowledgeable of SOPs availability in the ED     | Nominal (Binary) | 11                          |
|                                       |   |   | Not aware                        | Nurses not knowledgeable of SOPs availability in the ED |                  |                             |
| Availability of essential equipment   | These refers to the presence or percentage of time that a piece of equipment or machinery is able to perform its intended function and operate satisfactorily (Gupta et al., 2020)  | These refers to presence of functional equipment used for assessment, physiological monitoring and patient management   | Available                        | Essential equipment was accessible and functional       | Nominal (Binary) | Section 4                   |
|                                       |   |   | Not available                    | Essential equipment was not accessible to be used.      |                  |                             |

## **1.9 Conclusion**

This chapter included an introduction, background data on the subject, a problem description, a study justification, and the conceptual framework for quality of care, which serves as the study's guiding structure, the research objectives. (Afaya et al., 2021; Kivlehan et al., 2021; Shanthakumar et al., 2021) found that 1.3% of the world's total disease burden and more than 90% of mortality from injuries and 63% for emergency medical diseases occur in SSA. Therefore, Botswana forms part of the SSA and was not an exception to this problem as elicited by information found in Table 1.1 on Percentage mortality rate in Accident and Emergency Department of three Primary Hospitals in Tutume and North-East districts, Botswana for 2021-2023 Reports, which indicated rising trends in emergency cases and with an average mortality rate (outcome) of 6.0% leading to the study aim which was to examine the determinant of provision of patient-centred ENC by nurses at selected Primary Hospitals in Tutume and North-East district, Botswana.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presented a review of the literature that was pertinent to providing efficient ENC. Many search engines, including Research for Life, the Cochrane Library, Pub Med, Open Access, Google Scholar, and the University of Zambia Library, were employed in the literature search. The search terms were emergency nursing, emergency and trauma nursing, effective emergency nursing, emergency nursing competencies, triage knowledge and availability of essential equipment.

#### **2.2 Overview of Determinants of Patient- Centred Emergency Nursing Care**

Patient- Centred Emergency Nursing Care (ENC) is crucial for managing urgent medical patients. It involves efficient triage, prioritizing patients based on urgency, and evaluating physiological and psychological factors. This ensures timely allocation of resources and appropriate interventions for critical patients.(Bahlibi et al., 2022; Curtis et al., 2020). the application of IPC measures in EDs, this includes adhering to strict aseptic techniques, proper waste management, and ensuring that all staff are trained in infection control protocols(Harun et al., 2022; Jeong et al., 2022). Effective communication increases patient adherence to treatment regimens and builds trust. Coordinated care also requires interprofessional communication amongst team members (Al-Kalaldeh et al., 2020). Knowledge of SOPs: According to Adewole et al. (2024), a successful ENC requires the following essential elements: adequate space, equipment, personnel ratios, and qualifications. These guidelines guarantee that all ED nurses are aware of the protocols for handling particular situations, reducing variability in patient care and improving overall efficiency. An ED may offer successful patient-centred ENC when these traits are coupled with good execution, which would eventually improve patient outcomes, service quality, and the mortality rate. This study will consider all of the previously mentioned factors.

#### **2.3 Socio-Demographic Characteristics of Nurses in the Emergency Departments**

Among the specific demographic characteristics of emergency department nurses who offer ENC are age, gender, level of education attained, and duration of service. Globally, regionally, locally, and in the sub-Saharan region, age and gender are irrelevant when it comes to the supply of ENC and its related characteristics (Twagirayezu et al., 2021). According to (Duko

et al., 2019; Phukubye and Mothiba, 2019; Bam et al., 2020; Nshutiyukuri et al., 2020; Twagirayezu et al., 2021; Salameh et al., 2023), the bulk of those providing ENC are between the ages of 20 and 49, accounting for 88% and 12% for those over 49. The oldest age group has the lowest percentage; this suggests that nurses in emergency departments constitute the most active working age group. However, with the exception of the following research (Nshutiyukuri et al., 2020; Salameh et al., 2023), women predominate in the bulk of investigations (Duko et al., 2019; Phukubye and Mothiba, 2019; Bam et al., 2020; and Twagirayezu et al., 2021).

ED nurses must possess the necessary skills, information, and training to improve their clinical competency. Formal education, workshops, and in-service trainings can all help to empower patient care and increase the bar for patient care (Salameh et al., 2023). Studies involving highly skilled ED nurses and specialized ED nurses in ETN, Critical Care Nursing, trauma courses, short-term emergency courses including BLS, and triage courses have shown high levels of ENC knowledge (Duko et al., 2019; Phukubye and Mothiba, 2019; Bam et al., 2020; Nshutiyukuri et al., 2020). On the other hand, general nurses with diplomas who worked in emergency departments but had no further basic training in emergency care had demonstrated poor levels of expertise (Twagirayezu et al., 2021; Ndung'u et al., 2022); Salameh et al., 2023). In order to improve patient care standards and proactively close the knowledge and skill gaps that less trained ED nurses have, it is suggested that continuous development programs related to ENC be made available to ED nurses on a regular basis.

In the context of Botswana, there was a dearth of information about the qualifications of EDs. According to Mamalelala, Dithole, and Maripe-Perera (2023), the researcher identified patient observation and triaging as the two main responsibilities of ED nurses, added that none of the current ED nurses possess formal triage or emergency trauma nurse (ETN) training. Training is therefore necessary because the lack of specialized ED nurses in all of the country's EDs indicates a lack of knowledge and low standards of ENC practices, which can result in a higher death rate, patient dissatisfaction with services, and a delay in the delivery of treatment (Afaya et al., 2021). The study's identified factor a lack of specialized training proves to be important for advancing nursing education in the future, improving patient satisfaction and care standards, and lowering the death rate. This is in complete accordance with the worldwide recommendation. However, the study did not investigate other relevant variables, such as the staff- ratio, availability of necessary infrastructure and equipment, and sociodemographic characteristic (experience), all of which have a direct impact on the outcome of ENCs.

Studies show that nurses who work in emergency rooms for a long time typically have more knowledge and practical skills (Duko et al., 2019; Phukubye and Mothiba, 2019; Bam et al., 2020; Nshutiyukuri et al., 2020). In contrast, emergency departments staffed by nurses with less than five years of experience exhibit lower levels of knowledge, as noted by Twagirayezu et al. (2021), where only 33% of nurses have been in their roles for over five years. A minimum of three years of experience in the same work environment is usually required to achieve competency, according to Benner's theory of skill development. The studies show potential for overgeneralization and should take into account each ED nurse's prior training and knowledge in ENC because some can possess significant knowledge and skill despite their short tenure due to motivation, relevant ENC short courses, and informal learning. Despite offering a solid foundation for understanding how ED nurses progress through stages of skill acquisition in providing ENC and emphasizing the importance of experience in the ED, the studies also show potential for overgeneralization.

#### **2.4 Provision of Patient-Centred Emergency Nursing Care**

Patient-centred care in emergency nursing is an essential component of delivering high-quality, compassionate, and effective care in the chaotic and fast-paced environment of the ED. Patient-centred ENC provision is a critical health care service that strives to identify life-threatening conditions in a timely manner, provide appropriate management for resuscitation and stabilization measures, prevent disability, and provide safe health care that improves patient satisfaction, safety, quality of life, and lowers mortality (Trisyani et al., 2023). Emergency nurses at hospital emergency departments are responsible for a number of crucial tasks, including triage, which is a process by which they organize patients' needs according to urgency, manage their conditions, foster critical thinking abilities, accurately identify patient issues, and ensure that interventions are made on time. The ability to deliver patient-centered care while managing acute conditions requires not only clinical expertise but also the ability to prioritize patients' needs and preferences in treatment planning (Stone et al., 2021). They must also have strong interpersonal and communication abilities.

Emergency nurses need to be capable of making timely clinical decisions since these decisions ultimately improve the accuracy of triage. Emergency nurses employ information from a range of sources, including as clinical examinations, visual observations, and the patient's reason for visiting the emergency room, to make the best decisions possible (Suamchaiyaphum et al., 2024). Through the use of a formal triage protocol in emergency rooms to prioritize care based on a patient's needs rather than the order of arrival. Curtis et al., (2020) suggest that

implementing systematic processes to improve the quality of emergency care can save lives. This improves outcomes even in situations where resources are limited. Since ED nurses are in charge of the early evaluation, care, and safety of seriously ill and injured patients, emergency department nurses who provide triage must be knowledgeable in this area. As the first healthcare professionals to engage with and attend to sick and injured patients, emergency nurses are at the forefront of hospital service delivery. Additionally, they take into account the primary pillars of hospital triage (Dulandas and Brysiewicz, 2018; AlMarzooq, 2020).

According to a study by Yang et al., (2023) from 11 hospitals, emergency nurses in northern China have poor decision-making skills when it comes to triage. This is in contrast to a study conducted in Saudi Arabia by AlShatarat et al., (2022), where participants showed generally high levels of triage knowledge (71.8%) and insufficient knowledge (28.2%). Apart from study high response rate its use of a validated tool which offers adequate validity and reliability it was only done at one institution and it could not be broadly applied to other areas, the study needed to be carried more other facility in a different geographic area. In the same nation, a comparable survey was conducted by (AlMarzooq, 2020) To ascertain the ED nurses' level of triage knowledge, a comparative descriptive cross-section hospital-based study design was carried out in the two emergency departments. While the study site 2 emergency department nurses' level of knowledge is less than 70%, which is considered a moderate score, the study site 1 emergency department nurses' level of knowledge was more than 70%, which is regarded as a high score, the study provided an insight possible of the factors that could be influencing triage know in the two institute and a possible identification of area of improvement.

A cross-sectional, descriptive correlational study was conducted in Jordan by Malak et al. in 2022 to assess emergency nurses' knowledge, abilities, and patient triage methods. The findings showed a strong positive link between the completion of triage training programs and triage abilities, indicating that good training improves nurses' capacity to deliver emergency treatment on time. This improvement is essential to avoiding unfavourable clinical outcomes, including longer periods for diagnosis and treatment, wasteful hospital resource usage, lower levels of satisfaction among patients and staff, and higher death rates. Convenience sampling was used in the study, which may have introduced bias because participants were chosen only on the basis of their availability, restricting the findings' generalizability. On the other hand, in Palestine, an LMIC, Awwad et al. (2022) revealed that emergency nurses' knowledge and proficiency in trauma triage were, respectively, poor and high. Because it only looked at one part of triage trauma triage it was unable to give an accurate picture of the abilities and expertise

utilized in regular hospitals. The emergency medical diseases were not represented. Different results were obtained due to the ED nurses' comprehension of triage across the African continent. According to a research by Duko et al. (2019), which was conducted in Ethiopia utilizing an institutional-based cross-sectional survey approach, triage knowledge is low, at 51.5%. The methodology used in this study improves the dependability of the findings and offers a precise framework for evaluating the knowledge of the local healthcare practices. Even though the study was carried out in a low- and middle-income country (LMIC), the results cannot be generalized to other nations because to differences in patient geographic settings and variables that contribute to limited triage knowledge. This disparity emphasizes the necessity of focused instruction and training initiatives to raise awareness of triage and ensure precise and reliable triage procedures. The studies conducted in Ethiopia and Rwanda highlight significant deficits in triage knowledge and skills among emergency department (ED) nurses. In Ethiopia, Duko et al. (2019) found that 51.5% of nurses had low triage knowledge scores. Similarly, Twagirayezu et al. (2021) reported that 63.6% of ED nurses in Rwandan referral hospitals had a low level of triage knowledge, while 47.9% had a high level of triage skills. In contrast, a study conducted in rural hospitals in Limpopo, South Africa by Phukubye and Mothiba, (2019) found that 61% of respondents had adequate triage knowledge, while 39% did not. However, even among nurses with triage knowledge, 30% had poor triage practice, indicating an inability to effectively apply their knowledge in clinical decision-making. The study is very relevant as it was conducted in rural areas at level II hospitals because they face unique challenges and less prioritized during resource allocations. But for its findings cannot be applied beyond Limpopo province due to level of resource capacity and different geographic region.

The need of evidence-based triage education to improve nurses' triage skill is emphasized in the study by Bahlibi et al. (2022) on the impact of triage training for emergency department (ED) nurses in Eritrea. The results imply that this kind of training is essential to raising the efficacy of triage procedures in emergency situations. Furthermore, a similar study by Phukubye et al. (2021) emphasized the educational requirements of nurses working in rural hospital EDs by using a descriptive qualitative research technique. Only 17 out of 84 nurses took part in the survey, which limits the representativeness of the results. This raises questions about the validity of the conclusions made about the overall population of ED nurses in the five hospitals that were the subject of the study. Both studies approaches were qualitative and a quantitative approach is needed for statistical significance. Information about the triage abilities of nurses in Botswana is scarce. A research by Siamisang et al. (2022) focused on

"Waiting Times and Length of Stay of Trauma Patients in a Botswana; Princess Marina Referral Hospital Emergency Department". The waiting time (from triage to the medical officer's initial evaluation) was 3.8 hours, based on the results. The South African Triage Scale, or SATS, is a tool used to measure waiting times during triage. No urgent patient triaged as priority 1 (red) was seen within the goal time of 15 minutes. These findings imply that ED PMH nurses lack sufficient knowledge for triage. However, because the study used a retrospective approach to collect data, errors might have occurred throughout the record-keeping process, which would have affected the validity of the findings. Furthermore, this study, which was carried out in a level I hospital and concentrated on trauma triage without including EMDs, cannot be applied to other settings.

In order to ensure patient satisfaction, promote positive patient outcomes, and deliver safe patient care, effective communication is essential in the ED (Blackburn et al., 2019). Excellent communication also improves the ED patient experience. The participant in this qualitative study, which employed a focus group discussion technique, reported feeling more in charge, educated, and aware about their conditions when there is it. Additionally, it was discovered by (Alghamdi et al., 2023) and (Gabay et al., 2022) that enhanced communication resulted in greater patient satisfaction and healthcare outcomes. The studies were conducted in Hungary and Saudi Arabia, respectively. A cross-sectional research by Alghamdi et al. (2023) found that ED nurses are less likely to tell patients about their outcomes or course of treatment or to offer baseline data. However, the study focused on the patient's perspective rather than the factors such as workload, time constraints, and nursing education that contributed to the communication problems. Al-Kalaldeh et al. (2020) found that ED nurses had little communication competence in a research on effective nurse-patient communication in the emergency department (ED) in Palestine. These findings demonstrate the need for improved organizational structure and protocols in emergency departments. To increase patient happiness, improve patient compliance, and deliver safe care, effective communication in the emergency department must be established. Improved communication is associated with better patient outcomes and satisfaction. Patients like being made aware of anticipated wait times, lengths of stay in the department, possible investigational orders, and treatment options.

In the Sub-Saharan Africa context, a scoping review by Kwame and Petrucka, (2020) revealed that nurse-patient communication was often poor, with nurses dominating interactions and neglecting patient needs in Primary healthcare settings. Among other factors staff shortage and excessive workloads were mentioned to be the cause of ineffective communication. This study

did not focus on communication in EDs but addressed nursing communication with patients. Just 4% of nurses in a study by (Dithole et al., 2016) using an exploratory and retrospective research methodology in Botswana were found to be communicating with patients. Therefore, this is an indication that nurse- patient communication is a challenge. The study was conducted more than six years ago, and contact with ED nurses was not its primary focus, things may have altered since then. Infection prevention and control (IPC) is important in emergency departments (EDs), with a focus on healthcare-associated infections such as bloodstream infections associated with central lines, ventilator-associated pneumonia, and urinary tract infections associated with catheters. Higher rates of morbidity and death are linked to an increased risk of hospital acquired infections (HAIs). Over 1.4 million patients worldwide are affected by them annually, and their estimated fatality rate exceeds 10%. The prevalence of HAIs is disproportionately high in low- and middle-income countries (LMICs), with rates as high as 25% (Harun et al., 2022). The following are aspects of infection prevention: hand hygiene, safety measures based on transmission, cleaning of the surroundings, and sterilization of equipment (Liang et al., 2018).

As per the findings of Harun et al.'s (2022) investigation on infection prevention and control in Bangladeshi tertiary care hospitals. The study's findings, which indicated that the IPC level was insufficient, are in line with those of (Savul et al., 2020) investigation, which found that all hospitals and departments, respectively, had failed to guarantee the security of their staff, patients, and guests. It solely focused on public hospitals; thus, it does not offer a whole picture of IPC in the area. On the other hand, according to a study by Jeong et al., (2022) carried out in Korea, the majority of hospitals complied with the requirements, indicating that the IPC measures, programs, and structures are in place. Thus, better nursing care can be provided with high-quality care. (Assefa et al., 2020) and (Oppong et al., 2020) conducted cross-sectional studies in Ethiopia and Ghana, respectively, and found that a significant proportion of healthcare providers had unsafe practices and inadequate knowledge of IPC. However, neither study examined the barriers or challenges to improving IPC levels in the study sites. The literature review about facility assessment, knowledge, and practice of healthcare providers on IPC in Africa and Sub-Saharan Africa has revealed that IPC levels are low and knowledge and practices are inadequate. On the other hand, (Zimba et al., 2022) study in Zambia revealed that although participants showed a good comprehension of the advantages of adhering to conventional IPC principles in the workplace, challenges to compliance were noted in nearly every site. Infection Prevention Practices were not being followed correctly due to staff turnover, infrastructure constraints, and excessive clinical workloads. Because the study was

restricted to a specific location, it's possible that the conclusions cannot be applied to different healthcare environments.

After a survey of the literature, it was found that few to none of it discussed the IPC-level facility assessments or the IPC knowledge and practices of HCP in Botswana. According to (Mpinda-Joseph et al., 2019), a tertiary hospital in Botswana conducted research on illnesses associated with hospitals, including bloodstream infections in neonates. According to the study, HAIs occurred in 48% of the 47 patients. This demonstrates the low IPC level of the facility and the institute's requirement for training.

## **2.5 Knowledge of nurses on Emergency Nursing Care**

Azizi et al. (2023) state that an emergency nurse's theoretical knowledge, past experience, and the cognitive and psychomotor domains are among the factors that influence their understanding of ENC. Additionally, Ashton, Morris, and Smith (2018) emphasized the need for technological proficiency, social consciousness, the ability to collaborate with pre-hospital and other facility-based healthcare professionals, and upkeep of current knowledge for emergency department nurses. These skills are related to both basic and sophisticated procedures, such as interpreting ECGs, arterial blood gas, X-rays interpretation, performing intubations, and using external defibrillation machines.

A review of recent literature highlights significant variability in the clinical competency of emergency department (ED) nurses across different geographic and socioeconomic settings. In a cross-sectional study conducted in Palestine, Salameh et al. (2023) found that only 19.4% of the 170 participating nurses demonstrated a good level of clinical competence, with none achieving a very good level. However, the study's findings are limited by its single-site design, which restricts generalizability. Similarly, studies conducted in Albania and Australia by Callihan et al., (2023) and Harley et al., (2019) reported low competency levels among ED nurses, particularly in recognizing emergency conditions. The study by Callihan et al. was simulation-based and limited in both scope and sample size, thereby necessitating broader research to validate its conclusions.

In contrast, research by Ying et al., (2020) in China and AlRashedi et al., (2022) in Saudi Arabia reported moderate to satisfactory levels of emergency nursing competence. These mixed findings suggest that regional variations, particularly in terms of economic resources and healthcare infrastructure, may play a critical role in shaping clinical competency. For example, China and Saudi Arabia are high-income countries with greater access to resources

for nursing education, training, and clinical practice. Conversely, Palestine, as a lower-middle-income country (LMIC), may face systemic constraints that limit the development and maintenance of high-level clinical skills among nurses. These disparities underscore the importance of contextual factors in evaluating and improving emergency nursing competence.

In the geography of Africa in Ghana, a self-assessed competency research on emergency nursing techniques was carried out by Bam et al., 2020. The study's findings demonstrated that nurses thought they were competent. Muthiani et al., (2022) reported similar results in their study done in Kenya, with 56% of participants demonstrating adequate awareness of emergency preparedness. Cross-sectional research designs and convenience and random sample strategies were applied in both investigations. Furthermore, Rwandan researchers Nshutiyukuri, Bhengu, and Gishoma (2020) discovered that when nurses receive training prior to working in A&E facilities, their knowledge and practice are either high or extremely high. This results may be bias because the nurses might have over-rated themselves. However, studies by Dulandas and Brysiewicz (2018) and Ndung'u et al., (2022) show that there is a need for education due to inadequate knowledge and skill levels. These investigations were carried out in Kenya and South Africa. Ndung'u et al.'s study from 2022 only included two large hospitals, which limited the generalizability of the findings, and the self-administered test didn't accurately represent participants' actual skill levels.

Bedada, Tarpley, and Tarpley's (2021) study in the Botswana household investigated the characteristics and outcomes of trauma admissions to an adult general surgery unit at PMH, Gaborone, Botswana, a tertiary teaching hospital. The findings demonstrated that trauma-related deaths accounted for a sizable fraction of emergency room admissions. The report also highlighted how the issues are made worse by the dearth of emergency personnel and the shortage of trained personnel in primary and secondary care settings. Additionally, the researcher stressed the necessity of training nurses at lower-level health facilities (Mamalelala, Mokone, and Obeng-Adu, 2022). Both studies, however, did not investigate additional factors that influence the quality of ENC given. Additionally, because both studies are retrospective, their selection records may be biased, whereas a prospective study might provide comprehensive information on the subject. Because the study was limited to a single location, its findings cannot be generalized to other contexts. Therefore, the gaps that have been discovered must be filled per the need assessment to improve or close the knowledge gap among nurses in the EDs providing ENC.

A single-group quasi-experimental study with a pre-test/post-test design was carried out in 2020 in Tehran, Iran, according to Nursing and Midwifery Research Center, Iran University of Medical Sciences, Tehran, Iran, et al., (2022); the study proved that an interventional in-service training and retraining courses can help on issues of patient safety. therefore, training in ENC is essential.

## **2.6 Awareness of Standard of Operation**

Standard Operating Procedures (SOPs) for emergencies are essential frameworks that guide organizations in responding effectively to various crises. These procedures ensure that all personnel understand their roles and responsibilities during an emergency, facilitating a coordinated and efficient response (Lucas et al., 2021).

According to (Lucas et al., 2021) who studied existence and role of standard operating procedure in the Emergency Department in German, and the researcher's findings were that SOPs were more frequently available in hospitals with higher health care levels, with participants working in EDs without SOPs felt less confident regarding treatment of patients which was associated with a subjective delay in patient treatment. This is in congruent with the study by Chen et al (2016), in China which concluded that the use and implementation of SOPs and checklists in prehospital emergency medicine have shown some benefits of improving guidelines adherence and patient outcomes in airway management, patient records, identification and triage, and other prehospital interventions.

In the sub-Saharan Africa a study by Adewole et al., (2024) on Implications for healthcare services and policy in South Africa, North-West province, found out that there is a need for policy and strategies to service the high proportion of patient visiting the hospital ED. e.g., Triage, emergency condition management procedures (airway management). In the context of Botswana there is little information on studies relating to SOPs.

## **2.7 Availability of essential Equipment in the ED**

Equipment are essential elements of emergency preparedness that must be available and functional ready-to-hand (Osei et al., 2014). The success of advanced life-support attempts relies largely on the availability of resuscitative equipment. Some conditions are irreversible if ALS not attempted in time e.g., brain injury will occur four minutes if intubation not done to someone with compromised oxygen uptake (Pillay et al., 2022).

A cross-sectional study by (King et al., 2020) on availability of paediatrics emergency equipment in Cape-town, South Africa, results indicate suboptimal availability and functionality of equipment at health facilities providing district level and tertiary level this is in congruent with a study done by Sultan et al. (2022) which indicated not more than 20% of equipment availability in 10 hospitals in Ethiopia. In contrast a study by Pillay et al. (2022) in South Africa indicated that more than 80% of equipment availability and functioning. The study was done at one level hospital not giving a clear picture of equipment availability in the region. But the study can be used for benchmarking how the hospital source or equipment available.

(Mwandri and Hardcastle, 2018) study, conducted in Botswana, used a convenience sample approach that included a checklist and questionnaire. Results from two tertiary hospitals and a District hospital (level II) showed that the necessary equipment was sufficient. Similar findings were also obtained by (Rajeswaran and Ehlers, 2012) in their investigation. Due to differences in resource allocation and the fact that the studies were conducted many years ago, many things have changed, such as the daily usage of consumables, both studies cannot be extended to inferior institutions that provide emergency treatment. Having standardized, fully operational equipment and maintaining checklists for each shift to make sure the emergency trolleys are supplied and operating properly can greatly improve ENC results.

## **2.7 Conclusion**

The final section of the literature study looks at the factors that influence the ENC that nurses give. In order to treat patients who, need emergency care right away, ENC includes a number of vital tasks. The emergency nurse must triage patients, which comprises arranging patients according to the extent of their disease or injury, in order to deliver patient-centred ENC (Barh, 2020). Effective communication is also necessary between ED nurses and doctors, as well as between ED nurses and patients. In communication, various techniques for information transmission and reception are employed. A further advantage of ENC is that it provides a safe environment that raises the bar for care for both emergency department nurses and patients. Examined aspects include knowledge of emergency nurses, their qualifications, the length of time they have worked as ENs, and their significance in providing ENCs.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 Introduction**

This chapter described the procedures that were used to examine the determinants of provision of Patient-centred ENC at three primary hospitals in Tutume and North-East District Botswana. The chapter presents the research design, study setting, target population, sampling technique, inclusion criteria, exclusion criteria, data collection technique, data analysis method, pilot study and furthermore outlines ethical consideration.

#### **3.1 Study Design**

A facility-based cross-sectional descriptive study design was adopted in this study. The study was analytical in nature to allow for the comprehensive assessment of the current state of determinants of patient-centred ENC since evidence on the same was not known. A cross section approach was chosen because the researcher intended to collect data that served as baseline for future studies as well as designing practical initiatives that could promote provision of patient-centred emergency nursing care since there was no known survey on the topic.

#### **3.2 Study Setting**

The study was conducted at Tutume, Gweta and Masunga Primary Hospitals emergency departments from two districts of Tutume and North-East in Botswana. In these two districts there are no level II referral hospitals and therefore serve as referral points for most conditions including to both governments owned clinics and privately owned clinics in their respective locality. Additionally, they operate 24 hours every day of the week to facilitate immediate, continuous, and comprehensive care, thereby improving patient outcomes and community health. All the three hospitals admit all kinds of emergencies; including cardiac, respiratory, trauma and obstetric and gynaecological emergencies. The hospitals are the only health facilities providing primary care services in the two districts.

TPH is located in Tutume district in the central region of Botswana and is 108km away from Francistown city the second capital city of Botswana. It serves the western part of the district with an estimated population of 83221 (Botswana statistics, population census;2022) as a referral point of 16 clinics and 11 health posts, with a 46-bed capacity. It has maternity ward, paediatric ward, theatre, female and male ward admitting different conditions including

surgical and an Accident and Emergency department. The A&E unit has a 4-bed space; 3 for emergencies and another for observation.

Gweta Primary Hospital is located in the central region of Botswana and is 288.9 km from Francistown. It serves the Eastern part of Tutume District. It serves an estimated population of 81007 (Botswana statistics, population census;2022), it is a referral point for 8 clinics, which has 45-bed capacity. It has maternity ward, paediatric ward, theatre, general ward admitting different conditions including surgical and an Accident and Emergency department. The A&E unit ha 2-bed space; 1 emergency bed and another for observation.

Masunga Primary Hospital is in the North-East District. It is located in the North-East of Botswana and is 100km from Francistown.it serves an estimated population of 172 769 (Botswana statistics, population census; 2022), is a referral point for 10 clinics and 24 health posts. Which has 50 bed capacity. The hospital has maternity ward, general ward, theatre, OPD/A&E. The A&E unit has 1-bed space for examination.

The average of trauma and emergency condition cases for the three primary hospital is 6.9% with an average percentage mortality rate of 6.5% a year (see table 1). All the three primary hospitals in Tutume and North-East districts were chosen as study sites to allow for a balanced and comprehensive understanding of patient-centred ENC from a diverse patient population. This provided a greater range of data and ideas for enhancing ENC. Therefore, this gave all facilities and their patients in the two districts an opportunity to contribute to and benefit from the study. Additionally, the inclusion of the three hospitals had increased the number of respondents in the study which was important in providing a strong and more reliable results and to increase more precise outcomes.

### **3.3 Study Population**

The study population were nurses working in primary hospitals in Tutume and North-East District, Botswana.

#### **3.3.1 Target population**

The target population for the study were all nurses working in emergency departments of the three primary hospitals selected for this study.

### **3.3.2 Accessible population**

The study targeted to collect data from an accessible total number of 47 nurses: 27 nurses at TPH A&E and Gweta Primary Hospital in Tutume District and 20 nurse at Masunga Primary Hospital in North-East District.

### **3.4 Sampling Technique**

This study employed a census sampling method, which involves including all eligible participants rather than selecting a subset through random sampling techniques. The census method was chosen to ensure comprehensive representation of all nurses providing emergency care in primary hospitals within Tutume and North-East Districts, Botswana. Given the relatively small population size of emergency nurses in these districts, the census approach eliminated sampling bias and ensured that all relevant perspectives were captured, enhancing the study's generalizability within the context of these healthcare settings.

All nurses working in the emergency departments of the selected primary hospitals were invited to participate, provided they met the inclusion criteria. The census method was particularly suitable for this study because it allowed for a complete dataset, minimizing the risk of sampling error that may arise from selecting only a portion of the population (Etikan and Bala, 2017). While the census method enhances data reliability and validity, potential challenges that were envisioned included non-response bias and workload constraints. To address these, efforts were made to maximize response rates through repeated follow-ups and flexible data collection schedules.

### **3.5 Sample Size Determination**

Due to the small population, a census was used and therefore the sample size was 52 at the time of data collection from the initial anticipated number of 47, this was due the transfers-in that took place. The sample size was determined based on various factors, including the study objectives, research design and statistical considerations. Choosing an appropriate sample size was crucial for ensuring the study has sufficient statistical power to detect meaningful effects. This was particularly important in small populations where excluding even a few individuals can significantly affect the results (Polit and Beck, 2017; Creswell and Creswell, 2018). It was on this premise that all nurses available during data collection constituted the sample size in order to provide sufficient statistical power. This is how the 52 participants were distributed:

Tutume Primary Hospital had 17 respondents, Masunga Primary Hospital 18 and Gweta Primary Hospital 9. Then the total number of respondents was 44.

### **3.6 Inclusion and Exclusion Criteria**

#### **3.6.1 Inclusion Criteria**

A total of 44 nurses working at A&Es, consented to participate in the study were included. All nurses working full-time regardless of whether they were employed on permanent and working on contract basis were included in the study because they all provide ENC and thus this provided a complete picture of their practices. All nurses were registered with NMCB. Nurses should have worked for 6 months or more, it was believed that they would have been oriented to all the processes and standard of operation concerning the unit and therefore, have the knowledge and skills for effective practice.

#### **3.6.2 Exclusion Criteria**

The study excluded three nurses who were not available during data collection due to Annual leaves.

### **3.7 Data Collection Tool and Technique**

#### **3.7.1 Data collection tool**

A structured questionnaire was used to collect data after obtaining permissions from all relevant authorities. The questionnaire schedule had four sections, which included socio-demographic characteristics, provision of patient-centred ENC; knowledge of ED nurses on emergency care which include trauma and emergency conditions according to systems, awareness of SOPs and availability of essential equipment. The Cronbach alpha for the adopted tool is  $\geq 0.7$ .

An adapted edited version of the data collection tool, validated questionnaire developed by Rominski et al. (2011), was used to obtain data on socio-demographic characteristics and objectives 1,2 and 3 of the study which sought to establish the provision of patient-centred ENC by nurses, knowledge of nurses on ENC and availability of SOPs at three Hospitals in Tutume and North-East Districts Botswana respectively. Another validated equipment checklist developed by the WHO (WHO/HPW/CPR/2003; WHO Generic Essential Emergency Equipment List” was used to measure objective no 4 focusing on availability of

essential equipment. The adapted questionnaire had 4 sections and for this study, section 4 was adapted and included SOPs, effective communication and IPC measures. The questionnaire was developed to primarily assess the educational needs of Emergency nurses.

Several researchers in different countries have used the self-perceived competency level questionnaire and including Rominski et.al (2011) in Ghana whose study focused on Skills and educational needs of accident and emergency nurses in Ghana; an initial needs analysis. The self-perceived competency level questionnaire was also used in Kenya by Ndung'u et.al (2022) who conducted a Cross-sectional Study of Self-Perceived Educational Needs of Emergency Nurses in Two Tertiary Hospitals in Nairobi. It is noteworthy that the questionnaire was also applied in sub-Saharan Africa where Botswana is also found, Dulandas and Brysiewicz (2018) conducted a study on A description of the self-perceived educational needs of emergency nurses in Durban, KwaZulu-Natal, South Africa.

The adapted questionnaire had 3 sections. The first section constituted of nurses' socio-demographic data (1-6). Section 2 of the questionnaire has questions on provision of effective ENC which has a three-point Likert scale; less competent, competent and highly competent column, where a circle will be placed based on the response to the assigned number in the box. Less competent will reflect nurses who struggle with basic emergency procedures often requiring supervision, competent reflecting the ability or demonstrating adequate skills, effectively managing common cases but has gaps in advanced competencies and a highly competent column which reflect that nurses excels in both basic and advanced procedures, manages complex cases, able to utilizes the resources around adequately and effectively under high pressure environment.

While on the other hand section 3 was on knowledge of nurses on ENC conditions according to systems. The section has a Likert scale with disagree, neither agree nor disagree and agree, assigned 1,2 and 3 in each box where the nurse will circle to base on their response respectively. Selecting "disagree" indicates that the nurse is not interested in learning more about the specified topics. This could mean that they already have sufficient knowledge in these areas or that they do not consider these topics to be a priority for their learning needs. Choosing "neither agree nor disagree" suggests that the nurse is neutral or undecided about their desire to learn more about the topics mentioned furthermore selecting "agree" shows that the nurse is interested in learning more about the specified topics. This indicated that they recognize the

importance of these topics and are motivated and would like to expand their knowledge in these areas.

Another tool adapted from WHO “WHO Generic Essential Emergency Equipment List” was used to answer objective 3; to determine the availability of essential emergency equipment in the three Primary Hospital in Tutume and North-East district Botswana. The tool was first created in 2003 and later formatted in 2012. The tool will have a Yes or No columns where a tick will be placed based on the response. The Yes will reflect the presence of a particular equipment and a No reflect the absence of that particular equipment. A nominal scale was used for scoring whereby a Yes will be assigned 1 and a No a 0 for easy analysis of the results. Additionally, the adaptation will include categorizing essential equipment according to system use and adding advanced equipment and a table for emergency drugs.

All adapted questionnaires/tools were ideal to be used in this study because the adapted components measure the same variables as those in the current study. Additionally, the tools have been used successfully in several studies in countries which are similar to Botswana in terms of region, socio-economic status as they are LMICs in the sub-Saharan Africa. The data collection tool was designed in English because both the researcher and nurses were literate in English. Permission to adapt the tool was obtained from the developers through an online application via email (see appendix 4.7) and was granted.

### **3.7.2 Validity**

To ensure construct and internal validity, an extensive literature review was conducted, which guided the designing of the data collection tool to ensure that only relevant questions about the study variables are included in the questionnaire. Content and face validity was ensured by subjecting the data collection instrument to research supervisors and experts who reviewed the questions to determine whether they elicited the desired responses from the study population. The questions were constructed in a simple, clear, and precise way in order to give respondents a chance to give clear and precise answers. External validity was ensured through the use of census sampling method, enabling all ED nurses at the three sites an equal opportunity to be included on the study to allow the result to be applied to similar set up.

### **3.7.3 Reliability**

Reliability in research is a concept describing how reproducible or replicable a study is. Coefficient alpha or Cronbach alpha was used as a measure of the internal consistency of a set

of questions in a survey (Polit and Beck, 2012, Heale and Twycross, 2015; Ranganathan, Caduff and Frampton, 2024). In general, if a study is repeated and the same results are found, the study is considered reliable. Therefore, to increase reliability, the items were measured for Cronbach's alpha after measuring how the different items complement each other ( $\alpha=0.86$ ). The adapted scales in the interview schedule were checked by determining the correlation between questions on the same factor and see if the responses were consistent. This was achieved by conducting a pilot study at Gweta Primary Hospital in Tutume District, Botswana before the main study to ensure consistency in the results obtained. During the pilot study, participants were asked if there were any questions they did not understand. In addition, privacy was maintained during the interviews to enhance honest responses.

#### **3.7.4 Pilot study**

Pilot study was conducted at three primary hospitals. The researcher used the fixed percentage approach, utilising 10% and 20% rule of determining the sample size for the pilot study. This method was particularly helpful for feasibility testing without overburdening the resources. As a result of the smaller sample size, the start of range (10%) was chosen in this study. Five ED nurses, two from Tutume and Masunga Primary Hospitals, respectively, and one from Gweta Primary Hospital, were the subjects of the pilot project, which accounted for 10% of the estimated total population of 47 ED nurses at the time the proposal was developed. The pilot results were relevant directly informing the research questions, and no changes were made to the instrument following the pilot study.

#### **3.7.5 Data collection technique**

A self-administered Structured questionnaire schedule was used to collect data from the ED nurses tool. The ED nurses in the chosen primary hospitals were given the questions to respond to face to face.

Prior to data collection, a time for an appointment was arranged with the hospital's most senior staff members, or matrons to agree on the time and duration of the activity. The researcher either made this arrangement in person or over the phone. On the first day of data collection, the researcher welcomed the ED nurses, introduced himself, and explain his background. The group was then given an opportunity to introduce themselves. The researcher stated the goal of the study and its subject. Thereafter, the researcher discussed privacy and confidentiality with the ED nurses and reassured them that any information they provided would not be used against them or damage their relationship with their employer. Since the data were needed for academic

purposes and had the potential to help administrators and policymakers make informed decisions, they were informed that participation in the study was entirely voluntary, that participants can withdraw at any time, and that there would not be any consequences or penalties for those who choose to do so.

After reading the information sheet, the responders were encouraged to ask questions if they had any further questions. A signed copy of the informed consent form was distributed; once signed, it was gathered and examined. The researcher then agreed with the ED nurses on the time when they would be free to complete the questionnaire and when to come back to collect the tool. ED nurses were given the questionnaire guide to answer.

On the scheduled date and time of collecting the questionnaire, the researcher gathered the questionnaire one by one from the ED nurses and immediately checked for legibility, completeness and any errors and confirm with them if necessary. The questionnaires were then sealed in an envelope, and coded. Until they were entered into an encrypted and password-protected database, the envelopes were kept by the primary researcher in a lockable cabinet. Each nurse was thanked for their participation at the end of data collection.

Keeping participants informed throughout the study process was essential to preserving their trust and involvement. It took a planned communication approach to inform participants on the findings and advancements of the study. To guarantee informed consent, participants were provided with a comprehensive description of the research goal, aims, process, and any hazards at the beginning of the study. Maintaining regular email and phone contact with research participants to make sure they were informed about the study's progress and feel involved. On a monthly or quarterly basis, there was an ongoing and prompt email update.

### **3.8 Data Management and Storage**

After collecting the data, the researcher processed and analysed the data. The researcher examined the raw data to detect errors and omissions and correct them when necessary and possible. Once the examination of the raw data was finished, the step of encoding followed to clean and classify the raw data into the usable and purposeful category of Excel. Post data collection, the completed questionnaires were kept under lock and key for security and to keep away from unauthorized access to the information gathered in the researcher's cabinet and on a personal password protected computer. The researcher did not in any circumstance falsify data or make claims that were not adequately supported by the results of the research study.

All secondary data sources were properly cited and acknowledged as prescribed by the Harvard referencing style.

### **3.9 Data Analysis**

Data were cleaned by identifying and correcting data entry errors, inconsistencies, and missing data before being analysed. All data from the Likert scale were dichotomized. Data were then coded and entered on excel spreadsheet and exported to Statistical Software Package for Social Science (SPSS) version 27.0 for analysis. Descriptive statistical analysis was used to describe demographic data (age, gender, length of employment, and qualification) and the variables. using frequency tables, means, standard deviation, and percentages. Descriptive analysis allowed the researcher to organize data in a meaningful way (Grove & Gray, 2018). Fisher's Exact test which calculates the exact p-value for a chi-square statistic was used to find the association between the dependent variable (provision of patient-centred ENC) and independent variables (Knowledge of nurses on ENC, availability of essential equipment in A&E department and availability of SOPs in A&E department) since the sample size was small and all variables were categorical in nature. A p-value <0.05 was the threshold for statistical significance and therefore indicated that there was an association between provision of patient-centred ENC and the independent variables. For those variables with a p-value  $\leq 0.05$ , binary logistic regression was used to predict the strength of the relationship between the dependent and independent variables (Grove and Gray, 2018). Use of the logistic regression model provides insights into the relationship between variables, even in small samples (McDonald, 2014). The crude and adjusted odds ratios with a 95% confidence interval were reported to measure the strength of the association between independent and outcome variables. The results of logistic regression were considered statistically significant at p-value <0.05 (Mishra et al., 2019).

### **3.10 Ethical Considerations**

Researcher adhered to various research standards to protect participants and the integrity of the research process (Varkey, 2021). Some of the ethical principles that were adhered to in conducting this study included seeking authority from different relevant authorities, informed consent, participants information confidentiality, privacy and anonymity. Ethical review and clearance were necessary to ensure a balance between risks and benefits of a study and prevent research misconduct.

Ethical approval was obtained from the University of Zambia Biomedical Research Ethics Committee (UNZABREC) (REF. No. 5981- 2024) and Botswana Health Research Development Committee (HPRD:6/14/1). Permission to conduct the study was obtained from the National Health of Zambia and National Health Authority of Botswana. Institutional authority was obtained from the University of Zambia School of Nursing Sciences, Ministry of Health Botswana Research and Development Unit. Permission to conduct the study was obtained in writing from the Tutume DHMT-Coordinator, North-East DHMT-Coordinator, Chief Medical Doctors for Tutume Primary Hospital, Gweta Primary Hospital and Masunga Primary Hospital as well as the Chief Registered Nurses for TPH, Gweta Primary Hospital and Masunga Primary Hospital Accident and Emergency department.

Informed consent is a process by which participants voluntarily confirms his or her willingness to participate in a particular study after having been informed adequately about the study (full disclosure), its nature, the likely risks and benefits. It enables shared decision-making between the participant and the researcher (Varkey, 2021). ED nurses were allowed to voluntarily decide whether to take part on the study or not.

Confidentiality is defined as the ethical and legal obligation of healthcare providers to keep patient's information private and secured (Polit and Beck, 2012; Varkey, 2021). Participants were assured that no information they provided was not shared or published exposing their identity and their data were kept in a strictest confidence. Autonomy (self-determination) was exercised, participants were given the liberty to decide whether to take part in the study or not without coercion (Polit and Beck, 2012).

### **3.11 Conclusion**

This chapter provided research methodology and research design adopted for the study. The study employed a quantitative analytical cross-sectional design to establish determinants of provision of patient-centred ENC at Tutume, Gweta Primary Hospital A&E department, Tutume District, and Masunga Primary Hospital A&E department, North-East District, Botswana. Ethical and cultural considerations were adhered to during research process and described, as well as the research setting, data collection process, data analysis, data management, and data presentation.

## **CHAPTER FOUR**

### **STUDY RESULTS**

#### **4.0 Introduction**

This chapter presents research results based on the analysis of data collected through interviews from ED nurses at selected primary hospitals in Tutume and North-east District, Botswana.

During data collection it was found that there were actually a total of 52 nurses that were accessible (Five respondents were absent from the proposal development head count because they were freshly hired and transferred to the EDs) and therefore, all were included in the main study except for those who participated in the pilot study. A total of 44 respondents were included in the analysis, without any missing cases, thereby achieving a 100 percent response rate. The analysed data have been summarized and presented in line with the study's specific objectives which were to (1) assess the provision of patient-centred ENC (2) determine the level of knowledge on emergency care, (3) examine nurses' awareness of the availability of emergency care SOPs, and (4) assess the availability of essential emergency care equipment. The respondents' socio-demographic characteristics have also been outlined.

#### **4.1 Presentation of results**

The results of this study are presented using frequency tables and charts, and also cross-tabulations and regression odds ratios with corresponding confidence intervals (CI) and p-values for associations between independent and dependent variables considered. Frequency tables have been used for easy reference and comprehension while tables showing results from statistical analysis displays a clear and concise relationship between variables, providing deeper insight into their associations.

#### **4.2 Socio-Demographic Characteristics of Study Respondents**

Table 4.1 below displays the distribution of the respondents' socio-demographic characteristics which were considered in the study. These include age, sex, level of education, marital status, designation, emergency training and work experience. This information was collected because socio-demographic were considered as a variable that could influence the provision of patient-centred ENC among nurses.

**Table 4.1: Respondent's socio-demographic characteristics by facility (N=44)**

| Variable                    | Frequency (%)    |                  |                  | Total (%)       |
|-----------------------------|------------------|------------------|------------------|-----------------|
|                             | Gweta            | Tutume           | Masunga          |                 |
| <b>Age (years)</b>          |                  |                  |                  |                 |
| 20 – 29                     | 1 (12.5)         | 3 (37.5)         | 4 (50)           | 8 (18.2)        |
| 30 – 39                     | 7 (30.4)         | 8 (34.8)         | 8 (34.8)         | 23 (52.3)       |
| 40 – 49                     | 2 (20)           | 3 (30)           | 5 (50)           | 10 (22.7)       |
| ≥ 50                        | 0                | 2 (66.7)         | 1 (33.3)         | 3 (6.8)         |
| <b>Total</b>                | <b>10 (22.7)</b> | <b>16 (34.4)</b> | <b>18 (40.9)</b> | <b>44 (100)</b> |
| <b>Gender</b>               |                  |                  |                  |                 |
| Female                      | 7 (25)           | 9 (32.1)         | 12 (42.9)        | 28 (63.6)       |
| Male                        | 3 (18.8)         | 7 (43.8)         | 6 (37.5)         | 16 (36.4)       |
| <b>Total</b>                | <b>10 (22.7)</b> | <b>16 (34.4)</b> | <b>18 (40.9)</b> | <b>44 (100)</b> |
| <b>Marital status</b>       |                  |                  |                  |                 |
| Single                      | 4 (12.5)         | 12 (37.5)        | 16 (50)          | 32 (72.7)       |
| Married                     | 6 (50)           | 4 (33.3)         | 2 (16.7)         | 12 (27.3)       |
| <b>Total</b>                | <b>10 (22.7)</b> | <b>16 (34.4)</b> | <b>18 (40.9)</b> | <b>44 (100)</b> |
| <b>Education</b>            |                  |                  |                  |                 |
| Nursing diploma             | 6 (22.2)         | 12 (44.5)        | 9 (33.3)         | 27 (61.4)       |
| Nursing bachelor's degree   | 4 (23.5)         | 4 (23.5)         | 9 (53)           | 17 (38.6)       |
| <b>Total</b>                | <b>10 (22.7)</b> | <b>16 (34.4)</b> | <b>18 (40.9)</b> | <b>44 (100)</b> |
| <b>Designation</b>          |                  |                  |                  |                 |
| Registered nurse            | 9 (23.1)         | 14 (35.9)        | 16 (41)          | 39 (88.6)       |
| Principal registered nurse  | 0                | 0                | 1 (100)          | 1 (2.3)         |
| Registered ophthalmic nurse | 0                | 1 (100)          | 0                | 1 (2.3)         |
| Family nurse practitioner   | 0                | 1 (50)           | 1 (50)           | 2 (4.5)         |
| Nursing officer 1           | 1 (100)          | 0                | 0                | 1 (2.3)         |
| <b>Total</b>                | <b>10 (22.7)</b> | <b>16 (34.4)</b> | <b>18 (40.9)</b> | <b>44 (100)</b> |
| <b>Emergency training</b>   |                  |                  |                  |                 |
| Yes                         | 3 (37.5)         | 2 (25)           | 3 (37.5)         | 8 (18.2)        |
| No                          | 7 (19.4)         | 14 (38.9)        | 15 (41.7)        | 36 (81.8)       |
| <b>Total</b>                | <b>10 (22.7)</b> | <b>16 (36.4)</b> | <b>18 (40.9)</b> | <b>44 (100)</b> |
| <b>Type of training</b>     |                  |                  |                  |                 |
| BEC                         | 1 (50)           | 1 (50)           | 0                | 2 (18.2)        |
| BLS*                        | 2 (33.3)         | 1 (16.7)         | 3 (50)           | 6 (54.5)        |
| ACLS*                       | 0                | 0                | 1 (100)          | 1 (9.1)         |
| PALS*                       | 0                | 0                | 1 (100)          | 1 (9.1)         |
| ITLS*                       | 0                | 0                | 1 (100)          | 1 (9.1)         |
| <b>Work experience</b>      |                  |                  |                  |                 |
| ≥6 months < 1 year          | 1 (11.1)         | 3 (33.3)         | 5 (55.6)         | 9 (20.5)        |
| 1 – 2 years                 | 1 (6.6)          | 7 (46.7)         | 7 (46.7)         | 15 (34.1)       |
| 2 – 5 years                 | 3 (33.3)         | 3 (33.3)         | 3 (33.3)         | 9 (20.5)        |
| > 5 years                   | 5 (45.4)         | 3 (27.3)         | 3 (27.3)         | 11 (25)         |
| <b>Total</b>                | <b>10 (22.7)</b> | <b>16 (36.4)</b> | <b>18 (40.9)</b> | <b>44 (100)</b> |

\*Multiple entry

Table 4.1 above shows that 52.3% (23) of the respondents were aged 30 – 39 years; 63.6% (28) were female and 72.7% (32) were single. Most (61.8%; 27) of the respondents had a nursing

diploma. Only 18.2% (8) had received training in emergency care and of these, respondents who had BLS training were the highest with 54.5% (6). A percentage of 34.1 (15) respondents had 1 to 2 years of working experience in the emergency unit.

### 4.3 Provision of Patient-Centred Emergency Nursing Care among Respondents

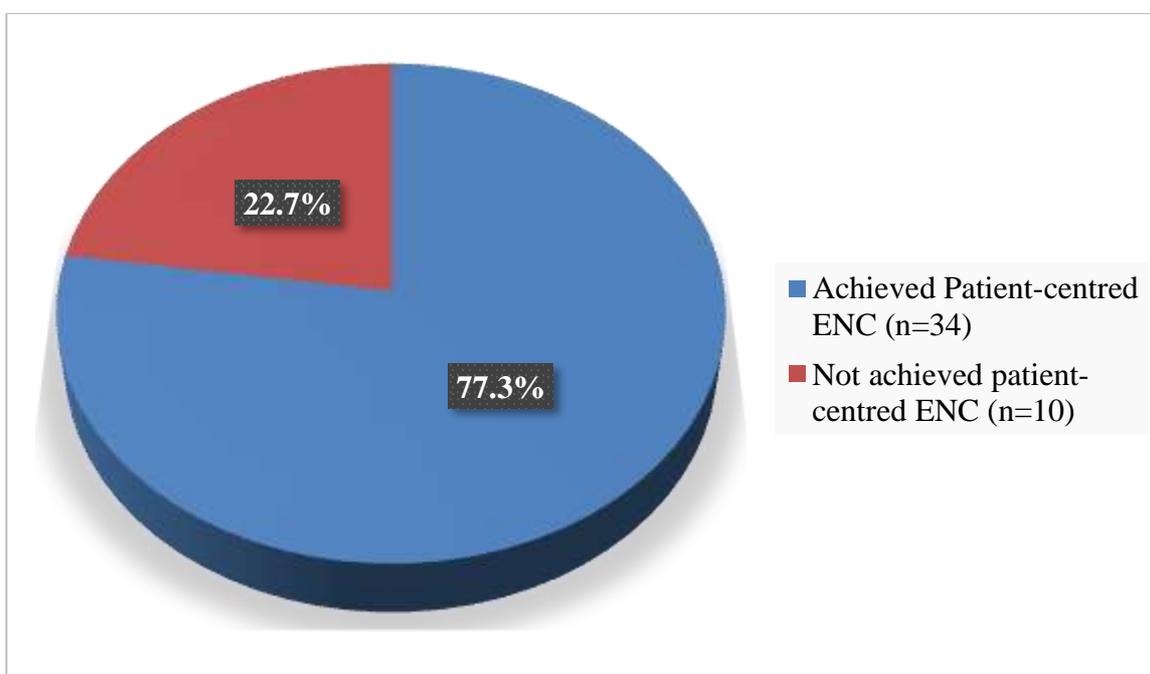
This section shows results of the dependent variable, provision of patient-centred ENC in primary hospitals by assessing parameters such as ability to prepare and assist with endotracheal intubation, administer local anaesthetic and apply sutures, perform cardiopulmonary resuscitation, and perform cardioversion/defibrillation using a validated questionnaire. The section had 14 questions which were scored on a 3- point Likert scale as less competent, competent or highly competent for each question. The aggregated scoring from the scores on these questions were categorised as effective ENC and ineffective ENC following the categorisation prescribed for the variable. Table 4.2 below shows the aggregates and percentages from the Likert scale while figure 4.1 is the summary of these categories.

**Table 4.2: Distribution of respondents' Provision of Patient-centred ENC-related characteristics (N=44)**

| Provision of Patient-centred ENC   | Frequency (%)  |           |                  |
|--|----------------|-----------|------------------|
|  | Less competent | Competent | Highly competent |
| Able to assess breathing: rate, effort, cyanosis   | 2 (4.5)        | 12 (27.3) | 30 (68.2)        |
| Able to administer oxygen: cannula, mask, bag-valve-mask   | 2 (4.5)        | 13 (29.5) | 29 (65)          |
| Able to prepare and assist with endotracheal intubation  | 17 (38.6)      | 22 (50)   | 5 (11.4)         |
| Able to perform needle decompression e.g., pneumothorax  | 28 (63.6)      | 14 (31.9) | 2 (4.5)          |
| Able to assess circulation: pulses, skin colour, capillary refill, blood pressure, signs of bleeding | 2 (4.5)        | 5 (11.4)  | 37 (84.1)        |
| Able to control haemorrhage: apply tourniquet, fracture splint, pelvic wrap                          | 5 (11.4)       | 24 (54.5) | 15 (34.1)        |
| Able to administer local anaesthetic and apply sutures   | 5 (11.4)       | 11 (25)   | 28 (63.6)        |
| Able to manage shock: obtain intravenous/ intraosseous access and administer fluids                  | 3 (6.8)        | 11 (25)   | 30 (68.2)        |
| Able to assess mental status: monitor GCS  | 4 (9.1)        | 19 (43.2) | 21 (47.7)        |
| Able to perform cardiopulmonary resuscitation  | 11 (25)        | 18 (40.9) | 15 (34.1)        |
| Able to obtain and interpret electrocardiograms: detect arrhythmias e.g., atrial fibrillation        | 30 (68.2)      | 9 (20.4)  | 5 (11.4)         |
| Able to prepare and administer drugs in cardiac arrest   | 14 (31.8)      | 17 (38.7) | 13 (29.5)        |
| Able to prepare and administer thrombolytics   | 25 (56.8)      | 10 (22.7) | 9 (20.5)         |
| Able to perform cardioversion/defibrillation   | 31 (70.5)      | 7 (15.9)  | 6 (13.6)         |

Table 4.2 above shows descriptive statistics on the variable, provision of patient-centred ENC. Only significant results from five of Table 4.2's questions are explained. When asked about their ability to assess the breathing status and ability to manage shock, 68.2% (30) of the respondents indicated that they were highly competent and 84.1% (37) stated that they were highly competent in assessing the circulation status of a patient. However, 68.2% (30) of the respondents indicated that they were less competent to obtain and interpret an ECG; and 70.5% (31) were less competent in performing cardioversion/defibrillation.

Overall, 77.3% (34) respondents achieved in providing patient-centred ENC; while 22.7% (10) respondents did not achieve to provide patient-centred ENC as shown in figure 4.1 below.



**Figure 4.1: Overall level of provision of patient-centred ENC among study respondents (N=44)**

#### **4.4 Knowledge on Emergency Nursing Care among Respondents**

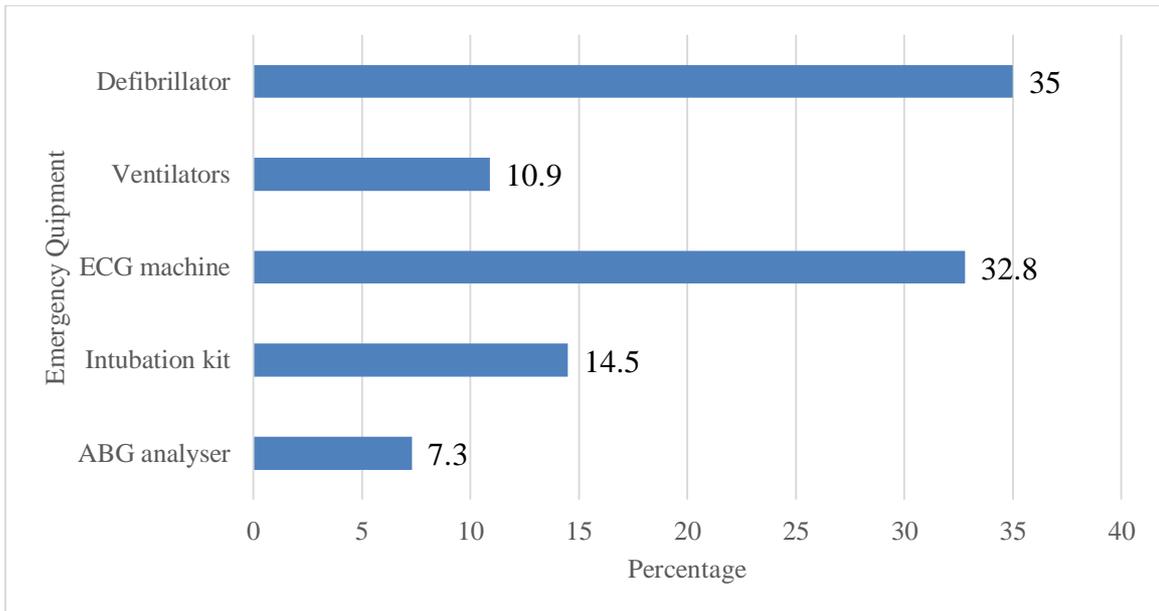
Knowledge on ENC was assessed by measuring four parameters, namely trauma, cardiovascular, neurological and respiratory care, using a validated scale. Trauma is the most common condition seen in ED while the other three parameters represent the vital functions of the human body. The scale had 27 questions on emergency care nursing knowledge scored as agree or disagree for each question. In addition, questions on knowledge of the use of emergency equipment were asked. The aggregated scoring from the scores on these questions was categorised as adequate knowledge level and inadequate knowledge level, following the categorisation prescribed for the variable.

**Table 4.3: Knowledge on trauma, and management of vital body functions (N=44)**

| Emergency Knowledge Scale                         | Frequency (%) |           |
|---|---------------|-----------|
|   | Disagree      | Agree     |
| <b>Trauma care</b>                                |               |           |
| Abdominal trauma e.g., intra-abdominal bleed      | 4 (9.1)       | 40 (90.9) |
| Geriatric emergencies                             | 13 (29.5)     | 31 (70.5) |
| Paediatric emergencies                            | 3 (6.8)       | 41 (93.2) |
| Orthopaedic e.g., fractures, compartment syndrome | 13 (29.5)     | 31 (70.5) |
| Obstetrics/Gynaecology/Pregnancy                  | 18 (40.9)     | 26 (59.1) |
| Spinal Cord Injuries                              | 8 (18.2)      | 36 (81.8) |
| Burns and traumatic injury                        | 8 (18.2)      | 36 (81.8) |
| Ophthalmic (eye) injuries                         | 12 (27.3)     | 32 (72.7) |
| Head injuries e.g., intracranial bleeding         | 3 (6.8)       | 41 (93.2) |
| <b>Cardiovascular care</b>                        |               |           |
| Acute Coronary Syndrome                           | 7 (15.9)      | 37 (84.1) |
| Acute Myocardial Infarctions                      | 5 (11.4)      | 39 (88.6) |
| Arrhythmias                                       | 3 (6.8)       | 41 (93.2) |
| Cardiac Medications                               | 7 (15.9)      | 37 (84.1) |
| Defibrillation / Cardioversion                    | 6 (13.6)      | 38 (86.4) |
| Cardiogenic Shock                                 | 6 (13.6)      | 38 (86.4) |
| <b>Neurological care</b>                          |               |           |
| Stroke  | 11 (25)       | 33 (75)   |
| Intra Cranial Haemorrhage                         | 8 (18.2)      | 36 (81.8) |
| Headaches   | 11 (25)       | 33 (75)   |
| Meningitis  | 12 (27.3)     | 32 (72.7) |
| <b>Respiratory care</b>                           |               |           |
| Arterial Blood Gas Analysis                       | 13 (29.5)     | 31 (70.5) |
| Ventilators                                       | 19 (43.2)     | 25 (56.8) |
| Pneumonia   | 22 (50)       | 22 (50)   |
| Pulmonary Embolism                                | 16 (36.4)     | 28 (63.6) |
| Breath Sounds                                     | 18 (40.9)     | 26 (59.1) |
| Asthma  | 24 (54.5)     | 20 (45.5) |
| Chronic Obstructive Pulmonary Disease             | 18 (40.9)     | 26 (59.1) |

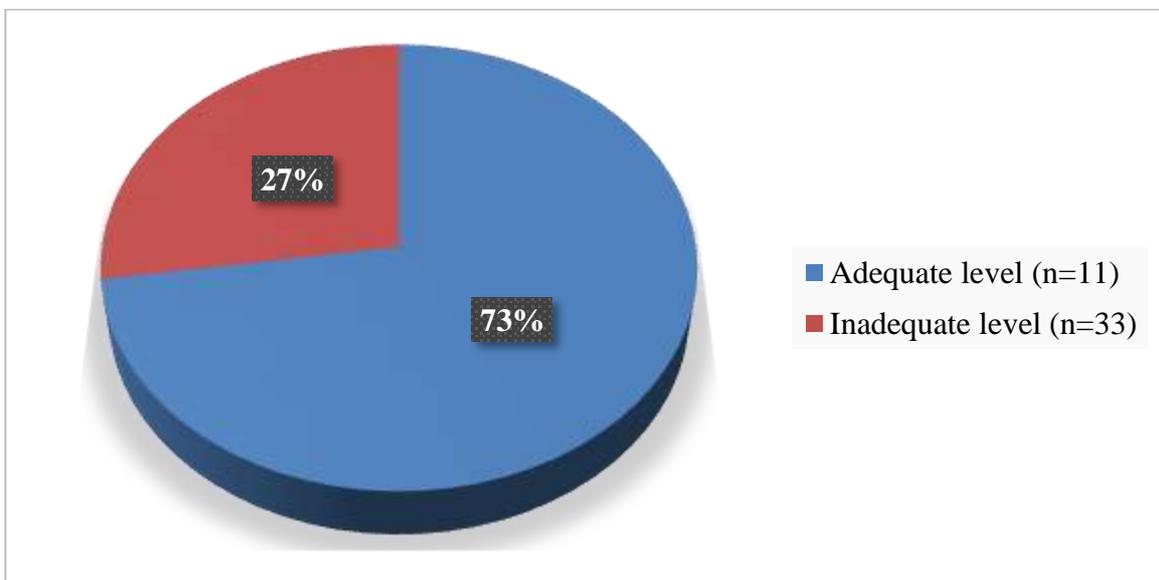
Table 4.3 above shows majority of the respondents were knowledgeable on trauma care, with 93.2% (41) agreeing that they understood paediatric and head injuries trauma care effectively. Similarly, majority of respondents were knowledgeable on cardiovascular care with 93.2% (41) agreeing that they understood how to care for arrhythmias effectively. Majority of respondents were knowledgeable on neurological care with 81.8% (36) agreeing that they understood how to care for intracranial haemorrhage effectively. Further, most of the respondents were knowledgeable on respiratory care with 70.5% (31) agreeing that they understood how to effectively perform ABG analysis.

Concerning knowledge on use of emergency equipment, 35% (16) of the respondents indicated the defibrillator as shown in figure 4.2 below.



**Figure 4.2: Knowledge on use of emergency equipment among respondents (N=44)**

Overall, 75% (33) of the respondents had inadequate level of knowledge on use of emergency equipment as shown in figure 4.3 below.



**Figure 4.3: Overall level of knowledge among use of emergency equipment from study respondents (N=44)**

Most respondents understood much about trauma management (93.2%), cardiovascular care (93.2%), neurological care (81.8%), and respiratory care (70.5%). Nonetheless, 75% of those

surveyed knew very little about how to utilize emergency gear. The respondents' average level of ENC knowledge was 72.7%, which is considered sufficient.

#### 4.5 Availability of SOPs in Emergency Care

This section presents results for respondents on availability of SOPs. The results were derived from assessing the respondents' awareness of SOPs in the ED by using the response options of "Yes or No". The aggregated scoring from the 15 responses were then dichotomized as aware and not aware.

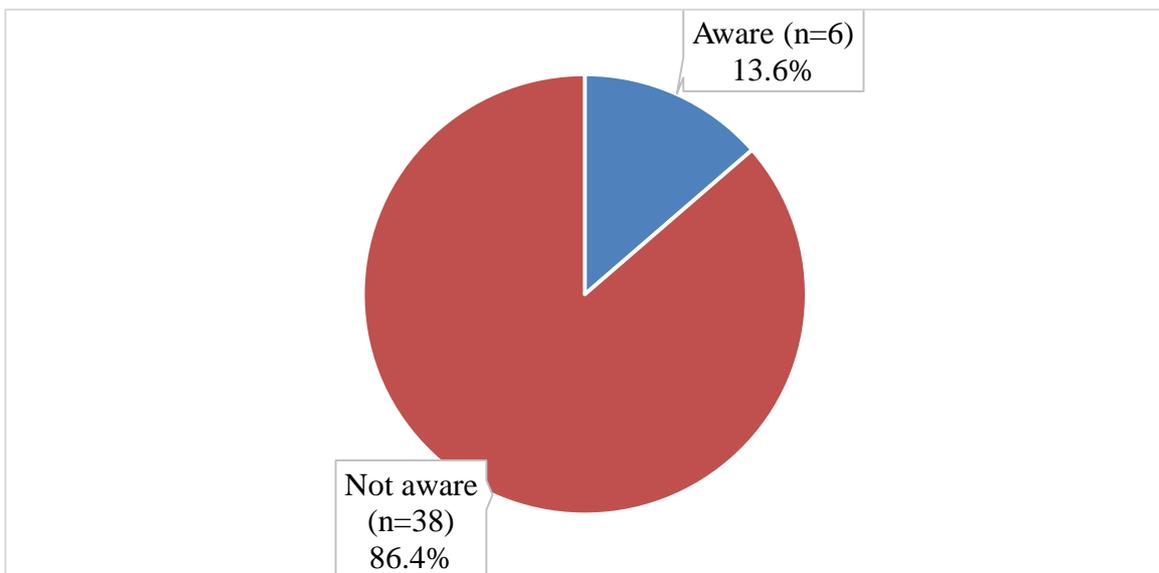
**Table 4.4: Availability of SOPs in Emergency Care (N=44)**

| Variable                                  | Frequency (%) |           |
|---|---------------|-----------|
|   | Yes           | No        |
| <b>Available SOPs</b>                     |               |           |
| Triage                                    | 6 (13.6)      | 38 (86.4) |
| Accident and emergency                    | 7 (15.9)      | 37 (84.1) |
| Infection Prevention and control measures | 10 (22.7)     | 34 (77.3) |
| Effective Communication                   | 9 (20.5)      | 35 (79.5) |
| Advanced cardiac life support             | 3 (6.8)       | 41 (93.2) |
| Paediatric advanced life support          | 5 (11.4)      | 39 (88.6) |
| Pre-hospital trauma life support          | 5 (11.4)      | 39 (88.6) |
| Sexual assault/violence                   | 12 (27.3)     | 32 (72.7) |
| Mental health                             | 15 (34.1)     | 29 (65.9) |
| Pharmacology                              | 8 (18.2)      | 36 (81.8) |
| Disaster/emergency preparedness           | 6 (13.6)      | 38 (86.4) |
| Poisoning                                 | 8 (18.2)      | 36 (81.8) |
| Diabetes emergencies                      | 9 (20.5)      | 35 (79.5) |
| Wound Care                                | 14 (31.8)     | 30 (68.2) |
| Pain Management                           | 12 (27.3)     | 32 (72.7) |

Table 4.4 above showed that when asked about awareness on the availability of SOPs, 86.4% (38) respondents indicated that they were not aware of triage SOPs; 84.1% (37) respondents indicated that they were not aware of accident and emergency SOPs; 93.2% (41) respondents indicated that they were not aware of advanced cardiac life support measures; 88.6% (39) respondents indicated that they were not aware of paediatric advanced life support SOPs and

pre-hospital trauma life support; 86.4% (38) respondents indicated that they were not aware of disaster/emergency preparedness.

Overall, 86.4% (38) of the respondents were not aware of the availability of the SOPs on emergency care as shown in figure 4.4 below.

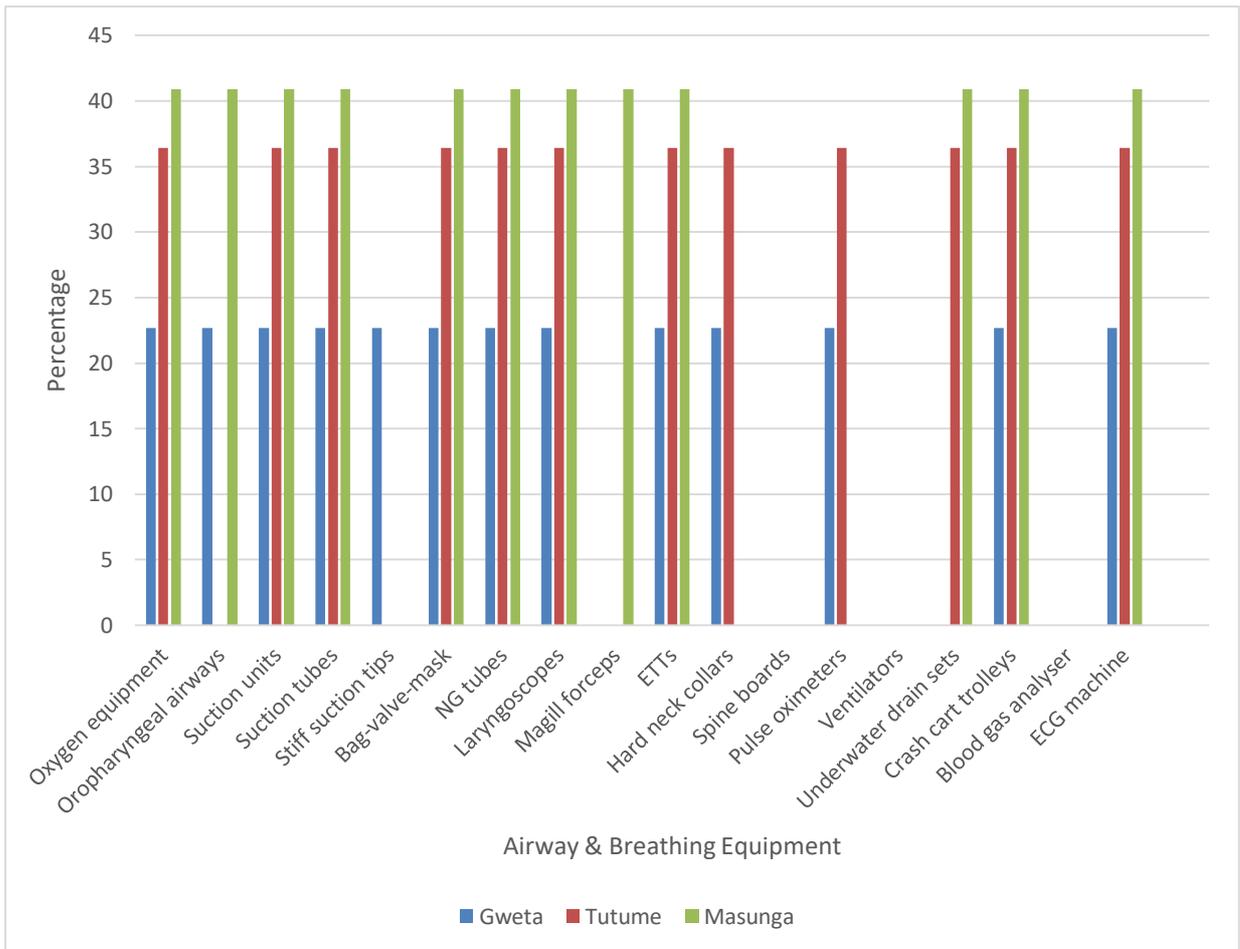


**Figure 4.4: Overall awareness on the availability of SOPs on Emergency Care among respondents (N=44)**

#### **4.6 Availability of Essential Equipment for ENC**

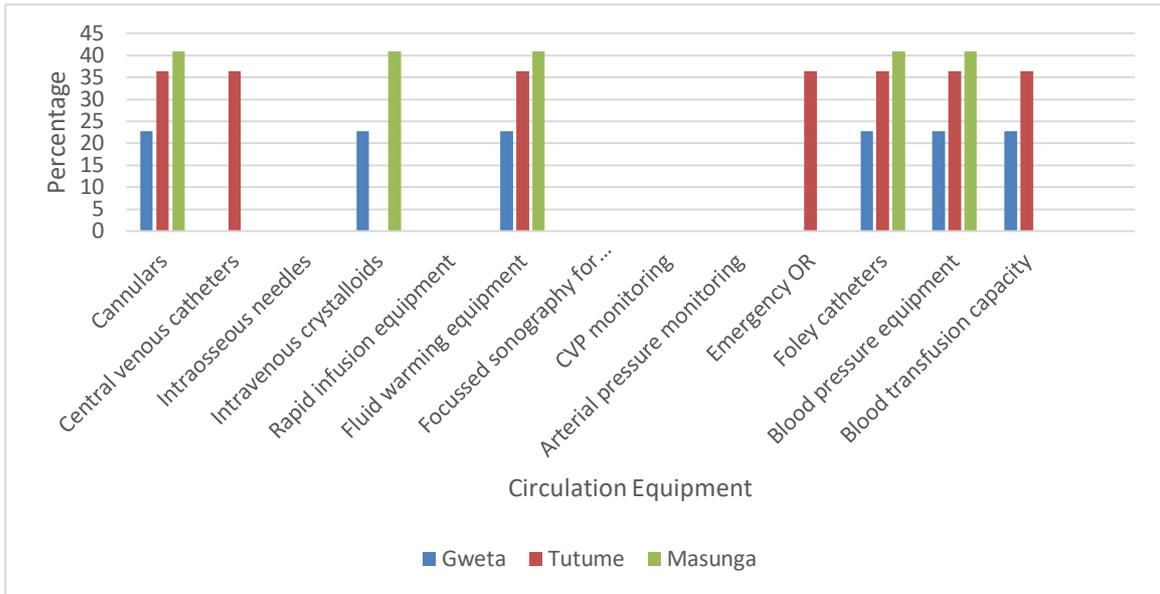
This section presents results on the availability of essential equipment for ENC from the three study settings. The results were derived from three questions assessing the resources for management of airway and breathing problems, circulation problems, and availability of emergency drugs. The aggregated scoring from the questions was then dichotomized as available and not available.

Concerning availability of airway and breathing equipment, most of the equipment were available at all three facilities, only Gweta and Masunga facilities had oropharyngeal airways (63.6%); Gweta had stiff/yankeur suction tips (100%); Masunga had Magill's forceps (100%); Gweta and Tutume had hard-neck collars (59.1%); Gweta and Tutume had pulse oximeters (59.1%); Tutume and Masunga had underwater drain sets (77.3%). While, spine boards, ventilators and blood-gas analyser were lacking from all facilities as shown in figure 4.5.



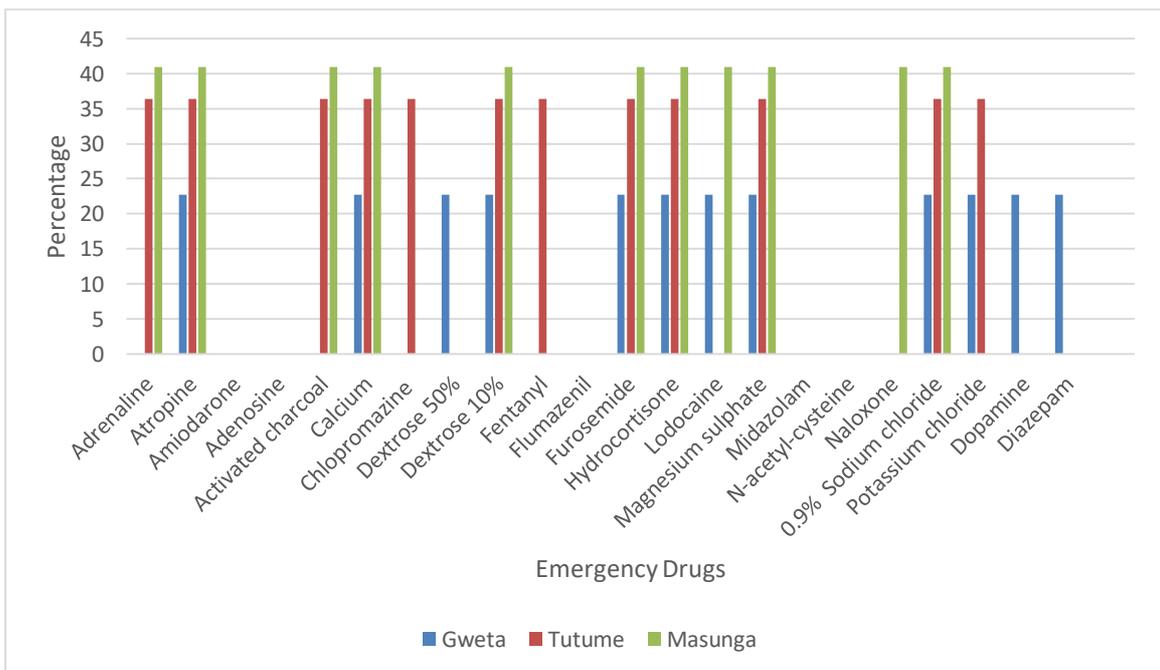
**Figure 4.5: Availability of airway & breathing equipment for ENC at the study sites**

Concerning availability of circulation equipment, only Tutume had central venous catheters (100%); Gweta and Masunga had IVF crystalloids (63.6%); Tutume had an emergency operating room (100%); Gweta and Tutume had blood transfusion capability (59.1%). While, intraosseous needles, rapid infusion equipment, fluid warming equipment, focussed assessment sonography for trauma, CVP monitoring, and arterial pressure monitoring were lacking from all facilities as shown in figure 4.6.



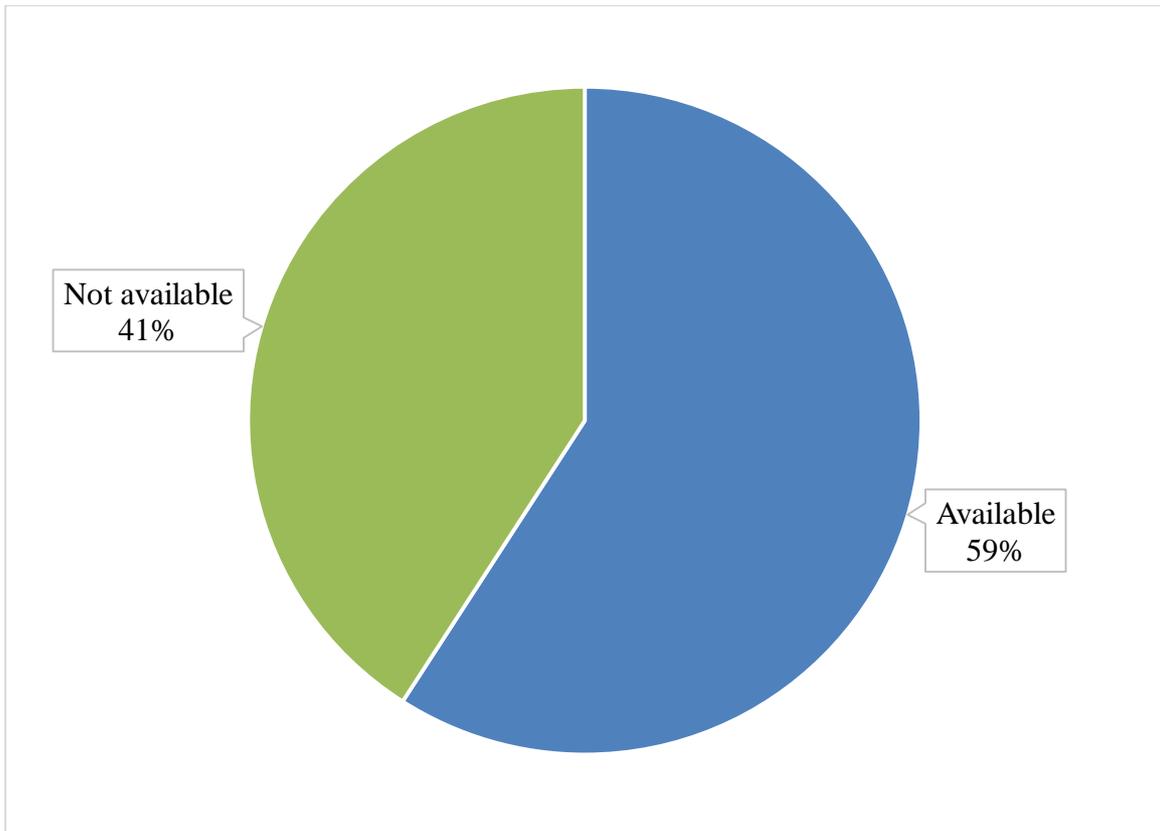
**Figure 4.6: Availability of circulation equipment for ENC at the study sites**

Concerning availability of emergency drugs, only Tutume and Masunga had adrenaline (77.3%); Tutume and Masunag had activated charcoal (77.3%); Tutume had chlopromazine (100%); Gweta had dextrose 50% (100%); Tutume had fentanyl (100%); Gweta and Masunga had lidocaine (63.6%); Masunga had naloxone (100%); Gweta and Tutume had potassium chloride (59.1%); Gweta had dopamine and diazepam (100%). While, amiodarone, adenosine, flumazenil, midazolam, and N-acetyl-cysteine were lacking from all facilities as shown in figure 4.7.



**Figure 4.7: Availability of emergency drugs for ENC at the study sites**

Overall, 59% (26) of the respondents indicated that essential ENC equipment were available in EDs as shown in figure 4.8 below.



**Figure 4.8: Availability of essential ENC equipment at the study sites**

#### **4.7 Chi-Square Test Results of Association Between Variables**

Table 4.5 presents the distribution of respondents' provision of patient-centred ENC across various independent variables. The table shows the breakdown by age group, gender, experience, level of education, training. For each variable, the number and percentage of respondents who were achieved in providing ENC and not achieved are presented. The table also includes the corresponding p-values to indicate the statistical significance of the associations.

**Table 4.5: Chi-square test results of factors associated with provision of patient-centred ENC (N=44)**

| Variable                                       | Provision of ENC (%) |              | Total (%) |
|--|----------------------|--------------|-----------|
|  | Achieved             | Not achieved |           |
| <b>Gender</b>                                  |                      |              | 0.786     |
| Female   | 22 (78.6)            | 6 (21.4)     |           |
| Male   | 12 (75)              | 4 (25)       |           |
| <b>Marital status</b>                          |                      |              | 0.422*    |
| Single   | 26 (81.3)            | 6 (18.8)     |           |
| Married  | 8 (66.7)             | 4 (33.3)     |           |
| <b>Education</b>                               |                      |              | 0.920     |
| Nursing diploma                                | 21 (77.8)            | 6 (22.2)     |           |
| Nursing bachelor's degree                      | 13 (76.5)            | 4 (23.5)     |           |
| <b>Emergency training</b>                      |                      |              | 0.167*    |
| Yes  | 8 (100)              | 0            |           |
| No   | 26 (72.2)            | 10 (27.8)    |           |
| <b>Knowledge level</b>                         |                      |              | 0.692*    |
| Adequate                                       | 8 (72.7)             | 3 (27.3)     |           |
| Inadequate                                     | 26 (78.8)            | 7 (21.2)     |           |
| <b>Awareness on availability of SOPs</b>       |                      |              | 0.310*    |
| Aware  | 6 (100)              | 0            |           |
| Not aware                                      | 28 (73.7)            | 10 (26.3)    |           |
| <b>Availability of essential ENC equipment</b> |                      |              | 0.489*    |
| Available                                      | 19 (73.1)            | 7 (26.9)     |           |
| Not available                                  | 15 (83.3)            | 3 (16.7)     |           |

\*=Fisher's exact test

Table 4.5 above shows that all the independent variables age group ( $p=0.183$ ), gender ( $p = 0.786$ ), marital status ( $p = 0.422$ ), level of nursing education ( $p = 0.920$ ), emergency training ( $p = 0.167$ ), knowledge level ( $p = 0.692$ ), awareness on availability of SOPs ( $p = 0.310$ ), and availability of essential ENC equipment ( $p = 0.489$ ) were not statistically significantly associated with nurses' provision of patient-centred ENC.

#### **4.8 Binary Logistic Regression Results: Factors Associated with Provision of Patient-Centred ENC**

Data analysis was conducted to assess whether age group, gender, education, experience, knowledge, awareness on the availability of SOPs and availability of essential equipment predicts provision of patient-centred ENC. The assumption for running the regression model was that although variables were non-significant in univariate tests (e.g., Fisher's), they may have meaningful effects when adjusted for other confounders. Thus, the model assumes significance testing accounting for multivariate relationships, not isolated associations. Also,

pre-specified variables were retained to prevent overfitting and ensure reproducibility, rather than cherry-picking based on statistical significance. The results are presented in the table below, which shows the Crude Odds Ratios (COR) and Adjusted Odds Ratios (AOR) with their corresponding 95% confidence intervals (CI) and p-values for each variable.

**Table 4.6: Logistics regression results of factors associated with provision of patient-centred ENC (N=44)**

| <b>Variable</b>                                | <b>COR (95% CI)</b> | <b>P-value</b> | <b>AOR (95% CI)</b>    | <b>P-value</b> |
|--|---------------------|----------------|------------------------|----------------|
| <b>Age (years)</b>                             |                     |                |                        |                |
| 20 – 29  | 1                   |                |                        |                |
| 30 – 39  | 6.67 (1.06 – 42.07) | <b>0.044</b>   | 45.69 (1.71 – 1222.39) | <b>0.023</b>   |
| 40 – 49  | 4.0 (0.50 – 31.98)  | 0.191          | 26.21 (0.43 – 1615.65) | 0.120          |
| ≥ 50   | 2.0 (0.13 – 31.98)  | 0.624          | 34.61 (0.24 – 4935.61) | 0.161          |
| <b>Gender</b>                                  |                     |                |                        |                |
| Female   | 1.22 (0.29 – 5.20)  | 0.786          | 0.75 (0.09 – 6.34)     | 0.794          |
| Male   | 1                   |                |                        |                |
| <b>Marital status</b>                          |                     |                |                        |                |
| Single   | 2.17 (0.49 – 9.64)  | 0.310          | 4.99 (0.44 – 56.35)    | 0.194          |
| Married  | 1                   |                |                        |                |
| <b>Education</b>                               |                     |                |                        |                |
| Nursing diploma                                | 1.08 (0.26 – 4.55)  | 0.920          | 6.88 (0.47 – 101.48)   | 0.160          |
| Nursing bachelor's degree                      | 1                   |                |                        |                |
| <b>Work experience</b>                         |                     |                |                        |                |
| < 1 year                                       | 3.0 (0.26 – 35.33)  | 0.383          | 6.66 (0.21 – 210.46)   | 0.282          |
| 1 – 2 years                                    | 1.50 (0.24 – 9.38)  | 0.665          | 3.32 (0.12 – 91.05)    | 0.478          |
| 2 – 5 years                                    | 0.75 (0.11 – 5.11)  | 0.769          | 0.74 (0.03 – 16.47)    | 0.848          |
| > 5 years                                      | 1                   |                |                        |                |
| <b>Knowledge level</b>                         |                     |                |                        |                |
| Adequate                                       | 0.72 (0.15 – 3.44)  | 0.679          | 0.06 (0.002 – 1.45)    | 0.083          |
| Inadequate                                     | 1                   |                |                        |                |
| <b>Awareness on availability of SOPs</b>       |                     |                |                        |                |
| Aware  | -                   | 0.999          | -                      | 0.999          |
| Not aware                                      | 1                   |                |                        |                |
| <b>Availability of essential ENC equipment</b> |                     |                |                        |                |
| Available                                      | 0.54 (0.12 – 2.46)  | 0.429          | 0.23 (0.02 – 2.92)     | 0.256          |
| Not available                                  | 1                   |                |                        |                |

Table 4.6 reveals that only one factor significantly influenced the provision of patient-centred ENC. Age emerged as a significant predictor, with respondents aged 30 – 39 years (AOR: 45.69; 95% CI, 1.71–1222.39; p = 0.023) being 46 times more likely to achieve providing patient-centred ENC compared to those aged 20 – 29 years.e

## **4.9 Conclusion**

This chapter presented research results based on the analysis of data collected from ED nurses at Tutume, Gweta and Masunga Primary Hospitals emergency departments from 2 districts of Tutume and North-East in Botswana. The chapter first described how data were presented, then outlined the descriptive statistics and ended with presenting cross-tabulations and regression odds ratios with corresponding confidence intervals (CI) and p-values for associations between independent and dependent variables considered. The results of this study were presented using frequency tables, charts, and contingency tables in line with the study's specific objectives.

## CHAPTER FIVE

### DISCUSSION

#### 5.0 Introduction

This chapter provides an in-depth discussion of the results on the determinants of patient-centred emergency nursing care in primary hospitals at Tutume and North-East Districts, Botswana. The discussion is structured around the specific objectives, drawing comparisons with existing literature and the Donabedian Structure, Process, and Outcome model that provided a framework for understanding this study. The chapter begins with the sociodemographic characteristics, followed by provision of patient-centred ENC, then knowledge on emergency care, awareness of availability of SOPs, and availability of essential equipment. The chapter then applied the study results to the Donabedian Structure, Process, and Outcome model that provided a framework for understanding and improving ENC delivery in this setting. Finally, the chapter presented the conclusion, the strengths and limitations, the implications of the results to emergency and trauma nursing, recommendations, and the plan for dissemination of results.

#### 5.1 Sociodemographic Characteristics of Respondents

The study examined various sociodemographic in determinants of provision of patient-centred emergency nursing care in primary hospitals within Tutume and North-East Districts, Botswana. The study revealed a predominantly female (63.6%), unmarried (72.7%), and mid-career nursing workforce (52.3% aged 30–39 years), with most holding a diploma (61.8%) and lacking formal emergency training (81.8%). These results align with broader trends in Botswana and similar low-resource settings and other studies in the sub-saharan region by Duko et al., 2019; Phukubye and Mothiba, 2019; Bam et al., 2020; Nshutiyukuri et al., 2020; Twagirayezu et al., 2021 and Salameh et. al.,2021 from Palastine. The overrepresentation of unmarried female nurses in the present study mirrors Botswana's healthcare workforce demographics, where women dominate nursing roles due to sociocultural norms and occupational gender stratification (Keetile and Yaya, 2021; Mamalelala et al., 2023). However, marital status may indirectly influence on job performance and availability for emergency duties though existing studies have not established a strong correlation between marital status and ENC quality (Twagirayezu et al., 2021; Nshutiyukuri et al., 2020). The unmarried/ single nurses often face fewer familial obligations, potentially enabling longer shifts in understaffed emergency units (Rajeswaran et al., 2018).

The predominance of nurses aged 30–39 years reflects retention challenges in Botswana’s rural healthcare system, where younger nurses often migrate to urban centres, leaving mid-career professionals to fill critical roles (Mamalelala et al., 2023; Nkhwalume and Mashalla, 2021). Limited emergency experience (34.1% had 1–2 years) highlights systemic gaps in rotational training and mentorship programs (Nkhwalume and Mashalla, 2021). This lack of experience could hinder decision-making and confidence in managing emergencies, potentially increasing the risk of errors and delayed interventions.

The high proportion of diploma holders (61.8%) in this study aligns with Botswana’s reliance on diploma-level nursing education to meet staffing demands in primary care settings. However, this contrasts with global trends where advanced degrees correlate with improved emergency care outcomes (Mamalelala et al., 2023; Nkhwalume and Mashalla, 2021). While diploma programs provide foundational nursing knowledge, advanced nursing degrees often incorporate critical thinking, advanced assessment skills, and leadership training, all of which are essential in the complex and high-pressure environment of the emergency unit (Dunbar et al., 2019). Only 18.2% of nurses had emergency training, with BLS being the most common (54.5%). This echoes results from Mamalelala et al. (2023), Dithole, and Maripe-Perera (2023), who reported a lack of formal ENC training among emergency nurses in Botswana. The absence of standardized ENC training can result in delays in treatment, increased patient mortality, and dissatisfaction with emergency care services (Afaya et al., 2021). However, gender, marital status, level of nursing education, and nursing experience were not found to be independently associated with provision of patient-centred ENC in this study.

Among the analysed variables, age was found to be statistically significant in the regression model, suggesting that it plays a critical role in determining the quality and efficiency of ENC. The statistical analysis revealed a significant association between age and provision of patient-centred ENC. Nurses aged 30–39 years were significantly more likely to provide patient-centred ENC compared to those aged 20–29 years (AOR: 45.69; 95% CI, 1.71–1222.39;  $p = 0.023$ ). The result that nurses in the 30–39-year age bracket was more likely to provide patient-centred ENC is intriguing and could potentially reflect a combination of factors. Nurses aged 30–39 years were significantly more likely to provide patient-centred ENC, likely due to a balance of clinical experience and physical stamina. Older nurses may have better clinical judgment and practical experience, allowing them to respond more effectively in emergency scenarios.

This is supported by a study by Duko et al., 2019; Phukubye and Mothiba, 2019; Bam et al., 2020; Nshutiyukuri et al., 2020 from Ghana, South Africa and Rwanda, respectively, Chaghari et al., 2017, found that age and experience contribute to enhanced competence in handling critical care situations, though in the current study, experience alone was not a statistically significant factor. This suggests that while younger nurses may possess formal training and updated knowledge, older nurses might demonstrate greater situational awareness and crisis management skills, leading to improved emergency nursing care. This aligns with Mamalelala et al. (2023), who reported mid-career nurses in Botswana demonstrated better CPR performance than younger peers, despite similar training levels. This is also consistent with Benner's "novice to expert" theory, which posits that clinical competence develops gradually through experience and exposure to various clinical situations (Dunbar et al., 2019). The significant relationship between age and patient-centred ENC aligns with existing literature indicating that age often correlates with professional maturity, decision-making abilities, and adaptability to high-pressure situations (Huston et al., 2020). It is, therefore, not unexpected that nurses in this age group demonstrated ENC compared to their younger counterparts.

Contrary to expectations, the level of nursing qualification was not found to be a significant predictor of patient-centre ENC. In many settings, higher levels of education are associated with increased knowledge, skills, and critical thinking abilities, leading to improved patient outcomes (e.g., Aiken et al., 2014; Haegdorens et al., 2019 Duko et al., 2019; Phukubye & Mothiba, 2019; Bam et al., 2020). However, the lack of association observed in this study might be due to factors such as the curriculum content not adequately preparing nurses for emergency situations, limited opportunities for practicing advanced skills in the clinical setting, or other factors (e.g., resources, support) that may play a more critical role. Similarly, the homogeneity of the sample with the majority holding only a diploma may not have provided enough variability to detect a significant difference. This highlights the importance of continuing education, particularly focused on emergent and urgent care that can improve nurses' competence in ENC (Kim et al., 2016).

Furthermore, the study reported that gender and marital status were not significantly associated with patient-centred ENC. While some studies suggest that gender differences in communication styles or decision-making processes may influence patient outcomes (Dall'Ora et al., 2020), the current results do not support this association in the context of Botswana primary hospitals. The non-significance of female gender (AOR: 0.75;  $p = 0.794$ ) challenges stereotypes associating female nurses with better empathetic care. Instead, high patient loads

and resource constraints in Botswana may neutralize gender-based differences (Keetile and Yaya, 2021). Similarly, the lack of association with marital status suggests that this factor does not significantly impact nurses' ability to provide patient-centred ENC.

Furthermore, the lack of association between nursing experience and patient-centred ENC is also surprising, contradicting Ugandan task-shifting models where novice nurses improved outcomes with mentorship (Baine and Kasangaki, 2014). In Botswana, inadequate supervision and protocol adherence may negate experience benefits (Nkhwalume and Mashalla, 2021). However, experience alone may not guarantee proficiency, as motivated nurses with short-term ENC training can acquire sufficient skills to perform effectively (Ndung'u et al., 2022). Thus, while work experience is important, it should be complemented by ongoing training and professional development. Experience is often considered a crucial factor in developing clinical competence, particularly in high-pressure environments like the emergency unit (Yıldız and Ergün, 2020; Twagirayezu et al., 2021; Salameh et al., 2023). One possible explanation for this result might be that the nurses with several years of experience demonstrate significantly higher clinical competency and decision-making abilities compared to those with fewer years of practice (Twagirayezu et al., 2021; Salameh et al., 2023) compared to those who have not received adequate training or exposure to diverse emergency cases or those with less experience who have received targeted education and mentorship (Smith et al., 2016). This discrepancy may stem from Botswana's standardized diploma curricula lacking emergency care specialization (Nkhwalume and Mashalla, 2021; Mamalelala, Dithole, and Maripe-Perera (2023) It is also possible that the relatively small sample size of this study limited the power to detect a significant association.

Overall, these results highlight that age may be a key determinant of patient-centred ENC, possibly due to its association with clinical exposure and decision-making capacity. However, the lack of significance in other sociodemographic factors suggests that institutional and environmental factors, such as training opportunities, workload management, and hospital protocols, might play a more dominant role in ensuring effective emergency nursing care. Future research could explore how training interventions and workplace culture interact with age to shape emergency care outcomes in similar healthcare settings.

## **5.2 Provision of patient-centred emergency nursing care**

Provision of patient-centred ENC is a critical component of healthcare delivery in primary hospitals, ensuring timely and efficient management of life-threatening conditions. The study revealed that majority (77.3%) of respondents demonstrated competency in providing patient-

centred ENC, while 22.7% lacked competency. This result presents a mixed picture, indicating a generally adequate level of perceived competence but also highlighting a significant proportion of nurses who may require further training and support. Similar study by Phukubye and Mothiba 2019 found that 61% knowledge adequacy while among this 30% lacked technical practice. Additionally, a study from Saudi Arabia by Alshatarat et. Al., 2022 participants showed generally high levels of triage knowledge (71.8%) and insufficient knowledge (28.2%). This necessitates a closer look at the factors that contribute to or hinder the provision of patient-centred ENC.

The competency rate observed in this study reflects Botswana's emphasis on emergency nursing education. Mamalelala et al. (2022) noted that nurses in Botswana's primary hospitals who participated in simulation-based training demonstrated 80% accuracy in trauma care, comparable to the 77.3% competency observed in this study. Mamalelala et al. (2023) reported a 72% competency rate among nurses in Botswana after WHO-endorsed emergency care training, emphasizing the role of standardized protocols in enhancing skills like triage and resuscitation. A study by Lojo (2020) reported that nurses with higher levels of self-reported competence in emergency care were associated with lower rates of adverse events. Similarly, a review by Baumann et al. (2018) emphasized that nurse competency leads to quality health care and positive patient outcomes. The need for competent ENC is further underscored by Hoyt et al. (2018), who highlighted the necessity for emergency nurses to possess a broad range of skills and knowledge to effectively manage diverse and often unpredictable patient presentations. Patient-centred ENC decreases the workload for nursing staff because there is a decrease in error and an improvement in patient health (Finkelman et. al., 2017).

On the other hand, other studies have indicated many nurses do not feel prepared to work in the emergency department due to factors such as lack of experience, insufficient training, and the fast-paced environment of the emergency settings (AlRashedi et al., 2022). An integrative review by Morgan and Calleja (2020) conducted in a rural setting noted that confidence of nurses to perform emergency intervention skills was related to frequency of performing the skill, and competency decreased when a skill was performed rarely. A cross-sectional study by Lam et al. (2020) confirmed insufficient knowledge of emergency medicine exists and there is a lack of adequate clinical practice for nurses. In Malawi, Majamanda et al. (2022) reported only 58% competency among emergency nurses despite similar training, attributing discrepancies to inconsistent skill application during high-pressure scenarios. This mirrors the

22.7% non-competency rate in the current study, suggesting that theoretical knowledge does not always translate to practical proficiency.

### **5.3 Knowledge on Emergency Care**

Knowledge is a fundamental aspect of nursing practice, often assumed to directly influence the quality and effectiveness of patient-centred ENC (Alshammari et al., 2019). However, the results of this study revealed that only 25% of respondents had adequate knowledge related to use of emergency equipment and 72.7% of respondents revealed averagely had adequate knowledge in Emergency Care. This is a concerning result; as adequate knowledge both in equipment use and emergency knowledge essential for providing patient-centred ENC. Inadequate knowledge about emergency equipment can lead to delayed intervention, increased errors, reduced team efficiency, low confidence and increased stress. This can also lead to compromise patient care outcomes, leading to longer recovery times or increased deaths. It is a worrying phenomenon because other studies in Botswana also consistently highlight low CPR and emergency care knowledge among nurses. For instance, a study Rajeswaran et al. (2018) found pre-test CPR knowledge scores averaged 48%, with skills deteriorating by 14.5% six months post-training. Similarly, a 2014 evaluation reported that all nurses failed pre-training CPR assessments, underscoring systemic gaps in foundational knowledge (Rajeswaran and Ehlers, 2014). A 2018 audit in Botswana revealed that CPR training improved skills temporarily, but retention was poor without ongoing education (Rajeswaran et al., 2018). This aligns with results from Nigeria, where structural deficiencies (e.g., outdated protocols, knowledge on equipment) hindered knowledge application despite training (Ogunlade et al., 2020). Equipment audits in Botswana showed availability below 50%, indirectly affecting nurses' ability to practice and retain skills (Rajeswaran et al., 2018). Mamalelala et al. (2023) emphasized that inadequate resources undermine confidence, even among trained nurses. Academic qualification correlated with knowledge in some studies (Rajeswaran et al., 2018), but this was inconsistent. A 2023 study in Nepal found nurses lacked algorithm-specific CPR knowledge despite understanding basic concepts (Joshi et al., 2023). Socioeconomic inequalities in Botswana limit healthcare access, indirectly reducing nurses' exposure to complex emergencies and practical learning opportunities (Keetile and Yaya, 2021).

Paradoxically, the current study revealed no significant association between knowledge and provision of patient-centred ENC (AOR: 0.06;  $p = 0.083$ ). Consistent with the results of the current study, AlShatarat et al. (2022) reported that there was no significant difference in triage knowledge and practice according to participants' demographics including gender, job title,

qualification, emergency nursing training, and previous training in triage ( $P > 0.05$ ). This is a concerning result, as adequate knowledge is essential for providing patient-centred ENC. This result is not supported by a study by Sadeghi and Alavi (2018) which revealed that nurses' knowledge of emergency care ( $p = 0.004$ ) was a significant predictor of their performance in emergency situations. Similarly, a study by Li et al. (2019) which found that nurses' knowledge of emergency care was a significant predictor of the provision of patient-centred emergency care. Similarly, a study by Wang et al. (2018) reported that nurses' knowledge of emergency care was a critical factor in the provision of quality patient-centred ENC. However, this result is supported by a study by Zhang et al. (2023) which found that while knowledge was important, it was not the only factor influencing nurses' provision of patient-centred ENC. Other factors, such as experience, skills, and attitudes, also played a significant role. This is in line with a study by Wu et al. (2024) which reported that nurses' experience and skills were more important than knowledge in the provision of patient-centred ENC. The lack of significance of knowledge level on respondents' provision of patient-centred ENC in this study may be attributed to various factors, including the respondents' experience and skills, the availability of resources and equipment, and the quality of leadership and management in the hospitals (Martins et al., 2018).

In Botswana, nurses cited lack of protocols, equipment shortages, and poor hospital leadership as greater impediments than knowledge gaps (Rajeswaran et al., 2018; Rajeswaran and Ehlers, 2014). For instance, prolonged emergency department waits due to administrative delays reduced care efficiency, regardless of nurse competency (Siamisang et al., 2020). Emergency nurses in Botswana reported prioritizing acute care over holistic interventions (e.g., social determinants of health screening) due to high patient volumes (Wood et al., 2024). Similar results in Nigeria highlighted that nurses with adequate knowledge were often unable to comply with triage protocols under time pressure (Ogunlade et al., 2020). Keetile and Yaya (2023) found that poverty and education disparities in Botswana limited patients' access to care, forcing nurses to manage advanced pathologies without adequate preparation. CPR skills deteriorated within months post-training in Botswana, indicating that knowledge retention requires institutional support (e.g., mannequins, simulations) (Rajeswaran et al., 2018; Rajeswaran and Ehlers, 2014). A 2023 study noted that nurses' low confidence in addressing social needs despite recognizing their importance limited proactive care, independent of knowledge (Wood et al., 2024). The Nursing and Midwifery Research Center, Iran University of Medical Sciences, Tehran, Iran, et al. (2022) conducted a research in 2020 in Tehran, Iran, which demonstrated the effectiveness of interventional in-service training and retraining

courses in addressing patient safety concerns. Consequently, ENC training is crucial. Additionally, 2015 Jordanian trial linked simulation-based training to sustained CPR skill improvement (Toubasi et al., 2015). However, such studies often signifies overlooking contextual barriers prevalent in low-resource settings like Botswana.

While knowledge is a foundational component of ENC, its impact is mediated by systemic, organizational, and socioeconomic factors in Botswana. The results indicate that nursing knowledge alone is insufficient to guarantee patient-centred emergency care provision. Instead, practical experience, workplace support, access to resources and ability to utilize emergency equipment, and emergency response training play a more significant role in ensuring high-quality emergency nursing care. These results emphasize the need for integrating competency-based training programmes, hands-on emergency simulations, and continuous learning opportunities to enhance emergency nursing practice. Moreover, hospital administrators should focus on strengthening institutional support systems, ensuring that nurses have the necessary tools, guidelines, and professional mentorship to deliver timely and effective patient-centred emergency nursing care.

#### **5.4 Awareness of Availability of SOPs on Emergency Care**

This section discusses the role of Standard Operating Procedures (SOPs) in shaping patient-centred ENC in primary hospitals in Tutume and North-East Districts, Botswana. SOPs are essential tools in emergency nursing care, providing structured guidelines that enhance clinical decision-making, patient safety, and the standardization of care. The results of this study indicate that only 13.6% of respondents were aware of the availability of SOPs in their hospitals, while 86.4% were not aware, with this results may highlight systemic gaps in policy dissemination and training. The lack of awareness about SOPs among emergency nurses may lead to inconsistencies in care, delayed treatment, and poor patient outcomes. This result is contrary to literature which revealed that SOPs are essential in ensuring that healthcare providers deliver high-quality care, especially in emergency situations where timely and effective interventions are critical (WHO, 2019). Botswana's National Health Quality Standards outline protocols for emergency services, including triage and resuscitation, which are designed to standardize care (Mashalla et al., 2016). However, poor dissemination and lack of training in rural districts contribute to low awareness among nurses (Mamalelala et al., 2023). A 2023 study noted that rigid protocols can hinder nurses' situational awareness in dynamic environments, particularly when patient acuity outpaces resource availability (Takase

et. al., 2023). Conversely, a 2016 systematic review found that SOPs improve guideline adherence in prehospital emergency care, particularly in airway management and triage, by reducing variability in practice (Chen et al., 2016). Similarly, a 2024 randomized trial in China demonstrated that structured protocols reduced treatment delays for chest pain patients by 30% (Zhu and Ding, 2024). Mamalelala et al. (2023) emphasized that SOPs are ineffective without concurrent investments in training and equipment. In Botswana, only 25% of nurses reported access to emergency care refresher courses, exacerbating knowledge gaps. The WHO advocates for SOPs as part of health system strengthening, yet audits in Botswana reveal that compliance monitoring is absent in 80% of primary facilities (Mashalla et al., 2016).

The current study observed no significant association between SOP awareness ( $p = 0.999$ ) and provision of patient-centred ENC, suggesting that systemic barriers overshadow procedural knowledge. It suggests that simply being aware of SOPs does not necessarily translate into their consistent application or improved emergency nursing performance. This is contrary to several studies that highlighted the importance of training and resources in ensuring that healthcare providers can implement SOPs effectively. A study by Sholehah and Holifah (2024) found that the provision of training and resources significantly improved healthcare providers' adherence to SOPs for emergency care. Similarly, a study by Ebben et al. (2022) reported that the availability of resources, including equipment and staff, was critical in ensuring that healthcare providers could implement SOPs for emergency care effectively.

On the other hand, some studies have suggested that the availability of SOPs may not be sufficient to ensure provision of patient-centred ENC, especially in resource-constrained settings. A study conducted at Botswana's Princess Marina Hospital, prolonged emergency department stays (median: 9.6 hours) and overcrowding limit nurses' capacity to adhere to SOPs, regardless of awareness (Siamisang et al., 2020). Siamisang et al. (2020) also observed that hierarchical hospital structures in Botswana discourage nurses from questioning deviations from protocols, perpetuating inconsistent practices. Keetile and Yaya (2023) linked low healthcare utilization in Botswana to poverty and education disparities, which delay patient presentations and complicate SOP-driven care. CPR skills among Botswanan nurses deteriorated by 14.5% within six months post-training, underscoring the need for ongoing education to sustain SOP adherence (Mamalelala et al., 2023). A study by Chen et al. (2016) revealed that despite the availability of SOPs for emergency care, healthcare providers in resource-constrained settings faced significant challenges in implementing them due to lack of resources and infrastructure. The absence of a significant link between SOP awareness and

provision of patient-centred ENC in this study underscores the multifactorial nature of care quality. This highlights the need for policymakers and healthcare administrators to address the underlying systemic challenges that hinder the implementation of SOPs in emergency care.

### **5.5 Availability of Essential Emergency Equipment**

This section discusses the role of essential emergency equipment availability and its influence on the provision of patient-centred ENC. The results of this study revealed that 59% of essential ENC equipment were available at all centres while 41% of essential ENC equipment was not available at all the centres. Furthermore, the availability of essential ENC equipment was not an independent factor on respondents' provision of patient-centred ENC.

The availability of essential emergency equipment is a critical component of patient-centred ENC. The WHO (2019) emphasizes the importance of having functional equipment in emergency care settings to ensure timely and effective treatment of patients. A 2019 audit in Botswana revealed that CPR equipment availability in district hospitals ranged from 19% to 31%, with resuscitation trolleys often lacking airway kits, defibrillators, and updated algorithms (Tsimba et al., 2019). Similarly, the same study noted that only 20.4% of essential resuscitation drugs were available in Botswanan hospitals, with expired medications frequently stored in trolleys (Tsimba et al., 2019). Similarly, a 2023 study highlighted that only 10 out of 40 wards in Botswana maintained CPR algorithms in resuscitation trolleys, and daily equipment checks were limited to critical care units (Mamalelala et al., 2023). This aligns with results from South Africa, where emergency departments faced shortages of airway management tools and monitoring devices with only 67% of listed equipment being available and functional, while 31% was completely unavailable and 2% was available but not working (Pillay et al., 2022). Equipment functionality is compromised by poor maintenance. For instance, a 2022 review emphasized that non-functional defibrillators and oxygen delivery systems were common in African primary hospitals due to inadequate servicing protocols (Hunter et al., 2022). Nurses in Botswana reported that even after CPR training, the lack of manikins and simulation tools hindered skill retention, as noted in a 2014 study (Mamalelala et al., 2023).

The availability of essential emergency equipment is expected to have a significant impact on the provision of patient-centred ENC. However, the results of this study suggest that the availability of essential ENC equipment was not an independent factor on respondents' provision of patient-centred ENC (AOR: 0.23;  $p = 0.256$ ). This is consistent with the findings of a study by Burrows et al. (2019), which found that the availability of equipment was not a

significant predictor of quality of care in emergency departments. CPR skills among Botswanan nurses deteriorated by 14.5% within six months post-training, even in hospitals with adequate equipment, due to infrequent practice opportunities (Tsimba et al., 2019; Mamalelala et al., 2023). A 2014 Ugandan task-shifting model showed that equipping nurses with basic resuscitation tools reduced acute care mortality by 18% (Baine and Kasangaki, 2014). However, such models assume stable staffing and training, which are often absent in Botswana's primary hospitals. On the other hand, several studies have reported a positive correlation between the availability of essential equipment and the quality of emergency care. A systematic review by Rowe and Knox (2023) reported that the availability of essential equipment, including defibrillators and ventilators, was associated with improved patient outcomes in emergency care settings. Another study by Hunie et al. (2020) revealed that the availability of essential equipment, including cardiac monitors and oxygen therapy, was a critical factor in providing high-quality emergency care. The lack of association between the availability of essential ENC equipment and the provision of patient-centred ENC in this study may be due to other factors, such as the competence and experience of emergency nurses, the availability of medications, and the organizational culture of the healthcare facility. Thus, the dominance of mid-career nurses and the insignificance of traditional predictors (e.g., education, gender) underscore the unique challenges of Botswana's emergency care landscape.

## **5.6 Application of Study Results to the Donabedian Structure, Process, and Outcome Model**

The Donabedian model provides a framework for evaluating the quality of care, comprising three components: structure, process, and outcome (Donabedian, 2005). The study results were applied to this model as follows:

**Structure:** This element encompasses the resources and organizational settings in which care is delivered. The study's results that 41% of essential ENC equipment was not available highlights a significant structural deficiency. Addressing this requires investment in equipment procurement, maintenance, and inventory management. Furthermore, the lack of awareness about SOPs suggests a need for improved dissemination and accessibility of these guidelines (Mamalelala et al., 2023). Structural improvements could include providing regular training sessions on the use of equipment and SOPs, ensuring that SOPs are readily available in emergency units, and creating a supportive environment where nurses feel empowered to utilize these resources.

**Process:** This element refers to the actions taken by healthcare providers in delivering care. The study's results that a significant proportion of nurses lacked adequate knowledge related to emergency care represents a critical process-related weakness. Remediating this could require targeted educational interventions, such as continuing professional development programs, mentorship opportunities, equipment-based training and simulation-based training (Mamalelala et al., 2023; Siamisang et al., 2020). Additionally, implementing regular audits of ENC processes can help identify areas for improvement and ensure adherence to best practices.

**Outcome:** This element reflects the impact of care on patient health and well-being. While this study did not directly measure patient outcomes, the results suggest that the existing structural and process-related deficiencies may compromise patient outcomes. Improving equipment availability, enhancing nurse knowledge, and promoting awareness of SOPs are all expected to lead to better outcomes.

## 5.7 Conclusion

This study aimed to establish the determinants of patient-centred ENC in primary hospitals at Tutume and North-East Districts, Botswana, focusing on key sociodemographic and institutional factors. The study revealed a mixed picture regarding the provision of patient-centred ENC. While a significant proportion of nurses (77.3%) were deemed competent, a concerning 22.7% were not. A major gap was identified in knowledge related to emergency care, with 75% of nurses demonstrating inadequate knowledge. The lack of awareness regarding available SOPs was also alarming, with 86.4% of respondents unaware of their existence. Equipment availability was also a notable challenge, with 41% of essential ENC equipment consistently unavailable across the facilities. Age emerged as a significant predictor of competency, with nurses aged 30-39 exhibiting significantly higher odds of providing patient-centred ENC compared to those aged 20-29. As alluded to, this result supports the argument that age-related factors such as professional maturity, stress tolerance, and refined critical thinking skills contribute to better emergency care outcomes (Labrague et al., 2018). However, it is important to note that age alone does not guarantee competence, and younger nurses can achieve similar levels of effectiveness through specific training, mentorship, and structured exposure to emergency scenarios. Other factors such as gender, marital status, education level, experience, knowledge, SOP awareness, and equipment availability were not found to be statistically significant predictors of provision of patient-centred ENC, though the trends suggest potential influences. The non-significance of qualification, experience, knowledge, availability of SOPs and equipment in this study challenges traditional assumptions

that formal education and years of practice directly translate into higher competence in emergency nursing.

In addition, it should be noted that while a majority of nurses are deemed competent, significant knowledge gaps, a lack of awareness of SOPs, and deficits in equipment availability collectively threaten the consistent delivery of patient-centred ENC in these primary hospitals. The age-related difference in competence warrants further investigation and targeted intervention. Moving forward, healthcare systems must embrace evidence-based training approaches and ensure that emergency nursing care is driven by competency, preparedness, and a culture of continuous learning and support.

## **5.8 Implications to Emergency and Trauma Nursing**

The results of this study have significant implications for emergency and trauma nursing practice, administration, education, and research in Botswana and potentially other resource-limited settings.

### **5.8.1 Emergency and trauma nursing practice**

1. **Competency-based training:** The study's findings highlight the need for competency-based training programs to enhance ENC skills, particularly for nurses aged 20-29 years. This could include simulation-based training, mentorship, and peer evaluation to improve ENC skills.
2. **Knowledge updates:** The significant knowledge gap identified in this study underscores the need for regular updates and refresher courses on emergency care, especially for nurses with inadequate knowledge. This could include workshops, conferences, and online courses.
3. **SOPs implementation:** The low awareness of SOPs availability suggests that hospitals should prioritize the development and dissemination of SOPs for emergency care, ensuring that all nurses are familiar with these guidelines.
4. **Equipment availability and maintenance:** The study's results emphasize the importance of ensuring that essential ENC equipment is available and functional at all centres. This requires regular inventory checks, maintenance schedules, and procurement plans.

### **5.8.2 Emergency and trauma nursing administration**

1. **Human resource planning:** The age-related predictor of provision of patient-centred ENC highlights the need for strategic human resource planning, including recruitment and

retention strategies, to ensure an adequate workforce with the necessary skills and experience.

2. Staff development and performance evaluation: Administrators should prioritize staff development opportunities, including training and mentorship programs, to improve ENC skills. Regular performance evaluations should also be conducted to identify areas for improvement.
3. Resource allocation: The study's findings emphasize the need for adequate resource allocation, including budgeting for equipment, training, and personnel, to support patient-centred ENC delivery.
4. Quality improvement initiatives: Administrators should establish quality improvement initiatives, such as quality circles or quality improvement projects, to identify areas for improvement and implement evidence-based practices.

### **5.8.3 Emergency and trauma nursing education**

1. Curriculum review: The study's results suggest that emergency care content should be reviewed and updated in nursing curricula to ensure that graduate nurses have adequate knowledge and skills in patient-centred ENC.
2. Clinical placement and mentorship: Nursing education programs should prioritize clinical placement and mentorship opportunities in emergency care settings to provide students with hands-on experience and guidance from experienced emergency nurses.
3. Continuing professional development: educational institutions should offer continuing professional development opportunities, such as postgraduate diplomas or certificates, to support practicing nurses in enhancing their ENC skills and knowledge.
4. Inter-professional education: educational programs should incorporate inter-professional education and training to promote collaboration and teamwork among emergency care professionals.

### **5.8.4 Emergency and trauma nursing research**

1. ENC skills assessment tools: Researchers should develop and validate assessment tools to evaluate ENC skills, particularly for nurses in primary hospitals, to identify areas for improvement.
2. Knowledge and awareness studies: Further studies are needed to explore the knowledge and awareness gaps in emergency care, including the impact of knowledge updates and SOPs implementation on ENC delivery.

3. Predictors of provision of patient-centred ENC: Researchers should investigate other predictors of patient-centred ENC, including organizational factors, leadership, and teamwork, to provide a comprehensive understanding of ENC delivery.
4. Intervention studies: Intervention studies should be conducted to evaluate the effectiveness of training programs, SOPs implementation, and resource allocation on ENC delivery and patient outcomes.

## **5.9 Recommendations**

### **5.9.1 To the Ministry of Health**

1. The Ministry of Health should develop and implement policies that prioritize ENC, including the development of national guidelines and standards for emergency care provision.
2. The government should allocate resources to support the development of emergency care infrastructure, including equipment and facilities.

### **5.9.2 To Stakeholders**

3. Regulatory bodies should ensure that nursing education programs include comprehensive training in emergency care, and that nurses are certified to provide emergency care.

### **5.9.3 To Tutume, Gweta and Masunga Primary Hospitals**

4. Healthcare administrators and nurse managers should prioritize training and capacity-building programs for ENC, focusing on knowledge gaps and skill development.
5. SOPs should be developed, disseminated, and regularly updated to ensure consistency in emergency care provision.
6. Emergency care equipment should be regularly inventoried, maintained, and replaced to ensure availability and functionality.
7. Mentorship programs should be established to support nurses aged 20-29 years, who may require additional guidance and support.

### **5.9.4 For Future Research**

8. A qualitative study should be conducted to explore the experiences and challenges of nurses providing emergency care in primary hospitals, to identify areas for improvement.
9. A comparative study should be conducted to compare the provision of emergency care in primary hospitals with that in secondary and tertiary hospitals, to identify best practices and areas for improvement.

10. An intervention study should be conducted to evaluate the effectiveness of training programs on emergency care provision, to inform policy and practice.

### **5.10 Plan for Dissemination and Utilization of Results**

The study results will be disseminated to different stakeholders to promote the implementation of the recommendations that will be made. Hard copies of the research report will be submitted to the UNZA School of Nursing Sciences and Main Library in order to contribute academic information and enrich students learning experiences. A hard copy will also be presented to the Ministry of Health (Botswana), to inform policymakers in the ministry who are expected to implement evidence-based decision-making in enhancing provision of provision of patient-centred ENC in Botswana. This could lead to a potential improvement in nursing care for ENC. Summary reports will be submitted to the Tutume DHMT- Coordinator's office and North-East- Coordinator's office and respective primary hospitals so that health care providers can have access to evidence-based information that they can utilize to enhance ENC for patients in need of emergent care.

Soft copies will be published in peer-reviewed journals, and potentially, publication would be made with the International Journal of Nursing and the African Journal of Emergency Medicine (AFJEM) to share the knowledge that could effectively be used in similar settings to improve patient outcomes in emergency care. Additionally, this could help ensure that the study is evaluated by experts in the field of emergency care and research to validate its scientific integrity. Publishing in journals could also help contribute to the results being accessed by other researchers globally, thereby contributing to the body of knowledge in ENC.

Study results will also be presented at academic and professional scientific conferences, such as the University of Botswana, Botswana Society of Emergency Care (BSEC), African Federation for Emergency Medicine, AFRE-health, ECSACON, Emergency and Trauma Nurses Association, and Critical Care Nurses Association annual conferences. This could help the researcher network with other researchers, discuss study findings, and receive feedback, which could help identify areas for improvement in conducting a study. Regional conferences can facilitate the sharing and discussion of study results related to provision of patient-centred ENC within the region with focus on similar aspect. This could help in improving ENC regionally.

## **5.11 Study Strengths and Limitations**

### **5.11.1 Strengths**

The study strengths include; the use of appropriate statistical methods allowed for the identification of significant predictors of provision of patient-centred ENC. Further, the study was conducted in a specific context (Tutume and North-East Districts, Botswana), making the findings directly relevant to healthcare policymakers and providers in that region. Furthermore, the study identifies areas for improvement, including the need for training and capacity-building programs, development of SOPs, and provision of essential equipment.

### **5.11.2 Limitations**

The study limitations included, limited generalization: this study was limited to three primary hospitals and this may restrict the generalization of results to other primary hospitals in Botswana with similar healthcare infrastructure, patient demographics, and emergency care challenges. The results can also be applicable to rural healthcare settings in sub-Saharan Africa where resources and training levels of nurses may be similar. The researcher provided comprehensive details about the study context, methodology, and limitations to help other researchers and practitioners assess the applicability of the findings to their settings. Reduced statistical power: the small sample size may have resulted in reduced statistical power, making it harder to detect significant differences or relationships. To increase the statistical power, tests that were appropriate for small sample size were used and included Fisher's Exact test and Binary logistic regression. This study was self-assessed and no actual measurement of competence or knowledge and skills were performed.

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## APPENDICES

### Appendix I: Time Line

| Activity                               | Feb | Mar | April | May | June | July | Aug | Sep | Oct | Nov | Dec | Jan | Feb |
|--|-----|-----|-------|-----|------|------|-----|-----|-----|-----|-----|-----|-----|
| Proposal writing                       |     |     |       |     |      |      |     |     |     |     |     |     |     |
| Submission of proposal to ethics       |     |     |       |     |      |      |     |     |     |     |     |     |     |
| Ethical clearance                      |     |     |       |     |      |      |     |     |     |     |     |     |     |
| Data collection and entry              |     |     |       |     |      |      |     |     |     |     |     |     |     |
| Data analysis and dissertation defense |     |     |       |     |      |      |     |     |     |     |     |     |     |
| Writing of final report                |     |     |       |     |      |      |     |     |     |     |     |     |     |
| Submission of finding                  |     |     |       |     |      |      |     |     |     |     |     |     |     |
| Dissemination of results               |     |     |       |     |      |      |     |     |     |     |     |     |     |

## Appendix II: Budget

| Nature of Expenditure/ Item                   | Quantity                                | Amount<br>Kwacha | in<br>Botswana<br>Pula (BWP) |
|---|---|------------------|------------------------------|
| <b>Direct costs</b>                           |   |                  |                              |
| Personnel                                     |   |                  |                              |
| Research Assistants Stipend (at each site)    | K500 per person /day×3×3                | K4500            | P2250                        |
| <b>Personnel Subtotal</b>                     |   | <b>K4500</b>     | <b>P2250</b>                 |
| Material and Supplies                         |   |                  |                              |
| 1. A4 papers                                  | 3*450                                   | K1350            | P675                         |
| 2.stappler                                    | 1                                       | K100             | P50                          |
| 3.stapples                                    | 1 box                                   | K50              | P25                          |
| 3 Pens  | 1 box                                   | K300             | P150                         |
| 4 Communication/<br>Internet/Photocopying     |   | K1500            | P750                         |
| 5 software (SPSS)                             |   | K2000            | P1000                        |
| <b>Sub-total material and supplies</b>        |   | <b>K5300</b>     | <b>P2650</b>                 |
| Data collection costs                         |   |                  |                              |
| International                                 |   |                  |                              |
| 1. Zambia to Botswana (to and from) by Flight | K3800*2 trips                           | K7600            | P3800                        |
| Local transport (between research sites)      |   |                  |                              |
| 1. Tutume                                     | K60 per day *3                          | K180             | P90                          |
| 2. Tutume to Gweta Accommodation              | K220 per Day*2(500*2 for accommodation) | K1440            | P720                         |
| 3. Tutume to Masunga                          | K160 per day *2+(500*2night)            | K1320            | P660                         |
| <b>Travel sub-total</b>                       |   | <b>K10540</b>    | <b>P5270</b>                 |
| <b>Other Direct Costs</b>                     |   |                  |                              |
| UNZABREC clearance costs                      | K1500                                   | K1500            | P750                         |
| National Health Research Authority            | K2040                                   | K2040            | P1020                        |
| <b>Subtotal Other Direct Costs</b>            |   | <b>K3540</b>     | <b>P1770</b>                 |
| <b>Indirect Costs (Miscellaneous)</b>         |   | <b>K1500</b>     | <b>P750</b>                  |
| TOTAL   |   | K27380           | P13690                       |
| Contingency (10% of total)                    |   | K2738            | P1324                        |
| <b>GRAND TOTAL</b>                            |   | <b>K30118</b>    | <b>P15059</b>                |

### Budget Justification

The budget was a narrative description of all expenses included in the budget form. Funding in the amount of K30118/ P15059 is requested for this research project.

#### 1. Personnel

Funds are requested to support the research assistant stipend to compensate for their time. The researcher's role will be to oversee project activities. Being responsible for supervision to the stipend in issuing and collection of data collection tools, checking the completeness of the tool, coding and to instruct the research assistant to seek clarification where they don't understand during the process of data collection. Also, to compile the reports make analysis.

## 2. Material and supplies

The fund proposed for the project were utilize for quantitative data requiring specialized analyzing software. Funding for K2000 is requested for SPSS version 26 will be installed in the laptop for the researcher to use. K1500 was used for photocopying and printing surveying instruments, research proposal document was sent to UNZABREC, consent forms, letter for requesting authorization to conduct the survey, also in this amount it was to carter for communication purpose for making appointments and follow up via mails or direct calls. K1350 was requested for A4 plain papers used for survey instruments, consent form, letters, proposal document printing. Staples for binding the papers and pens for nurses to use during data collection.

## 3. Travel:

International trips: funds in the amount of K7600 used for Flight from Zambia (Lusaka) to Botswana (Francistown) to collect data. The researcher took trips from Zambia to Botswana. After data collection the researcher travelled back to Zambia for data analysis and data presentations.

Domestic travel: funds were requested in the amount of K2940. The first trip was from Francistown to Tutume village, for pilot study at Tutume Primary Hospital A&E. The researcher took 6 local trips with a Tax, trip from Tutume to Gweta village (Gweta Primary Hospital) with 4 local trips, then Gweta to Masunga village (Gweta Primary Hospital) with 4 local trips, 2 nights spent on hotel at Gweta and Masunga respectively.

| <b>Category</b>                        | <b>Amount</b> | <b>Description</b>             |
|--|---------------|--------------------------------|
| Hotel                                  | K2000         | 500/night for 4 nights         |
| <b>Road trips</b>                      |               |                                |
| Tutume local                           | K280          | Taxi fares                     |
| Tutume-Gweta                           | K120          | K120 /trip by bus              |
| Accommodation                          | K1000         | K500/night for 2 nights        |
| 1.Local trips                          | K180          | K30/trip for 6 trips           |
| Gweta- Masunga                         | K160          | K160/trip by bus               |
| Accommodation                          | K1000         | K500/night for 2 nights        |
| Local trips                            | K180          | K30/trip for 6 trips           |
| <b>International</b>                   |               |                                |
| Zambia (Lusaka)–Botswana (Francistown) | K7600         | K3800/ trip for 2 flight trips |
| Total                                  | K12520        |                                |

## 4. Other direct costs:

K2040 funds used for National Health Research Authority registration and certification of researcher. The board promote research, coordinate research, capacity building, knowledge transition and research advisory. Furthermore, to ensure the development of consistent health research standards, guides and protect right, dignity of research participants. K1500 used for UNZABREC for obtaining ethical clearances.

5. Indirect Costs (miscellaneous):

Funds requested is K3000 for administrative costs things that will be found appropriate. Also support staff refreshments.

## **Appendix III: Participant Information Sheet**

### **Research Project**

**Title:** DETERMINANTS OF PATIENT-CENTRED EMERGENCY NURSING CARE IN PRIMARY HOSPITALS AT TUTUME AND NORTH-EAST DISTRICTS, BOTSWANA.

**Investigator:** Ubepo Josepher Mafolo

### **Introduction**

I am Ubepo Josepher Mafolo doing Master of Science in Emergency and Trauma Nursing science at the University of Zambia, School of Nursing, Lusaka, Zambia. I am researching on “Determinants of provision of patient-centred Emergency Nursing Care by nurses at Tutume, Gweta Primary Hospital in the Tutume District and Masunga Primary Hospital in North-East District, Botswana.

This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have a question, you can ask even later.

### **Background and rational for the Study**

As a nurse working in Tutume Primary Hospital, the daily duty includes provision of patient-centred emergency nursing care (accurate patient triage, effective communication with patients and amongst colleagues), conduct several procedures to save lives, which includes patient assessment, ordering investigations, interpretation of results, and giving drugs for patient in an emergency.

### **Purpose**

The focus of this study is therefore; to establish the determinants of patient-centred ENC at three Primary Hospitals in Tutume and North-East District, Botswana.

This study was further intended to assess the provision of patient-centred ENC, to determine the level of knowledge among nurses providing emergency nursing care, to examine the nurses’ awareness of the availability of emergency care SOPs and assess the availability of essential emergency care equipment at selected primary hospitals in Tutume and North-East Districts, Botswana. However, by addressing the objectives the study seek to contribute to the body of knowledge to policymakers and administrators to make informed decisions about A&E resources allocation and the development of a defined scope of practice for emergency nurses. This will enhance the delivery quality of care.

### **Procedure**

You are requested to take part in a survey once you agree to participate in the study with information in your hospital about the provision of patient-centre emergency nursing care, if you volunteer to be part of the study, you will be asked to sign a consent form and answer a questionnaire. The questionnaire will be self-administered directly in person at the comfort of the participants by answering a questionnaire that will approximately last 25-30 minutes but the research takes place over 2 weeks (14 days).

**Who will participate in the study?**

Nurses working in EDs of the three hospitals (TPH, Gweta Primary Hospital and Masunga Primary Hospital)

**Uses of Information:** the information we shall get from you will be used to help in making decisions by the hospital management, district and policymakers.

**Risk and discomforts:**

The researcher guarantees that there are no significant dangers or discomforts associated with the study and that it will not interfere with any nurses' ability to complete their shift duties.

**Benefits:**

You as a participant will not directly gain materially from this study. Nonetheless, the information gathered will enable better healthcare service delivery in TPH, Gweta and Masunga Primary Hospital A&Es, improving patient outcomes and hospital performance.

**Alternatives:**

Voluntary Participation and the right to withdraw: You are under no obligation or duress to participate, so please be aware of that. Should you choose to participate in the research, you will be required to sign the consent form attached

**Cost**

The participation will not incur any cost during the conduct of the study.

**Compensation for participation in the study**

There is no compensation for participating in the study. However, participants injured during the course of the study will be assisted, it will be the responsibility of the study to ensure that the participant receives medical assistance and optimal care. Participants who may suffer permanent damage will be ensured that the participant receives necessary medical attention and cover all medical expenses related to the injury.

**Reimbursement**

The study will take place in the EDs of the three Primary hospitals in the two Districts and no cost will be incurred by participants.

**Statement of voluntariness**

Participation in this study is completely voluntary. You are free to stop participating in the study at any time and or leave the study without feeling an obligation to continue. Furthermore, you are not required to give a reason for quitting the study.

**Confidentiality**

Any disclosed information will remain private. We promise not to use your names in any study, data-collecting instrument, or data-gathering. The completed questionnaire and checklist will be deleted after the study and inaccessible to anybody other than the research team.

### **Questions about participant's rights**

Participants who have questions about their rights as research participant can have their queries addressed to the contact provided below.

### **Ethical Approval**

If you need clarification on ethical approval, please get in touch with the University of Zambia Biomedical Research Ethics Committee.

Telephone: +260 977925304

Ridgeway Campus

Telegrams: UNZA, LUSAKA

Telax: UNZALU ZA 44370

P.O.Box 50110 Lusaka, Zambia

Fax: +260-1-250753

Email: [unzarec@unza.zm](mailto:unzarec@unza.zm)

Federal Assurance No: FWA00000338 IRB00001131 of IORG0000774 NHRAR- REC No: 2021- 05- 0002.

### **Persons to contact for queries**

If you have any questions about your participation in this study process, you should contact;

1. Ubepo Josepher Mafolo, researcher. School of nursing sciences. Contact: +26771253096/ +260771569614.

Email: [ujmafolo@gmail.com](mailto:ujmafolo@gmail.com)

2. Dr. Ruth Wahila, supervisor. School of Nursing sciences. Contacts: + 260 975971620

Email: [ruth.wahila@unza.zm](mailto:ruth.wahila@unza.zm)

3. Mrs. Martha M. Mwelwa (Co-Supervisor): University of Zambia, School of Nursing Sciences. Contacts: Cell +260 9778216663,

Email: [Martha.mbewe@unza.zm](mailto:Martha.mbewe@unza.zm)

## Appendix IV: Informed Consent Form

Should you choose to participate in the research, you will be required to sign the consent form attached:

**Title:** Determinants of patient-care emergency nursing care by nurses in emergency department at three primary hospitals in Tutume District and North-East District, Botswana.

### Statement of consent/ assent

..... Has explained the contents of the participation information sheet to me, which I therefore fully understand the contents of the information letter. I have been offered the opportunity to ask questions and these have been answered to my satisfaction. I understand that I may withdraw from this verification process at any stage without penalty. I have been assured that my anonymity and confidentiality will be maintained.

Name of participant.....

Signature of participants.....

Date: DD/MM/YYYY

Name of witness.....

Signature of witness.....

Date: DD/MM/YYYY

Name of interviewer.....

Signature of interviewer.....

Phone number.....

Date: DD/MM/YYY

For more information, /inquiries, please contact:

1. Prof Sody Munsanka (Chairperson) University of Zambia Biomedical Research Ethics Committee. Contacts : +260977925304.email: s.musanka@unza.za
2. Dr. Seipone (Chairperson): Botswana Health Research Development Committee. Contacts: +2673632466email:hhealthresearch@govbots.onmicrosoft.com
3. Mr. Ubepo Josepher Mafolo (researcher): University of Zambia, School of Nursing Sciences. Cell: +267 71253097/+267 72960920, email: [ujmafolo@gmail.com](mailto:ujmafolo@gmail.com)
4. Dr. Ruth Wahila (Principal Supervisor): University of Zambia, School of Nursing Sciences, P.O Box 50110, Lusaka Zambia. Cell: +260 975971620, email: [ruth.wahila@unza.zm](mailto:ruth.wahila@unza.zm)
5. Mrs. Martha M. Mwelwa (Co-Supervisor): University of Zambia, School of Nursing Sciences, P.O Box 50110, Lusaka Zambia. Cell +260 9778216663, email: Martha.mbewe@unza.zm

## **Appendix V: Data Collection Tool**

### **Questionnaire Guide on DETERMINANTS OF PATIENT-CENTRED EMERGENCY NURSING CARE IN PRIMARY HOSPITALS AT TUTUME AND NORTH-EAST DISTRICTS, BOTSWANA.**

Adapted from: Rominski et al. (Rominski S, Bell SA, Yeboah D, et al. Skills and educational needs of accident and emergency)

#### **Section 1: socio-demographic Characteristics**

Instructions: Please circle the most appropriate answer.

1. Gender

a. Female

b. Male

2. What is your marital status?

a. single

b. married

c. divorced

d. widowed

3. Age

a. 20-29

b. 30-39

c. 40-49

d. 50 and above

4. What is your highest level of nursing education?

a. Certificate

b. Diploma

c. Bachelor's Degree

d. Other \_\_\_\_\_

4. What is your current designation within the emergency Centre?

a. Registered nurse

b. Enrolled nurse

c. Other (specify).....

5. Any specialty in Emergency nursing? If any specify the level. E.g diploma

a. Emergency and trauma nursing.....

- b. Critical Care Nursing.....
- c. Other (specify).....

6. How long have you worked in the Emergency Centre?

- a. 6 months < 1 year
- b. >1 year < 2 years
- c. >2 year < 5 years
- d. More than 5 years

**Section 2: Provision of Patient-Care Emergency Nursing Care**

6. Rate your level of competence with 1 being least competent and 3 being most competent. Please circle

|   | Least competent* | Competent† | Highly competent‡ |
|---|------------------|------------|-------------------|
| 6.1 Able to assess breathing: rate, effort, cyanosis  | 1                | 2          | 3                 |
| 6.2 Able to administer oxygen: cannula, mask, bag-valve-mask  | 1                | 2          | 3                 |
| 6.3 Able to prepare and assist with endotracheal intubation   | 1                | 2          | 3                 |
| 6.4 Able to perform needle decompression e.g. pneumothorax  | 1                | 2          | 3                 |
| 6.5 Able to assess circulation: pulses, skin color, capillary refill, blood pressure, signs of bleeding | 1                | 2          | 3                 |
| 6.6 Able to control hemorrhage: apply tourniquet, fracture splint, pelvic wrap                          | 1                | 2          | 3                 |
| 6.7 Able to administer local anesthetic and apply sutures   | 1                | 2          | 3                 |
| 6.8 Able to manage shock: obtain intravenous/   | 1                | 2          | 3                 |

|  |   |   |   |
|--|---|---|---|
| intraosseous access and administer fluids  |   |   |   |
| 6.9 Able to assess mental status: monitor Glasgow Coma Scale                                   | 1 | 2 | 3 |
| 6.10 Able to perform cardiopulmonary resuscitation   | 1 | 2 | 3 |
| 6.11 Able to obtain and interpret echocardiograms: detect arrhythmias e.g. atrial fibrillation | 1 | 2 | 3 |
| 6.12 Able to prepare and administer drugs in cardiac arrest                                    | 1 | 2 | 3 |
| 6.13 Able to prepare and administer thrombolytic   | 1 | 2 | 3 |
| 6.14 Able to perform cardioversion/defibrillation  | 1 | 2 | 3 |

\* Novice nurse with little or no nursing skills, works under guidance of more experienced nurses

† Efficient and confident in skills, works independently

⊠ Accurate decision maker, analytical nurse who makes independent decisions

### **Section 3: (a) Knowledge of ED Nurses on Emergency Nursing Care**

#### **Please rate the following:**

7. I would like to learn more about the following trauma care topics: Please circle all that apply

|  | Disagree | Neither agree nor disagree | Agree |
|--|----------|----------------------------|-------|
| 7.1 Abdominal trauma e.g. intra-abdominal bleed      | 1        | 2                          | 3     |
| 7.2 Geriatric emergencies                            | 1        | 2                          | 3     |
| 7.3 Pediatric emergencies                            | 1        | 2                          | 3     |
| 7.4 Orthopaedic e.g. fractures, compartment syndrome | 1        | 2                          | 3     |
| 7.5 Obstetrics/Gynaecology/Pregnancy                 | 1        | 2                          | 3     |

|  |   |   |   |
|--|---|---|---|
| 7.6 Spinal Cord Injuries                     | 1 | 2 | 3 |
| 7.7 Burns and traumatic injury               | 1 | 2 | 3 |
| 7.8 Ophthalmic (eye) injuries                | 1 | 2 | 3 |
| 7.9 Head injuries e.g. intracranial bleeding | 1 | 2 | 3 |

I would like to learn more about the following cardiovascular topics: Please circle all that apply

|                                    | Disagree | Neither agree nor disagree | Agree |
|------------------------------------|----------|----------------------------|-------|
| 8.1 Acute Coronary Syndrome        | 1        | 2                          | 3     |
| 8.2 Acute Myocardial Infarctions   | 1        | 2                          | 3     |
| 8.3 Arrhythmias                    | 1        | 2                          | 3     |
| 8.4 Cardiac Medications            | 1        | 2                          | 3     |
| 8.5 Defibrillation / Cardioversion | 1        | 2                          | 3     |
| 8.6 Cardiogenic Shock              | 1        | 2                          | 3     |
|                                    |          |                            |       |

9. I would like to learn more about the following neurological topics: Please circle all that apply

|                              | Disagree | Neither agree nor disagree | Agree |
|------------------------------|----------|----------------------------|-------|
| 9.1 Stroke                   | 1        | 2                          | 3     |
| 9.2 Intra Cranial Hemorrhage | 1        | 2                          | 3     |
| 9.3 Headaches                | 1        | 2                          | 3     |
| 9.4 Meningitis               | 1        | 2                          | 3     |

10. I would like to learn more about the following respiratory topics: Please circle all that apply

|                                  | Disagree | Neither agree nor disagree | Agree |
|----------------------------------|----------|----------------------------|-------|
| 10.1 Arterial Blood Gas Analysis | 1        | 2                          | 3     |

|  |   |   |   |
|--|---|---|---|
| 10.2 Ventilators                           | 1 | 2 | 3 |
| 10.3 Pneumonia                             | 1 | 2 | 3 |
| 10.4 Pulmonary Embolism                    | 1 | 2 | 3 |
| 10.5 Breath Sounds                         | 1 | 2 | 3 |
| 10.6 Asthma                                | 1 | 2 | 3 |
| 10.7 Chronic Obstructive Pulmonary Disease | 1 | 2 | 3 |

**(b) Awareness on the Availability of SOPs in Emergency Nursing Care**

11. The following SOPs will positively impact the emergency care I provide? Please circle

|  | Aware | Neither aware nor not aware | Not Aware |
|--|-------|-----------------------------|-----------|
| 11.1 Triage                                    | 1     | 2                           | 3         |
| 11.2 Accident & emergency SOPs                 | 1     | 2                           | 3         |
| 11.3 Infection Prevention and control measures | 1     | 2                           | 3         |
| 11.4 effective Communication                   | 1     | 2                           | 3         |
| 11.5 Advanced cardiac life support             | 1     | 2                           | 3         |
| 11.6 Pediatric advanced life support           | 1     | 2                           | 3         |
| 11.7 Pre-hospital trauma life support          | 1     | 2                           | 3         |
| 11.8 Sexual assault/violence                   | 1     | 2                           | 3         |
| 11.9 Mental health                             | 1     | 2                           | 3         |
| 11.10 Pharmacology                             | 1     | 2                           | 3         |
| 11.11 Disaster/emergency preparedness          | 1     | 2                           | 3         |
| 11.12 Poisoning                                | 1     | 2                           | 3         |
| 11.13 Diabetes emergencies                     | 1     | 2                           | 3         |

|                       |   |   |   |
|-----------------------|---|---|---|
| 11.14 Wound Care      | 1 | 2 | 3 |
| 11.15 Pain Management | 1 | 2 | 3 |

12. List any type of equipment used for patient care for which you would like a skill update/review

**Section 4: Availability of essential equipment on Emergency Nursing Care.**

Table 1 Assessment of physical resources for management of airway and breathing problems in emergency room

Assessment unit Hospitals

| Essential equipment                       | YES | NO |
|---|-----|----|
| 1. Oxygen supply/cylinders                |     |    |
| 2. Oropharyngeal airway adults            |     |    |
| Oropharyngeal airway paed                 |     |    |
| 3. Suction unit-powered                   |     |    |
| 4. Suction tubes (P *A)                   |     |    |
| 5. Yankauer or stiff suction tip          |     |    |
| 6. Bag-valve-mask                         |     |    |
| Bag-valve-mask paed                       |     |    |
| 7. Nasogastric tubes(paediatric)          |     |    |
| Nasogastric tube Adults                   |     |    |
| 8. Laryngoscope Adults (Macintosh Blades) |     |    |
| Laryngoscope paediatrics (Miller Blades)  |     |    |
| 9. Magill forceps                         |     |    |
| 10. Endotracheal tube (paediatric sizes)  |     |    |
| Endotracheal tube adults sizes            |     |    |
| 11. Hard neck collars                     |     |    |
| 12. Spine boards                          |     |    |
| 13. Pulse oximeter                        |     |    |
| 14. Ventilator machine                    |     |    |
| 15. Underwater drain set (Paediatrics)    |     |    |

|  |  |  |
|--|--|--|
| Underwater drain set (Adult)                 |  |  |
| 16. Crash cart trolleys (*P *A)              |  |  |
| 17. Crash cart trolleys maintenance protocol |  |  |
| 18. Blood gas Analyzer                       |  |  |

\*P pediatric size, \*A adult size, service or consumables adequately available, – service, equipment or consumable not available, AH available in the hospital but not stationed at emergency room

Table 2 Assessment of physical resources for initial management of circulation problems in emergency room

Assessment unit Hospitals

|  | YES | NO |
|--|-----|----|
| 1. Cannular (14, 16, 18) (*P*A)                    |     |    |
| 2. Central venous catheters                        |     |    |
| 3. Intraosseous needles                            |     |    |
| 4. IVF crystalloids                                |     |    |
| 5. Rapid infusion equipment (PUMP)                 |     |    |
| Infusion syringe                                   |     |    |
| 6. Fluid warming equipment                         |     |    |
| 7. Focused Assessment Sonography for Trauma (FAST) |     |    |
| 8. Central venous pressure monitoring              |     |    |
| 9. Arterial pressure monitoring                    |     |    |
| 10. Emergency operation theater                    |     |    |
| 11. Foley catheters (*P *A)                        |     |    |
| 12. BP machines & cuffs (*P *A)                    |     |    |
| 13. Blood transfusion capacity                     |     |    |

\*P pediatric size, \*A adult size? service, equipment or consumable adequately available, – service, equipment or consumable not available.

Table 3: Drug table

| Drugs          | Quantity | Yes | No |
|----------------|----------|-----|----|
| Adrenaline 1mg | 4        |     |    |
| Atropine 3mg   | 1        |     |    |

|                         |    |  |  |
|-------------------------|----|--|--|
| Amidarone 30mg          | 1  |  |  |
| Adenosine 6mg           | 4  |  |  |
| Calcium 10ml            | 2  |  |  |
| Chloraphenamine 10mg    | 2  |  |  |
| Dextrose 50%            | 10 |  |  |
| Dextrox 10%             | 2  |  |  |
| fentanyl                | 2  |  |  |
| Furosemide 20mg         | 5  |  |  |
| Hydrocortisone 100mg    | 10 |  |  |
| lidocaine               | 1  |  |  |
| Magnesium sulphate 2g   | 2  |  |  |
| Medazolam 10mg          | 2  |  |  |
| Naloxone 400mcg         | 5  |  |  |
| NaCl 0.9% 500ml/1l      | 2  |  |  |
| Potassium chloride 50ml | 1  |  |  |

WHO/HPW/CPR/2003 formatted 2012

## Appendix VI: UNZABREC Approval Letter



### UNIVERSITY OF ZAMBIA BIOMEDICAL RESEARCH ETHICS COMMITTEE

Telephone: +260 977925304      Ridgeway Campus      Telegrams: UNZA, LUSAKA      P.O. Box      50110  
Lusaka, Zambia  
Tele: UNZALU ZA 44370  
Fax: +260-1-250753  
E-mail: [unzarec@unza.zm](mailto:unzarec@unza.zm)  
Federal Assurance No. FWA00000338      IRB00001131 of IORG-0000774      NHRAR-REC No 2021-05-0002

29<sup>th</sup> November, 2024

Your REF. No. 5981-2024.

Mr. Ubepo Mafola,  
University of Zambia,  
School of Nursing Sciences,  
PO Box 50110,  
Lusaka.

Dear Mr. Mafola,

**RE: DETERMINANTS OF EFFECTIVE PROVISION OF EMERGENCY NURSING CARE BY NURSES AT EMERGENCY DEPARTMENTS OF THREE PRIMARY HOSPITALS IN TUTUME AND NORTH-EAST DISTRICTS, BOTSWANA (REF. NO. 5981-2024)**

The above-mentioned research proposal was presented to the Biomedical Research Ethics Committee on 29<sup>th</sup> November, 2024. The proposal is **approved**. The approval is based on the following documents that were submitted for review:

- a) Study proposal
- b) Questionnaires
- c) Participant Consent Form

**APPROVAL NUMBER**

: REF. No. 5981-2024.

**This number should be used on all correspondence, consent forms and documents as appropriate.**

- i. **APPROVAL DATE** : 29<sup>th</sup> November 2024
- ii. **TYPE OF APPROVAL** : Standard
- iii. **EXPIRATION DATE OF APPROVAL** : 28<sup>th</sup> November 2025
- iv. After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the UNZABREC Offices should be submitted one month before the expiration date for continuing review.
- v. **SERIOUS ADVERSE EVENT REPORTING**: All SAEs and any other serious challenges/problems having to do with participant welfare, participant safety and study integrity must be reported to UNZABREC within 3 working days using standard forms obtainable from UNZABREC.
- vi. **MODIFICATIONS**: Prior UNZABREC approval using standard forms obtainable from the UNZABREC Offices is required before implementing any changes in the Protocol (including changes in the consent documents).
- vii. **TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the UNZABREC using standard forms obtainable from the UNZABREC Offices.
- viii. **NHRA**: You are advised to obtain final study clearance and approval to conduct research in Zambia from the National Health Research Authority (NHRA) before commencing the research project.
- ix. **QUESTIONS**: Please contact the UNZABREC on Telephone No. +260977925304 or by e-mail on [unzarec@unza.zm](mailto:unzarec@unza.zm).
- x. **OTHER**: Please be reminded to send in copies of your research findings/results for our records. You are also required to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study. Use the online portal: [unza.rhinno.net](http://unza.rhinno.net) for further submissions.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Sody Munsaka'.

Prof. ~~Sody Mvesthya Munsaka~~ Munsaka, BSc., MSc., PhD  
**CHAIRPERSON**  
Tel: +260977925304  
E-mail: [s.munsaka@unza.zm](mailto:s.munsaka@unza.zm)

Appendix VII: HPRD Approval Letter

TELEPHONE: 363 2500  
FAX: 391 0647  
TELEGRAMS: RABONGAKA  
TELEX: 2818 CARE BD



REPUBLIC OF BOTSWANA

MINISTRY OF HEALTH  
PRIVATE BAG 0038  
GABORONE

REFERENCE NO: HPRD: 6/14/1  
Health Research and Development Division

16<sup>th</sup> January 2025

Notification of IRB Review: **New application**

Ubepo Josepher Mafolo  
P O Box 121  
Marobela

Dear Ubepo Josepher Mafolo

**PROTOCOL TITLE: DETERMINANTS INFLUENCING EFFECTIVE EMERGENCY NURSING CARE IN PRIMARY HOSPITALS AT TUTUME AND NORTH-EAST DISTRICTS, BOTSWANA**

**Review Type:** Health Research and Development Division  
**Review Date:** 08<sup>th</sup> January 2025  
**Approval Date:** 16<sup>th</sup> January 2025  
**Effective Date:** 16<sup>th</sup> January 2025  
**Expiration Date:** 15<sup>th</sup> January 2026  
**Risk Determination:** Less than Minimal Risk

Thank you for submitting new application for the above-referenced protocol. The permission is granted to conduct the study. **The approval is for academic fulfillment only.**

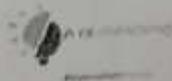
This permit does not however give you authority to collect data from the selected sites without prior approval from the management. Consent from the identified individuals should be obtained where applicable.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

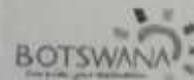
Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Copies should also be submitted to all other relevant authorities.

#### **Continuing Review**

In order to continue work on this study (including data analysis) beyond the expiry date, submit a Continuing Review Form for Approval at least three (3) months prior to the protocol's expiration date.



*Vision: A Healthy Nation  
Values: Botho, Equity, Timeliness, Customer Focus,  
Teamwork, Accountability.*



TELEPHONE: 363 2500  
FAX: 391 0647  
TELEGRAMS: RABONGAKA  
TELEX: 2818 CARE BD



MINISTRY OF HEALTH  
PRIVATE BAG 0038  
GABORONE

REPUBLIC OF BOTSWANA

The Continuing Review Form can be obtained from the Health Research Division Office (HRDD), Office No. 7A.7 or Ministry of Health website: [www.moh.gov.bw](http://www.moh.gov.bw) or can be requested via e-mail from HRDD office, e-mail address: [hhealthresearch@gov.bw](mailto:hhealthresearch@gov.bw) or [hhealthresearch@govbots.onmicrosoft.com](mailto:hhealthresearch@govbots.onmicrosoft.com). As a courtesy, the HRDD will send you a reminder email about eight (8) weeks before the lapse date, but failure to receive it does not affect your responsibility to submit a timely Continuing Report form.

### Amendments

During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek HRDC approval before implementing it. Please summarize the proposed change and the rationale for it in the amendment form available from the Health Research Division Office (HRDD), Office No.7A7 or Ministry of Health website: [www.moh.gov.bw](http://www.moh.gov.bw) or can be requested via e-mail from HRDD Office, e-mail address: [hhealthresearch@govbots.onmicrosoft.com](mailto:hhealthresearch@govbots.onmicrosoft.com). In addition, submit a copy of an updated version of your original protocol application showing all proposed changes in bold or "track changes".

### Reporting

Other events which must be reported promptly in writing to the HRDC include:

- Suspension or termination of the protocol by you or the grantor
- Unexpected problems involving risk to subjects or others
- Adverse events, including unanticipated or anticipated but severe physical harm to subjects.

If you have any questions please do not hesitate to contact Mr Abia Sebaka at, [asebaka@gov.bw](mailto:asebaka@gov.bw), Tel +267-3632754 and Mr Kgomoiso Motlhanka at, [kgmmotlhanka@gov.bw](mailto:kgmmotlhanka@gov.bw), Tel +267-3632751.

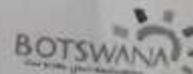
Thank you for your cooperation and your commitment to the protection of human participants in research.

Yours Sincerely

Mr. Abia Sebaka  
**for/PERMANENT SECRETARY**



Vision: A Healthy Nation  
Values: *Bohlo, Equity, Timeliness, Customer Focus, Teamwork, Accountability*



TUTUME DHMTTEL: (+267)  
P OBOX36FAX: (+267)  
TUTUME



2987239  
2987536

REF: TDHMT 6/17/1 11 (5)

29 January 2025

TO: Ubepo J. Mafolo  
P O Box  
121 Marobela

Protocol Title: DETERMINANTS OF PATIENT-CENTRED  
EMERGENCY NURSING CARE IN PRIMARY HOSPITALS AT  
TUTUME AND  
NORTH-EAST DISTRICT BOTSWANA

---

Dear Ubepo J. Mafolo

Notification of IRB review: New Application  
Approval Status: Approved  
Risk Determination: less than Minimal Risk

The Tutume DHMT thanks you for submitting the documents of the above captioned protocol for evaluation. The application was reviewed and awarded approval. This approval is valid for a period of ONE- year effective from 27<sup>th</sup> January 2025. The research should be conducted as outlined in the approved proposal. Please notify the IRB when you start collecting data.

If you have any queries/questions, please contact Dr K. T. Tsiako ([tshegotshego@gmail.com](mailto:tshegotshego@gmail.com), tel; 73695130) or O Seleka (tel: 74638805)

Thank you for your commitment in protecting human subjects in research in Tutume DHMT.

Yours Faithfully



Dr Keleabetswe. T. Tsiako  
Tutume DHMT IRB CHAIR



**Vision: A Healthy Nation**  
**Values: Botho, Equity, Timeliness, Customer**  
Healthy

Focus, Teamwork, Accountability.



BOTSWANA Our :

North East Institutional Review Board  
Private Bag 14  
Masunga

24<sup>th</sup> January 2025

Ubepo Josepher Mafolo  
P.O. Box 121  
Marobela

Dear Ubepo Josepher Mafolo

**RE: DETERMINANTS INFLUENCING EFFECTIVE EMERGENCY NURSING CARE IN MASUNGA PRIMARY HOSPITAL**

|                         |                               |
|-------------------------|-------------------------------|
| IRB Approved Date:      | 24 <sup>th</sup> January 2025 |
| IRB Expiration Date:    | 23 <sup>rd</sup> January 2026 |
| IRB Review Type:        | Expedited Review              |
| IRB Review Determinant: | Approved                      |
| Risk Determination:     | Minimal Risk                  |

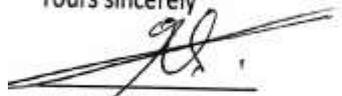
Thank you for submitting an application for the above referenced Research Protocol.

Permission is therefore granted to conduct the study for academic fulfilment only. This approval is valid for a period of one (1) year effective 24<sup>th</sup> January 2025 until 23<sup>rd</sup> January 2026. The study should be carried out as outlined in the proposal. Any changes or deviation from the proposal must first be approved by North East IRB.

This permit does not however grant you authority to collect data from the selected clientele without approved consent.

By virtue of this letter, management will be notified of the impending study.

Yours sincerely



Dr. I. Muchapa  
For North East IRB Secretary