EVALUATING THE PERCEIVED IMPACT OF RADIOGRAPHY PRACTICES ON RADIOGRAPHERS WORKING IN EDO STATE HOSPITALS.

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OCTOBER 2025

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A PROJECT SUBMITTED TO THE DEPARTMENT OF RADIOGRAPHY IN PARTIAL FULFILLMENT FOR THE REQUIREMENT OF THE AWARD OF BACHELOR DEGREE IN RADIOGRAPHY (B.RAD)

UNIVERSITY OF BENIN, BENIN CITY, NIGERIA

SUPERVISOR: MR. VICTOR .C. EGBUKICHI

OCTOBER, 2025.

CERTIFICATION

This is to certify the project on EVALUATING THE PERCEIVED IMPACT OF RADIOGRAPHY PRACTICES ON RADIOGRAPHERS WORKING IN EDO STATE HOSPITALS. written by LOVETH CHARLES-OGIEVA with matriculation number BMS2001293 in partial fulfillment of the Bachelor of Radiography Degree (B.Rad) in the DEPARTMENT OF RADIOGRAPHY, SCHOOL OF BASIC MEDICAL SCIENCES, UNIVERSITY OF BENIN.

……

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(Supervisor) Date

……

MRS. F. O. IGBINEDION ……..

(Head of Department) Date

_____ ……

EXTERNAL EXAMINER Date

DEDICATION

I dedicate this project first and foremost to Almighty God, whose grace, wisdom, and unfailing love have been my source of strength throughout this academic journey. His guidance has sustained me through every challenge and made this achievement possible.

With profound gratitude, I also dedicate this work to my beloved parents, Engr. Charles Ogieva and Deaconess Mrs. Mercy Ogieva, whose prayers, sacrifices, and constant encouragement have shaped my path. Their unwavering love and belief in my potential have been the light that guided me even in difficult times.

May this work stand as a reflection of their dedication, values, and the endless support that has brought me this far.

ACKNOWLEDGEMENT

I am profoundly grateful to Almighty God- El Roi for His boundless grace, wisdom, and strength throughout the course of my studies and this research work. His divine guidance has been the foundation upon which every success has been built. My deepest appreciation goes to my loving parents, Engr. Charles Ogieva and Deaconess Mrs. Mercy Ogieva, whose sacrifices, provision, prayers, and unconditional love have been my constant source of motivation. Their belief in my dreams has given me the courage to persevere and excel.

I sincerely acknowledge my supervisor Mr Victor C. Egbukichi for his patience, insightful guidance, and constructive feedback, which contributed immensely to the success of this work.

I also appreciate my siblings Shalom Charles-Ogieva and Ikponmwosa Charles-Ogieva for their contributions, support and prayers through the course of this work.

My heartfelt gratitude also goes to all my lecturers in the Department of Radiography, University of Benin, for their dedication, support, and invaluable impact on my academic journey — especially Mrs. Emmanuella Okeh, whose guidance and encouragement made a lasting difference.

I also appreciate my clinical instructor, Mrs Rebecca Matemi thank you for your love, encouragement and guidance. To my best friend, Obanor David Ikponmwosa, thank you for your unwavering support, encouragement, and understanding through every stage of this journey. I also deeply appreciate my dear friends Tina Ireyuwa, Walex, Queen-Esther, Jenifer, and Azu Victory for their friendship, inspiration, and the joyful moments we shared along the way.

I also appreciate Pst Osas and Mrs Petra Obakpolor for their continuous support and motivation through the course of my academic journey. To my uncle Osawaru and Osarumen, thank you so much for holding me down through this journey.

To my Senior colleagues who have gone ahead of me, especially Rad Princewill Yamah, thank you for all your guidance during the course of this research.

I also appreciate The Dean of Students, Prof F.O Ekhaise for his contributions towards my academic journey, The Mayors' Forum, and every student leader in the University of Benin who stood for me.

To all my classmates and colleagues, thank you for your cooperation, motivation, and companionship. You made this journey truly memorable.

Lastly, I want to thank me for showing up, for pushing through, for not giving up even when things got tough. I thank me for the late nights, early mornings, and countless sacrifices that brought me this far. I am indeed proud of you, Loveth.

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ABSTRACT

Radiography is expected to be a profession where practitioners perform diagnostic imaging procedures while adhering to standard safety protocols, ergonomic principles, and best practices designed to safeguard their physical and psychological well-being. This study set out to evaluate the perceived impact of radiography practices on radiographers working in Edo State hospitals. A total of 95 questionnaires were distributed, with 82 valid responses analysed, representing an 86.3% response rate. The findings revealed that conventional procedures such as chest X-rays, extremities, and abdominal radiography dominate daily workflow, while advanced modalities like MRI and mammography are less frequently performed. Most radiographers reported conducting more than 15 procedures per day, reflecting a heavy workload. The analysis of physical health challenges showed that musculoskeletal complaints, particularly lower back pain, fatigue, and joint or limb pain, were the most significant, while skin and eye irritation was less frequently perceived. On the psychological front, stress, burnout, and overwork due to limited staffing were highly rated, though many radiographers still indicated some degree of job satisfaction. Pearson correlation confirmed a significant positive relationship between radiographic practices and both physical and psychological health outcomes, establishing that workload and procedural demands directly influence the well-being of radiographers in Edo State. The study concludes that radiographic practice in Edo State is marked by a reliance on high-volume conventional imaging, which, while essential for service delivery, has notable consequences on radiographers' health. The physical burden of repetitive procedures and patient handling, combined with the psychological pressures of heavy workload and limited institutional support, significantly affect professional well-being.
Keywords: Practice, Radiography, physical health, musculoskelectal.

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Radiography remains a critical pillar of modern healthcare systems, contributing significantly to disease diagnosis, treatment planning, and patient monitoring (Woznitza et al., 2021). Radiographers, through their technical skills and professionalism, ensure that high-quality diagnostic images are produced to aid in accurate clinical decision-making (Harris et al., 2021). In Edo State, as in many other parts of Nigeria, radiographers provide vital imaging services in both public and private healthcare facilities (Rajan & Dhar, 2023). These professionals play a central role in ensuring that patients receive timely and effective care, despite often working in resource-constrained environments (Alkatheeri et al., 2024). In their daily routines, radiographers perform a wide array of imaging procedures that range from basic examinations such as chest and abdominal X-rays to more specialized studies like computed tomography (CT), mammography, and fluoroscopy (Rawle et al., 2023). These procedures demand not only technical precision but also strict adherence to radiation safety protocols designed to protect both patients and healthcare workers (Kjelle & Chilanga, 2022). Radiographers are also tasked with ensuring that images meet diagnostic standards, which often requires quick decision-making, effective communication with other healthcare professionals, and a deep understanding of anatomy and pathology (Alkatheeri et al., 2024).

However, while radiographic practice is deeply rewarding, it is also associated with a number of physical health challenges (Shettigar et al., 2025). Radiographers frequently engage in activities that require repetitive movements, awkward postures, and the manual handling of patients and heavy equipment (Rajan & Dhar, 2023). Over time, these factors can lead to musculoskeletal disorders, which are among the most commonly reported occupational health issues within the profession (Hulls et al., 2018). Prolonged standing during procedures, frequent bending, and working in poorly designed spaces can exacerbate these physical health risks, potentially leading to chronic pain and disability (Rajan, 2016). In Edo State hospitals, where staffing levels may be inadequate and equipment may not always be ergonomically designed, these risks could be even more pronounced (Makanjee et al., 2023).

In addition to physical health concerns, the psychological demands of radiography work deserve significant attention (Arif, 2024). Radiographers often work under substantial pressure to produce error-free images, particularly in high-volume settings where rapid service delivery is expected (Chinene et al., 2023). The emotional strain of working closely with patients who may be in pain, anxious, or critically ill can also contribute to job stress (Rajan, 2018). Stress in radiography is further amplified by organizational factors such as understaffing, inadequate support from management, and limited access to professional development opportunities (Shidolo et al., 2025). In Edo State, these challenges are likely to mirror those reported in similar healthcare environments, although comprehensive local data is lacking (Rajan & Dhar, 2023).

Burnout, which encompasses emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment, has been increasingly documented among

radiographers worldwide (Arif, 2024). This phenomenon not only impacts the well-being of radiographers but may also affect patient safety and the overall quality of imaging services (Shettigar et al., 2025). In a study conducted in Abu Dhabi, radiographers reported feeling undervalued and overburdened, which contributed to low job satisfaction and intentions to leave the profession (Alkatheeri et al., 2024). Although similar studies are sparse in Edo State, anecdotal evidence suggests that radiographers here may face comparable challenges.

Interestingly, advances in radiography technology and the push towards role extension, such as reporting radiography and advanced clinical practice, present both opportunities and additional pressures (Woznitza et al., 2021). While such developments can enhance professional identity and job satisfaction, they can also lead to role conflict and increased workload if not properly supported (Harris et al., 2021). In regions like Edo State, where health system infrastructure may lag behind technological advancements, the gap between expected and actual practice conditions can create further stress for radiographers (Makanjee et al., 2023).

It is important to recognize that radiographers' work environment directly shapes their health, job satisfaction, and career longevity (Stogiannos et al., 2025). Poorly designed workspaces, outdated equipment, and lack of access to training not only hinder job performance but also contribute to both physical injuries and psychological strain (Hulls et al., 2018). In addition, the culture of the workplace whether supportive or punitive can significantly influence how radiographers cope with these challenges (Chinene et al., 2023). While studies from other countries have shed light on these issues, research focusing specifically on radiographers working in Edo State hospitals is scarce (Rajan & Dhar, 2023).

Without local evidence, it is difficult for hospital administrators, policymakers, and professional bodies to implement targeted interventions that can safeguard radiographers' health and enhance service delivery (Shettigar et al., 2025).

1.2 Statement of the Problem

Radiography is expected to be a profession where practitioners perform diagnostic imaging procedures while adhering to standard safety protocols, ergonomic principles, and best practices designed to safeguard their physical and psychological well-being (Woznitza et al., 2021). Under normal conditions, radiographers are supported through adequate staffing, modern equipment, and workplace policies that promote occupational health and job satisfaction (Harris et al., 2021). Ideally, radiographers should be able to deliver high-quality imaging services without undue risk of physical injury or mental distress (Rawle et al., 2023).

However, in reality, radiographers working in many hospitals, particularly in resource-constrained environments such as Edo State, face significant challenges that deviate from these standards (Rajan & Dhar, 2023). There is growing concern about the physical health issues, such as musculoskeletal disorders, experienced by radiographers due to repetitive movements, manual handling of patients, and prolonged standing during imaging procedures (Shettigar et al., 2025). At the same time, psychological stress, burnout, and low job satisfaction are becoming increasingly reported among radiographers, largely due to high workloads, limited support systems, and inadequate infrastructure (Arif, 2024). Despite these challenges, there is a lack of comprehensive local data on how daily radiographic practices affect the health and well-being of radiographers in Edo State

hospitals, leaving a critical gap in evidence needed to inform effective interventions (Chinene et al., 2023).

This study therefore seeks to bridge this gap by identifying the common radiographic procedures carried out by radiographers in Edo State, assessing the physical health challenges they face, and examining the psychological effects of their work, such as stress and job satisfaction. The findings are expected to provide a clearer understanding of these issues and offer insights that can support policy improvements and workplace interventions aimed at protecting radiographers and enhancing service delivery in the region (Alkatheeri et al., 2024).

1.3 Research Questions

1. What are the common radiographic procedures carried out by radiographers in Edo State hospitals?
2. What physical health challenges do radiographers experience as a result of their daily radiographic practices?
3. What psychological effects, including stress and job satisfaction, do radiographers experience in the course of their work?

1.4 Hypothesis

Null Hypothesis (H_0): There is no significant relationship between radiographic practices and the physical or psychological health of radiographers working in Edo State hospitals.

Alternative Hypothesis (H_1): There is a significant relationship between radiographic practices and the physical or psychological health of radiographers working in Edo State hospitals.

1.5 Aim of the Study

To evaluate the perceived impact of radiography practices on radiographers working in Edo State hospitals.

1.6 Specific Objectives

1. To identify the common radiographic procedures carried out by radiographers in Edo State hospitals.

2. To assess the physical health challenges experienced by radiographers as a result of their daily radiographic practices.

3. To examine the psychological effects of radiographic work, such as stress and job satisfaction, among radiographers.

1.7 Significance of the Study

This study is expected to contribute meaningful knowledge to the radiography profession by providing local evidence on the challenges radiographers face in their daily practice within Edo State hospitals. The findings will highlight the physical and psychological demands placed on radiographers, which can help professional bodies advocate for better working conditions and support systems. It will also offer insight into common radiographic procedures in the region, helping to identify areas where training and professional development may be enhanced. This evidence can guide the formulation of policies that promote the safety, well-being, and career satisfaction of radiographers.

The study's focus on physical and psychological health challenges among radiographers has important implications for occupational health within the healthcare sector. By identifying the specific health risks faced by radiographers in Edo State, the research will support

efforts to design interventions aimed at reducing work-related injuries, preventing burnout, and promoting mental well-being. This can ultimately lead to a healthier, more resilient radiography workforce, which is crucial for maintaining high standards in patient care and diagnostic accuracy.

A healthy and well-supported radiography workforce is essential to the broader healthcare system, as it ensures the delivery of timely and high-quality imaging services that contribute to accurate diagnosis and effective treatment. The findings of this study will indirectly benefit society by highlighting the need for improved healthcare infrastructure and better working conditions for radiographers, which can lead to enhanced patient outcomes. Additionally, by informing policies that promote occupational health and safety, the study supports the goal of building a more sustainable and efficient healthcare system that serves the needs of the population.

1.8 Scope of the Study

This study focuses on exploring the impact of radiography practices on radiographers working in hospitals across Edo State, Nigeria. It covers both public and private hospital settings where radiographers provide diagnostic imaging services. The study specifically examines the common radiographic procedures carried out by these professionals, the physical health challenges they experience as a result of their daily work, and the psychological effects, such as stress and job satisfaction, that arise from their professional responsibilities.

The research is limited to practicing diagnostic radiographers within Edo State and does not extend to other imaging professionals such as sonographers or radiation therapists. Data will be collected through structured questionnaires designed to gather information

about radiographers' work practices, physical health concerns, and psychological well-being. The study does not assess patients' perspectives or focus on the technical quality of the radiographic images produced.

In terms of time frame, the study will reflect the current experiences of radiographers at the time of data collection and will not attempt to assess long-term health outcomes or career trajectories. The findings will provide a snapshot of the present challenges faced by radiographers in Edo State hospitals and serve as a foundation for future research in this area.

1.9 Operational Definition of Terms

Radiography Practices: In this study, radiography practices refer to the routine diagnostic imaging procedures, techniques, and tasks performed by radiographers in hospitals within Edo State. These include activities such as patient positioning, image acquisition, and equipment handling.

Radiographer: A radiographer in this study refers to a licensed health professional who operates medical imaging equipment to produce diagnostic images for patient care in hospitals located in Edo State.

Common Radiographic Procedures: This refers to the imaging examinations most frequently performed by radiographers, such as chest X-rays, abdominal X-rays, musculoskeletal imaging, and other standard diagnostic procedures in Edo State hospitals.

Physical Health Challenges: Physical health challenges in this study refer to musculoskeletal problems, fatigue, and other work-related bodily discomforts or injuries experienced by radiographers as a result of their daily imaging tasks.

Psychological Effects: Psychological effects refer to mental and emotional responses to radiography work, including levels of stress, burnout, and job satisfaction, as reported by radiographers in this study.

Stress: Stress is defined in this context as the emotional and mental strain experienced by radiographers due to workload demands, time pressures, and work environment factors in Edo State hospitals.

Job Satisfaction: Job satisfaction refers to the degree to which radiographers feel fulfilled, valued, and content with their work, based on their experiences in daily radiography practice in Edo State hospitals.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Review

2.11 History of Radiography in Nigeria

Following Wilhelm Conrad Röntgen's discovery of X-rays in 1895, Radiography as a profession was conceived with formal definition and regulation in 1925 by the Society of Radiographers. In Africa, radiography started in South Africa with the documentation showing that x-ray machines were available in the country as early as 1897 (Adejoh, 2019). The first radiographer there, and perhaps, on the African continent, is a woman named May Tomkins, who was trained in London in 1930 by another woman, the iconic K.C. Clark (Adejoh, 2019).

Radiography in Nigeria traces back to the early 20th century with the installation of X-ray machines at Lagos Island General Hospital in 1913 and St. Margaret's Hospital, Calabar, in 1914. Initially dominated by expatriates, the profession saw the emergence of indigenous radiographers like Mrs. Olga Rhodes-Miller, trained in Leeds in 1943. Early hospital expansion during WWI and WWII heightened the demand for radiographers, prompting the training of local youths as technicians. Formal radiography training began in 1947 at the National Orthopaedic Hospital, Igbobi, later shifting to Lagos Island General Hospital in 1949. Indigenous radiographers, in partnership with technicians, established the Association of Radiographers of Nigeria (ARN) in 1958. By 1962, technician training evolved into radiographer training, leading to the establishment of the Federal School of Radiography, Lagos (FSRL), which later affiliated with the Society of Radiographers, London. University-based programs began in the 1970s to address the growing need for degree holders. The University of Calabar (UNICAL) pioneered Africa's first B.Sc.

Radiography program in 1981, followed by the University of Nigeria, Enugu Campus (UNEC) in 1983. UNEC's program became a model for radiography education, significantly contributing to the academic workforce across new universities. Challenges such as brain drain led to the closure of Ibadan's School of Radiography in 1987 and fueled the drive for degree-awarding programs. Radiography evolved from a mono-modality, technician-dominated profession into a respected, multidisciplinary field. Efforts by pioneers like Obong Effiong Philip Akpan were instrumental in this transformation. Today, radiography in Nigeria is bolstered by professional bodies like ARN, and affiliated organizations including the Nigerian Society of Radiography Lecturers (NSRL) and the International Society of Radiographers and Radiologic Technologists (ISRRT), reflecting its continued growth and global integration.

2.1.2 Challenges and Prospects of Radiographic Practice in Developing Countries: Focus on Edo State, Nigeria

Radiography practice in developing countries like Nigeria is shaped by an imbalance between rising healthcare demands and under-resourced systems, placing significant pressure on radiographers who must function under difficult conditions (Ilyasu et al., 2020). Limited infrastructure, aged equipment, and workforce shortages are particularly prevalent in sub-Saharan Africa, where radiographers often serve as the backbone of diagnostic imaging in poorly equipped hospitals (WHO, 2017; Eze et al., 2021). These challenges not only hinder service delivery but also directly affect the wellbeing, motivation, and job performance of radiographers.

In Nigeria, radiographers operate in environments frequently characterized by erratic power supply, analog imaging systems, and overcrowded departments, all of which

compromise the efficiency and accuracy of imaging services (Adejoh, 2019; Eze et al., 2021). Radiographic units in secondary healthcare facilities often lack modern equipment, resulting in repeat exposures, delays in diagnosis, and reduced image quality, which adds physical and psychological strain on radiographers (Shettigar et al., 2025).

The situation in Edo State closely mirrors these national trends. While the University of Benin Teaching Hospital (UBTH) has relatively advanced facilities, many general and private hospitals in the state lack updated radiographic machines and protective infrastructure (Nwankwo & Ajayi, 2023). Radiographers working in these under-resourced settings often face prolonged exposure to radiation due to inadequate shielding and are burdened with long hours, high patient loads, and the absence of supportive ergonomic equipment (Shettigar et al., 2025). In fact, Nwankwo and Ajayi (2023) reported that only 38% of radiology departments in Edo State meet the minimum safety standards for practice.

Beyond physical strain, the mental and emotional impact on radiographers is increasingly evident. According to Rajan and Dhar (2023), radiographers in Nigeria experience high levels of job-related fatigue, stress, and emotional burnout, often linked to insufficient staffing, irregular rest periods, and lack of professional recognition. These health concerns—ranging from musculoskeletal disorders to psychological distress—are reported with high frequency among radiographers working in high-pressure hospital environments, including those in Edo State (Shettigar et al., 2025).

Professional stagnation is another major challenge. Despite the existence of degree and postgraduate radiography programs in Nigerian universities, many radiographers report limited opportunities for specialization or career progression within their work settings

(Adejoh, 2019; Ogundiran et al., 2022). This reality often leads to dissatisfaction and contributes to the ongoing trend of skilled radiographers migrating to countries with better working conditions and clearer professional pathways (Ogundiran et al., 2022).

Nevertheless, the profession in Nigeria particularly in Edo State has promising prospects. Technological advancements such as PACS and digital radiography are gradually being adopted in tertiary centers like UBTH, improving workflow and diagnostic efficiency (Eze et al., 2021). The emerging integration of Artificial Intelligence and teleradiology is also creating new possibilities for extending services to remote regions, provided radiographers receive the necessary training and institutional support (Stogiannos et al., 2025; Knapp & Courtier et al., 2021).

Efforts by professional bodies such as the Association of Radiographers of Nigeria (ARN) and the Nigerian Society of Radiography Lecturers (NSRL) are beginning to influence national policy discussions and push for better working conditions, access to continuous professional development (CPD), and wider recognition of advanced radiographic roles (Adejoh, 2019). In Edo State, growing collaboration between academic institutions and healthcare centers could further enhance professional development and innovation in the field.

To fully realize these prospects, there is a need for deliberate investment in modern imaging infrastructure, targeted staff welfare policies, and sustained advocacy for the elevation of the radiographer's role in the healthcare system (Ilyasu et al., 2020; Ogundiran et al., 2022). By addressing these key areas, the radiography profession in Edo State can transition from a state of strain and underrecognition to one of growth, impact, and improved health outcomes.

2.1.3 Role of Radiographers in the Medical Practice

Radiographers hold a critical position within contemporary healthcare, often serving as the pillar of diagnostic imaging services. Radiographers are multifaceted professionals whose expertise is indispensable for accurate diagnosis and effective treatment planning. They routinely engage with sophisticated imaging modalities which include X-rays, computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound. Adjustments to factors like brightness, contrast, and positioning are made to ensure the production of diagnostically viable images, underscoring the technical rigor inherent in the role.

Patient interaction is a core foundational aspect of radiographic practice. Radiographers are responsible for preparing patients, articulating procedural details, and addressing concerns, which demands both clear communication skills and empathy. Patients may present with anxiety, discomfort, or limited mobility, and radiographers must respond appropriately by screening for contraindications such as pregnancy or allergies to contrast agents, and positioning individuals to balance diagnostic quality with patient comfort. The precise documentation of clinical observations, imaging parameters, and patient interactions further highlights the administrative precision required in this field. Collaboration is an essential component of the radiographer's responsibilities. This entails close coordination with radiologists, physicians, and nursing staff is necessary to ensure comprehensive patient care. As intermediaries between the clinical team and imaging process, radiographers offer valuable insights regarding technical challenges and patient history, influencing diagnostic decisions and the selection of imaging techniques. The ability to perform efficiently in high-pressure, emergency settings further distinguishes radiographers as adaptable and resilient professionals.

Radiographers also play an intricate role in role extension. A proof of this is a research conducted in Abu Dhabi (Alkatheeri et al., 2024) that revealed a strong willingness among radiographers to extend their responsibilities into image interpretation, particularly in emergency skeletal radiography. The study found that 86.3% of participants were prepared to take on reporting duties, highlighting the potential for role expansion, contingent upon appropriate training and regulatory frameworks. Beyond clinical and collaborative duties, radiographers are tasked with the maintenance and quality assurance of imaging equipment. This involves regular calibration and adherence to strict safety protocols to minimize radiation exposure, safeguarding both patients and staff. Expertise in radiation protection is especially vital in high-volume departments. Furthermore, ongoing professional development is a hallmark of the profession; radiographers frequently pursue advanced certification in areas such as mammography, vascular interventional radiography, or MRI to remain current with technological advancements and best practices.

The landscape for radiographers is undergoing significant transformation, largely driven by the increasing influence of artificial intelligence and telemedicine. While advanced AI systems now handle substantial aspects of image analysis and help streamline workflows, the expertise of radiographers remains absolutely crucial. These professionals are essential for supervising technological processes, ensuring diagnostic precision, and upholding the standards of patient-centered care that machines simply can't replicate. Notably, a 2025 European survey revealed that radiographers equipped with both AI education and practical experience expressed greater optimism about AI's potential to enhance their practice (Stogiannos et al, 2025). Still, it's important to acknowledge that concerns about deskilling and the erosion of professional identity have not disappeared.

Telemedicine, especially teleradiology, has also broadened the reach of imaging services. Radiographers now frequently collaborate with remote specialists, bringing timely diagnostic capabilities to regions that previously lacked access. This adaptability underscores the evolving and increasingly dynamic role of radiographers within modern healthcare systems. (Knapp&Courtier et al., 2021).

2.1.4 Common Radiographic Procedures Carried Out by Radiographers

Conventional radiography, or X-ray imaging, remains foundational when it comes to procedures carried out by radiographers, serving as the initial modality for assessment of bone fractures, pulmonary conditions, and abdominal pathologies. Beyond image acquisition, radiographers engage in patient preparation, uphold rigorous radiation safety standards, and perform preliminary evaluations of image quality prior to radiologist interpretation. Their scope extends further within computed tomography (CT), where they manage complex multidetector scanners capable of producing highly detailed cross-sectional images. CT protocols are tailored to clinical indications; for example, non-contrast head CTs are vital for acute stroke evaluation, whereas contrast-enhanced abdominal CTs are indispensable for tumor staging and characterization. Radiographers are responsible for administering iodinated contrast media, assessing patients for potential renal impairment or allergies, and monitoring for adverse reactions. Advancements such as dual-energy CT have broadened diagnostic possibilities. Radiographers now possess the ability to distinguish tissue types with reasonable accuracy which can significantly influence clinical management.

Magnetic resonance imaging (MRI) stands as a particularly demanding domain within radiography, requiring practitioners to possess not only advanced technical proficiency but

also strong patient management capabilities. Unlike modalities that rely on ionizing radiation, MRI makes use of powerful magnetic fields and radiofrequency pulses to create highly detailed images of soft tissues. This makes it indispensable for neurological, musculoskeletal, and oncological imaging. Radiographers must carefully select appropriate coils and imaging

sequences tailored to specific clinical scenarios.

Ultrasound imaging has likewise become an essential component of contemporary radiography practice. It makes use of high-frequency sound waves. Ultrasound provides real-time visualization of internal organs and vascular structures, with radiographers performing a range of examinations including obstetric monitoring, abdominal scans, and vascular assessments for conditions such as deep vein thrombosis. The modality's portability and absence of ionizing radiation are particularly beneficial for bedside and pediatric imaging. Technological advancements such as elastography and contrast-enhanced ultrasound have further expanded diagnostic possibilities. Notably, a 2025 study in The Ultrasound Journal (Wilson et al., 2025) found that targeted training improved radiographers' accuracy in measuring optic nerve sheath diameter by 22%. Radiographers also play a pivotal role in interventional ultrasound, guiding procedures such as biopsies and drainages in real time.

Fluoroscopic procedures represent another specialized area of radiography, enabling real-time visualization for dynamic studies such as barium swallows, intravenous urograms, and orthopedic interventions. These examinations necessitate close collaboration between radiographers and clinicians, with radiographers responsible for adjusting exposure parameters and collimation to optimize both image quality and patient safety.

Specialized procedures in radiography encompass a diverse spectrum of advanced imaging techniques, including mammography, interventional radiology, and nuclear medicine. Within interventional radiology, radiographers play an integral role in complex procedures such as angioplasties and embolizations, demonstrating expertise in both equipment management and the maintenance of sterile technique. The scope of radiographers' responsibilities is expanding, particularly in the realm of image interpretation and reporting. A recent study from the UAE (Alkatheeri et al., 2025) found that 86% of radiographers are willing to pursue additional training to take on reporting roles in skeletal radiography, a shift that may help address radiologist shortages in emergency departments.

2.1.5 Health Challenges Experienced by Radiographers

Radiographers face considerable physical health challenges that are closely tied to the demands of their daily work. Extended periods of standing, repetitive motions, awkward postures, and the manual handling of patients and heavy equipment are all part of the job. Unsurprisingly, these factors put significant strain on the musculoskeletal system. Shettigar et al., 2025 reported that roughly 85% of radiographers experience work-related musculoskeletal disorders, with the neck and lower back being particularly vulnerable. These problems largely stem from the sustained static positions required during imaging procedures, as well as the frequent lifting and repositioning of patients, both of which can lead to chronic pain, decreased mobility, and lasting functional limitations.

The impact of these physical health issues extends well beyond mere discomfort. Chronic musculoskeletal pain can impair a radiographer's ability to carry out clinical duties

effectively and is often accompanied by fatigue and sleep disturbances. These conditions, in turn, may result in higher rates of absenteeism and reduced job satisfaction. Workplace ergonomics also play a critical role; non-adjustable tables and heavy protective gear force radiographers into unnatural positions, further increasing the risk of injury (Shettigar et al., 2025).

Rajan & Dhar, 2023 revealed that fatigue, low energy, body pain, sleep disturbances, depression, anger, emotional dysregulation, and gastrointestinal disturbances were the dominant health concerns identified. Other notable issues included dermatological and ocular conditions, urinary tract infections, diabetes, hypertension, menstrual irregularities, weight loss, and hair loss (Rajan & Dhar, 2023).

Workplace practices such as limited opportunities for rest and the lack of proper lifting aids further exacerbate these challenges. Without appropriate interventions, the cumulative effects of these physical stressors may lead to long-term disability and decreased workforce productivity. Addressing these issues necessitates a comprehensive approach, including ergonomic improvements, training in safe manual handling techniques, and organizational policies that prioritize the health and wellbeing of staff (Shettigar et al., 2025).

2.1.6 Psychological Effect of Stress from Radiography

Burnout among radiographers is a pressing occupational issue that's often underestimated in healthcare discussions. It is a serious threat to both practitioner well-being and patient care (Arif, 2025). Burnout's been recognized since Freudenberger's work in the 1970s, and now it's officially classified in ICD-11 (Arif, 2025). It's not just about being tired. It's a syndrome marked by emotional exhaustion, depersonalization, and a declining sense of

personal accomplishment. In practice, that means radiographers aren't just drained they're at risk of detaching from patients and losing motivation for their work.

The demands of radiographic work really doesn't make it any less stressful as radiographers must maintain intense focus, handle potentially hazardous environments, and deliver precise results that can directly impact patient outcomes. With the constant stress and responsibility, it's no surprise emotional fatigue sets in, which can lead to mistakes that radiology simply can't afford. The consequences don't stop at the workplace. Burnout/ stress extends into radiographers' personal lives, contributing to insomnia, anxiety, depression, and even increased substance use or absenteeism. These effects can compound, further diminishing professional effectiveness and overall quality of care.

Addressing burnout in radiography requires more than superficial fixes. Institutions must develop meaningful interventions such as adjusting workloads, offering counseling, providing stress management resources, and supporting work-life balance. Chinene et al. (2023) examined the perceptions of radiographers in the Harare Metropolitan Province of Zimbabwe regarding occupational factors affecting their mental health. Their findings highlighted an array of psychological disturbances, including frustration, stress, burnout, feelings of being overwhelmed, perceived underappreciation, anxiety, depression, anger, loneliness, grief, and feelings of powerlessness. The study also observed an exacerbation of several behavioral and emotional symptoms, such as increased smoking and alcohol use, intrusive thoughts, heightened alertness, diminished self-esteem, pervasive worry, disturbing dreams, somatic discomfort, appetite fluctuations, insomnia, compassion fatigue, and uncertainty about future career prospects.

2.1.7 Coping Mechanisms for Radiographers

The challenges facing the radiography profession have always included stress stemming from the workplace, clinical expectations, and patient interactions. The role of a radiographer is characterized by numerous challenges: steep workloads, extended working hours, high volumes of patients and patients' attendants to interact with, along with making rapid decisions that rely on precision and accuracy. In order to maintain mental resilience during tirelessly demanding work schedules while maintaining personal productivity standards professionally, coping mechanisms emerged as grounds for coping within clinical context. Increased workload compounded pre-existing fears such as a looming risk of infection, ongoing contagiousness wearing out personnel who had previously contracted viruses and resultantly supporting overwhelming levels of anxiety among workers (Shidolo et al., 2025). Radiographers used a combination of problem-focused strategies alongside emotion focused-approaches stemming from self-care rituals combating burnout. One significant form emerged where caregivers sought support socially helping practitioners verbalize concerns easing burden through empathy from their community network comprised by colleagues, friends or family members witnessing their struggles firsthand (Shidolo et al., 2025). Additional dimensions also surfaced including exercise routines alongside meditative and religious practices serving as methods drastically relieving emotional release along with physical tension both physically nurturing radiologist emotionally stabilizing staff mentally relax(Shidolo et al., 2025).

2.2 Theoretical Framework

2.3.1 Job Demands–Resources (JD–R) Model

The JD–R Model proposes that every job has its own demands (e.g., workload, time pressure, patient care demands) and available resources (e.g., managerial support, equipment, and training). The balance between these determines employee well-being, motivation, and performance.

Application to the study

In the context of radiographers working in Edo State hospitals, the JD–R Model can be used to understand how factors such as long working hours, equipment shortages, and staffing constraints create high demands that may lead to burnout and reduced job satisfaction. By applying this framework, administrators can identify areas of strain and areas where support can be increased.

2.3.2 Karasek's Job Demand–Control Model

Karasek's model focuses on the interplay between job demands (workload and pressure) and job control (autonomy and decision-making ability). High demands combined with low control can result in strain and decreased well-being.

Application to the study

In the radiography departments across hospitals in Edo State, this model can help analyze how the demands of patient load, equipment constraints, and workflow pressures interact with radiographers' autonomy over their work. Radiographers who have low decision-making authority (for example, limited control over patient scheduling or technique) may experience higher levels of stress and fatigue. Understanding this can guide interventions

like providing more autonomy, input in departmental policies, or adjusted scheduling, which could reduce strain and foster a healthier work environment.

2.3.3 Social Cognitive Theory (Bandura)

This theory emphasizes the role of observational learning, self-efficacy, and personal belief in shaping behavior and adaptation. In a clinical context, how radiographers perceive their ability to perform under challenging circumstances influences their coping and performance.

Application to the study

In the radiology departments of Edo State hospitals, Social Cognitive Theory can be applied to understand how role modeling by senior staff, peer support, and mentoring impacts the way radiographers adapt to technological advances and clinical pressures. Radiographers who witness colleagues employing effective coping strategies and demonstrating mastery with new equipment or challenging cases may build their own self-efficacy, leading to better clinical practice and job satisfaction despite external constraints.

2.3 Empirical Review

2.3.1 Identification of the Common Radiographic Procedures Carried Out By Radiographers

Rawle et al., 2021 aimed to investigate the motivations and influences that shaped radiographers' decisions when modifying their imaging acquisition techniques. They conducted an exploratory, descriptive, qualitative study with an inductive approach. Semi-structured interviews were conducted via video conferencing with a convenience sample of 12 radiographers from three public hospitals in Queensland, and the data were analysed

using thematic analysis. Five main themes emerged from the interviews: advances in technology, reliance on experience rather than evidence, the influence of radiology departments, sources of information, and priorities related to image quality. The primary motivator for adapting techniques was achieving optimal image quality. Radiographers tended not to consult research-based evidence, relying more on their observations and experience. The researchers concluded that ignoring evidence-based practice could lead to outdated clinical decisions and called for more efforts to embed research in radiographic practice and to foster a culture that embraced evidence-based approaches.

Woznitza et al., 2021 set out to assess the diagnostic radiography workforce across the United Kingdom by exploring the breadth of advanced practice roles and comparing these roles with Health Education England standards for multi-professional advanced clinical practice (ACP). They invited 174 diagnostic imaging departments to participate in an online survey conducted between October and December 2019. The survey addressed advanced-level roles, their scope of practice, and their education and accreditation requirements across modalities including breast imaging, computed tomography, fluoroscopy, interventional radiology, lithotripsy, magnetic resonance imaging, and projectional radiography. Of the 97 responses received, 79 met the inclusion criteria, yielding a response rate of 45%. The results showed advanced-level practice across every modality surveyed. The most common roles were in clinical reporting for plain radiography (95%) and mammography (67%), while fluoroscopy accounted for the largest proportion of procedure-based roles (25%). Only 39% of departments required role descriptions that adhered to the four pillars of ACP, and just 12% required staff to hold a full master's degree qualification. The study concluded that although advanced clinical practice roles were

widespread, inconsistencies existed between role descriptions and national standards. The authors advocated for aligning roles with the multi-professional ACP framework and suggested making accreditation as an advanced clinical practitioner a requirement for both staff and organisations.

Harris et al., 2021 aimed to identify the capabilities required of advanced and specialist diagnostic radiographers and map those capabilities against the Society and College of Radiographers' Education and Career Framework, as well as their home country advanced practice documents. The researchers collected a sample of UK job advertisements over a six-month period and analysed them for role focus, responsibilities, clinical duties, and expectations regarding experience and knowledge. A total of 42 job descriptions were examined across various Trusts and Health Boards, with 31 positions (73.8%) referring to themselves as advanced or specialist roles. Seventy-three point eight per cent of role descriptions (n = 31) matched the outcomes outlined in the Society and College of Radiographers framework. Notably, 95.2% (n = 40) of these descriptions, originating from England, failed to cover a significant number of the multi-professional framework competencies (n = 13), yielding a chi-square value of 14.6 ($p < .01$). The role descriptions often reflected clinical practice requirements, but elements such as leadership, education, and research were internal and operational. The researchers concluded that many positions labelled as 'advanced' were not aligned with the nationally defined characteristics of advanced clinical practice.

Kjelle & Chilanga , 2022 aimed to investigate radiographers' assessments of medical usefulness and reasons for accepting or rejecting X-ray images. An online survey was

conducted across countries and was distributed via the EFRS Research Hub at the ECR 2020. Eighty-one radiographers participated, with 42% working in the UK or Ireland. The participants were asked to review 30 cases and justify accepting or rejecting images. In total, 1,176 open-ended comments were received, with 60% referring to kept images. The results showed that, on average, 63% of images were kept. Among the "Keep," "Could keep," and "Reject" categories, average retention rates were 84%, 63%, and 43%, respectively. Suboptimal positioning and centering were the primary reasons for rejection, while potential diagnostic value and considerations related to radiation protection were reasons cited for keeping images despite quality concerns (n = 353 and n = 33, respectively). The researchers concluded that while consensus existed internationally about what constituted a good-quality X-ray, differences emerged when weighing medical usefulness versus image quality. They advocated for including diagnostic quality as an assessment parameter in clinical practice.

2.3.2 Assessment of the Physical Health Challenges Experienced By Radiographers As A Result Of Their Daily Radiographic Practices

Rajan & Dhar, 2023 conducted a survey-based descriptive study in Tirunelveli City, Tamil Nadu, focusing on the health-related problems experienced by radiographers working in private multi-speciality hospitals. The researchers used a questionnaire administered to a sample of 60 radiographers recruited through convenience and judgemental sampling techniques. The results revealed that tiredness, low energy, body pain, sleeping disturbances, depression, anger, emotional disturbances, and digestive disorders were the primary health-related problems reported. Other common concerns included skin and eye problems, urinary tract infections, diabetes, hypertension, irregular menstruation, weight

loss, and hair loss. The radiographers rated their perceptions towards these health issues as moderate.

Hulls et al., 2018 examined work-related health issues across four categories of staff within the UK: radiographers, ultrasonographers, other radiography staff, and staff in other professions, including senior staff. The researchers analysed four health domains: musculoskeletal, respiratory, skin, and mental health, as well as other conditions. The findings indicated that radiographers had higher instances of work-related skin disease when compared with other staff groups. Conversely, other occupations demonstrated higher rates of respiratory illnesses than radiographers.

Evans et al., 2021 aimed to investigate self-reported musculoskeletal symptoms among radiographers registered with the American Registry of Radiologic Technologists (ARRT) in the United States. An online survey was conducted, with questions focusing on pain and discomfort experienced during patient care activities, as well as exposure to risk factors. Of the 635 participating radiographers, 81% reported pain or discomfort related to patient handling. Logistic regression identified four personal factors (including poorer perceptions of overall health and quality of sleep), one work-demographic factor (fluoroscopy), and three psychosocial work factors (highly demanding physical workloads, work pressure, and stress) as significant differentiators between those with and without pain. The researchers concluded that both physical and psychosocial factors were associated with the development of musculoskeletal discomfort. They advocated for targeted interventions, such as rotating staff out of fluoroscopy, reducing physical demands, addressing staffing shortages, and promoting self-care practices, to mitigate work-related discomfort and pain.

2.3.3 Examination of the Psychological Effects of Radiographic Work

Rajan, 2012 examined the impacts of occupational stress on radiographers. The findings indicated that the primary organisational stressors included inadequate staffing, low salaries, unequal shift allocations, long working hours, limited facilities, and a lack of recognition. Other factors such as insufficient staff benefits, delays in salary increments, low radiation allowances, frequent changes in policies, inter-departmental conflict, and a lack of effective communication channels were also significant. Specific radiographer-centred stressors comprised fears of radiation exposure, the absence of protective equipment, attending multiple accident cases simultaneously, and managing multiple tasks at once. The least significant factors included fears of chemical exposure, wastage of resources, managing the heavy mobile X-ray units, attending to patients of the opposite gender, and dealing with patient complaints. The study identified common outcomes of stress, including fatigue, back and headaches, difficulty waking in the morning, sleep disturbances, digestive issues, low motivation, depression, and feelings of inadequacy. To manage these stressors, radiographers commonly engaged in talking with colleagues, meditation, exercise, and prioritising work.

Rajan, 2016 explored the perceptions of radiographers regarding occupational hazards and their impacts on physical and mental health. The results indicated that weight loss, sleeping disturbances, pain, fatigue, gastrointestinal issues, irregular sleep patterns, sleeplessness, heightened stress, and an increased risk of cancer due to long-term exposure to ionising radiation were the leading occupational impacts. The perception of these impacts was generally moderate across respondents.

Rajan, 2018 analysed perceptions of radiographers working in private multi-speciality hospitals towards the causes of occupational hazards. The study found that organisational structure and policies, role-specific demands, fear and safety concerns emerged as the primary dimensions. Secondary contributors included resource availability, workload, shift patterns, and environmental and hygiene issues, while interruptions, patient and communication factors, and training requirements were least cited. The overall perception levels across the variables were moderate.

Rajan, 2019 compared the perceptions of radiographers working in private multi-speciality hospitals and diagnostic centres in Tirunelveli City towards the impacts of occupational hazards on their physical and mental health. The results revealed no significant differences between the two groups, and both rated their perceptions of occupational impacts as moderate.

CHAPTER THREE

METHODOLOGY

3.1 Research Setting

This study was conducted in selected public and private hospitals within Edo State, Nigeria. Edo State is located in the South-South geopolitical zone of Nigeria and is home to several tertiary, secondary, and primary healthcare facilities where radiographers practice. The selected hospitals was include both urban and semi-urban healthcare institutions to ensure a representative sample of radiographers working under varying conditions and resource levels.

3.2 Research Design

The study was adopted a descriptive cross-sectional survey design. This design is appropriate because it allows for the collection of data at a single point in time to explore the impact of radiographic practices on the physical and psychological health of radiographers in Edo State hospitals. This design has been widely used in similar studies assessing occupational health challenges among healthcare workers (Arif, 2024; Rajan & Dhar, 2023).

3.3 Target Population

The target population for this study comprised of licensed diagnostic radiographers working in selected hospitals across Edo State. This population includes radiographers of varying levels of experience, working in both government-owned and private healthcare

facilities, and engaged in routine diagnostic imaging procedures. There are 3 teaching hospitals with 15 radiographers each, 2 specialist hospital with 10 radiographers each and 6 diagnostic centers with 5 radiographers each making an estimated total of 95 radiographers.

3.4 Sample Technique and Sample Size

A census sampling technique was used, where all eligible radiographers working in the selected hospitals during the study period was invited to participate. This technique ensures that the entire accessible population is covered, given the relatively small number of practicing radiographers in the state and the need to capture comprehensive data. The sample size was the total number of radiographers available at the time of data collection.

3.5 Instrument of Data Collection

Data was collected using a structured, self-administered questionnaire designed specifically for this study. The questionnaire consisted of both closed and open-ended items. The questionnaire was developed based on existing validated instruments from related studies, but adapted to suit the local context of Edo State hospitals.

3.6 Validity of Instrument

The face and content validity of the questionnaire was established through a review by experts in radiography, public health, and occupational health. Their feedback was used to refine the instrument to ensure that all items are clear, relevant, and comprehensive in capturing the study objectives. A pilot test was conducted among a small group of

radiographers outside the study sample to further confirm clarity and appropriateness of the items.

3.7 Reliability of Instrument

The reliability of the questionnaire was determined through a test-retest method. The instrument was administered twice to the same group of radiographers (outside the study hospitals) at an interval of two weeks. The correlation between the two sets of responses was calculated, and a reliability index of at least 0.7 was considered acceptable.

3.8 Method of Data Collection

The researcher personally distributed the questionnaires to the radiographers in the selected hospitals or via online after obtaining necessary permissions from hospital management. Clear instructions on how to complete the questionnaire was provided, and participants were encouraged to ask questions if any item is unclear. Completed questionnaires were retrieved on the same day or within an agreed-upon short period to ensure a high response rate.

3.9 Method of Data Analysis

Data collected was checked for completeness and entered into the Statistical Package for the Social Sciences (SPSS) software version 25. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data. Inferential statistics, including chi-square tests and correlation analysis, were applied to test the

relationship between radiographic practices and physical or psychological health outcomes. The level of significance will be set at $p < 0.05$.

3.10 Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee of the University of Benin Teaching Hospital. Informed consent was obtained from all participants, and they were assured of the confidentiality and anonymity of their responses. Participation was entirely voluntary, and respondents had the right to withdraw from the study at any stage without any consequences.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Results

Table 4.1: Questionnaire Distribution and Response Rate

Questionnaire Status	Frequency	Percentage (%)
Administered	95	100.0
Returned/Valid	82	86.3
Not Returned/Invalid	13	13.7

Source: Field Survey, 2025

From table 4.1 a total of 95 questionnaires were distributed to radiographers working in Edo State hospitals. Out of these, 82 were completed and returned, yielding a response rate of 86.3%. This high response rate is commendable, as it reflects strong participation and enhances the reliability and validity of the study findings. A response rate above 70% is generally considered adequate for survey-based studies, indicating that the data obtained can be regarded as representative of the target population.

Table 4.2: Socio-Demographic Characteristics of Respondents (N = 82)

Variable	Frequency	Percentage (%)
Gender		
Male	64	78.0
Female	18	22.0
Age (years)		
20–29	19	23.2
30–39	31	37.8
40–49	17	20.7
50 and above	15	18.3
Marital Status		
Single	27	32.9
Married	41	50.0
Divorced	7	8.5
Widowed	7	8.5
Educational Qualification		
B.Sc	35	42.7
PGD	11	13.4
M.Sc	23	28.0
Others	13	15.9
Years of Experience		
< 1 year	5	6.1
1–5 years	29	35.4
6–10 years	24	29.3
Over 10 years	24	29.3
Type of Hospital		
Public	21	25.6
Private	17	20.7
Teaching	31	37.8
Others	13	15.9

Source: Field Survey, 2025

According to table 4.2 out of the 82 respondents, 64 (78.0%) were male while 18 (22.0%) were female. The largest age group was 30–39 years with 31 respondents (37.8%),

followed by 20–29 years with 19 (23.2%), 40–49 years with 17 (20.7%), and 50 years and above with 15 (18.3%). In terms of marital status, 41 respondents (50.0%) were married, 27 (32.9%) single, while 7 (8.5%) each were divorced and widowed. Educational qualification showed that 35 (42.7%) had a B.Sc degree, 23 (28.0%) an M.Sc, 11 (13.4%) a PGD, and 13 (15.9%) other qualifications. Regarding years of radiography experience, 29 (35.4%) had 1–5 years, 24 (29.3%) had 6–10 years, 24 (29.3%) had over 10 years, while 5 (6.1%) had less than one year. For type of hospital, 31 (37.8%) worked in teaching hospitals, 21 (25.6%) in public hospitals, 17 (20.7%) in private hospitals, and 13 (15.9%) in other facilities.

Table 4.3a: Radiographic Procedures Regularly Performed by Respondents

Procedure	**Frequency**	**Percentage (%)**
Chest X-rays	72	87.8
Abdominal X-rays	55	67.1
Skull X-rays	47	57.3
Extremities	63	76.8
CT scans	39	47.6
Fluoroscopy	28	34.1
Ultrasound	50	61.0
MRI	13	15.9
Mammography	11	13.4

Source: Field Survey, 2025

From table 4.3a the most commonly performed procedures were chest X-rays (87.8%), extremities (76.8%), and abdominal X-rays (67.1%). Moderate proportions of respondents

reported carrying out ultrasound (61.0%) and skull X-rays (57.3%), while fewer indicated performing fluoroscopy (34.1%), MRI (15.9%), and mammography (13.4%).

Table 4.3b: Number of Radiographic Procedures Performed Daily by Respondents

Procedures per Day	Frequency	Percentage (%)
1–5	3	3.7
6–10	6	7.3
11–15	10	12.2
More than 15	63	76.8

Source: Field Survey, 2025

According to table 4.3b regarding daily workload, the majority of respondents, 63 (76.8%), reported performing more than 15 procedures daily. By contrast, 10 (12.2%) carried out 11–15 procedures, 6 (7.3%) performed 6–10, and only 3 (3.7%) carried out 1–5 procedures per day. This indicates that radiographers in Edo State hospitals generally have very high workloads, with conventional radiographic examinations dominating their daily practice.

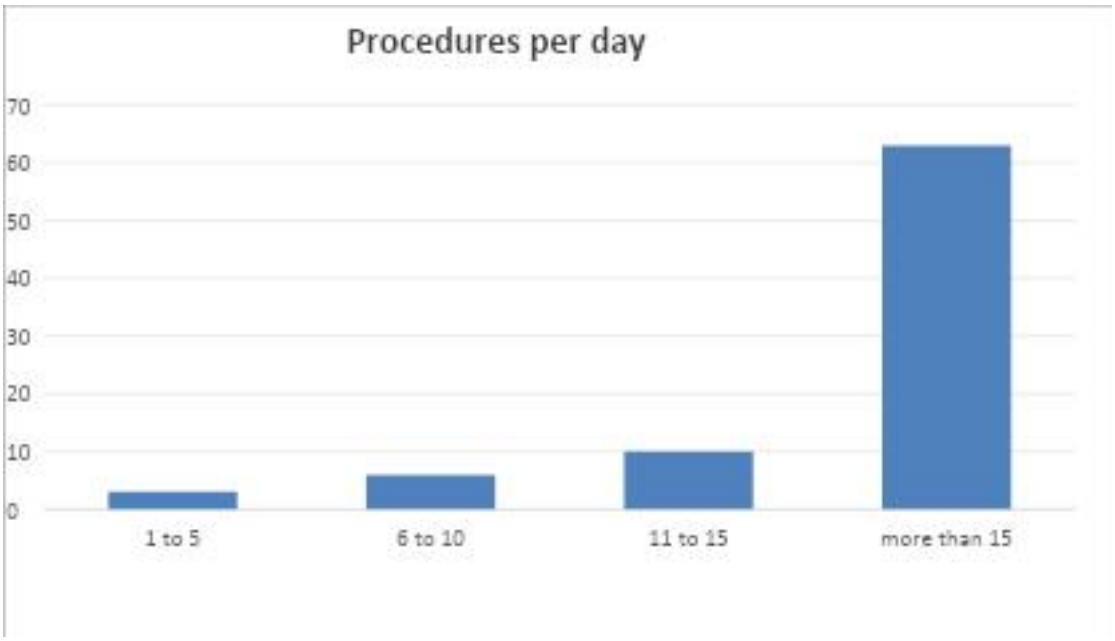

Fig 4.1 Procedures per day

Table 4.4: Physical Health Challenges Experienced by Radiographers (N = 82)

Statement	Never	Rarely	Sometimes	Often	Always	Mean ± SD	Decision
Neck pain	4 (5%)	7 (9%)	19 (23%)	28 (34%)	24 (29%)	3.7 ± 1.1	Accepted
Lower back pain	2 (2%)	6 (7%)	12 (15%)	30 (37%)	32 (39%)	4.1 ± 0.9	Accepted
Joint or limb pain	3 (4%)	8 (10%)	17 (21%)	27 (33%)	27 (33%)	3.9 ± 1.0	Accepted
Fatigue or exhaustion	1 (1%)	5 (6%)	14 (17%)	30 (37%)	32 (39%)	4.1 ± 0.9	Accepted
Headaches or migraines	6 (7%)	11 (13%)	20 (24%)	23 (28%)	22 (27%)	3.6 ± 1.1	Accepted
Sleep disturbanc	5 (6%)	9 (11%)	18 (22%)	24 (29%)	26 (32%)	3.8 ± 1.0	Accepted

es							
Skin or eye irritation	11 (13%)	15 (18%)	20 (24%)	18 (22%)	18 (22%)	3.2 ± 1.0	Rejected
Discomfort from protective gear	6 (7%)	9 (11%)	16 (20%)	26 (32%)	25 (30%)	3.7 ± 1.0	Accepted

Grand Mean = 3.89

Table 4.4 showed that the most pronounced physical challenges were lower back pain (4.1 ± 0.9), fatigue or exhaustion (4.1 ± 0.9), and joint or limb pain (3.9 ± 1.0), all well above the grand mean of 3.89. Sleep disturbances (3.8 ± 1.0) and neck pain (3.7 ± 1.1) were also accepted as common issues. Skin or eye irritation (3.2 ± 1.0) was below the grand mean and thus rejected as a significant problem.

Table 4.5: Psychological Effects of Work among Radiographers (N = 82)

Statement	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**Mean ± SD**	**Decision**
Feelings of stress due to workload	3 (4%)	6 (7%)	17 (21%)	28 (34%)	28 (34%)	3.9 ± 1.0	Accepted
Burnout or emotional exhaustion	2 (2%)	7 (9%)	16 (20%)	29 (35%)	28 (34%)	4.0 ± 0.9	Accepted
Lack of motivation for work	8 (10%)	13 (16%)	19 (23%)	23 (28%)	19 (23%)	3.4 ± 1.1	Rejected

Anxiety while performing procedures	7 (9%)	12 (15%)	20 (24%)	25 (30%)	18 (22%)	3.4 ± 1.1	Rejected
Feeling undervalued by management	5 (6%)	10 (12%)	21 (26%)	24 (29%)	22 (27%)	3.6 ± 1.0	Accepted
Overwork due to limited staffing	3 (4%)	8 (10%)	18 (22%)	26 (32%)	27 (33%)	3.9 ± 0.9	Accepted
Job satisfaction	4 (5%)	9 (11%)	18 (22%)	28 (34%)	23 (28%)	3.7 ± 1.0	Accepted

Grand Mean = 3.70

Table 4.5 showed that the most significant psychological factors were burnout (4.0 ± 0.9), stress due to workload (3.9 ± 1.0), and overwork from limited staffing (3.9 ± 0.9), all above the grand mean of 3.70. Feeling undervalued by management (3.6 ± 1.0) and job satisfaction (3.7 ± 1.0) were also accepted. By contrast, lack of motivation (3.4 ± 1.1) and anxiety while performing procedures (3.4 ± 1.1) were rejected, indicating they were not as strongly perceived compared to other psychological factors.

Table 4.6: Pearson Correlation Results for Radiographic Practices and Health Outcomes (N = 82)

Variables Correlated	N	r-value	p-value	Decision
Radiographic practices × Physical health	82	0.482	0.000	Significant (Reject H_0)
Radiographic practices × Psychological health	82	0.426	0.001	Significant (Reject H_0)

Source: Field Survey, 2025

The Pearson correlation analysis revealed a moderate positive relationship between radiographic practices and physical health challenges ($r = 0.482$, $p < 0.05$). This implies that as radiographic workload increases, the likelihood of experiencing physical health issues such as back pain and fatigue also increases. Similarly, a significant positive relationship was observed between radiographic practices and psychological effects ($r = 0.426$, $p < 0.05$), indicating that higher workloads are associated with elevated stress, burnout, and overwork among radiographers. Since both tests yielded p-values < 0.05, the null hypothesis (H_0) is rejected in favor of the alternative hypothesis (H_1). Thus, radiographic practices have a significant impact on both the physical and psychological health of radiographers working in Edo State hospitals.

4.2 Discussion of Findings

The results of this study revealed that chest X-rays (87.8%), extremity examinations (76.8%), and abdominal X-rays (67.1%) were the most commonly performed procedures among radiographers in Edo State hospitals. Ultrasound (61.0%), skull radiography (57.3%), and CT scans (47.6%) followed closely, while more specialized modalities such as fluoroscopy (34.1%), MRI (15.9%), and mammography (13.4%) were less frequently carried out. Daily workload statistics further showed that the vast majority of respondents, 76.8%, performed more than 15 radiographic procedures per day, confirming the high-volume nature of radiography practice in these settings.

These findings highlight the dominance of conventional projectional radiography in everyday practice. The reliance on chest and extremity X-rays, alongside abdominal studies, reflects both the availability of equipment and the demand for rapid diagnostic support in routine clinical care. Ultrasound has also emerged as a core component of the workflow,

owing to its versatility, portability, and absence of ionizing radiation, but advanced imaging modalities such as MRI and mammography remain less accessible. The high proportion of radiographers performing more than 15 examinations per day indicates an intense workload that prioritizes efficiency and diagnostic turnaround, but it may also contribute to work strain and the health challenges that were examined in subsequent objectives.

When compared with previous research, these findings align with the study by Rawle et al. (2021), who observed that radiographers frequently adapt their imaging techniques with the central aim of achieving optimal image quality, often relying on departmental culture and professional experience rather than on formal evidence-based guidelines. This is consistent with the prominence of routine procedures in the present study, where practice is likely shaped by familiarity and service demand rather than structured innovation. Harris et al. (2021) also reported that many advanced or specialist roles in the UK still revolve around projectional radiography, which mirrors the centrality of chest and extremity imaging observed in Edo State. However, differences appear when the findings are compared with those of Woznitza et al. (2021), who documented widespread advanced clinical practice across the UK, particularly in mammography and cross-sectional modalities. In Edo State, the relatively low frequency of mammography and MRI examinations points to contextual limitations in infrastructure and training. Similarly, the work of Kjelle and Chilanga (2022), which emphasized radiographers' decision-making around image retention and rejection, resonates with the present findings in that efficiency and diagnostic adequacy often outweigh debates about image perfection when the workload is heavy and patient needs are pressing.

The implications of these findings are significant for radiography practice in Edo State. The overwhelming reliance on conventional radiography demonstrates the urgent need for continuous investment in maintaining and upgrading basic imaging equipment, while also creating pathways to expand access to advanced modalities. The high throughput of more than 15 cases per day suggests that radiographers are working under pressure, and this could predispose them to both physical strain and psychological stress, reinforcing the importance of adequate staffing, workflow management, and support systems. Furthermore, the dependence on experience-driven practice rather than evidence-based protocols indicates a gap that could be bridged by fostering a stronger culture of research utilization, audit, and professional development. Finally, the observed pattern underscores the need for alignment with global trends in advanced clinical practice so that radiographers in Edo State can not only deliver routine examinations effectively but also gradually integrate specialized imaging roles in a structured and sustainable manner.

The analysis of physical health challenges showed that the most prominent problems were lower back pain (4.1 ± 0.9), fatigue or exhaustion (4.1 ± 0.9), and joint or limb pain (3.9 ± 1.0). Other issues such as sleep disturbances (3.8 ± 1.0), neck pain (3.7 ± 1.1), and headaches or migraines (3.6 ± 1.1) were also reported above the acceptance threshold. By contrast, skin or eye irritation (3.2 ± 1.0) fell below the grand mean of 3.89 and was therefore not considered a significant concern. Taken together, the findings indicate that musculoskeletal complaints and fatigue are the most common health problems associated with radiography practice in Edo State hospitals.

The prominence of musculoskeletal pain, particularly in the lower back, neck, and limbs, underscores the physical demands of radiography practice. Daily lifting, positioning of

patients, and prolonged standing contribute to strain on the musculoskeletal system, while the high workload evidenced by more than 15 procedures per day compounds the risk of fatigue and exhaustion. Sleep disturbances and recurrent headaches further suggest that radiographers are experiencing cumulative effects of stress and irregular work rhythms. The lower rating of skin and eye irritation indicates that although radiation and protective equipment are part of the work environment, these are less frequently perceived as severe compared to musculoskeletal discomfort.

These results are consistent with the findings of Rajan and Dhar (2023), who reported tiredness, body pain, and sleep disturbances as key health problems among radiographers in Tamil Nadu, alongside other systemic conditions such as digestive issues and emotional disturbances. Similarly, Evans et al. (2021) observed that musculoskeletal pain was widespread among radiographers in the United States, with 81% reporting discomfort, and identified heavy workloads, poor sleep, and stress as important contributory factors. This mirrors the current study, where musculoskeletal pain and fatigue emerged as dominant complaints. Hulls et al. (2018) also noted that radiographers in the UK faced higher risks of work-related skin disease compared to other staff groups; however, unlike their study, the present findings suggest that in Edo State skin problems are less frequently perceived, perhaps reflecting different environmental exposures or reporting priorities. Taken together, the global literature and the present results affirm that musculoskeletal and fatigue-related complaints are universal among radiographers, though contextual variations exist in the prominence of other health problems.

The implications of these findings are far-reaching for the radiography workforce in Edo State. The dominance of musculoskeletal pain and fatigue highlights the urgent need for

ergonomic interventions such as proper lifting techniques, use of mechanical aids, and scheduled rest periods to minimize strain. The presence of sleep disturbances and headaches also points to the need for workload redistribution and supportive staffing policies to reduce the intensity of daily schedules. Inadequate attention to these physical challenges could not only impair radiographers' long-term health but also compromise the quality of diagnostic services. By addressing these health burdens through staff welfare initiatives, professional training in ergonomics, and better resource allocation, radiography departments in Edo State hospitals can foster a healthier, more resilient workforce capable of sustaining high-quality patient care.

The psychological effects of radiographic practice revealed several significant patterns. The highest-rated challenges were burnout or emotional exhaustion (4.0 ± 0.9), feelings of stress due to workload (3.9 ± 1.0), and overwork due to limited staffing (3.9 ± 0.9). Respondents also reported feeling undervalued by management (3.6 ± 1.0) and job satisfaction (3.7 ± 1.0) as important factors above the acceptance threshold. In contrast, lack of motivation for work (3.4 ± 1.1) and anxiety while performing procedures (3.4 ± 1.1) scored below the grand mean of 3.70 and were therefore rejected as major psychological concerns. These findings suggest that radiographers in Edo State hospitals experience high levels of stress and burnout, often linked to workload and staffing constraints, yet many still maintain moderate satisfaction with their jobs.

The results illustrate the paradox of radiographic practice: on the one hand, professionals face substantial stress due to heavy caseloads, long working hours, and inadequate staffing; on the other hand, they derive a measure of satisfaction from their professional roles, perhaps because of their contribution to patient care or professional pride. Burnout and

stress indicators demonstrate that the pressures of sustaining high patient throughput are taking a psychological toll, while the sense of being undervalued by management points to institutional factors that erode morale. The rejection of anxiety and lack of motivation as major issues may reflect resilience within the workforce — radiographers appear able to sustain engagement with their work, even when faced with difficult conditions.

These findings are closely aligned with those of Rajan (2012), who identified inadequate staffing, long hours, and poor recognition as central stressors for radiographers, leading to outcomes such as fatigue, headaches, and depression. Similarly, Rajan (2016) and Rajan (2019) highlighted sleep disturbances, stress, and feelings of exhaustion as occupational hazards associated with radiography, echoing the present study's evidence of burnout and workload-related strain. Rajan (2018) further noted that organisational structures, resource shortages, and safety concerns drive perceptions of occupational hazards, consistent with the observation here that limited staffing and lack of recognition from management are major psychological burdens. Together, these comparisons show that the stress and burnout seen in Edo State are not unique but part of a broader pattern observed internationally.

The implications of these findings are significant for both workforce sustainability and patient care. Persistent stress and burnout among radiographers not only threaten individual well-being but also risk reducing efficiency, accuracy, and overall quality of service delivery. The fact that many radiographers still report some degree of job satisfaction suggests that targeted interventions could strengthen motivation and resilience. Addressing workload through improved staffing levels, promoting fair recognition and communication from management, and embedding wellness initiatives

such as stress management programs or counseling services could help to mitigate burnout. Ultimately, the psychological health of radiographers is a cornerstone for maintaining safe and effective imaging services, and health institutions in Edo State must recognize that supporting staff well-being is integral to sustaining the radiography profession.

The Pearson correlation analysis revealed a moderate positive relationship between radiographic practices and physical health challenges ($r = 0.482$, $p < 0.05$) as well as between radiographic practices and psychological effects ($r = 0.426$, $p < 0.05$). In both cases, the relationships were statistically significant, leading to the rejection of the null hypothesis and acceptance of the alternative hypothesis that radiographic practices significantly affect the physical and psychological health of radiographers in Edo State hospitals.

These results show that the intensity and nature of radiographic practices have a measurable impact on the well-being of radiographers. The positive correlations indicate that as workload and procedural frequency increase, radiographers are more likely to experience musculoskeletal problems such as back pain and fatigue, as well as psychological outcomes like stress and burnout. The significance of both associations reflects the dual burden that radiographers carry — the physical strain of repetitive patient handling and positioning, and the emotional strain of sustaining productivity under pressure. The findings thus confirm that radiographic practice is not merely a technical activity but one that deeply influences the health and resilience of those delivering the service.

The present findings resonate with Evans et al. (2021), who found that heavy workloads and poor sleep quality were significant predictors of musculoskeletal discomfort among

radiographers. The overlap between physical and psychosocial risk factors in their study mirrors the correlation observed in Edo State, where workload affected both domains of health simultaneously. Similarly, Rajan (2012) highlighted occupational stressors such as inadequate staffing and long working hours, linking them to both physical complaints and psychological stress. The present study also aligns with Rajan and Dhar (2023), who reported fatigue, body pain, and sleep disturbances as major consequences of daily radiographic routines. Taken together, these studies reinforce the conclusion that radiographic practice exerts a substantial impact on multiple dimensions of health, a trend that cuts across both local and international contexts.

The implication of rejecting the null hypothesis is clear: radiographic practice in its current form exerts a significant toll on practitioners' health. This has consequences not only for individual well-being but also for workforce sustainability and the quality of patient care. Addressing these issues will require deliberate policy and management interventions, including better workload distribution, adequate staffing levels, ergonomic training, and institutional recognition of the challenges radiographers face. By tackling both the physical and psychological consequences of radiography practice, hospital management in Edo State can enhance the resilience of their workforce, reduce burnout, and ultimately improve diagnostic service delivery.

CHAPTER FIVE

SUMMARY, CONCLUSION AND SUGGESTION FOR FURTHER STUDIES

5.1 Summary

This study set out to evaluate the perceived impact of radiography practices on radiographers working in Edo State hospitals. A total of 95 questionnaires were distributed, with 82 valid responses analysed, representing an 86.3% response rate. The findings revealed that conventional procedures such as chest X-rays, extremities, and abdominal radiography dominate daily workflow, while advanced modalities like MRI and mammography are less frequently performed. Most radiographers reported conducting more than 15 procedures per day, reflecting a heavy workload.

The analysis of physical health challenges showed that musculoskeletal complaints, particularly lower back pain, fatigue, and joint or limb pain, were the most significant, while skin and eye irritation was less frequently perceived. On the psychological front, stress, burnout, and overwork due to limited staffing were highly rated, though many

radiographers still indicated some degree of job satisfaction. Pearson correlation confirmed a significant positive relationship between radiographic practices and both physical and psychological health outcomes, establishing that workload and procedural demands directly influence the well-being of radiographers in Edo State.

5.2 Conclusion

The study concludes that radiographic practice in Edo State is marked by a reliance on high-volume conventional imaging, which, while essential for service delivery, has notable consequences on radiographers' health. The physical burden of repetitive procedures and patient handling, combined with the psychological pressures of heavy workload and limited institutional support, significantly affect professional well-being. These results reinforce the urgent need for targeted interventions to protect radiographers and to align practice with international standards that prioritize both image quality and workforce sustainability.

5.3 Recommendations

Based on the findings, the following recommendations are made:

1. Hospital management should implement ergonomic policies and training to reduce musculoskeletal strain, including access to patient handling aids and scheduled rest breaks.
2. Staffing levels should be increased to reduce overwork and balance workload distribution across shifts.
3. Regular wellness and stress management programs should be introduced to support radiographers' mental health.

4. Investment in advanced imaging modalities such as MRI and mammography should be prioritized to reduce overdependence on conventional radiography and diversify practice.
5. Continuous professional development should emphasize evidence-based practice, enabling radiographers to align their work with global standards and improve patient outcomes.

5.4 Suggestions for Further Studies

1. Future research should expand the sample to include radiographers from other states in Nigeria to allow broader generalization and regional comparison.

2. A longitudinal design could be employed to monitor changes in physical and psychological health challenges over time.

3. Studies should also examine institutional factors such as management policies and equipment availability that influence radiography practice.

5.5 Limitations of the Study

1. The study was restricted to radiographers in Edo State hospitals, which may limit the generalizability of the findings.

2. The use of self-administered questionnaires introduced the risk of recall and social desirability bias.

3. The study relied on perceived health outcomes rather than objective clinical assessments, which may affect the accuracy of reported challenges.

4. Resource and time constraints prevented the inclusion of a larger sample size and additional qualitative data collection.

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APPENDIX I

QUESTIONNAIRE
Section A: Socio-Demographic Information
1. Gender:
( ) Male ( ) Female
2. Age:
( ) 20–29 ( ) 30–39 ( ) 40–49 ( ) 50 and above
3. Marital Status:
( ) Single ( ) Married ( ) Divorced ( ) Widowed

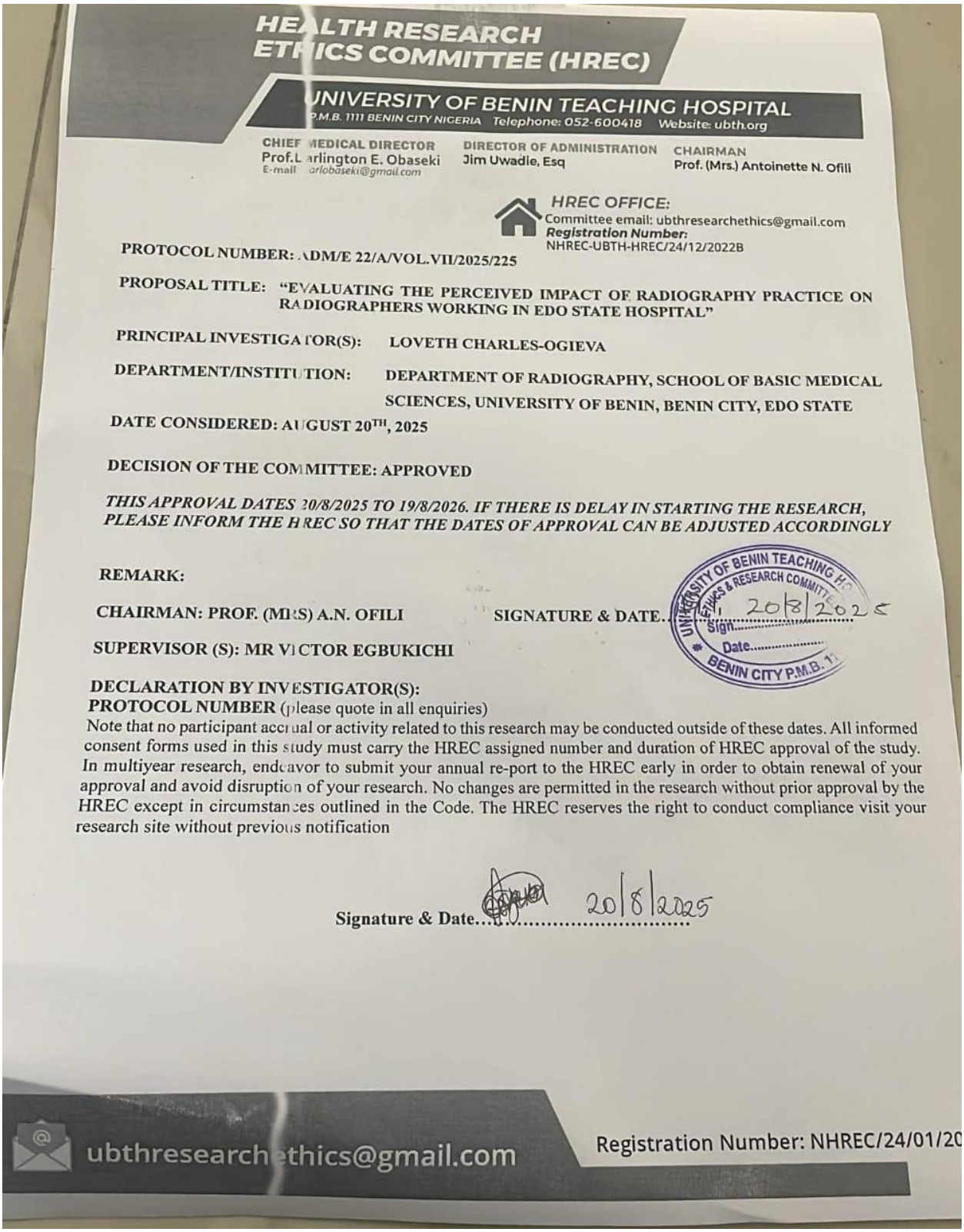
4. Educational Qualification:
( ) B.Sc ( ) PGD ( ) M.Sc ( ) Others
5. Years of Radiography Experience:
( ) Less than 1 year ( ) 1–5 years ( ) 6–10 years ( ) Over 10 years
6. Type of Hospital:
( ) Public ( ) Private ( ) Teaching ( ) Others
Section B: Common Radiographic Procedures
7. Which of the following procedures do you perform regularly?
( ) Chest X-rays ( ) Abdominal X-rays ( ) Skull X-rays ( ) Extremities
( ) CT scans ( ) Fluoroscopy ( ) Ultrasound ( ) MRI
( ) Mammography ( ) Interventional Procedures
8. How often do you perform radiographic procedures per day?
( ) 1–5 ( ) 6–10 ( ) 11–15 ( ) More than 15
Section C: Physical Health Challenges

Physical Health Challenges	Never	Rarely	Sometimes	Often	Always
Neck pain					
Lower back pain					
Joint or limb pain					
Fatigue or exhaustion					
Headaches or migraines					
Sleep disturbances					
Skin or eye irritation					
Discomfort from protective gear (e.g. aprons)					

Section D: Psychological Effects of Work

Psychological Factors	Never	Rarely	Sometimes	Often	Always
Feelings of stress due to workload					
Burnout or emotional exhaustion					
Lack of motivation for work					
Anxiety while performing procedures					
Feeling undervalued by hospital management					
Overwork due to limited staffing					
Job satisfaction					

APPENDIX II



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PROTOCOL NUMBER: ADM/E 22/A/VOL.VII/2025/225

PROPOSAL TITLE: "EVALUATING THE PERCEIVED IMPACT OF RADIOGRAPHY PRACTICE ON RADIOGRAPHERS WORKING IN EDO STATE HOSPITAL"

PRINCIPAL INVESTIGATOR(S): LOVETH CHARLES-OGIEVA

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

UNIVERSITY OF BENIN TEACHING HOSPITAL ETHICS & RESEARCH COMMITTEE Sign..... Date..... BENIN CITY P.M.B. 11

SUPERVISOR (S): MR VICTOR EGBUKICHI

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..... 20/8/2025

ubthresearchethics@gmail.com Registration Number: NHREC/24/01/20