EVALUATION OF THE ROLES OF RADIOGRAPHERS AS MEMBERS OF THE EMERGENCY TEAM IN A TERTIARY HOSPITAL IN BENIN METROPOLIS

BY

OSAMUDIAMEN PAMELA ESEOSA

BMS2005211

RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE DEGREE IN RADIOGRAPHY

DEPARTMENT OF RADIOGRAPHY

SCHOOL OF BASIC MEDICAL SCIENCES

UNIVERSITY OF BENIN.

SUPERVISOR: MRS FANNY IGBINEDION

DATE: OCTOBER 2025

CERTIFICATION

This is to certify that the research work for this project and the subsequent write up by Osamudiamen Pamela Eseosa, with matriculation number BMS2005211 were carried out under my supervision.

Mrs. Fanny Igbenedion ……

(Head of Department & Supervisor) (Signature and Date)

DEDICATION

I dedicate this research project to my beloved parents, who instilled in me the desire to work hard and excel and supported me morally and financially.

ACKNOWLEDGMENT

All gratitude and appreciation to Almighty God who gave me the wisdom, courage, opportunity, and good health to undergo this study.

I would like to express my heartfelt gratitude to my supervisor, who is also the Head of Department, Mrs Fanny Igbinedion for her guidance, patience, and valuable support throughout the project. Her insights and expertise were important in determining the direction and focus of this study. May God reward her and her family abundantly.

I would also like to express my sincere gratitude to all my lecturers and all non-academic staff, God bless you for the support to see this program become successful.

My heartfelt gratitude goes to my Parents, Engr and Mrs Osamudiamen Uduojie for their care, love, support, prayers, sacrifice, and encouragement. My appreciation also goes to my siblings, David and Eva Osamudiamen and my relatives, Aunty Pat and her husband Uncle Silver, Aunty Christy and her husband, Aunty Gloria and her husband, Uncle Ozes and his wife Aunty Obehi, Aunty Olens and her husband, Aunty Gladys

My special appreciation to my Friends who became family, Tobaby Praise, Xaint Elijah, Evidence, Christabel Ochuwa, Daisy, Priscilla, Flourish and Dumebi for your support and prayers. My posting Group Members particularly Frances Ozioma and Chucks who made posting enjoyable, Thank you.

Last but not least, I want to thank me. I want to thank me for believing in me, I want to thank me for doing all the hard work. I want to thank me for having no days off, I want to thank me for never quitting

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

Radiographers have an important role in emergency medical care.. However, their knowledge , current practices and factors influencing their participation within emergency response teams in Nigerian hospitals remain inadequately evaluated.

To assess radiographers' knowledge of their roles in emergency response, determine their current practices and level of involvement, and examine factors influencing their participation in emergency teams.

A descriptive cross-sectional design was used for the study. Thirty-one radiographers at the University of Benin Teaching Hospital were included in the study using a census sampling method. Data were collected using a structured self-administered questionnaire and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used, while inferential statistics (Chi-square tests) examined associations between variables, with a significance level set at $p < 0.05$.

Most radiographers demonstrated moderate knowledge of their emergency roles 16 (51.6%), while 11 (35.5%) had high knowledge and 4 (12.9%) had low knowledge. Practice level was fair in 17 (54.8%), good in 10 (32.3%) and poor in (12.9). Participation level among respondents was high 11 (35.5%), moderate 19 (61.3%), and low 1 (3.2%). There was a significant relationship between practice and participation ($p< 0.001$).

Radiographers possess good awareness of their responsibilities in emergency care, particularly in performing urgent imaging and patient positioning. Practical competence significantly improved active involvement in the emergency team. There is need for continous training exercises to improve radiographers roles in emergency care.

Keywords: Emergency, radiographers, knowledge, practice, participation

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Since the discovery of X-rays, their application in medical diagnosis and treatment planning has expanded dramatically across the globe (Abdulkadir, 2020). Within this field, emergency radiology has emerged as a rapidly developing subspecialty that focuses on imaging and managing patients with acute illnesses or traumatic injuries (Hassanin & Ramadhan, 2024; Kaewlai & Lee, 2025). The Accident and Emergency (A&E) unit, often referred to as the emergency room, provides immediate and frequently life-saving interventions to individuals presenting without prior appointments (Alzughaibi *et al*., 2024).

The discipline of emergency medicine originated in the 1960s when communities began demanding accessible and timely medical attention, leading to the establishment of structured emergency services supported by government initiatives (Chong *et al*., 2019). In Nigeria, organized emergency medical service (EMS) systems began evolving only in the early 2000s (Akinreni *et al*., 2023).

Globally, emergency medicine remains one of the most demanding specialties, and shortages of trained personnel continue to hinder effective service delivery (Daniels *et al*., 2024). Nigeria particularly faces challenges of inadequate healthcare funding, weak infrastructure, and increasing population pressure (Abdulkadir, 2020). Although emergency response programs have been introduced to save accident victims nationwide, the country still struggles with inconsistent implementation and the absence of a unified national emergency policy. Pre-hospital care remains poorly

developed due to weak ambulance networks and limited coordination among response agencies (Aborode *et al*., 2024). Strengthening emergency units and ensuring they are well equipped could substantially reduce delays in diagnosis and treatment.

Emergency management depends on multidisciplinary collaboration, where radiographers serve as vital members of the healthcare team. Their responsibilities include identifying pathological conditions, correctly positioning patients, acquiring diagnostically adequate images, and operating advanced imaging equipment (Almehmadi *et al*., 2024; Kennedy & Davis, 2021). Through modalities such as X-ray, computed tomography (CT), and magnetic resonance imaging (MRI), radiographers provide essential diagnostic information that guides clinicians in making prompt, evidence-based decisions (Pearce *et al*., 2024).

In some regions, radiographers also provide preliminary observations to reduce reporting delays and diagnostic errors (Pearce *et al*., 2024). This practice, common in the United Kingdom, has gained attention globally for its potential to enhance workflow efficiency in emergency radiology (Hardy *et al*., 2013). However, interprofessional collaboration may be constrained by differences in work schedules, unclear role definitions, and institutional limitations (Anderson *et al*., 2021). Consequently, radiographers often remain underutilized in emergency care despite their crucial contributions.

This study, therefore, seeks to assess radiographers' knowledge, current practices, and level of participation in emergency response teams within Benin Metropolis, Nigeria. teams.

1.2 Statement of research problem

Trauma accounts for approximately six million deaths annually worldwide, with nearly 90% occurring in low- and middle-income countries (Adenuga & Adeyeye, 2023). The World Health Organization (WHO) recognizes emergency medical care as a basic human right, placing an ethical obligation on nations to make such services universally available (Okpalla *et al*., 2022).

In Nigeria, healthcare delivery remains limited by inadequate funding and insufficient infrastructure (Abdulkadir, 2020). Pre-hospital emergency services are poorly organized, with minimal ambulance support and fragmented coordination across agencies (Aborode *et al*., 2024). The absence of an effective national emergency framework further weakens emergency response capacity (DaCosta *et al*., 2020).

Radiographic imaging forms a critical component of trauma management, as nearly half of all trauma patients require diagnostic imaging during their care (Koch, 2014). The Emergency Care Institute (U.S.) identifies prompt imaging results as a major determinant of survival outcomes in emergency departments (Klobasa *et al*., 2025).

Locally, several studies have confirmed that road traffic accidents (RTAs) are a major source of trauma admissions in Benin City, causing intense pressure on emergency units at the University of Benin Teaching Hospital (UBTH). Ohanaka *et al*. (2003) found that out of 1,398 trauma patients seen at UBTH within one year, 52% sustained injuries from road traffic accidents. Most cases were of minor to moderate severity, indicating a high volume of trauma cases requiring imaging support rather than surgical intervention.

These findings shows that road traffic injuries are the leading cause of trauma admissions in Benin City, placing significant diagnostic and workload demands on radiographers who provide imaging for trauma evaluation. Despite this, there is limited empirical evidence assessing whether radiographers at UBTH possess adequate knowledge, training, and integration within emergency teams to meet this high demand. Therefore, this study aims to evaluate the knowledge, current practices, and level of participation of radiographers in emergency response at UBTH addressing an important gap in local evidence and contributing to the improvement of emergency imaging services in Benin Metropolis.

1.3 Research questions

i. What are the knowledge of radiographers roles as members of emergency response team in University of Benin Teaching Hospital?.
ii. What are the current practices and involvement of radiographers in emergency situations?
iii. What factors influence their participation in emergency teams?

1.4 Research hypothesis

Null Hypothesis (H_0): There is no significant relationship between the level of knowledge and practices of radiographers and their participation in emergency medical teams in Benin Metropolis.

Alternative Hypothesis (H_1): There is a significant relationship between the level of knowledge and practices of radiographers and their participation in emergency medical teams in Benin Metropolis.

1.5 Aim of the study

The study aimed at evaluating the roles of radiographers as members of emergency response team at the University of Benin Teaching Hospital.

Objectives of the study

i. To evaluate the radiographers knowledge on their roles as members of emergency response team in University of Benin Teaching Hospital
ii. To determine the current practices and involvement of radiographers in emergency situations
iii. To examine the factors influencing their participation in emergency teams

1.6 Significance of the study

This study will provide information about radiographers' readiness and performance during emergencies. It can help understand the role of radiographers, educating the public and other health professionals on their importance as vital members of the emergency care team. This may encourage greater respect, collaboration, and investment in the profession.The findings will benefit hospitals and emergency departments seeking to improve teamwork and protocol adherence, although if results indicate poor knowledge, institutions may be viewed as lacking staff preparedness. radiography education training, enabling curriculum updates with emergency care courses, professional bodies, like the association of radiographers, to design targeted continuous professional development (CPD).healthcare administrators, to promote better role integration and emergency preparedness among radiographers. This study presents minimal risk to participants.Some radiographers may feel judged while responding to questions about their knowledge or practices. To reduce this, the

questionnaire will be anonymous, and no personally identifiable information will be collected. There are no physical, legal, or financial risks to participants. Ethical standards will be strictly adhered to, and approval will be obtained from institutional ethics committee.

1.7 Scope of the study

The study focused on radiographers who worked at the University of Benin Teaching Hospital between July to September 2025.

1.8 Operational definition of terms

Radiographer: A licensed medical imaging professional trained to perform diagnostic imaging examinations.

Emergency team: A group of healthcare professionals responsible for handling emergency and trauma cases.

Emergency radiography: Imaging services rendered during urgent or life threatening conditions.

Teamwork: Collaboration with other healthcare workers in emergency scenarios.

Acute trauma: A sudden injury requiring urgent imaging intervention.

CT scan: Computed Tomography imaging used extensively in emergencies.

Emergency protocol: A standard procedure followed during emergencies.

Emergency preparedness: Readiness of a healthcare worker to function effectively during emergencies.

Emergency radiographer: A radiographer specifically trained or experienced in emergency cases.

Mobile radiography: Portable imaging used in emergency or ICU settings.

Patient positioning: Correct alignment of the patient for accurate imaging.

Radiation safety: Measures taken to minimize exposure to ionizing radiation.

Resuscitation room: The critical care unit where emergency treatment is provided.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual review

Radiographers play an increasingly dynamic role in modern healthcare, contributing significantly to patient management and clinical workflow efficiency. Several studies have highlighted how radiographers improve patient pathways and enhance the overall capacity of medical imaging departments (Field & Snaith, 2013). Emergency care settings demand rapid, coordinated decision-making by multidisciplinary teams, where radiographers serve as inportant contributors by producing high-quality diagnostic images that support clinical evaluation and treatment planning. According to Pearce *et al*. (2023), accurate diagnostic imaging is essential to decision-making in emergency departments, underscoring the vital contribution of radiographers to prompt and effective patient management.

Beyond image acquisition, radiographers are active participants in clinical decision-making processes. Their effectiveness depends on a sound understanding of anatomy, pathology, trauma mechanisms, and imaging protocols (Talevski *et al*., 2023). In high stress situations, such as cases involving multiple injuries or suspected stroke, radiographers' ability to prioritize scans, ensure appropriate patient positioning, and communicate with other health professionals becomes crucial for achieving timely and accurate results.

2.1.1 Knowledge of emergency preparedness

Knowledge Knowledge serves as the cornerstone of emergency preparedness among radiographers. It encompasses awareness of trauma imaging protocols, critical patient

pathways, prioritization of urgent cases, and the theoretical principles underlying rapid diagnostic procedures. Examining the extent of radiographers' knowledge within Benin Metropolis is essential for determining their readiness to function effectively during emergencies.

Although many radiographers are aware of trauma imaging techniques, several studies have reported that their understanding is often incomplete or outdated compared to evolving best practices (Eze et al., 2013). One contributing factor is the lack of structured emergency radiography modules within most undergraduate programs, where training often focuses on general imaging rather than acute trauma management (Akpaniwo *et al*., 2018). Consequently, new graduates may have limited exposure to specialized emergency protocols, such as those applied in stroke, abdominal trauma, or polytrauma imaging (Kaewlai & Lee, 2025).

Another factor contributing to knowledge gaps is the inconsistent availability of continuing professional development (CPD) programs. Many of these programs are optional, poorly attended, or infrequent, resulting in a disparity between radiographers working in emergency units and those in elective imaging departments. Bienstock *et al*. (2022) emphasized that without regular reinforcement through simulation-based learning, workshops, or interprofessional training, radiographers' knowledge tends to stagnate and lose relevance in fast-paced emergency environments.

Importantly, emergency preparedness extends beyond technical know how. It also involves understanding radiographic triage principles, effective communication with distressed patients, infection prevention during emergencies, and coordination with

other professionals during mass casualty events (Kumar *et al*., 2024). Radiographers lacking such multidimensional knowledge may experience uncertainty, reduced confidence, and inefficiency when managing emergency cases (Kennedy & Davis, 2021).

2.1.2 Practice in emergency preparedness

While Knowledge serves as the cornerstone of emergency preparedness among radiographers. It encompasses awareness of trauma imaging protocols, critical patient pathways, prioritization of urgent cases, and the theoretical principles underlying rapid diagnostic procedures. Examining the extent of radiographers' knowledge within Benin Metropolis is essential for determining their readiness to function effectively during emergencies.

Although many radiographers are aware of trauma imaging techniques, several studies have reported that their understanding is often incomplete or outdated compared to evolving best practices (Eze *et al*., 2013). One contributing factor is the lack of structured emergency radiography modules within most undergraduate programs, where training often focuses on general imaging rather than acute trauma management (Akpaniwo *et al*., 2018). Consequently, new graduates may have limited exposure to specialized emergency protocols, such as those applied in stroke, abdominal trauma, or polytrauma imaging (Kaewlai & Lee, 2025).

Another factor contributing to knowledge gaps is the inconsistent availability of continuing professional development (CPD) programs. Many of these programs are optional, poorly attended, or infrequent, resulting in a disparity between radiographers working in emergency units and those in elective imaging departments.

Bienstock *et al.* (2022) emphasized that without regular reinforcement through simulation based learning, workshops, or interprofessional training, radiographers' knowledge tends to stagnate and lose relevance in fast-paced emergency environments.

Importantly, emergency preparedness extends beyond technical know-how. It also involves understanding radiographic triage principles, effective communication with distressed patients, infection prevention during emergencies, and coordination with other professionals during mass casualty events (Kumar *et al*., 2024). Radiographers lacking such multidimensional knowledge may experience uncertainty, reduced confidence, and inefficiency when managing emergency cases (Kennedy & Davis, 2021).

2.1.3 Interprofessional collaboration in emergency teams

Successful emergency management relies on seamless collaboration among professionals from various healthcare disciplines. Radiographers must interact efficiently with doctors, nurses, and paramedics to prioritize imaging needs and support timely interventions. Ineffective communication or role ambiguity can disrupt workflow and compromise patient outcomes (Bekkink *et al*., 2018). Halilu *et al*. (2021) further noted that well-defined task allocation within the emergency team enhances morale and minimizes interdepartmental conflicts. Regular multidisciplinary briefings, structured handovers, and joint simulation exercises strengthen mutual understanding and accountability across professions (Dillon *et al*., 2009).

2.1.4 Institutional support and training opportunities

Institutional structures play a crucial role in promoting emergency preparedness among radiographers. Hospitals that provide access to trauma simulations, emergency drills, and structured training enable radiographers to build competence and confidence (Khirekar *et al*., 2023). Availability of adequate imaging equipment, emergency checklists, and standard operating procedures significantly influences radiographers' performance during mass casualty incidents (Suda *et al*., 2025).

Furthermore, facilities that prioritize regular workshops, mentorship programs, and continuing education demonstrate better imaging outcomes and response times during emergencies (Hefferman *et al*., 2019). Therefore, strong institutional commitment is indispensable for sustaining high-quality emergency imaging services

Moreover, facilities that invest in regular emergency radiography workshops and mentorship programs demonstrate better overall response times and imaging quality metrics (Hefferman *et al*., 2019).

2.1.5 Technological advancement and role expansion

Recent technological innovations have transformed the scope of radiographers' duties. The introduction of portable X-ray units, artificial intelligence (AI) assisted image interpretation, and high speed CT scanners has revolutionized trauma imaging (Alharbi *et al*., 2024). However, these advancements require radiographers to acquire new competencies and engage in regular upskilling. Elechi *et al*. (2023) reported that radiographers trained in mobile and trauma imaging techniques demonstrated faster image acquisition times and greater diagnostic accuracy compared to untrained colleagues. Thus, continuous training in emerging technologies is essential for maintaining efficiency and safety in emergency departments.

2.1.6 Barriers and enablers of emergency involvement

Radiographers encounter several challenges that hinder their active participation in emergency response. Common barriers include vague job descriptions, inadequate communication with referring clinicians, limited access to functional imaging equipment, and fear of legal consequences arising from diagnostic errors. Despite these obstacles, certain factors can facilitate effective involvement. These enablers include consistent training, supportive leadership, clearly defined emergency protocols, and inclusion of radiographers in triage and decision-making processes (Adhikari *et al*., 2024). Encouraging professional accountability and empowerment among radiographers enhances service delivery and aligns with international patient safety standards established by the World Health Organization (WHO, 2021).

.

2.2 Empirical review

A wide range of studies has determined the knowledge, attitudes, and practices of healthcare professionals radiographers included regarding their participation in emergency response activities.

Klobasa *et al*. (2025) investigated a radiographer comment model implemented across several emergency departments in New South Wales, focusing on how promptly and safely abnormal radiographic findings were communicated to emergency physicians. Their retrospective review revealed that radiographers occasionally identified critical abnormalities, and that direct communication, whether verbal or written, significantly reduced diagnostic discrepancies. Out of 1,102 comments analyzed, 42 were false positives, none leading to adverse outcomes, showing that radiographer-initiated alerts provide an efficient and low-risk method of improving diagnostic accuracy and patient safety.

Moradian *et al*. (2025) examined radiograph rejection patterns in both emergency and routine imaging departments in Yazd, Iran. Among 7,006 radiographs, positioning errors and patient motion accounted for most rejections. Although the overall rejection rate met international standards, the authors recommended periodic audits and targeted quality-improvement initiatives to enhance departmental efficiency.

Paul (2025) evaluated the preparedness of radiologic technologists in UAE hospitals for managing emergencies using a quantitative cross-sectional design. While the majority recognized the importance of emergency readiness, less than half felt adequately confident to manage such situations, and about one-quarter lacked

practical training. These findings emphasized the need for simulation-based instruction and continuous professional development to strengthen response capacity.

Poon *et al*. (2025) analyzed radiographers' accuracy in preliminary image evaluation of pediatric trauma radiographs in Australia. Reviewing 498 examinations, the authors found overall diagnostic accuracy of 93.3 %, with sensitivity and specificity values of 84.3 % and 98.1 %, respectively. Extremity imaging showed the highest rate of misinterpretation. The study concluded that radiographers can effectively contribute to diagnostic decision-making in emergency units, especially in the absence of radiologists.

Alzughaibi *et al*. (2024) compared the knowledge, attitudes, and practices of radiologists and paramedics concerning accident and emergency preparedness. From 139 respondents, only 61.4 % were familiar with the key steps in major emergency response. Although most participants demonstrated positive attitudes, fewer than one-third believed that collaboration between radiologists and paramedics was feasible in emergency case interpretation, highlighting gaps in interprofessional coordination.

Daniels *et al*. (2024) explored working conditions among emergencymdepartment staff across the UK using focus-group discussions with 33 participants from various professional backgrounds. Their qualitative analysis identified several systemic barriers, including blame culture, inadequate leadership, and poor institutional support. Leadership quality was particularly linked to staff morale and retention, underscoring its central role in sustaining effective emergency teams.

Jambi *et a*l. (2024) conducted a two-phase prospective assessment of image quality and radiation-safety practices for disabled and non disabled patients. Among 55

procedures, 31-43 % of images achieved high diagnostic value, whereas 5-25 % were substandard. Technologists reported deficiencies in radiation protection, prompting recommendations for ongoing training and stricter adherence to safety standards.

In a study on imaging overuse, Kwee *et al*. (2024) surveyed 66 radiologists and 425 emergency physicians. Both groups rated over-utilization as a major concern, particularly for CT scans (84.8 % and 75.3 %, respectively). Contributors included fear of litigation, limited clinical experience, and patient pressure. These findings reflected wider anxieties about unnecessary exposure and healthcare costs associated with defensive imaging practices.

Shakya *et al*. (2024) evaluated disaster-preparedness awareness among healthcare workers in Nepal. Out of 118 participants, prior experience and higher educational level significantly correlated with familiarity in emergency procedures ($\chi^2 = 6.982$, $p = 0.008$; $\chi^2 = 5.507$, $p = 0.019$). Despite this, overall preparedness remained low, indicating an urgent need for consistent simulation training to improve institutional readiness.

Sipos *et al*. (2023) assessed burnout among Hungarian radiographers during the COVID-19 pandemic. Of 439 responses analyzed, those in emergency units reported greater emotional exhaustion and depersonalization, particularly among early career males. The researchers recommended workplace policies promoting mental-health support and workload balance to curb occupational stress.

Talevski *et al*. (2023) examined how radiographers make clinical decisions in adult trauma imaging through virtual focus-group interviews. Five central themes emerged: multidisciplinary support, patient understanding, pain-reduction strategies, informed

communication, and professional competence. The findings underscored that teamwork and patient-centred approaches are integral to radiographers' performance in trauma care.

Tran *et al*. (2023) investigated the perceptions of newly qualified radiographers regarding emergency and trauma imaging through phenomenological interviews with 19 participants. The study revealed that exposure to emergency imaging during training significantly shaped their confidence and adaptability in clinical practice.

Shubayr and Alashban (2022) explored nuclear medicine technologists' preparedness for radiological emergencies in Saudi Arabia. Among 60 respondents, most demonstrated strong competence in radiation detection equipment, including gamma and Geiger counters. Those who had undergone prior emergency response training were markedly more willing to assist during radiological incidents, confirming the positive impact of continuous education on professional readiness.

Kennedy and Davis (2021) assessed radiographers' self-confidence in managing emergencies within Irish hospitals. Although many felt adequately prepared, several admitted poor familiarity with vital sign monitoring. They recommended mandatory life-support courses to improve competence and response efficiency.

Brown *et al*. (2019) reviewed 6,290 radiographic examinations to determine radiographers' preliminary evaluation accuracy. Their analysis yielded an average diagnostic accuracy of 92 %, sensitivity 71.1 %, and specificity 98.4 %, reinforcing the reliability of radiographers' image assessments as diagnostic support in emergencies.

Nofal *et al*. (2018) studied disaster preparedness among emergency staff in Riyadh, Saudi Arabia, using a structured questionnaire administered to 189 participants. Respondents with over five years' experience demonstrated significantly higher preparedness scores ($p = 0.009$). Nearly all participants agreed on the necessity of regular training, although familiarity with existing disaster protocols remained moderate.

Koch (2014) evaluated 40 radiographers in South Africa and identified substantial demand for first-aid and emergency-response training. The results formed the basis for proposed competency-building programs tailored to imaging professionals.

Hardy *et al*. (2013) conducted a randomized controlled trial assessing the impact of immediate radiographer reporting in emergency departments. Among 1,502 patients, interpretive errors dropped notably in the immediate reporting group compared with standard practice, without affecting perceived health outcomes. The findings demonstrated that real-time reporting by radiographers can reduce errors and optimize diagnostic efficiency.

2.3 Theoretical framework

2.3.1 Role theory and application to the study

Role theory provides information into the behavioral patterns of radiographers within the emergency care setting. It suggests that individuals perform according to the expectations attached to their social roles, which are shaped by institutional norms, job descriptions, and interprofessional dynamics. In the context of this study, Role theory explains how radiographers' perceived underperformance or passive

participation in emergency scenarios may arise from unclear roles, lack of defined responsibilities, or exclusion from emergency training (Chika & Osuagwu 2022).

When institutions or team structures fail to clearly assign clinical responsibilities to radiographers during emergencies, it may lead to reduced engagement, as they may not see themselves as active contributors. This aligns with Chika and Osuagwu (2022), who found that unclear role definitions lead to job dissatisfaction and reduced motivation among healthcare professionals. Thus, this theory helps the current study explore not only what radiographers do in emergencies, but why their involvement may be limited often due to systemic and organizational factors rather than individual capacity.

2.3.2 Knowledge to Action (KTA) framework

Role theory provides an essential foundation for interpreting how radiographers behave within emergency care environments. It postulates that individuals act in accordance with the expectations and responsibilities associated with their designated roles, which are influenced by institutional norms, professional boundaries, and interprofessional relationships. In the context of this research, role theory offers a lens for understanding why some radiographers appear to play a limited or passive role during emergency situations. Such behavior may stem from vague job definitions, insufficiently structured responsibilities, or exclusion from emergency training initiatives (Chika & Osuagwu, 2022).

When healthcare institutions fail to clearly delineate radiographers' responsibilities during emergency operations, their involvement tends to diminish, as they may not perceive themselves as core members of the care team. Chika and Osuagwu (2022)

similarly observed that a lack of explicit role definition within healthcare settings leads to lower job satisfaction and motivation. Therefore, the theory not only clarifies what radiographers do in emergencies but also why their engagement may be constrained. It attributes reduced participation to systemic and organizational limitations rather than to a lack of competence or willingness on the part of individual practitioners.

2.3.2 Knowledge to Action (KTA) framework

The Knowledge to Action (KTA) framework developed by Graham *et al*. (2006) is highly applicable to this study as it describes how knowledge moves from theoretical understanding to practical implementation. The framework emphasizes that knowledge translation is a dynamic and iterative process involving adaptation, application, evaluation, and sustainability. Within the context of emergency radiography, this model helps explain the disparity between radiographers' theoretical awareness of emergency imaging principles and their actual application of such knowledge in clinical practice.

Radiographers may possess adequate conceptual understanding of emergency protocols yet fail to demonstrate these competencies in real-world scenarios due to barriers such as limited institutional support, insufficient feedback mechanisms, or inadequate exposure to emergency cases. Using the KTA model, this study seeks to identify at which point this breakdown occurs—whether during the knowledge-acquisition stage (e.g., limited hands-on training) or during implementation (e.g., lack of opportunities or mentorship). The framework thus guides the development of strategies to bridge the knowledge–practice divide, such as regular simulation-based

learning, structured emergency training for radiographers, and establishment of monitoring and feedback systems that reinforce practical application.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research setting

The study was conducted in Benin City, Edo State, Nigeria, at the University of Benin Teaching Hospital (UBTH). University of Benin Teaching Hospital is a public tertiary hospital in Ugbowo, Benin City. Although established on May 12th, 1973, it was taken over by the Federal Government in 1975. The hospital has over 860 bed capacity as at August 2017 and still increasing.

3.2 Study design

A descriptive cross-sectional design was used because it allowed assesment of the knowledge and practices of radiographers regarding their roles in emergency response teams at the University of Benin Teaching Hospital (UBTH) in Benin Metropolis.

3.3 Target population

All registered and licensed radiographers in a teritiary hospital, University of Benin Teaching Hospital (UBTH) in Benin Metropolis.

3.3.1 Inclusion criteria

- Radiographers who worked in diagnostic imaging departments.
- Radiographers who have spent at least two months in the facility.
- Radiographers who gave informed consent.

3.3.2 Exclusion criteria

- Radiologist, x-ray technicians and any other health care professional.
- Radiography students.

- Radiographers on extended leave during the study period.

3.4 Sampling technique/ Sample Size

A census sampling technique was employed to include all 31 registered and licensed radiographers working in the Radiology Department of the University of Benin Teaching Hospital (UBTH) during the study period (July-September 2025). The census approach was chosen because the target population (N=31) was sufficiently small and operationally accessible, making complete enumeration feasible without the logistical complexities of probability sampling. Also, including every eligible radiographer minimized sampling variability and prevents selection bias that could arise from random or convenience sampling in a small frame. Additionally, any non-response can substantially reduce precision. A census maximizes the effective sample size and improves confidence in estimates of frequencies and percentages.

3.5 Instrument for data collection

A self structured questionnaire was used. A self-administered, structured questionnaire (23 items) was developed to align tightly with the study's objectives (knowledge, current practices, participation, and influencing factors). Four stages were employed in developing the questionnaire;

i. Construct definition:

- Knowledge of radiographers' roles and emergency protocols (e.g., awareness of positioning standards, CT indications, infection control, radiation protection, communication pathways).
- Current practices and involvement (frequency of emergency imaging, simulation participation, collaboration with physicians/nurses).
- Perceived competence and participation (self-rated competence; participation in emergency teams).

- Influencing factors/barriers and enablers (training/CPD, equipment availability, role clarity, staffing, communication).

ii. Items were written in clear, context appropriate English, avoiding jargon.

Response formats included dichotomous (Yes/No), multiple-response checklists, and 5-point Likert scales (Strongly disagree to Strongly agree; Never to Very often). Negatively worded items (if any) were reverse-scored to reduce acquiescence bias.

Scoring and categorisation:

Knowledge and practice items were scored (Correct/Appropriate = 1; Incorrect/Not sure/Not applicable = 0 for knowledge; Positive practice/participation = 1 for practice items). Composite scores were converted to percentages and classified using Bloom's cut-offs: High (≥80%), Moderate (60-79%), Low (<60%).

Level of competence was determined by using a 3-level scale: Highly competent / Competent / Moderately competent.

3.6 Validity of instrument

The draft questionnaire was reviewed by the project supervisor and two senior radiography/research-methods experts. Reviewers rated each item for relevance, clarity, simplicity, and necessity. Item-level Content Validity Indices (I-CVI) were computed; items with I-CVI <0.78 were revised or removed. A Scale-level CVI (S-CVI/Ave) ≥0.80 was targeted to indicate adequate content validity. Wording refinements addressed ambiguity, improved alignment with UBTH emergency workflow, and ensured contextual appropriateness.

3.7 Reliability of instrument

A pilot test with five radiographers in another hospital outside the study site assessed length, clarity, and administrative logistics. Median completion time was about 10-12 minutes; minor edits streamlined skip patterns and refined response options.. The data from the pilot study were analyzed using Cronbach's alpha, yielding a reliability coefficient of 0.82, indicating good internal consistency.

3.8 Method of data collection

Printed questionnaires were given to participants who gave consent and were given 2 to 3 days to complete and return the questionnaire after filling.

3.9 Method of data analysis

The data was analysed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics including frequencies, percentages, means and chi-square test will be used test associations between variables. A p-value of less than 0.05 was considered statistically significant.

3.10 Ethical considerations

Ethical The study received ethical approval from the UBTH Health Research Ethics Committee (HREC) (Approval No.: [NHREC/24/01/202]). All procedures adhered to the principles of the Helsinki Declaration, institutional policies.

Participants received an information sheet detailing the study purpose, procedures, risks/benefits, data use, and contact information. Written informed consent was obtained before participation. Participation was voluntary; respondents could decline or withdraw at any time without repercussion. No incentives that could unduly influence participation were provided. No personally identifiable information (e.g., names, staff IDs, phone numbers) was collected on the questionnaire.

Each questionnaire was assigned a unique alphanumeric code for tracking and data management without revealing identity. Ethical approval request, Consent form and ethical approval letter are attached as appendix II, III and IV.

CHAPTER FOUR

RESULTS AND DISCUSSION

The results are presented in narrative and tabular formats. These results cover data obtained from descriptive (percentages and frequencies) and inferential statistics.

4.1 Presentation

A total of 31 radiographers participated in the study. The majority were male 22 (71.0%), while females were 9 (29.0%). Most of the respondents were within the 26-30 years category (48.4%), followed by those less than 26 years (22.6%), 31-40 years (19.4%), and >40 years (9.7%).

Table 4.1: Demographic information of radiographers

Variable	Category	Frequency (31)	Percentage (%)
Gender	Male	22	71
	Female	9	29
Age	<26yrs	7	22.6
	26-30yrs	15	48.4
	31-40yrs	6	19.4
	>40yrs	3	9.7
Experience	<1yr	9	29.0
	2-5yrs	15	29.4
	6-10yrs	6	19.4
	>15yrs	1	3.2
Qualification	B.sc	29	93.5
	M.sc	2	6.5

29 (93.5%) strongly agreed and 2 (6.5%) agreed that radiographers are essential members of the emergency team. The most commonly recognized roles were:Performing urgent imaging 31 (100%), patient positioning for trauma cases 30 (96.8%) (Table 4.2).

Table 4.2: Roles of radiographers as members of the emergency team

5. Radiographers are essential members of the emergency response team	Frequency (N)	Percentage (%)
Strongly agree	29	93.5
Agree	2	6.5
6. Which of the following roles do radiographers perform in emergency situations?		
Patient positioning for trauma cases	30	6.8
Performing urgent imaging (X-ray, CT, MRI)	31	100.0
Providing preliminary image observations	22	71.0
Communicating with physicians/nurses	28	90.3
Supporting resuscitation or patient monitoring	19	61.3
7. What additional contributions can radiographers make to improve emergency care?		
Faster image acquisition for trauma patients	29	93.5
Preliminary interpretation of urgent images	18	58.1
Participation in resuscitation or monitoring	11	35.5
Providing mobile imaging in critical care areas	26	83.9
Enhanced communication with physicians/nurses	18	58.1

Regarding involvement in emergency imaging, 4 (12.9%) very often, 11 (35.5%) often, 16 (51.6%) sometimes. Only 22.6% highly competent, 51.6% competent, 25.8% moderately competent in performing emergency imaging procedurs. 16.1% regular, 38.7% occasional, 45.2% none. About 29% always, 29% often, 41.9% sometimes work with physicians/nurses.. There was a significant association between years of experience and competence in emergency imaging (p=0.009) (Table 4.3).

Table 4.3: Current practices and involvement in emergency situations

8. How often are you involved in emergency imaging procedures?	Frequency (N)	Percentage (%)
Very often	4	12.9
Often	11	35.5
Sometimes	16	51.6
9. How would you rate your level of competence in performing emergency imaging procedures?		
Highly competent	7	22.6
Competent	16	51.6
Moderately competent	8	25.8
10. Have you participated in multidisciplinary emergency simulations?		
Yes, regularly	5	16.1
Occasionally	12	38.7
No	14	45.2

Table 4.3: Current practices and involvement in emergency situations

11. How often do you usually work alongside physicians and nurses during emergency cases?		
Always	9	29.0
Often	9	29.0
Sometimes	13	41.9
12. Do you feel radiographers receive equal respect as other health care professionals during emergency cases?		
Strongly agree	4	12.9
Agree	15	48.4
Disagree	10	32.3
Strongly Disagree	2	6.5

From Table 4.4 below, unstable patients 17 (54.8%), equipment shortage 4 (12.9%), poor communication 3 (9.7%), undefined roles 2 (6.5%), staff shortage 4 (12.9%) were the common challenges. All respondents 31 (100%) reported rapid patient positioning & trauma radiographs; 19 (61.3%) assisted in stabilizing patients; 17 (54.8%) provided immediate image observations; 13 (41.9%) actively participated in multidisciplinary teams**.**

Table 4.4: Challenges during emergency imaging & radiographers' roles

13. What challenges have you faced during emergency imaging?	Frequency (N)	Percentage (%)
Unstable patients	17	54.8
Lack of equioment	4	12.9
Poor communication	3	9.7
Undefined roles	2	6.5
Staff shortage	4	12.9
All options	1	3.2

Table 4.4: Challenges during emergency imaging & radiographers' roles

14. Which of the following roles do radiographers perform in emergency situations?	Frequency (N)	Percentage (%)
Rapid patient positioning for imaging	31	100.0
Performing urgent trauma radiographs/CT scans	31	100.0
Assisting in stabilizing patients during imaging	19	61.3
Providing immediate image observations to clinicians	17	54.8
Participating actively in a multidisciplinary emergency team	13	41.9

Factors influencing participation in emergency teams

From Table 4.5 below, only 4 (12.9%) had received training/CPD, while 27 (87.1%) had not. About 23 (74.2%) reported no protocol, 6 (19.4%) yes, 6.5% not sure. Majority mentioned lack of training 27 (87.1%), Equipment shortage 23 (74.2%) ,Undefined roles 25 (80.6%), Poor communication 22 (71%). Limited staffing 19 (61.3%), as factors influencing radiographers participation in emergency teams. All 31(100%) were willing to take additional training. All radiographers listed CPD workshops 31 (100%), improved equipment 26 (83.9%), clearer role definition 23 (74.2%), better communication 25 (80.6%), staffing support 24 (77.4%), recognition/incentives 24 (77.4%).

Table 4.5: Factors influencing participation in emergency teams

Question	**Yes (%)**	**No(%)**
Have you received formal training or Continuous Professional Development (CPD) on emergency radiography	4 (12.9)	27 (87.1)
Does your hospital have a protocol defining radiographers' emergency roles?	6 (19.4)	23 (74.2)
Would you be willing to take additional training or certifications in emergency radiography if provided?	31 (100)	0 (0.0)
To what extent do you agree with the following statements?	**Frequency**	**Percentage**
Lack of training reduces radiographers' participation in emergencies.	27	87.1
Lack of equipment limits radiographers' involvement.	23	74.2

Table 4.5: Factors influencing participation in emergency teams

To what extent do you agree with the following statements?	Frequency	Percentage
Undefined roles reduce radiographers' effectiveness.	25	80.6
Poor interprofessional communication hinders participation.	22	71.0
Radiographers are adequately recognized in emergency care.	23	74.2
Interprofessional collaboration improves emergency outcomes.	22	71.0
Limited staffing in your department affects the quality of emergency imaging services?	19	61.3
What measures would improve radiographers' involvement in emergency response?		
Regular training/CPD workshops	31	100.0
Clearer role definition in emergency protocols	23	74.2
Improved access to imaging equipment	26	83.9
Better interprofessional communication	25	80.6
Increased staffing support	24	77.4
Recognition and incentives for emergency work	24	77.4

There was a significant association between years of experience and training received (p=0.030) (Table 4.6).

Table 4.6: Association between years of experience and training/ CPD received

Years of experience	Received Training/ CPD	Did not receive training/CPD	p- value
< 1 year	1 (9.1%)	10 (90.9%)	
2-5 years	3 (15.8)	16 (84.2%)	0.030
6-10 years	0 (0.0%)	1 (100%)	

From table 4.7 below, Majority 16 (51.6%) had moderate knowledge of the roles of radiographers as members of the emergency team, while 14 (52.2%) had high knowledge. Only 1 (3.2%) had low knowledge.

Table 4.7: Knowledge level among radiographers

Knowledge level	Frequency	Percentage
High	14	45.2
Moderate	16	51.6
Low	1	3.2

Table 4.8 show the participation level of radiographers in emergency situations. Majority 17 (54.8%) and14 (45.2%) had high and moderate level of participation.

Table 4.8 Participation level among radiographers

Participation level	frequency	percentage
High	17	54.8
Moderate	14	45.2
Low	0	0.0

From Figure 4.1 below, 9 (28%) of radiographers had good level of practice and incolvement in emergency situations. About 12 (38.7), 10 (32.3%) had fair and poor practice level respectively.

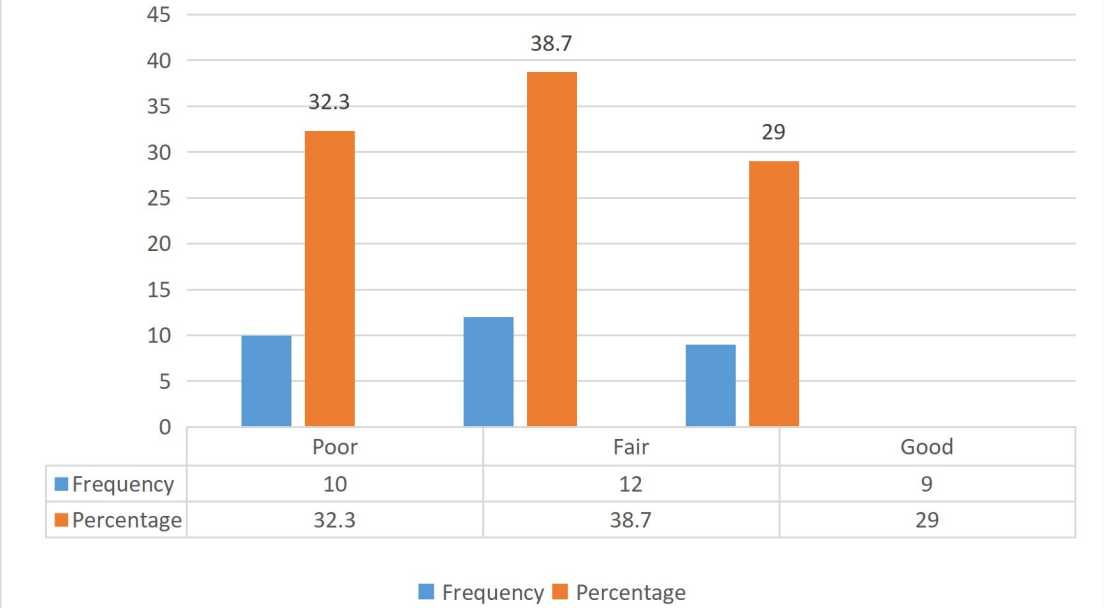


Figure 4 1: Practice level and involvement of radiographers in emergency situations

There was no statistically significant relationship between radiographers' level of knowledge and their level of practice (p = 0.592). This shows that a higher level of knowledge about emergency roles did not necessarily correspond to better practical engagement among the radiographers.

Table 4.9: Association between knowledge and practice level of radiographers

Knowledge	Level of practice			p-value
	Poor 4 (%)	Fair 17 (%)	Good 10 (%)	
Low	1 (3.2%)	2 (6.5%)	1 (3.2%)	0.592
Moderate	3 (9.7%)	10 (32.3%)	3 (9.7%)	
High	0 (0.0%)	5 (16.1%)	6 (19.4%)	

There was a statistically significant relationship between practice level and participation level among radiographers (p = 0.000). Radiographers with higher practice levels were more likely to demonstrate high participation in emergency medical team activities, emphasizing that stronger practical competence improves active involvement (Table 4.10).

Table 4.10: Association between practice level & level of participation of radiographers

Practice Level	Level of participation			
	Low (n, %)	Moderate (n, %)	High (n, %)	p-value
Poor	0 (0.0%)	4 (12.9%)	0 (0.0%)	
Fair	1 (3.2%)	14 (45.2%)	2 (6.5%)	p = 0.000
Good	0 (0.0%)	1 (3.2%)	9 (29.0%)	

4.2 DISCUSSION

This study evaluated the roles of radiographers as members of the emergency team in a tertiary hospital in Benin Metropolis. It examined their knowledge of emergency roles, current practices and involvement, as well as factors influencing their participation in emergency cases.

Knowledge of roles of radiographers in emergencies

The study revealed that all radiographers at the University of Benin Teaching Hospital (UBTH) acknowledged having an essential role in emergency teams, with 29 (93.5%) strongly agreeing and 2 (6.5%) agreeing. This demonstrates a strong professional awareness of their relevance within emergency care, alongside other healthcare providers such as physicians, nurses, and paramedics. This high level of awareness aligns with findings by Eze et al. (2018) and Paul (2025), who both reported similar recognition of emergency roles among radiologic technologists. However, Koch et al. (2014) emphasized that awareness must be complemented by adequate practical preparedness and continuous emergency training. While radiographers at UBTH are aware of their responsibilities, regular simulation exercises and interprofessional drills would further improve their readiness and confidence in actual emergency scenarios.

The most commonly identified roles were urgent imaging 31 (100%) and trauma patient positioning 30 (96.8%), followed by communication with physicians and nurses 28 (90.3%) and preliminary image observation 22 (71%). However, only 19 (61.3%) recognized participation in resuscitation or patient monitoring. This indicates that radiographers at UBTH mainly associate their emergency function with imaging

procedures rather than direct patient management. This is similar to the observation of Koch *et al*. (2014), who reported that radiographers, though skilled in imaging during trauma cases, were often unfamiliar with first aid and emergency procedures. The situation at UBTH may be influenced by the institutional policy where nurses and paramedics handle patient stabilization while radiographers focus on imaging. In contrast, Poon *et al*. (2025) found that radiographers in Australia played a more comprehensive role, including preliminary image interpretation and active contribution to diagnosis. The disparity shows the influence of health system structure and resource availability on the scope of radiographers' participation. Therefore, expanding radiographers' roles beyond imaging and improving interprofessional collaboration could improve the timeliness and quality of emergency care delivery.

Current practices and involvement in emergency cases

Regarding practice and involvement, more than half of the respondents 16 (51.6%) were only "sometimes" involved in emergency cases, while 4 (12.9%) reported being "very often" involved. This moderate level of participation coud be due to the fact that imaging at UBTH is primarily request based, radiographers are engaged only when formally called upon. A similar pattern was reported by Paul (2025), who noted that radiologic technologists are frequently in close proximity to emergencies but often underutilized due to limited inclusion in emergency response teams. Eze *et al*. (2018) also found that Nigerian radiographers are usually called upon after patient stabilization, limiting their exposure to acute care situations. The implication is that institutional policies defining radiographers' roles in emergency departments should

be reviewed to encourage early involvement during the resuscitation phase, thereby improving patient outcomes and workflow efficiency.

Competence levels among radiographers were relatively high, with 23 (74.2%) reported themselves as competent or highly competent. Competence was significantly associated with years of experience ($p = 0.009$), indicating that hands on exposure contributes to professional confidence and skill development. This finding is in line with Nofal *et al.* (2018) and Shakya *et al*. (2024), who reported that competence and confidence in emergency care are largely experience driven. Similarly, Poon *et al*. (2025) demonstrated that radiographers could effectively support diagnostic processes in emergency departments, particularly when radiologists were unavailable. However, the present finding contrasts with Kennedy and Davis (2021), who found that while radiographers in Ireland felt prepared for imaging roles, many lacked confidence in clinical monitoring and emergency support. This shows the need for continuous training and mentorship programs, especially for younger radiographers, to strengthen competence across both technical and patient care dimensions.

Factors influencing participation in emergency teams

Participation in multidisciplinary training was found to be low, with 14 (45.2%) of radiographers reporting no involvement in emergency simulations or drills. This mirrors the findings of Paul (2025), who observed that radiologic technologists often receive less hands-on emergency training than their peers in other health professions. Limited exposure to simulations may hinder teamwork and delay response time during emergencies. Koch *et al*. (2014) stressed the importance of emergency preparedness training as part of continuing professional development (CPD). This

implies that including regular emergency simulations and first aid training in hospital CPD programs could improve radiographers' preparedness and enhance interprofessional synergy during emergencies.

The major challenges identified during emergency imaging were unstable patients 17 (54.8%), staff shortages 4 (12.9%), equipment shortages 4 (12.9%), poor communication 3 (9.7%), and undefined roles 2 (6.5%). These challenges are consistent with the reports of Adeola (2021), who highlighted the lack of modern imaging facilities in Nigerian hospitals, and Daniels *et al*. (2024), who noted that poor working conditions and weak leadership discourage radiographers from working in emergency settings in the UK. Similarly, Al-Ayed *et al*. (2024) emphasized that effective communication and interprofessional collaboration are crucial for timely and accurate diagnosis. These challenges point to the need for better communication channels, adequate staffing, and improved equipment availability. Addressing these systemic issues could significantly improve workflow efficiency and patient care during emergencies.

An important factor influencing participation was limited access to training, as only 4 (12.9%) respondents had received CPD in emergency radiography. This finding corroborates Eze *et al*. (2018), who identified inadequate training as a major constraint to effective emergency participation among radiographers. The lack of postgraduate courses focusing on emergency radiography further exacerbates the situation, leaving most practitioners to depend on occasional workshops or seminars. Additionally, 23 (74.2%) of respondents reported the absence of institutional protocols clearly defining radiographers' roles in emergencies. Although UBTH

defines imaging related responsibilities, other critical activities such as patient resuscitation and monitoring remain the domain of physicians and nurses. This contrasts with the findings of Poon *et al*. (2025), where radiographers' participation in preliminary image interpretation improved diagnostic accuracy and reduced waiting times in emergency departments. Establishing clear institutional policies and structured emergency radiography training could therefore promote efficiency, improve teamwork, and expand the professional contribution of radiographers in emergency care.

Overall, the findings of this study are consistent with both local and international evidence indicating that radiographers play an indispensable role in emergency departments but are often constrained by inadequate training, limited role definition, and insufficient institutional support. Despite these barriers, all radiographers in this study expressed willingness to undergo further emergency training, reflecting a strong commitment to professional development. This enthusiasm presents an opportunity for hospital administrators and regulatory bodies to develop structured training programs, strengthen policy frameworks, and integrate radiographers more actively into emergency response teams. Such improvements would not only enhance radiographers' competence and confidence but also contribute to faster diagnosis, better patient outcomes, and a more cohesive multidisciplinary emergency care system.

There was a statistically significant relationship between practice level and participation level among radiographers ($p = 0.000$). Radiographers with higher practice levels were more likely to demonstrate high participation in emergency

medical team activities, this shows that stronger practical competence improves active involvement

Summary of findings

- A total of 31 radiographers participated in the study.
- Twenty two (71%) were males, and 9 (29%) were females.
- About 15 (48%) were aged 26-30 years, 7 (23%) below 26 years, 6 (19%) aged 31 40 years, and 3 (10%) above 40 years.
- Only 9 (29%) had less than one year, 15 (48%) had 2-5 years, 6 (19%) had 6-10 years, and 1 (3%) had more than 15 years.
- Majority 29 (94%) strongly agreed and 2 (6%) agreed that radiographers are essential members of emergency response teams.
- All radiographers performed urgent imaging 31 (100%), patient positioning for trauma 30 (97%), communication with physicians and nurses 28 (90%), providing preliminary image observations 22 (71%), and assisting in resuscitation or monitoring 19 (61%).
- Only 7 (23%) were highly competent, 16 (52%) competent, and 8 (26%) moderately competent.
- Level of knowledge was high among 14 (45%), moderate 16 (52%), low 1 (3%). Participation level was high in 17 (55%), moderate 14 (45%), low 0 (0%).
- More experienced radiographers had higher competence (p=0.009).
- Older radiographers were more trained in handling emergency cases (p=0.030).

CHAPTER FIVE

5.1 Conclusion

This study evaluated the roles of radiographers as members of the emergency team in a tertiary hospital in Benin Metropolis. Radiographers possess good awareness of their responsibilities in emergency care, particularly in performing urgent imaging and patient positioning. There was reduced participation in resustication and patient monitoring. However, their actual involvement in emergency situations remains moderate. Competence in emergency imaging was found to increase with years of professional experience, but factors such as inadequate training, lack of institutional protocols, poor communication, and shortage of equipment and staff significantly limit radiographers' full participation. All radiographers expressed willingness to undertake further training.

5.2 Recommendations

1. Organizing regular emergency radiography workshops, continuous professional development (CPD) programmes, and include radiographers in multidisciplinary emergency simulations.
2. Hospitals should develop and implement clear policies defining radiographers' emergency responsibilities.
3. Ensure adequate mobile and portable imaging facilities in emergency and critical care units.
4. Strengthen interprofessional collaboration through structured communication and regular joint training with physicians and nurses.

5. Provision of recognition and incentives for radiographers' contributions in emergencies to boost motivation and retention.
6. National regulatory and professional bodies (RRBN, ARN) should incorporate emergency radiography modules into undergraduate and postgraduate training programmes.

5.3 Limitations

This study was limited to radiographers in University of Benin Teaching hospital, a single tertiary hospital within Benin Metropolis, which may restrict the generalizability of its findings to other healthcare institutions. A small small number of radiographers participated in the study. The relatively small sample size and reliance on self reported data may introduce response bias or overestimation of competence. Additionally, the cross-sectional design captures information at a single point in time, limiting the ability to evaluate changes following training or policy interventions.

5.4 Suggestion for further studies

- Further studies should explore radiographers' emergency roles across multiple hospitals and regions in Nigeria to enhance the generalizability of findings.
- Comparative research between public and private hospitals is also recommended to assess institutional differences in practice and policy.
- Evaluating the impact of continuous professional development (CPD), emergency simulations, and protocol implementation on radiographers' competence and participation should be encouraged.

REFERENCES

Aborode, A. T., Edima, O., Samuel, F. O., Nwosu, K. O. S., Adeola, B. L., Oginni, O. G., Allison, M., Chinonso, S., Aderibole, O. O., Okoro, Y., Olasupo, A., & Scott, G. Y. (2024). Police report requirement for medical emergencies in Nigeria: A threat to universal healthcare coverage. *Medicine, Conflict and Survival*, 40(4), 339-346

Adenuga, A. T., & Adeyeye, A. (2023). Abdominal trauma imaging in a Nigerian tertiary hospital-Our experience with 87 adult patients. *Journal of West African College of Surgeons*, 13(2), 23-27.

Adeola, O. S (2021). Medical imaging system and the health care delivery system in Nigeria: An overview. *International Journal of Medical Imaging*. 9(1), 45-56. doi: 10.11648/j.ijmi.20210901.15

Adhikari, B., Shrestha, L., & Bajracharya, M. (2024). Triage practices for emergency care delivery: A qualitative study among febrile patients and healthcare workers in a tertiary care hospital in Nepal. *BMC Health Services Research*, 24, 180.

Akpaniwo, G. M., Sadiq, A., Danfulani, M., Abubakar, U., Mohammed, A., Iliyasu, Y. I., & Shehu, O. P. (2018). Challenges faced by undergraduate radiography students in Sokoto, Northwest Nigeria, during long vacation clinical posting. *International J Health Sci Res, 8(2), 29-36*

Akinreni, T., Filani, T., Asuni, O., & Owodunni, F. (2023). Awareness and utilization of emergency response service to road traffic crashes in Nigeria: A cross-sectional study. *Journal of Public Health and Emergency*, 7(17), 23-31

Akshay, S., Trivedi, J. D., Lambe, A., Dotel, P., & Karkar, M. (2023). Saving lives in real time: The role of radiology in emergency medicine. *Journal of Education Technology in Health Sciences*, 9(3), 65-67

Alharbi, M., Almohammadi, E., Alharbi, M., Mobaraki, A., & Mojammi, S. (2024). Technological advancements in X-Ray: From digital to AI-based interpretation. Saudi *Journal of Medicine and Public Health*, 1, 106-113.

Almehmadi, M. S., Aljabri, M. A., Aljabri, E. A., Soud, Y., Olfat, R. K., Alahmadi, M. A., Aljabri, A. A., Dawidy, R. M., Alqahtani, S. M., Alharbi, Y. S., Alrajeh, H. A., & Almohammadi, M. H. (2024). The role of radiology technologists in enhancing diagnostic accuracy and patient care. *Journal of Crisis and Risk Communication*, 7(8),3112-3120

Alzughaibi, B. M., Al Subait, H. K. A., Alotaibi, H. R., Almutairi, M. S., Daghas, I. A., Almutairi, A. R., AlOtaibi, H. S., & Alrami, M. I. M. (2024). Knowledge,

attitudes and practices of radiologists and paramedics towards accident and emergency preparedness and the role of biomedical engineering in prehospital emergencies. *Evolutionary Studies in Imaginative Culture*, 8(2), 686-693.

Anderson, J. E., Lavelle, M., & Reedy, G. (2021). Understanding adaptive teamwork in health care: Progress and future directions. *Journal of Health Services Research & Policy*, 26(3), 208-214.

Bearman, C., Hayes, P., & Thomason, M. (2023). Facilitating teamwork in emergency management: The team process checklist. *International Journal of Disaster Risk Reduction*, 9(7), 1-15.

Bienstock, J., & Heuer, A. (2022). A review on the evolution of simulation-based training to help build a safer future. *Medicine (Baltimore)*, 101(25).

Briggs, B., Kalra, S., & Panacek, E. (2022). Risk of radiation exposure to emergency department personnel from portable radiographs. *The Journal of Emergency Medicine*, 63(5), 645-650.

Brown, C., Neep, M. J., Pozzias, E., & McPhail, S. M. (2019). Reducing risk in the emergency department: A 12-month prospective longitudinal study of radiographer preliminary image evaluations. *Journal of Medical Radiation Sciences*, 66(3), 154-162.

Ohanaka, E.C., & Ighedosa, S. U. (2003). Epidemiology of Road Traffic Accidents in Benin City, Nigeria. *Nigerian Journal of Surgical Science* 11(1), 14-18

Chilambe, E., Muller, H., & du Plessis, J. (2024). Novel training approach to improve a cohort of radiographers' image interpretation skills of trauma chest radiographs. *Journal of Medical Imaging and Radiation Sciences*, 55(2), 244-257.

Chong, S. T., Robinson, J. D., Davis, M. A., Bruno, M. A., Roberge, E. A., Reddy, S., Pyatt, R. S., & Friedberg, E. B. (2019). Emergency radiology: Current challenges and preparing for continued growth. *Journal of the American College of Radiology*, 16(10), 1447-1455.

DaCosta, A., Osonuga, A., & Adesegun, O. (2020). The urgent need for postgraduate medical training in emergency medicine in Nigeria. *African Journal of Emergency Medicine*, 10(1), 1-2.

Daniels, J., Robinson, E., Jenkinson, E., & Carlton, E. (2024). Perceived barriers and opportunities to improve working conditions and staff retention in emergency departments: A qualitative study. *Emergency Medicine Journal*, 41(4), 257-265.

Dillon, P., Noble, K., & Kaplan, L. (2009). Simulation as a means to foster collaborative interdisciplinary education. *Nursing Education Perspectives*, 30(2), 87-90.

Edo Specialist Hospital. (n.d.). About us. Edo Specialist Hospital. Retrieved August 2025, from https://edospecialisthospital.com

Elechi, U., Adeoye, A., Obiya, S., Umar, S., Ezeamii, V., Iwu, P., Ugwuanyi, K., & Abone, K. (2025). Digital transformation in radiography practice in Nigeria: A comprehensive review. *Journal of Medical Science, Biology, and Chemistry*, 2(1), 92-103.

Eze, C., Abonyi, L., Njoku, J., Irurhe, N., & Olowu, O. (2013). Assessment of radiation protection practices among radiographers in Lagos, Nigeria. *Nigerian Medical Journal,* 54(6), 386-391.

Field, L. J., & Snaith, B. A. (2013). Developing radiographer roles in the context of advanced and consultant practice. *Journal of Medical Radiation Sciences*, 60(1), 11-15.

Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: Time for a map? *Journal of Continuing Education in the Health Professions*, 26(1), 13-24.

Halilu, S. D., Maiyegun, A. A., Aiyekomogbon, J. O., Shirama, Y. B., Mutalub, Y. B., & Oyediji, F. J. (2024). Interprofessional collaboration amongst healthcare workers of a tertiary hospital in North-Eastern Nigeria. *Nigerian Postgraduate Medical Journal*, 31(2), 163-169.

Hardy, M., Hutton, J., & Snaith, B. (2013). Is a radiographer-led immediate reporting service for emergency department referrals a cost effective initiative? *Radiography*, 19(1), 23-27.

Hassanin, A. M., & Ramadhan, S. A. H. A. (2024). The role of radiology in emergency medicine: Review article. *African Journal of Biomedical Research*, 27(3), 1834-1844.

Hefferman, G., Swenson, D., Ayyala, R., Murphy, B., Johnson, M., & Jindal, G. (2019). Information availability on emergency radiology fellowship websites: Current state and paths to improvement. *Emergency Radiology*, 26(6), 637-644.

Jambi, L., Almitairi, A., & Sulieman, A. (2024). Evaluation of image quality and radiation safety at the emergency department for disabled and nondisabled patients. *Journal of Disability Research*, 3(7), 1-6.

Kaewlai, R., & Lee, C. W. (2025). Emergency radiology: Current status and recent advances. *Korean Journal of Radiology*, 26(2), 91-104.

Kennedy, B., & Davis, D. M. (2021). Radiographers' role in predicting, identifying and treating medical emergencies and their need for more comprehensive life support training. *UCD Medical Journal3(2), 20-28*.

Khirekar, J., Badge, A., Bandre, G. R., & Shahu, S. (2023). Disaster preparedness in hospitals. *Cureus*, 15(12), e50073.

Klobasa, I., Denham, G., Roebuck, D. J., Sim, J., Baird, M., Petrie, D., Best, J., Abood, J., Tonks, A., Tu, C., & Jones, C. (2025). Risk–benefit analysis of a multi-site radiographer comment model for emergency departments. *Emergency Medicine Australasia*, 37, 2-12.

Koch, G. G. (2014). The need for qualified diagnostic radiographers to do additional first aid and emergency procedures training. *Radiography*, 52(2), 26-28.

Kumar, G. L., Mamta, P., Varshdeep, K., Kumar, J. R., & Dalbir, S. (2024). Radiology department disaster preparedness: Practice, strategies and emergency response. *International Journal of Medical Imaging*, 12(2), 41-50.

Kwee, R. M., Toxopeus, R., & Kwee, T. C. (2024). Imaging overuse in the emergency department: The view of radiologists and emergency physicians. *European Journal of Radiology*, 176(1), 2-4

Moradian, S. A., Zamani, H., & Dalvand, S. (2025). An analysis of the rate and reasons for rejected radiographs in emergency and non-emergency radiology departments in Yasuj, Iran. *Frontiers in Biomedical Technologies*, 12(1), 91-100.

Ngo, M., Thorburn, K., Naama, A., & Skelton, E. (2025). Exploring the lived experiences of diagnostic radiographers after transitioning to non-emergency imaging settings. *Radiography*, 31(2), 2-8.

Nofal, A., Alfayyad, I., Khan, A., Aseri, Z. A., & Abu-Shaheen, A. (2018). Knowledge, attitudes, and practices of emergency department staff towards disaster and emergency preparedness at tertiary health care hospital in central Saudi Arabia. *Saudi Medical Journal*, 39(11), 1133-1139.

Okobia, M.N., & Osime, U. (2004). Spectrum of emergencies in an accident centre in Benin-City, Nigeria. *Sahel Medical Journal*. 6. 10.4314/smj2.v6i2.12837.

Okpalla, C. L., Inyiama, H. C., Odii, J. N., Chukwuneke, C. I., & Onyemauche, U. C. (2022). Review of emergency health care delivery system in Nigeria. *Journal of Advances in Mathematics and Computer Science*,37(12), 67-74.

Olde Bekkink, M., Farrell, S. E., & Takayesu, J. K. (2018). Interprofessional communication in the emergency department: Residents' perceptions and implications for medical education. *International Journal of Medical Education*, 9, 262-270.

Oyedokun, T. O., Islam, E. M., Eke, N. O., Oladipo, O., Akinola, O. O., & Salami, O. (2023). Out of hospital emergency care in Nigeria: A narrative review. *African Journal of Emergency Medicine*, 13(3), 171-176.

Paul, J. (2025). Assessing the readiness of radiologic technologists in handling medical emergencies in clinical settings. *Journal of Medical Radiation Sciences*. 7(2), 2-6

Pearce, B., Nguyên, V. N. B., Cowling, C., Pinson, J.-A., & Sim, J. (2024). Australian radiographer roles in the emergency department; evidence of regulatory compliance to improve patient safety-A narrative review. Radiography, 30(1), 319-331.

Poon, T., Neep, M., & Gunn, T. (2025). Radiographer preliminary image evaluation accuracy in interpreting paediatric trauma radiographs. *Journal of Medical Radiation Sciences.*1(3), 1-11

Shubayr, N. A., & Alashban, Y. I. (2022). Knowledge on radiation emergency preparedness among nuclear medicine technologists. *Radioprotection*, 57(1), 27-31

Shakya, Y., Patel, J., Shrestha, R., Shrestha, S., Dangal, R., Pradhan, B., Pandya, J., & Basnet, Y. (2024). Preparedness and management among healthcare workers in Nepal. *Kathmandu University Medical Journal*, 22(3).173-178.

Sipos, D., Jenei, T., Kövesdi, O. L., Novák, P., Freihat, O., Tollár, J., Pandur, A. A., Kovács, Á., Repa, I., & Petőné Csima, M. (2023). Burnout and occupational stress among Hungarian radiographers working in emergency and non-emergency departments during COVID-19 pandemic. Radiography, 29(3), 466-472.

Suda, A. J., Franke, A., Hertwig, M., & Gooßen, K. (2025). Management of mass casualty incidents: A systematic review and clinical practice guideline update. *European Journal of Trauma and Emergency Surgery*, 51(1), 5-18.

Talevski, C., Kilgour, A., & Spuur, K. (2023). Radiographers' decision-making processes in the movement of pain-afflicted adult trauma patients in planar diagnostic imaging. *Journal of Medical Radiation Sciences*, 70 (3), 239-246.

Tran, M., Lin, L., Cowell, H., Makanjee, C., Hayre, C. M., & Lewis, S. (2023). An exploratory study on recently qualified Australian radiographers' expectations

and experiences in emergency and trauma imaging. *Journal of Medical Imaging and Radiation Sciences*, 54(1), 97-103.

University of Benin Teaching Hospital. (n.d.). General info. University of Benin Teaching Hospital. Retrieved August 10, 2025, from https://ubth.org

van Vuuren, C. J., van Dyk, B., & Mokoena, P. L. (2021). Overcoming communication barriers in a multicultural radiography setting. *Health SA*, 26 (1), 4-8.

World Health Organization. (2021). Global patient safety action plan 2021-2030.

APPENDIX I: Questionnaire form

My name is Osamudiamen Pamela Eseosa a student in the Department of Radiography, School of Basic Medical Science, University of Benin with matriculation number BMS2005211 conducting this study under the supervision of Mrs Fanny Igbenedion. The aim of the study is to evaluate the roles of radiographers as members of the emergency team in a tertiary hospital in benin metropolis

We would appreciate your kindness if you could take about 15 minutes of your time to respond to the following questions. Participation in this study is voluntary, you have the right to withdraw from the study at any given time without prior notice. Information provided will be solely used for this research, and will be treated with the utmost

SECTION A: DEMOGRAPHIC INFORMATION

(Please tick the option that applies)

1. Age: ☐ <26 years ☐ 26-30 years ☐ 31–40 years ☐ >40 years
2. Gender: ☐ Male ☐ Female
3. Years of professional experience: ☐ <1 year ☐ 2–5 years ☐ 6-10 years ☐ 11–15 years ☐ >15 years
4. Highest academic qualification: ☐ B.Sc ☐ M.Sc ☐ Ph.D ☐ Others (specify) _____

SECTION B: ROLES OF RADIOGRAPHERS AS MEMBERS OF THE EMERGENCY TEAM

5. Radiographers are essential members of the emergency response team.
   ☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree
6. Which of the following roles do radiographers perform in emergency situations? (Tick all that apply)
   ☐ Patient positioning for trauma cases
   ☐ Performing urgent imaging (X-ray, CT, MRI)
   ☐ Providing preliminary image observations
   ☐ Communicating with physicians/nurses

☐ Supporting resuscitation or patient monitoring

☐ Others (specify): _____

7. What additional contributions can radiographers make to improve emergency care? (Tick all that apply)

   ☐ Faster image acquisition for trauma patients

   ☐ Preliminary interpretation of urgent images

   ☐ Participation in resuscitation or monitoring

   ☐ Providing mobile imaging in critical care areas

   ☐ Enhanced communication with physicians/nurses

   ☐ Others (specify): _____

SECTION C: CURRENT PRACTICES AND INVOLVEMENT IN EMERGENCY TEAM

8. How often are you involved in emergency imaging procedures?

   ☐ Very often ☐ Often ☐ Sometimes ☐ Rarely ☐ Never

9. How would you rate your level of competence in performing emergency imaging procedures (e.g., trauma radiographs, CT for acute cases)?

   ☐ Highly competent ☐ Competent ☐ Moderately competent ☐ Not competent

10. Have you participated in multidisciplinary emergency drills/simulations?

    ☐ Yes, regularly ☐ Occasionally ☐ No

11. How often do you usually work alongside physicians and nurses during emergency cases?

    ☐ Always ☐ Often ☐ Sometimes ☐ Rarely ☐ Never

12. Do you feel radiographers receive equal respect as other health care professionals during emergency cases?

    ☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree

13. What challenges have you faced during emergency imaging? (Tick all that apply)

    ☐ Unstable patients ☐ Lack of equipment ☐ Poor communication ☐ Undefined roles ☐ Staff shortage ☐ Others: _____

14. In what ways have you contributed critically in an emergency case? (Tick all that apply)

    ☐ Rapid patient positioning for imaging

    ☐ Performing urgent trauma radiographs/CT scans

☐ Assisting in stabilizing patients during imaging

☐ Providing immediate image observations to clinicians

☐ Participating actively in a multidisciplinary emergency team

☐ Others (specify): _____

SECTION D: FACTORS INFLUENCING PARTICIPATION

15. Have you received formal training or Continuous Professional Development (CPD) on emergency radiography?
    ☐ Yes ☐ No
16. Does your hospital have a protocol defining radiographers' emergency roles?
    ☐ Yes ☐ No ☐ Not sure
17. To what extent do you agree with the following statements?

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
Lack of training reduces radiographers' participation in emergencies.	☐	☐	☐	☐
Lack of equipment limits radiographers' involvement.	☐	☐	☐	☐
Undefined roles reduce radiographers' effectiveness.	☐	☐	☐	☐
Poor interprofessional communication hinders participation.	☐	☐	☐	☐
Radiographers are adequately recognized in emergency care.	☐	☐	☐	☐
Interprofessional collaboration improves emergency outcomes.	☐	☐	☐	☐
Limited staffing in your department affects the quality of emergency imaging services?	☐	☐	☐	☐

18. *Would you be willing to take additional training or certifications in emergency radiography if provided?*
    ☐ Yes ☐ No ☐ Maybe
19. What measures would improve radiographers' involvement in emergency response? (Tick all that apply)
    ☐ Regular training/CPD workshops
    ☐ Clearer role definition in emergency protocols
    ☐ Improved access to imaging equipment
    ☐ Better interprofessional communication
    ☐ Increased staffing support
    ☐ Recognition and incentives for emergency work
    ☐ Others (specify): _____

APPENDIX II: Ethical approval request

Department of Medical Radiography,

School of Basic Medical Sciences,

University of Benin,

Edo State.

July 2025.

The Chairman,

Health Research and Ethics Committee

University of Benin Teaching Hospital,

Edo State.

Dear Sir/ma,

APPLICATION FOR ETHICAL APPROVAL TO CONDUCT A RESEARCH STUDY

I Osamudiamen Pamela Eseosa with matriculation number BMS2005211 , hereby apply for the above subject. I am an undergraduate student from the Department of Radiography, School of Basic Medical Science, University of Benin. I kindly request for ethics approval to conduct a research project on the topic titled "Evaluation of the roles of radiographers as members of the emergency team in a tertiary hospital in benin metropolis" in partial fulfillment of the requirements for the award of a Bachelor of Science degree in Radiography. Attached is a copy of my research project proposal. I hope my request will be considered.

Yours Faithfully,

Osamudiamen Pamela Eseosa
Phone number: 07052108543

Appendix III: Consent form

Dear radiographer,

My name is Osamudiamen Pamela Eseosa, a final year student from the Department of Radiography, School of Basic Medical Science, University of Benin with matriculation number BMS2005211. I am conducting research project titled: "Evaluation of the roles of radiographers as members of the emergency team in a tertiary hospital in Benin Metropolis". This research will be conducted under the supervision of my lecturer Mrs Fanny Igbinedion.

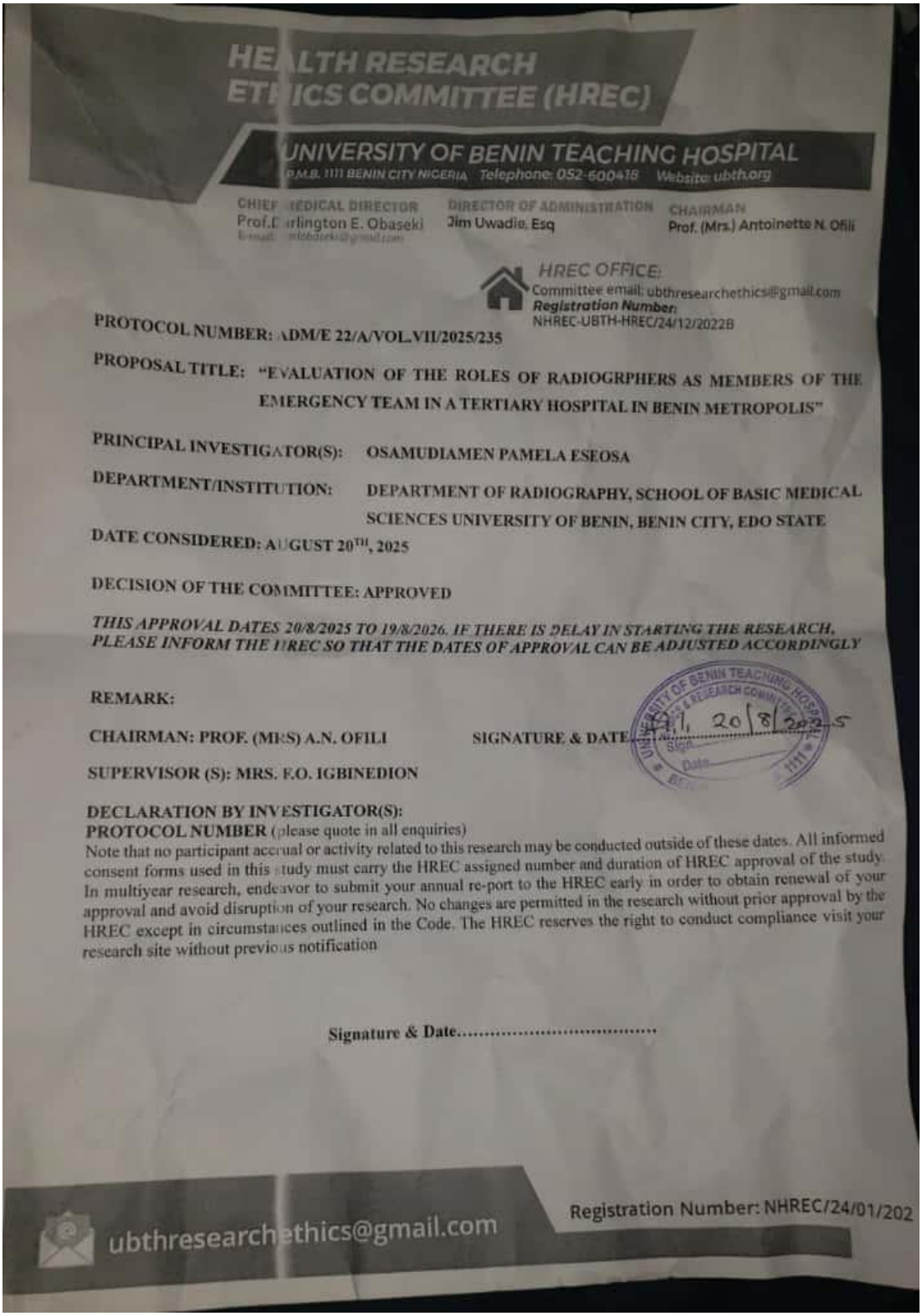
The aim of the study is to evaluate the knowledge and practices of radiographers regarding their roles as members of emergency response teams in Benin Metropolis.The information provided will be used for research purposes only and will be treated with utmost confidentiality. Kindly note that your participation is voluntary, and you may withdraw from the study at any time or stage without prior notice.

Thank you.

Signature of Participant & date

Signature of Researcher & date

APPENDIX IV: Ethical approval letter



HEALTH RESEARCH ETHICS COMMITTEE (HREC)

UNIVERSITY OF BENIN TEACHING HOSPITAL

P.M.B. 1111 BENIN CITY NIGERIA Telephone: 052-600418 Website: ubth.org

CHIEF MEDICAL DIRECTOR Prof. Darlington E. Obaseki

DIRECTOR OF ADMINISTRATION Jim Uwadie, Esq

CHAIRMAN Prof. (Mrs.) Antoinette N. Ofili

HREC OFFICE:
Committee email: ubthresearchethics@gmail.com
Registration Number:
NHREC-UBTH-HREC/24/12/2022B

PROTOCOL NUMBER: ADM/E 22/A/VOL.VII/2025/235

PROPOSAL TITLE: "EVALUATION OF THE ROLES OF RADIOGRPHERS AS MEMBERS OF THE EMERGENCY TEAM IN A TERTIARY HOSPITAL IN BENIN METROPOLIS"

PRINCIPAL INVESTIGATOR(S): OSAMUDIAMEN PAMELA ESEOSA

DEPARTMENT/INSTITUTION: DEPARTMENT OF RADIOGRAPHY, SCHOOL OF BASIC MEDICAL SCIENCES UNIVERSITY OF BENIN, BENIN CITY, EDO STATE

DATE CONSIDERED: AUGUST 20TH, 2025

DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATES 20/8/2025 TO 19/8/2026. IF THERE IS DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY

REMARK:

CHAIRMAN: PROF. (MRS) A.N. OFILI SIGNATURE & DATE 20/8/2025

SUPERVISOR (S): MRS. F.O. IGBINEDION

DECLARATION BY INVESTIGATOR(S):
PROTOCOL NUMBER (please quote in all enquiries)
Note that no participant accrual or activity related to this research may be conducted outside of these dates. All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study. In multiyear research, endeavor to submit your annual re-port to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification

Signature & Date.....

ubthresearchethics@gmail.com

Registration Number: NHREC/24/01/202