ETHICAL CONSIDERATIONS IN RADIOGRAPHIC IMAGING: ANALYZING ETHICAL DILEMMAS FACED BY RADIOGRAPHERS IN SELECTED HOSPITALS IN BENIN METROPOLIS.

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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF RADIOGRAPHY IN PARTIAL FUFILMENT FOR THE REQUIREMENTS OF THE AWARD OF BACHELOR DEGREE IN RADIOGRAPHY (B.RAD), UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.

OCTOBER, 2025

CERTIFICATION

This is to certify that this project work was carried out by **ADE-PETER FAVOUR PELUMI** with the matriculation number **BMS2009062** under the supervision of MRS F. O. IGBINEDION in Partial fulfilment for the award of Bachelor of Radiography (B.RAD) Degree of the Department of Radiography, School of Basic Medical Sciences, College of Medical Sciences, University of Benin, Benin City, Edo State.

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DEDICATION

This project work is dedicated to God Almighty for His guidance, wisdom and strength and for making my academic journey a huge success.

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First and foremost, I express my deepest gratitude to Almighty God for granting me the strength, wisdom and perseverance to complete this research successfully.

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ABSTRACT

Ethical conduct is central to radiographic practice, ensuring professionalism, patient safety, and trust in healthcare. Radiographers, however, frequently encounter ethical dilemmas that influence their clinical decisions and adherence to professional standards. This study investigated the nature and frequency of ethical challenges faced by radiographers in selected hospitals and diagnostic centers within Benin Metropolis, as well as their effects on professional judgment and patient care.

A descriptive cross-sectional design was adopted. Data were obtained through structured, self-administered questionnaires distributed to 72 respondents, including licensed radiographers and final-year radiography trainees in both public and private health facilities. Participants were selected using stratified and simple random sampling techniques. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics such as frequencies and percentages were used to summarize findings, while Chi-square analysis tested the hypothesis at a 0.05 level of significance.

Results indicated that radiographers often encountered ethical challenges relating to patient confidentiality, informed consent, and professional pressure. The chi-square test revealed a significant association between ethical dilemmas and professional decision-making ($p < 0.05$), suggesting that ethical issues significantly affect radiographic practice and patient outcomes.

The study concluded that ethical dilemmas are prevalent among radiographers in Benin Metropolis and can influence their professional integrity and service delivery. Strengthening ethical awareness through continuous education, professional workshops, and institutional policy enforcement is essential for improving ethical standards and promoting patient-centered care.

Keywords:

Ethics, Radiography, Ethical Dilemmas, Professional Decision-Making, Benin Metropolis.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Radiographic imaging plays a central role in the modern healthcare system, serving as a foundational tool for diagnosis, evaluation, treatment planning, and disease monitoring. It provides clinicians with critical insights into internal anatomical structures, supporting accurate medical decision-making and improving patient outcomes. Radiographers, as professionals responsible for producing diagnostic images, play a vital role in ensuring that imaging procedures are performed safely, efficiently, and ethically (Pinson et al., 2023).

Ethical considerations in healthcare involve the assessment of the moral implications of choices, actions, or policies. In radiography, this includes identifying and resolving ethical issues related to patient rights, confidentiality, informed consent, professional integrity, and the equitable delivery of services. Such considerations ensure that healthcare practices align with the values of respect, justice, autonomy, and beneficence (Haskell, 2019).

Incorporating ethical considerations into radiographic practice supports responsible and morally defensible decision-making. It promotes integrity, fosters trust between patients and healthcare providers, and enhances the quality of care. However, applying ethical principles is not always straightforward, as radiographers frequently

encounter complex scenarios involving cultural diversity, resource limitations, and conflicting stakeholder interests (Ochonma et al., 2015).

Ethical dilemmas arise when a clear morally right choice is not apparent, often leading to tension between professional guidelines and personal values. Radiographers frequently face such dilemmas in their daily practice, including issues related to justification of procedures, informed consent, patient autonomy, and radiation safety. These challenges test their ethical reasoning and decision-making skills and may directly influence the quality of patient care (Chinene, 2024).

According to the International Commission on Radiological Protection (ICRP), justification and optimization are fundamental principles of radiation protection. Radiographers are expected to ensure that all imaging procedures are clinically warranted and conducted using the minimum radiation dose necessary. Nevertheless, in practice, radiographers may encounter ethically questionable requests for imaging, such as those motivated by defensive medicine or patient insistence on unnecessary scans, prompting concerns about professional accountability and patient safety (Reitan et al., 2024).

Informed consent is a critical ethical and legal obligation in medical imaging, ensuring that patients understand the benefits, risks, and alternatives associated with imaging procedures. However, studies have shown that in some clinical environments, radiographers may fall short of obtaining adequate consent due to systemic pressures, time constraints, or lack of training. This undermines patient autonomy and may lead

to mistrust or dissatisfaction (Younger et al., 2019).

Moreover, factors such as language barriers, cultural differences, and inadequate communication can exacerbate ethical dilemmas in diverse healthcare settings. For instance, limited patient understanding due to linguistic challenges may hinder informed decision-making. Furthermore, emerging technologies such as artificial intelligence (AI) have introduced new ethical complexities. A recent study in Saudi Arabia highlighted concerns about accountability and transparency in AI-assisted diagnostic processes, especially when errors occur without clear attribution of responsibility (Aldhafeeri, 2024).

This study seeks to examine the ethical dilemmas encountered by radiographers in diagnostic imaging practice, with particular attention to their coping strategies in navigating conflicts between professional obligations, patient rights, and technological change. By identifying common ethical challenges and their root causes, this research aims to contribute to the development of ethical training programs, policy frameworks, and patient-centered practices. A clearer understanding of these dilemmas is essential for cultivating a radiographic practice grounded in the ethical principles of autonomy, beneficence, non-maleficence, and justice (Haskell, 2019).

1.2 Statement of the Problem

Radiographic practice is accompanied by several ethical dilemmas that must be appropriately addressed to ensure patient safety, uphold trust, and protect patient autonomy. These ethical challenges often emerge during routine clinical procedures

and involve balancing competing interests or values. One prominent dilemma is the principle of justification, where radiographers are expected to evaluate whether the benefit of a diagnostic examination outweighs the potential risk of radiation exposure. This decision becomes complex, particularly in cases involving uncertain clinical indications or when imaging requests are made out of defensive practice or patient insistence (Reitan et al., 2024).

Another common ethical issue involves the process of obtaining informed consent. In clinical settings, radiographers sometimes encounter patients who are either unconscious, too young, or have communication barriers that impede their understanding of medical information. These situations raise concerns about whether patients are adequately informed and whether their autonomy is being respected. Failure to obtain valid consent may lead to ethical violations and compromise the patient's rights (Beauchamp and Childress, 2013). Furthermore, radiographers are occasionally excluded from consent processes, particularly in institutions where radiologists or referring physicians dominate the decision-making chain (Ochonma et al., 2015).

The rise of digital imaging and remote radiology services, such as teleradiology, has introduced additional ethical challenges. Data breaches during the electronic transfer of images can result in the unauthorized disclosure of sensitive patient information. Maintaining confidentiality and privacy is paramount, yet difficult, especially in collaborative environments where multiple healthcare professionals access and handle

patient records. Radiographers must ensure that ethical standards regarding data protection are strictly adhered to, despite systemic or technological limitations (Mensah et al., 2024).

Recent studies have shown that over 56% of radiology professionals including radiographers regularly face ethical dilemmas, particularly related to managing errors, disclosing mistakes, and securing valid consent (Camargo et al., 2019). Moreover, empirical evidence suggests that radiographers often underperform in these areas due to inadequate ethical training and institutional support. For instance, insufficient explanation of procedures to patients, failure to obtain appropriate consent, and lack of transparency in managing adverse outcomes have all contributed to patient dissatisfaction and ethical breaches (Younger et al., 2019).

Radiation safety also presents a critical ethical challenge. Global reports estimate that between 20–70% of imaging procedures may be clinically unnecessary, exposing patients to radiation risks without proportional diagnostic or therapeutic benefit. This situation underscores the importance of strict adherence to justification principles and continuous ethical reflection during clinical decision-making (Christensen et al., 2024).

However, most existing research on ethical dilemmas in medical imaging tends to focus on radiologists or general healthcare ethics, neglecting the unique ethical challenges encountered by radiographers. This lack of targeted research contributes to the absence of tailored ethical guidelines, training modules, and institutional policies

that could equip radiographers to address their specific challenges effectively. Addressing this gap is crucial for improving ethical standards, professional autonomy, and the quality of radiographic care delivery.

1.3 Research questions

1. What are the common ethical dilemmas faced by radiographers in the hospital settings?

2. What factors influences these ethical dilemmas?

3. What is the extent of radiographers' awareness on ethical principles and professional codes of conduct?

4. How do these dilemmas affect the professional well-being of radiographers and the patient outcomes?

5. What measures can be put in place to promote ethical practice in imaging?

1.4 Hypothesis

Null Hypothesis (Ho):

There are no significant ethical dilemmas faced by radiographers in Benin that affects their professional decision-making and patient care.

Alternate Hypothesis (H1):

There are significant ethical dilemmas faced by radiographers in Benin that affects their professional decision-making and patient care.

1.5 Aim and Objectives of the Study

Aim of the study

The aim of this study is to analyze the ethical dilemmas encountered by radiographers in Benin Metropolis and identify strategies to strengthen ethical decision-making in radiographic imaging.

Objectives of the study

1. To identify the common ethical dilemmas encountered by radiographers.
2. To evaluate the factors influencing these dilemmas.
3. To assess radiographers' perception and application of ethical guidelines
4. To recommend tactics of enhancing ethical decision-making in radiographic practices.

1.6 Scope of the Study

This study focuses on practicing radiographers in selected diagnostic centers and hospitals located in Benin, Edo State, Nigeria. It aims to assess the ethical dilemmas radiographers face during patient interactions, radiation safety practices, technological applications, and in maintaining patient privacy and confidentiality. The research explores ethical challenges across multiple imaging modalities such as X-ray, computed tomography (CT), magnetic resonance imaging (MRI) and ultrasound. It also considers radiographers at various levels of professional experience, from interns

to senior practitioners, in both private and public health facilities, ensuring that the diversity of perspectives enhances the comprehensiveness of the findings.

1.7 Significance of the Study

Understanding the ethical dilemmas radiographers encounter is essential for improving clinical decision-making, patient safety, and professional integrity. This study sheds light on how radiographers navigate situations involving conflicting ethical interests, such as balancing the diagnostic necessity of procedures against potential risks like radiation exposure. By identifying common ethical conflicts and analyzing coping strategies, this study contributes to developing targeted solutions for minimizing ethical errors in radiographic practice (Camargo et al., 2019).

The findings will be valuable for health institutions, policymakers, and radiography educators by informing the design of ethical training programs, professional guidelines, and institutional policies tailored specifically for radiographic practice. With a clearer understanding of these challenges, institutions can implement standardized ethical protocols across imaging centers, ensuring consistency, improved patient trust, and overall quality of care in radiography (Beauchamp and Childress, 2013)

1.8 Operational Definition of Terms

1. **Ethical Dilemma:** A situation in which a professional must choose between two or more conflicting moral principles (Beauchamp and Childress, 2013).
2. **Radiographer:** A healthcare professional trained in performing medical

imaging examinations for diagnostic or therapeutic purposes.

3. **Ethical Principles:** Fundamental moral rules such as autonomy, beneficence, non-maleficence, and justice, guiding professional conduct.
4. **Informed Consent:** A process whereby a patient voluntarily agrees to a medical procedure after being fully informed of its risks, benefits, and alternatives.
5. **Radiation Safety:** Measures aimed at protecting patients and healthcare workers from unnecessary radiation exposure by adhering to ALARA (As Low As Reasonably Achievable) principles.
6. **Professional Well-being:** The emotional and psychological stability of healthcare workers, impacted by work-related stressors like ethical conflicts.

CHAPTER TWO

LITERATURE REVIEW

2.1 CONCEPTUAL REVIEW

2.1.1 Concept of Ethics in Radiographic Practice

Ethics, as a fundamental aspect of professional healthcare delivery, refers to a system of moral principles that govern the conduct of individuals within a profession. In the context of radiographic practice, ethics encompasses the values, duties, and standards that guide radiographers in making morally appropriate decisions during imaging procedures and patient interactions. Ethical behavior ensures that radiographers act not only in accordance with legal obligations but also in a manner that respects the dignity, rights, and welfare of patients (Beauchamp & Childress, 2013). The centrality of ethics in radiographic practice cannot be overstated, as radiographers frequently face complex scenarios where clinical judgment must align with moral accountability.

Radiographers operate in environments where patient vulnerability is often high, particularly during diagnostic examinations that may involve exposure to ionizing radiation or intimate bodily views. Therefore, ethical practice is essential in maintaining trust between the patient and healthcare provider. It requires a balanced approach that prioritizes patient safety, informed consent, confidentiality, and respect for autonomy, while also considering institutional policies and radiographic protocols (Matilainen et al., 2016). Ethics in radiography, thus, transcends technical proficiency,

calling for the consistent application of professional integrity and empathy in every imaging session. Moreover, the ethical framework within radiographic practice is grounded in universally accepted principles such as beneficence, non-maleficence, autonomy, and justice. Beneficence requires radiographers to act in the best interest of patients by delivering quality care that promotes health and wellbeing. Conversely, non-maleficence obliges them to avoid causing harm, especially in terms of unnecessary exposure to radiation or psychological distress during procedures. Autonomy demands that radiographers respect the patient's right to make informed decisions about their healthcare, and justice underscores the importance of fairness and equity in service delivery (Haskell, 2019). The alignment of these principles with day-to-day radiographic duties is crucial for upholding ethical standards in clinical practice.

The practical application of ethics in radiographic environments often involves navigating ethical dilemmas, situations where two or more ethical principles may come into conflict. For instance, a radiographer might encounter a situation where respecting a patient's wish to withhold medical information conflicts with the ethical responsibility to inform a physician of findings that could impact treatment outcomes. Such dilemmas require critical thinking, ethical sensitivity, and often, consultation with ethical guidelines or senior professionals (Chinene, 2024). This reinforces the need for continuous ethical training and awareness among radiographers to ensure decisions are not only legally compliant but also morally defensible. In the Nigerian

context, the ethical expectations of radiographers are defined by both global ethical norms and locally instituted codes of conduct. The Radiographers Registration Board of Nigeria (RRBN), in collaboration with professional associations such as the Association of Radiographers of Nigeria (ARN), provides ethical guidelines that stipulate acceptable conduct in patient care, professional relationships, and workplace responsibilities. These codes highlight the importance of confidentiality, professional competence, and accountability, thereby offering a framework that supports ethical decision-making in varied clinical scenarios (RRBN, 2020). However, the practical enforcement and adherence to these codes depend largely on the ethical awareness and personal values of individual practitioners.

Furthermore, ethics in radiographic practice is not static but evolves in response to emerging technologies, legal reforms, and changing patient expectations. The rise of digital imaging, telemedicine, and artificial intelligence in diagnostic procedures presents new ethical considerations related to data privacy, informed consent, and professional liability (Geis, 2019). Radiographers must, therefore, remain proactive in updating their ethical knowledge and competencies to adapt to these advancements without compromising patient rights and professional integrity. Education and professional development also play a pivotal role in shaping ethical radiographers. Integrating ethics into radiography curricula and continuing professional education helps inculcate a strong moral compass among trainees and practitioners. Ethical competence is not merely theoretical knowledge but a practical skill developed

through reflection, mentorship, and engagement with real-life case studies. Institutions that emphasize ethical discourse and provide supportive environments for ethical reflection are more likely to produce professionals capable of making sound ethical decisions. As radiography continues to evolve as a critical component of healthcare, ethical practice remains its foundation, ensuring that technical excellence is always matched with moral integrity.

In addition to the foundational ethical principles guiding radiographic practice such as autonomy, beneficence, non-maleficence, and justice radiographers must also operate within a defined medico-legal framework. Ethics and law intersect in clinical settings, particularly in the context of assault, battery, and tort, all of which are legal constructs that carry both ethical and professional implications. Assault in medical and radiographic practice refers to the act of intentionally causing a patient to fear that they will be subjected to unauthorized physical contact. While no physical interaction may occur, the mere threat or perception of forced procedure can constitute assault (Lane, 2016). In a radiography context, for instance, a practitioner who aggressively a patient to comply with a scan without providing adequate explanation or consent may inadvertently create a scenario perceived as coercive or threatening. Ethical practice requires that patient autonomy be upheld through respectful communication and reassurance (Beauchamp & Childress, 2013).

Battery, on the other hand, involves actual unauthorized physical contact with a patient. In radiographic procedures, this might occur when a patient is touched,

positioned, or scanned without informed consent or against their will. Even if the intention of the radiographer is clinically justified, performing any procedure without explicit or implied consent is legally considered battery. This not only breaches ethical standards but also violates a patient's legal rights to bodily autonomy and personal dignity (Pozgar, 2024). Radiographers must therefore ensure consent is always obtained verbally, written, or implied depending on institutional protocol and the context of care. The concept of tort is broader and encompasses civil wrongs that cause harm or injury to individuals, for which the injured party may seek legal remedy. In healthcare, this includes both negligent acts and intentional misconduct. A radiographer who administers an incorrect radiation dose due to carelessness or fails to verify a patient's identity may be liable under the tort of negligence. Such actions could result in physical harm, psychological distress, or delayed diagnosis, leading to potential legal claims. Torts in radiographic practice are not only about clinical errors but also about lapses in ethical judgment and adherence to professional standards (Pozgar, 2024).

These medico-legal concepts underscore the importance of comprehensive ethical training and professional vigilance. Radiographers must not only be competent in technical skill but also in recognizing and preventing actions that could be interpreted as unlawful or unethical. The overlap between ethical responsibility and legal accountability demands that professionals remain continuously informed about both radiographic protocols and patient rights.

2.1.2 Ethical Principles in Radiography

The practice of radiography, like all health professions, is firmly grounded in ethical principles that guide the interaction between radiographers and patients, colleagues, institutions, and society at large. Radiographers occupy a critical position within healthcare delivery, being responsible for obtaining diagnostic images while ensuring the safety, dignity, and rights of patients. Therefore, a sound understanding of ethical principles is essential not just for regulatory compliance, but also for the protection of human values and professional integrity. At the heart of radiographic ethics lie the four core principles of biomedical ethics: autonomy, beneficence, non-maleficence, and justice. These principles, while universal to medical practice, take on particular nuances in the radiographic context. The principle of autonomy underscores the patient's right to make informed decisions about their care, including diagnostic imaging. Radiographers must ensure that patients receive clear and truthful information regarding the procedure, potential risks, and alternatives, enabling them to give voluntary and informed consent (Varkey, 2021). The failure to secure proper consent not only violates ethical norms but also exposes the professional to legal consequences (Beauchamp & Childress, 2013).

Beneficence, the obligation to act in the patient's best interest, is central to radiographic decision-making. Radiographers must constantly balance the need for diagnostic accuracy with the patient's comfort, safety, and emotional well-being. This includes selecting appropriate imaging modalities that will yield maximum diagnostic

value with minimal exposure to radiation or discomfort. In certain cases, a radiographer may need to adapt protocols to suit the patient's physical limitations, clinical condition, or psychological state all in the interest of promoting positive outcomes (Cheraghi et al., 2023).

Closely related is the principle of non-maleficence, which requires radiographers to avoid causing harm. This principle is especially significant given the potential biological effects of ionizing radiation. Radiographers must apply the ALARA principle (As Low As Reasonably Achievable) to minimize radiation doses without compromising diagnostic quality. Moreover, they must be vigilant in preventing procedural errors, such as incorrect patient identification, wrong-side imaging, or equipment malfunction all of which can result in preventable harm. Ethical radiographic practice is therefore inherently linked with technical competence, attention to detail, and commitment to continual professional development (Zhou et al., 2024).

The fourth principle, justice, concerns fairness and equity in the delivery of radiographic services. Radiographers must ensure that all patients, regardless of race, gender, socioeconomic background, or disability, receive equal access to quality imaging services. Discrimination in the prioritization or quality of care not only breaches ethical standards but can exacerbate existing health inequalities. Justice also extends to the fair distribution of resources within imaging departments, including the equitable scheduling of procedures and appropriate management of staff workloads to

prevent burnout and ensure safe practice (Rus & Groselj 2021).

Beyond these foundational principles, there are additional ethical considerations that are specific to the radiographic profession. One such consideration is confidentiality. Radiographers often have access to sensitive personal and medical information. It is their duty to handle such information discreetly and ensure that it is not disclosed to unauthorized persons. With the rise of digital imaging systems and Picture Archiving and Communication Systems (PACS), the safeguarding of patient data has become even more crucial. Breaches of confidentiality can undermine patient trust and contravene data protection regulations (ESR, 2013). Another key ethical principle in radiography is professional accountability. Radiographers must take responsibility for their actions and decisions in clinical practice. This includes recognizing the limits of their competence and referring cases beyond their scope to appropriate professionals (Matilainen et al., 2016).

Respect for dignity and compassion is equally significant in radiographic ethics. Many imaging procedures require patients to remove clothing, adopt awkward positions, or remain still for extended periods. Radiographers must carry out these tasks in a manner that preserves the patient's modesty, comfort, and sense of control. In particular, extra care must be taken when working with vulnerable populations such as children, the elderly, people with disabilities, or those with mental health challenges. Ethical radiographers are sensitive to the emotional and psychological aspects of care and strive to provide reassurance and empathy throughout the

procedure (Society of Radiographers, 2013). Moreover, inter-professional ethics plays an important role in radiography. Radiographers often work closely with radiologists, nurses, referring physicians, and other healthcare professionals. Ethical practice demands respect for colleagues, clear communication, and collaboration in decision-making (Fatahi et al., 2020). Disputes or conflicts of interest must be handled constructively, without compromising patient care. The promotion of teamwork and mutual respect contributes to a safer and more effective healthcare environment (Mudadi et al., 2024).

In the Nigerian context, ethical principles in radiography are further guided by the codes and regulations established by the Radiographers Registration Board of Nigeria (RRBN) and professional bodies like the Association of Radiographers of Nigeria (ARN). These organizations outline expectations for integrity, respect, confidentiality, and competence. Radiographers are also expected to engage in continuous professional development to keep pace with technological advancements and evolving ethical challenges in the field. Adherence to these codes is a reflection of professional maturity and a commitment to excellence in patient care (RRBN, 2017). Ethical principles in radiography form the bedrock of responsible, safe, and patient-centered imaging practice.

2.1.3 Code of Conduct for Radiographers in Nigeria

The professional practice of radiography in Nigeria is governed by a clearly defined code of conduct, established to uphold the integrity, responsibility, and ethical

behavior expected of radiographers. The Radiographers Registration Board of Nigeria (RRBN), which serves as the regulatory body for the profession, sets out these codes and ensures their enforcement through monitoring, licensure, disciplinary procedures, and continuing education initiatives. The code of conduct represents not only a set of rules but also a moral compass that guides radiographers in making informed and principled decisions in both clinical and non-clinical settings.

The RRBN Code of Professional Conduct outlines several critical components of professional ethics, including professional competence, patient-centered care, confidentiality, accountability, and collegial respect. These guidelines are tailored to the Nigerian healthcare landscape while also aligning with global best practices, ensuring that Nigerian radiographers can operate both locally and internationally with credibility and ethical soundness (RRBN, 2017).

One of the primary pillars of the code is professional competence and diligence. Radiographers in Nigeria are expected to maintain high standards of professional knowledge and skill. They must remain up-to-date with developments in medical imaging technology and procedures, and they are encouraged to engage in continuous professional development through workshops, seminars, and academic advancement. This expectation is especially vital considering the rapid evolution of imaging modalities and the increasing demand for evidence-based practices in diagnostic radiography. A failure to maintain competence not only violates professional ethics but also puts patients at risk of harm or misdiagnosis (Okeji & Agwuna, 2015).

In addition to competence, the code emphasizes the necessity of putting patients' welfare at the forefront of practice. Radiographers are expected to treat patients with dignity, compassion, and respect, irrespective of their socioeconomic status, religious beliefs, gender, ethnicity, or age. They must act in the best interest of the patient, even when under pressure from employers or colleagues to act otherwise. The principle of informed consent is a particularly crucial component of patient-centered care in Nigeria. Radiographers are ethically bound to explain the nature, purpose, and possible risks of any imaging procedure in clear and understandable language before proceeding. Any form of coercion or assumption of consent without adequate explanation is a direct violation of both patient rights and the professional code (Onyemaechi et al., 2020).

Confidentiality is another cornerstone of the Nigerian code of conduct for radiographers. The sensitive nature of radiographic information, such as diagnostic findings and personal patient details, requires that such data be kept strictly confidential unless disclosure is legally or professionally warranted. This obligation continues even after the death of a patient. With the digitization of medical records and the use of PACS (Picture Archiving and Communication Systems), radiographers must be even more vigilant in ensuring that patient data is not accessed or shared inappropriately. Breaches of confidentiality not only erode patient trust but may also result in legal and disciplinary action (Abdullahi et al., 2019).

Closely tied to confidentiality is the principle of accountability and transparency in

practice. Radiographers must take full responsibility for their actions and omissions during professional engagements. They are expected to document procedures appropriately, report errors honestly, and accept feedback constructively. In situations where errors or complications occur, the code encourages openness and disclosure, provided it is done within the boundaries of institutional policy and patient safety protocols. Moreover, radiographers are obligated to report unethical or dangerous practices by colleagues or superiors, a provision that serves as a safeguard against institutional negligence or systemic misconduct (Ajayi et al., 2022).

The code of conduct also addresses interprofessional conduct, emphasizing the importance of mutual respect, cooperation, and effective communication with other healthcare professionals. Radiographers must avoid disparaging remarks about colleagues, and must not engage in activities that could bring the profession into disrepute. This includes maintaining a professional demeanor both within the clinical environment and in public life. Inappropriate behavior, whether physical, verbal, or digital, is considered a breach of professional integrity. Radiographers are reminded that their actions outside the hospital may also reflect on the profession and are therefore subject to scrutiny (Eze et al., 2021).

Ethical handling of equipment and institutional resources is another domain covered in the Nigerian code of conduct. Radiographers are stewards of expensive, highly specialized equipment, and are expected to use these resources efficiently and responsibly. Tampering with imaging machines, misusing contrast agents, or

falsifying image results for personal gain or departmental metrics is strictly prohibited. Ethical practice requires that radiographers follow operational protocols, report malfunctioning equipment promptly, and ensure that imaging devices are calibrated correctly to avoid unnecessary patient exposure or diagnostic errors (Nwankwo & Okoye, 2018). The code of conduct for radiographers in Nigeria serves as a comprehensive framework for ethical and professional behavior.

2.1.4 Common Ethical Dilemmas in Diagnostic Imaging

In the field of diagnostic imaging, radiographers frequently encounter ethical dilemmas that challenge their professional judgment and moral responsibility. These dilemmas arise due to the intersection of technological advancements, patient diversity, institutional policies, and legal frameworks. In Nigeria, as in many parts of the world, such issues are further compounded by resource constraints, socio-cultural beliefs, and gaps in ethical awareness among healthcare professionals. Understanding and managing these ethical dilemmas is essential for promoting patient safety, upholding professional standards, and ensuring quality healthcare delivery.

One of the most recurring ethical issues in diagnostic imaging is the issue of informed consent. Although obtaining patient consent before conducting any imaging procedure is an established ethical standard, the practical implementation of this principle is often fraught with complications. Many patients may not fully understand the nature or purpose of radiologic procedures, especially when complex imaging modalities such as CT scans or MRIs are involved. Language barriers, low health literacy, and

time constraints may result in consent being rushed or inadequately explained. In emergency situations, radiographers may also be pressured to proceed without consent, raising ethical questions about autonomy versus beneficence (Okeji et al., 2019).

Another major ethical dilemma involves the handling of incidental findings. In the course of routine imaging, radiographers may identify anomalies unrelated to the original reason for the scan. For instance, a scan intended to evaluate kidney stones may incidentally reveal a suspicious mass. While radiographers are trained not to interpret images beyond their scope, withholding potentially significant findings may conflict with their ethical duty to protect patient well-being. This creates a tension between respecting professional boundaries and ensuring that clinically relevant information is not overlooked. In many Nigerian settings where radiologists may not be immediately available, radiographers face pressure to interpret and act on such findings, sometimes without adequate legal or institutional protection (Abdullahi & Nwankwo, 2021).

Exposure to unnecessary radiation represents another ethical concern. The principle of ALARA (As Low As Reasonably Achievable) mandates that radiation doses be minimized without compromising diagnostic quality. However, radiographers often encounter situations where referring physicians order imaging procedures that are either redundant or clinically unjustified. In such cases, radiographers may struggle with whether to challenge the physician's directive or proceed, despite ethical

reservations. This dilemma is particularly common in private healthcare facilities where financial incentives may influence decision-making. Upholding the principle of non-maleficence doing no harm becomes difficult when institutional pressures encourage volume over value (Eze et al., 2022). The use of chaperones during imaging of vulnerable populations also presents an ethical dilemma. Female patients undergoing pelvic or chest imaging may feel uncomfortable without the presence of a female chaperone, particularly in conservative cultures. However, due to staff shortages, it may not always be feasible to provide a same-gender chaperone. Radiographers must then decide between delaying necessary procedures and risking patient discomfort or distress. Similar challenges occur when imaging children, mentally impaired individuals, or patients with a history of abuse. The balance between ensuring dignity and maintaining workflow efficiency is a persistent ethical struggle in many radiology departments across Nigeria (Onyemaechi et al., 2020).

Confidentiality breaches related to patient data is another ethical dilemma amplified by digitalization. With the widespread adoption of digital imaging and PACS, radiographic data is now more easily accessible, increasing the risk of unauthorized disclosure. Radiographers may inadvertently view or share patient information outside professional contexts, especially through mobile devices and social platforms. Such breaches not only violate ethical standards but also expose institutions to legal liabilities. In some cases, radiographers may be asked by colleagues or acquaintances for unofficial interpretations or access to imaging results, placing them in ethically

compromising positions (Nwankwo & Okeji, 2018).

Another notable ethical challenge arises from prioritization and resource allocation. In public hospitals where imaging equipment and manpower are limited, radiographers may be forced to make decisions about which patients to scan first. While triage is necessary, it must be based on clinical urgency rather than favoritism, social connections, or inducements. However, in real-world practice, radiographers may face pressure from influential patients or hospital officials to violate these principles. The dilemma of fairness versus authority highlights the fragile ethical terrain navigated by imaging professionals, particularly in settings with weak institutional oversight (Ajayi et al., 2022).

Conflict of interest is also an emerging ethical issue, especially as radiographers venture into private practice or partner with diagnostic centers. For instance, a radiographer working in a public hospital may refer patients to a private facility in which they have financial stakes. Even if the intention is to expedite care, this dual role presents a conflict that may undermine trust and objectivity. Professional integrity demands transparency and the avoidance of decisions that could be influenced by personal gain. Yet, in environments where public healthcare funding is inadequate, such arrangements are often seen as practical solutions, making ethical breaches more likely (Umeh & Adejumo, 2020).

Lastly, ethical issues related to cultural and religious considerations are particularly relevant in Nigeria's diverse sociocultural context. For example, Muslim female

patients may refuse to be imaged by male radiographers, or individuals from certain sects may decline imaging altogether due to religious prohibitions. Radiographers must balance respect for cultural values with the urgency of medical intervention. Failure to accommodate these values can result in non-compliance, poor patient experience, or litigation. However, excessive deference to cultural sensitivities may delay care or compromise diagnostic outcomes. This complexity underscores the importance of cultural competence and ethical sensitivity in modern radiographic practice (Chau, 2020).

2.1.5 Factors Contributing to Ethical Challenges in Radiography

Ethical challenges in radiography are influenced by a wide range of interrelated factors that reflect not only the complexity of clinical practice but also the social, institutional, and individual dynamics shaping the profession. In the Nigerian healthcare context, radiographers often navigate environments where ethical decision-making is hindered by infrastructural limitations, inadequate policy enforcement, cultural diversity, and gaps in ethical training. Understanding these contributing factors is essential in formulating strategies that promote ethical conduct and reduce professional burnout.

One primary factor contributing to ethical difficulties in radiography is the absence or weak enforcement of institutional ethics policies. Many healthcare institutions in Nigeria either lack formal ethics committees or do not implement their mandates effectively. As a result, radiographers may not receive adequate support or direction

when confronted with complex ethical decisions. This creates a vacuum in accountability, leaving practitioners to rely on personal values or informal guidance, which may be inconsistent with professional codes. The lack of institutional backing can make radiographers more susceptible to coercion from senior colleagues, administrative staff, or external stakeholders (Akinlabi & Okeji, 2020).

Inadequate training in ethics during radiography education is another significant contributing factor. While ethical modules are often included in radiography curricula, their depth and delivery are sometimes insufficient to prepare students for the real-world complexities they will face in practice. Many graduates enter the workforce with only a theoretical understanding of ethical principles, lacking the critical thinking and decision-making skills necessary for practical application. Furthermore, continuing professional development (CPD) opportunities focusing on ethics are limited, especially outside major cities. This educational gap results in varying levels of ethical competence among radiographers (Eze et al., 2021).

Workplace pressure and high workload also compromise ethical decision-making. In many radiology departments, particularly in public hospitals, radiographers face an overwhelming patient volume with limited staffing and outdated equipment. Under such conditions, radiographers may be forced to prioritize speed over accuracy or informed consent. These pressures create situations where ethical standards are knowingly compromised to meet institutional demands. In private facilities, the drive for profit can further aggravate this situation, as radiographers may be encouraged to

conduct unnecessary scans or bypass procedures to maximize financial returns, thereby violating ethical principles such as beneficence and non-maleficence (Nwankwo & Abdullahi, 2020).

Cultural and religious diversity in Nigeria also presents a unique layer of ethical complexity. Radiographers must often provide care to patients whose beliefs may conflict with certain medical procedures or standards. For example, some patients may resist imaging procedures due to religious objections or insist on same-gender care providers due to cultural sensitivities. Navigating these situations ethically requires not just cultural competence but also institutional support mechanisms, such as translation services or gender-sensitive staffing, which are often unavailable. Failure to adequately manage such cultural dynamics can result in breaches of autonomy, disrespect, or non-compliance (Okoye & Sule, 2019).

Another contributing factor is the power imbalance between radiographers and other healthcare professionals, particularly physicians. In many facilities, radiographers are often subordinate to doctors in the decision-making hierarchy. This dynamic may lead to ethical challenges when radiographers are expected to carry out procedures they deem unnecessary or potentially harmful. Questioning a doctor's order, even when ethically warranted, may be viewed as insubordination. This hierarchical tension limits the radiographer's ability to act independently and uphold ethical standards, especially in the absence of policies that clearly define and protect the scope of practice (Umeh et al., 2020).

Technological advancement without corresponding ethical frameworks is another modern dilemma. As imaging technology evolves introducing digital systems, Teleradiology, and artificial intelligence radiographers must adapt to new ways of handling data, interacting with patients, and interpreting results. However, ethical guidelines have not kept pace with these advancements (Ajayi & Omisore, 2022).

Limited awareness of professional codes and regulatory standards also plays a major role in ethical lapses. Although the Radiographers Registration Board of Nigeria (RRBN) provides a code of conduct, not all practitioners are familiar with its provisions. Lack of awareness may stem from inadequate dissemination, insufficient emphasis in training institutions, or a culture of indifference towards professional ethics. Consequently, radiographers may act in ways that contradict ethical and legal standards without even realizing it. This ignorance creates an environment where misconduct is normalized and accountability is difficult to enforce (Okeji & Akinbo, 2019).

Economic and financial constraints also impact ethical behavior. In a system where radiographers are often underpaid or work in under-resourced facilities, ethical compromises may arise from attempts to supplement income through unofficial services or referrals to private diagnostic centers. Additionally, patients may offer bribes to expedite services, and in the absence of strict oversight, some radiographers may succumb to these inducements. These practices erode professional integrity and widen disparities in access to imaging services, violating the ethical principle of

justice (Ifeanyichukwu & Onoh, 2020). Personal and emotional factors such as fear, fatigue, and moral distress can hinder ethical decision-making. A radiographer under extreme stress or facing personal challenges may make decisions that prioritize convenience over care. Emotional burnout, especially in the absence of psychological support systems, reduces moral sensitivity and can lead to ethical lapses (Emejulu & Oguegbu, 2019).

2.1.6 Impact of Ethical Dilemmas on Radiographers and Patient Outcomes

Ethical dilemmas in radiographic practice are not merely theoretical challenges; they have tangible consequences that affect both the professional well-being of radiographers and the health outcomes of the patients they serve. When ethical issues arise and are not effectively addressed, they can compromise the integrity of clinical decisions, lead to emotional distress among practitioners, erode patient trust, and ultimately lower the standard of care delivered within diagnostic imaging departments.

One of the most immediate impacts of ethical dilemmas is moral distress among radiographers. Moral distress arises when a radiographer knows the ethically appropriate action to take but feels powerless to take that action due to institutional constraints, hierarchical pressures, or fear of retaliation. For example, a radiographer may be pressured to perform a procedure without proper consent or to proceed with imaging that may not be in the best interest of the patient. Over time, repeated exposure to such dilemmas without adequate resolution may lead to moral residue

lingering feelings of guilt, frustration, or professional dissatisfaction. These emotional burdens not only reduce job satisfaction but may contribute to burnout, absenteeism, or premature exits from the profession (Adebayo & Oyenuga, 2020).

In addition to affecting radiographers themselves, ethical dilemmas can have serious implications for patient outcomes. One critical area is the violation of informed consent. When imaging is conducted without adequate explanation, or under coercion, it infringes upon the patient's right to autonomy and informed decision-making. Such breaches can result in a loss of trust, reduced patient satisfaction, and in some cases, refusal to return for follow-up procedures. This can delay diagnoses and compromise treatment timelines, particularly in diseases where early detection is crucial, such as cancer (Eze & Okonkwo, 2019). Ethical challenges may lead to clinical errors or suboptimal imaging practices. For instance, a radiographer who is overwhelmed by a high patient load and under pressure to complete procedures rapidly may inadvertently skip safety protocols, resulting in repeated exposures or misdiagnoses due to poor image quality. In such cases, the ethical principle of non-maleficence is clearly compromised. The patient may suffer unnecessary radiation exposure, misdiagnosis, or delayed treatment, all of which directly undermine the goal of achieving optimal clinical outcomes (Okeji et al., 2021).

Unresolved ethical conflicts may have a cumulative effect on the quality of healthcare delivery. When radiographers continually face ethical roadblocks without institutional support or ethical consultation services, there is a risk that a culture of ethical

complacency will emerge. In such a culture, ethical shortcuts become normalized, and patient welfare is deprioritized. Over time, this undermines the standard of diagnostic services, making it harder to maintain patient-centered care. In systems already grappling with limited resources and personnel shortages, such ethical decay can be devastating to overall healthcare outcomes (Umeh & Alabi, 2021).

The psychological burden of unresolved ethical dilemmas also has long-term implications for radiographers' mental health. Continuous exposure to ethically troubling situations without clear resolution may result in anxiety, depression, or emotional exhaustion. These mental health challenges not only affect job performance but may also lead to substance abuse, family problems, or social withdrawal. Yet, mental health support services for healthcare workers in Nigeria remain grossly inadequate, exacerbating the vulnerability of radiographers operating in ethically charged environments (Emejulu et al., 2019).

Ethical dilemmas in radiography have far-reaching consequences that extend beyond isolated incidents. They affect the emotional and psychological well-being of radiographers, influence inter-professional dynamics, and impact the clinical outcomes and experiences of patients.

2.1.7 Radiographers' Awareness and Adherence to Ethical Guidelines

Radiographers operate at a critical intersection of technology and human interaction, where adherence to ethical standards is not just recommended, but essential to safeguarding patient dignity, professional integrity, and public trust. In Nigeria and

globally, ethical guidelines serve as foundational frameworks that inform decision-making, shape professional behavior, and define the scope of responsible practice. Radiographers' awareness of these ethical principles and more importantly, their adherence to them plays a vital role in determining the quality of care delivered within diagnostic imaging environments.

Awareness of ethical guidelines among radiographers involves more than a mere recognition of codes or policies; it encompasses a comprehensive understanding of the principles behind these codes, their application in various clinical scenarios, and the moral reasoning required to navigate complex dilemmas. Radiographers are expected to be conversant with concepts such as patient autonomy, confidentiality, informed consent, beneficence, and non-maleficence, all of which are outlined in the ethical standards established by professional regulatory bodies such as the Radiographers Registration Board of Nigeria (RRBN) and international associations including the International Society of Radiographers and Radiological Technologists (ISRRT) (Okeji et al., 2020).

Research has indicated varying degrees of awareness among radiographers, often influenced by factors such as educational exposure, years of clinical experience, institutional policies, and access to continuing professional development. Radiographers who receive formal training in medical ethics during their undergraduate studies or who frequently participate in ethics-focused workshops are more likely to demonstrate a high level of ethical consciousness in their day-to-day

practice. Conversely, those who were inadequately exposed to formal ethical education or who operate in under-regulated settings may struggle to internalize and apply ethical standards effectively (Adebayo & Okonkwo, 2021).

Adherence to ethical guidelines is another layer that extends beyond knowledge. It refers to the consistent translation of ethical awareness into ethical action. In radiographic practice, this could manifest in actions such as ensuring that patients fully understand the procedure before obtaining informed consent, maintaining strict confidentiality of patient records, refusing to perform unnecessary or non-justified imaging procedures, and advocating for patients' rights even in the face of administrative or hierarchical pressures. This commitment to ethical adherence demonstrates professional maturity and is a hallmark of high-quality patient-centered care (Chukwudi & Olorunfemi, 2019).

Several challenges undermine radiographers' adherence to ethical guidelines in Nigeria. One of the major challenges is the absence of clearly institutionalized ethical protocols in some clinical settings. In such environments, radiographers may not have standard operating procedures that emphasize ethical conduct, nor access to ethics committees to consult when dilemmas arise. This vacuum can foster inconsistency in ethical application and, in worse cases, normalize unethical practices due to lack of accountability mechanisms (Okoroafor et al., 2022).

Moreover, workload pressures and infrastructural limitations in many public hospitals and diagnostic centers can make it difficult for radiographers to uphold ethical

standards. For instance, in high-volume settings where patient throughput is prioritized, ethical principles such as detailed patient communication and personalized care may be compromised. Radiographers under such strain may find themselves skipping essential procedures like proper consent acquisition or patient identity verification, simply to keep up with the demands of the workflow. These oversights, though often unintentional, amount to ethical lapses that could affect patient safety and care outcomes (Umeh & Alabi, 2021).

It is also important to note that radiographers' personal values, cultural orientation, and religious beliefs may intersect with professional ethical codes, sometimes creating conflict. For example, a radiographer with strong religious beliefs regarding certain medical procedures, such as abortions or prenatal diagnostics, may face difficulty aligning personal convictions with professional obligations. In such cases, ethical adherence requires a delicate balancing act and a high level of professional discipline, often supported by ethical consultation or mediation systems within the workplace (Adigun & Salako, 2020). Radiographers' awareness and adherence to ethical guidelines are indispensable to delivering responsible and compassionate imaging services. While a significant proportion of radiographers possess a foundational understanding of ethical standards, gaps remain in consistent application due to institutional, professional, and personal challenges.

2.1.8 Strategies for Enhancing Ethical Practice in Medical Imaging

Ensuring ethical practice in medical imaging requires more than individual integrity;

it necessitates a robust framework that combines education, regulation, institutional policy, and cultural reinforcement. Radiographic procedures involve a unique set of ethical concerns due to the complex interplay between technology, patient vulnerability, and professional discretion. As such, developing and implementing strategies to promote and sustain ethical behavior among radiographers is essential for patient safety, public trust, and professional advancement.

One of the most critical strategies for promoting ethical practice in medical imaging is the integration of comprehensive ethics education in radiography training programs. Ethical competence should not be considered an optional or peripheral component of radiography education. Instead, it must be deliberately embedded into the curriculum through dedicated modules, case-based learning, and critical reflection exercises. When students are exposed early to practical ethical issues such as confidentiality, informed consent, and professional boundaries, they are more likely to carry this awareness into clinical practice (Okoye & Chukwu, 2021). This foundational knowledge also enables future radiographers to engage in morally sound decision-making, even in complex or high-pressure environments.

Continuing Professional Development (CPD) is another indispensable tool in strengthening ethical standards among practicing radiographers. CPD opportunities focused specifically on ethics should be regularly made available through workshops, webinars, and in-service training programs. These platforms not only reinforce ethical knowledge but also provide forums for radiographers to discuss dilemmas they

encounter in practice and collectively explore appropriate responses. Moreover, CPD programs should be dynamic and responsive to emerging ethical issues, such as the use of artificial intelligence in diagnostics or patient data privacy in digital archiving (Bassey & Omotayo, 2020). The dynamic nature of medical imaging technology demands ongoing ethical engagement to maintain relevance and professionalism.

Equally important is the strengthening of institutional policies and governance frameworks. Ethical standards cannot flourish in a vacuum; they require systemic support. Hospitals and diagnostic centers must formulate and enforce clear ethical protocols that are accessible to all imaging staff. These policies should cover core areas such as patient confidentiality, imaging justification, communication standards, professional conduct, and the handling of errors. The presence of an internal ethics committee or a professional conduct oversight team further strengthens institutional capacity to manage ethical dilemmas proactively. This kind of structural support reassures staff that ethical challenges can be addressed fairly and collaboratively, thereby encouraging transparency and accountability (Adebimpe & Odion, 2022).

Leadership and role modelling also play pivotal roles in shaping ethical behavior among radiographers. Departmental heads, senior radiographers, and institutional administrators must model ethical excellence in their day-to-day interactions. When leaders demonstrate unwavering commitment to ethical standards through respectful communication, accountability in decision-making, and principled supervision they set a precedent that naturally cascades down to junior staff. Ethical leadership helps

cultivate a workplace culture where doing the right thing is valued and expected, rather than merely imposed (Okafor & Eze, 2019).

Peer collaboration and ethical dialogue can also enhance ethical awareness and consistency in radiographic practice. Regular peer review sessions, ethics roundtables, and departmental discussions create spaces where radiographers can collectively reflect on ethical dilemmas and learn from each other's experiences. These forums foster critical thinking and empathy, encourage knowledge sharing, and help radiographers realise that ethical challenges are not isolated events but common features of healthcare delivery that can be managed through collective wisdom and shared values (Ede & Nwankwo, 2020).

Public and patient education indirectly enhances ethical conduct among radiographers. When patients are educated about their rights such as the right to informed consent, to decline procedures, or to question the qualifications of the person attending to them they are better positioned to assert these rights. This dynamic compels healthcare providers, including radiographers, to adhere strictly to ethical and legal obligations. An informed patient population acts as an external check on professional behavior, reinforcing ethical consistency in clinical encounters (Oladele & Musa, 2019).

The role of regulatory bodies such as the Radiographers Registration Board of Nigeria (RRBN) cannot be overstated in promoting ethical excellence. These bodies should go beyond licensing and disciplinary functions to actively engage in ethics promotion. Strategies include publishing ethical guidelines, offering annual ethics symposia, and

developing mentoring platforms where seasoned professionals can guide younger ones in navigating ethical complexities. Strong regulatory oversight ensures that ethical standards are not only communicated but enforced, with clear consequences for violations (Akinyemi & Yusuf, 2020).

2.2 Review of Related Empirical Studies

Empirical research provides the evidentiary backbone to theoretical and conceptual discussions in radiographic ethics. Understanding the real-world experiences of radiographers, as well as the practical outcomes of ethical or unethical behavior in clinical settings, offers a more nuanced and contextual appreciation of the ethical landscape in radiographic imaging. A critical review of related empirical studies, both locally and globally, sheds light on the prevalence, nature, causes, and consequences of ethical dilemmas faced by radiographers, and the extent to which they are equipped to handle them.

A study conducted by Adebayo and Chika (2020) in selected tertiary hospitals in Lagos examined the ethical awareness and responsiveness of radiographers using structured questionnaires distributed among 120 participants. The findings indicated that while 85% of respondents acknowledged the importance of ethical standards in radiographic imaging, only 57% reported having received formal training in ethical decision-making during their academic programs. Notably, over half of the participants admitted to encountering situations where they felt compelled to act contrary to ethical guidelines due to pressure from senior colleagues or institutional

constraints. This study underscores the gap between theoretical understanding and practical adherence to ethical principles, suggesting the need for continuous ethics-based professional development. Similarly, in a regional study carried out by Okonkwo et al. (2019) in Enugu State, the researchers investigated the role of institutional support systems in mediating ethical dilemmas among radiology staff. Using both qualitative interviews and quantitative survey tools, the study revealed that ethical lapses were more frequent in environments where there were no clearly established or consistently enforced ethical policies. Radiographers working in such settings reported difficulty in handling situations involving patient consent, inappropriate referrals, and imaging of vulnerable populations without proper authorization. The study concluded that institutional culture plays a significant role in shaping ethical behavior and highlighted the need for ethics committees and peer-support structures within imaging departments.

In the international context, a cross-sectional study by Singh and Rehman (2018) in India explored the ethical attitudes of radiologic technologists across five metropolitan hospitals. The survey focused on core ethical areas such as informed consent, confidentiality, truth-telling, and professional boundaries. The study found that while most radiographers demonstrated high awareness of ethical protocols, a substantial number (43%) admitted to occasional non-adherence due to time pressure, lack of supervision, or economic incentives. This aligns with findings in several Nigerian studies where ethical challenges are often linked to systemic deficiencies

rather than intentional misconduct. In contrast, a study conducted in the United Kingdom by Bradley and Holmes (2017) employed focus group discussions among practicing radiographers to explore their perspectives on ethical dilemmas in the digital imaging era. Participants discussed issues surrounding patient data privacy, the use of automated diagnostic tools, and the ethics of second-opinion consultations via telemedicine platforms. Interestingly, the study highlighted that ethical concerns in the UK context were shifting from traditional dilemmas to more technologically influenced scenarios. Radiographers emphasized the need for updated guidelines and digital ethics training to cope with these changes.

In Nigeria, a recent empirical study by Bello and Ajayi (2022) evaluated the perception and ethical comportment of radiography students during clinical postings. The study surveyed 150 final-year students across three institutions and found that while 72% could correctly identify ethical breaches in clinical case scenarios, only 48% had the confidence to challenge unethical conduct by staff in real-life settings. Factors such as fear of victimization, lack of institutional feedback mechanisms, and unclear reporting channels were identified as barriers to ethical action. This suggests that ethics education alone is insufficient without structural and cultural support within clinical institutions.

Another relevant empirical study is that of Umeh and Chukwu (2021), which examined the frequency and types of ethical infractions reported in five diagnostic centres in Abuja. Using incident report analysis and anonymous staff interviews, the

study found a recurring pattern of ethical violations including inadequate patient explanation before procedures, poor documentation, and negligence in protecting patient dignity. The authors recommended the introduction of ethics-based key performance indicators (KPIs) and the inclusion of ethical reflection during staff appraisals. Furthermore, an empirical study by Edet and Udo (2023) in Cross River State examined ethical decision-making in rural radiographic practice. Radiographers in under-resourced facilities frequently encountered situations that demanded compromise, such as imaging without proper equipment, using outdated machines, or bypassing formal consent due to communication barriers. Although practitioners expressed awareness of the ethical breaches involved, they justified their actions as necessary trade-offs in the interest of timely diagnosis. This highlights the complexity of ethical decision-making in environments with limited resources and suggests the need for context-sensitive ethical frameworks.

Collectively, these empirical studies emphasize that ethical practice in radiography is not solely a matter of individual willpower or knowledge. It is significantly shaped by institutional policies, leadership culture, resource availability, regulatory enforcement, and the evolving nature of medical technology. While awareness of ethical standards appears to be generally high among radiographers, challenges persist in consistent application, especially in resource-constrained or poorly governed environs.

2.3 Theoretical Framework

In studies involving ethics in healthcare, especially radiography, theoretical

underpinnings are essential to understand how professionals make moral decisions and how these decisions align with both personal values and institutional expectations. For this study, several ethical and decision-making theories provide the foundation for analyzing ethical dilemmas encountered by radiographers in clinical imaging environments.

2.3.1 Principlism (Four Principles of Biomedical Ethics)

The most relevant and widely accepted theoretical model in medical ethics is Principlism, developed by Beauchamp and Childress. This theory is grounded on four primary ethical principles: autonomy, beneficence, non-maleficence, and justice (Beauchamp & Childress, 2013).

1. Autonomy recognizes the patient's right to make informed decisions about their care. In radiography, this pertains to obtaining valid consent before imaging procedures.
2. Beneficence requires radiographers to act in the best interest of the patient, including selecting the most appropriate imaging technique with the least risk.
3. Non-maleficence obligates radiographers to avoid causing harm, particularly in relation to radiation exposure.
4. Justice demands that services are provided fairly and equitably, without discrimination or bias.

This framework helps interpret ethical dilemmas where radiographers must balance technical tasks with patient-centered ethical responsibilities.

2.3.2 Deontological Ethics (Duty-Based Theory)

Deontological theory, rooted in the philosophy of Immanuel Kant, emphasizes that the morality of an action depends on whether it fulfills a professional or moral duty, regardless of the outcome. In radiographic practice, this theory supports the notion that radiographers have a duty to act ethically such as refusing to conduct an unjustified scan even if such refusal may inconvenience the patient or referring physician. Deontological ethics aligns with institutional codes of conduct and emphasizes rule-following, honesty, and professional integrity, which are foundational in maintaining public trust in medical imaging services.

2.3.3 Virtue Ethics

Virtue ethics, associated with Aristotle, focuses on the character and moral disposition of the individual rather than on specific rules or consequences. It holds that ethical behavior is the result of cultivated virtues such as honesty, compassion, courage, and empathy. In radiographic practice, a virtuous radiographer is one who instinctively acts ethically not because of rules but because it reflects who they are as a professional. This theory complements institutional codes of conduct by promoting internal moral strength that guides ethical decision-making in complex clinical scenarios where rules may not offer clear guidance.

CHAPTER THREE

METHODOLOGY

This chapter outlines the research methods that were employed to achieve the objectives of the study titled "Ethical Considerations in Radiographic Imaging: Analyzing Ethical Dilemmas Faced by Radiographers in Selected Hospitals in Benin Metropolis." It includes detailed explanations of the research design, study area, target population, sampling techniques, data collection methods, data analysis procedures, and ethical considerations.

3.1 Research Setting

The study was carried out in three selected hospitals and diagnostic centers, which includes the University of Benin Teaching Hospital (UBTH), Raytouch Diagnostic Center, and Lily Hospital in Benin Metropolis, Nigeria. Benin Metropolis is home to several public and private healthcare institutions with functional radiology departments, making it a suitable location for investigating ethical dilemmas in radiographic practice.

University of Benin Teaching Hospital (UBTH)

The University of Benin Teaching Hospital (UBTH) is a public, federally funded teaching hospital located in Benin City. It was established in 1975 to complement its sister institution, the University of Benin, and to provide comprehensive diagnostic, medical, and surgical services. UBTH houses a well-equipped radiology department

with modern imaging facilities.

The Radiology Department at UBTH is a vital unit, providing diagnostic and interventional imaging services. It offers a wide range of imaging modalities, including X-rays, CT scans, MRIs, ultrasounds, and fluoroscopy, which supports accurate diagnosis and treatment planning. Staffed by skilled radiologists, radiographers, and support personnel, the department ensures quality healthcare delivery. It also plays a significant role in medical education and residency training, fostering the development of future radiology professionals.

The UBTH radiology department comprises of 31 radiographers, including staff and interns, all committed to excellence in healthcare service delivery and innovation in medical imaging.

Raytouch Diagnostic Center

Raytouch Diagnostic Limited is a diagnostic center located in Benin City, Edo State. The center, established in 2017, owned mainly by Prof. Igbinedion, a consultant radiologist specializing in interventional radiology, along with other partners. Raytouch provides a variety of diagnostic services such as CT scans, MRI, X-rays, echocardiography, ECG, hormone profile tests, urine tests, and blood tests. It has multiple branches in Benin City, including locations at Oghogho Street, Dawson Road (opposite Hotel Felona), and Ikpoba Hill. The center has seven (7) licensed radiographers.

Lily Hospital

Lily Hospital in Benin City, established in 1984, is a private multispecialty healthcare facility known for its patient-centered approach, prompt service delivery, and effective use of diagnostic imaging for patient management. The hospital offers various diagnostic services, including radiology, imaging, and automated laboratory services, and employed five licensed radiographers.

These facilities provide a rich environment for exploring and understanding the ethical experiences of radiographers and radiography students practicing or interning in Benin Metropolis.

3.2 Research Design

The study adopts a descriptive cross-sectional research design. This design was chosen because it will enable the collection of data from a selected group of radiographers and radiography trainees within a defined period, providing a snapshot of their opinions and experiences concerning ethical challenges in diagnostic imaging. The descriptive approach was chosen for its effectiveness in exploring current realities, attitudes, and perceptions without manipulating variables. Using a quantitative framework allowed the researcher to obtain measurable, generalizable data that reflects the ethical dynamics of radiographic practice in Benin Metropolis.

3.3 Target Population

The population of the study comprised licensed radiographers and radiography

trainees working or undergoing clinical rotations in selected hospitals and diagnostic centers across Benin Metropolis. These included professionals in both public and private healthcare institutions with diverse levels of professional exposure and ethical responsibilities. The inclusion of trainees provided insight into how ethical challenges were perceived during training.

Inclusion Criteria:

1. Radiographers who are currently working in selected clinical settings in Benin (public or private hospitals).
2. Trainee radiographers or final-year students still undergoing training programs.
3. Radiographers who voluntarily consented to participate in the study.

Exclusion Criteria:

1. Radiographers who are not practicing within Benin Metropolis or worked exclusively in non-radiographic roles.
2. Individuals who declined to give informed consent.
3. Professionals in radiography-related fields who are not directly involved in patient care or imaging.

3.4 Sample Size and Sampling Technique

This study adopted a descriptive cross-sectional design to assess ethical dilemmas among radiographers in Benin Metropolis. A total of 72 participants were included,

comprising 43 practicing radiographers and interns, and 29 final-year radiography students undergoing clinical posting.

A stratified random sampling technique was employed to ensure adequate representation across relevant subgroups, including public and private facilities as well as trainees and practicing professionals. Within each stratum, a simple random sampling method was used to select participants proportionally.

This approach minimized selection bias and ensured that the selected sample reflected the wider radiography population within the Benin Metropolis. The inclusion of both students and practicing professionals also provided a broader perspective on ethical issues across different levels of professional exposure.

This method was guided by the principles described by Etikan et al. (2016) on probability-based sampling approaches for achieving representativeness in quantitative studies.

3.5 Instrument for Data Collection

Data were collected using a structured, self-administered questionnaire. The instrument was divided into several sections, each addressing specific research objectives, including demographic information, awareness of ethical guidelines, common ethical dilemmas encountered, and factors influencing ethical behavior. The questionnaire contained both close-ended and Likert-scale questions, allowing for quantitative analysis while capturing a range of responses.

3.6 Validity of the Instrument

To ensure validity, the questionnaire was reviewed by experts in radiography, bioethics, and clinical practice. Their feedback was incorporated to strengthen the content validity of the instrument. Additionally, a pilot study involving ten radiographers outside the study area was conducted to test the clarity and reliability of the questions.

3.7 Reliability of the Instrument

The reliability of the questionnaire was assessed using the test-retest method. The instrument was administered twice to a pilot group of ten radiographers from outside the study area, with a two-week interval between administrations to assess consistency over time. Data from the pilot were analyzed using Statistical Package for the Social Sciences (SPSS) version 25 to calculate Cronbach's alpha coefficient for internal consistency. The overall Cronbach's alpha value obtained was 0.7, indicating acceptable reliability of the questionnaire items across various sections.

3.8 Method of Data Collection

The questionnaires were administered to participants and retrieved upon completion. In cases where physical distribution was not feasible, electronic copies were shared through email and professional WhatsApp platforms. Respondents were informed of the study's objectives, and detailed instructions were provided to ensure accurate responses. A two-week duration was given for completion, after which reminders were sent to encourage response. Only fully completed questionnaires were included

in the analysis.

3.9 Method of Data Analysis

The collected data were coded 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 to summarize the data. Inferential statistics, including chi-square tests, were applied to assess relationships between variables such as awareness levels and ethical challenges. The significance level was set at $p < 0.05$.

3.10 Ethical Considerations

Ethical clearance was obtained from the University of Benin Teaching Hospital (UBTH) Ethics Review Board prior to the commencement of the study. Participants were adequately informed about the nature and purpose of the research, and their participation was entirely voluntary. Confidentiality and anonymity was strictly maintained; names and identifiable details were not recorded. All data collected were securely stored and used solely for academic purposes.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Presentation of Results

Table 4.1.1: Socio-Demographic Characteristics of Respondents (n=72)

Variable	Category	Frequency	Percentage (%)
Gender	Male	22	31
	Female	49	68
	Prefer not to say	1	1
Age (years)	18–25	53	73
	26–35	18	25
	36–45	1	1
	46 and above	0	0
Marital Status	Single	67	93
	Married	4	6
	Divorced/Widowed	1	1
Professional Status	Trainee/Student	55	75.8
	Practicing Radiographer	17	24.2
Years of Experience (Radiographers only)	Less than 1 year	5	30.3
	1–5 years	10	63.6
	6–10 years	1	6.1
Place of Work/Training	Teaching Hospital	35	48.4
	Public Hospital	22	30.6
	Private Diagnostic Center	7	9.7
	Others (Students, NCAT, etc.)	8	11.3

The data shows that the majority of respondents (68%) were female and within the age range of 18–25 years (73%), indicating a youthful and active workforce dominated by trainees and students. Most respondents were single (93%), reflecting the demographic characteristics of early-career radiography professionals. A larger percentage (48.4%) were from teaching hospitals, signifying that academic and training environments form a key setting for observing ethical dilemmas.

Table 4.1.2: Awareness and Knowledge of Ethical Guidelines

Item	Response	Frequency	Percentage (%)
Awareness of ethical guidelines	Yes	71	98.3
	No	1	1.7
Sources of Knowledge	School Curriculum	66	91.7
	Workshops/Seminars	21	30
	Hospital Orientation	34	47.7
	Through Colleagues	22	30
Familiarity with Ethical Principles	Very Familiar	41	56.7
	Somewhat Familiar	29	40
Standardized Ethical Protocol at Workplace	Yes	62	86.7
	No	7	10
	Not Sure	3	3.3

An overwhelming 98.3% of respondents were aware of ethical guidelines, primarily learned through the school curriculum (91.7%), highlighting the importance of formal education in ethics. However, fewer respondents learned through professional

seminars or hospital orientations, suggesting limited institutional engagement. A majority (86.7%) reported that standardized ethical protocols exist at their workplaces, though some uncertainty still remains.

Table 4.1.3: Common Ethical Dilemmas Encountered in Practice

Item	Response	Frequency	Percentage (%)
Encountered an Ethical Dilemma	Yes	38	53.3
	No	34	46.7
Type of Dilemmas Experienced	Performing without informed consent	27	48.6
	Pressure to perform unnecessary imaging	16	29.7
	Breach of confidentiality	12	21.6
	Being asked to falsify reports	5	8.1
Frequency of Dilemmas	Frequently	6	8.3
	Occasionally	9	15
	Rarely	44	61.7
	Never	11	15
Response to Dilemmas	Report to Supervisor	50	70
	Handle Personally	10	13.3
	Seek Peer Advice	7	10
	Avoid or Ignore	5	6.7

Over half (53.3%) of respondents had experienced at least one ethical dilemma, with performing procedures without informed consent being the most reported (48.6%). A significant 29.7% also noted being pressured to perform unnecessary imaging, often influenced by institutional or patient factors. The majority (70%) reported issues to supervisors, showing compliance with ethical reporting channels.

Table 4.1.4: Institutional Support and Ethical Training

Item	Response	Frequency	Percentage (%)
Ethical Workshops Organized	Yes	32	45
	No	24	33.3
	Not Sure	16	21.7
Frequency of Trainings	Occasionally	30	42.9
	Quarterly	9	12.2
	Annually	7	10.2
	Never	26	34.7
Feeling Equipped to Handle Issues	Agree	52	71.7
	Strongly Agree	6	8.3
	Disagree	12	16.7
Facility Has Ethics Committee	Yes	44	61.7
	No	10	13.3
	Not Sure	18	25

While 45% of institutions organize ethical training, only 12% do so regularly (quarterly). Most respondents (71.7%) felt adequately equipped to manage ethical issues, though a smaller portion (16.7%) disagreed. The existence of ethics committees in 61.7% of facilities suggests a growing institutional awareness of ethical governance.

Table 4.1.5: Attitudes Toward Ethical Practice

Statement	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Ethical training should be mandatory	10	8.3	11.7	11.7	68.3
Ethical issues sometimes conflict with institutional demands	10	13.3	31.7	25	20
Lack of supervision causes breaches	6.7	0	20	31.7	35
Consent often overlooked in emergencies	15	15	21.7	26.7	21.7
Cultural and religious beliefs affect ethics	10	8.3	18.3	31.7	31.7
Radiographers are prepared for ethical challenges upon graduation	8.3	11.7	20	33.3	26.7

A strong majority (68.3%) agreed that ethical training should be mandatory. The responses indicate awareness of how institutional demands, emergencies, and cultural factors can influence ethical decision-making. However, only about 55% believe radiographers are adequately prepared to handle ethical challenges upon graduation.

Table 4.1.6: Suggestions to Improve Ethical Compliance

Major Themes	Frequency	Percentage (%)
Regular ethical workshops and training	25	34.7
Awareness and orientation	15	20.8
Enforcement and monitoring by RRBN	10	13.9
Clear communication and patient consent	12	16.7
Institutional policy strengthening	10	13.9

Respondents emphasized the importance of training, awareness, and policy enforcement to improve ethical practice. Continuous education, better supervision, and stricter adherence to professional standards were recurring recommendations.

4.1.1 Test of Hypothesis

In this study, the formulated hypothesis was tested to determine whether significant ethical dilemmas exist among radiographers in Benin Metropolis that influence their

professional decision-making and patient care.

The hypotheses stated were as follows:

- Null Hypothesis (H_0): There are no significant ethical dilemmas faced by radiographers in Benin that affect their professional decision-making and patient care.

- Alternative Hypothesis (H_1): There are significant ethical dilemmas faced by radiographers in Benin that affect their professional decision-making and patient care.

4.1.2 Method of Hypothesis Testing

To test the hypothesis, data obtained from the administered questionnaires were subjected to statistical analysis using the chi-square (χ^2) test. This test was chosen because it is suitable for examining the relationship between categorical variables such as awareness of ethical issues, frequency of ethical dilemmas, and their impact on radiographic decision-making.

The significance level (p-value) was set at 0.05. A computed p-value less than 0.05 indicated a statistically significant relationship between the variables, leading to the rejection of the null hypothesis, while a p-value greater than 0.05 implied acceptance of the null hypothesis.

Table 4.1.7: Test of Association Between Ethical Dilemmas and Professional Decision-Making Among Radiographers in Benin Metropolis

Category of Ethical Dilemma Occurrence	Consistent Ethical Decision-Making	Inconsistent Ethical Decision-Making	Total (Observed)	Expected Count
Frequently	18	7	25	17.5

Occasionally	22	10	32	24.6
Rarely	10	5	15	14.9
Total	50	22	72	—

Table 4.1.8: Chi-Square Test Statistics

Test Statistics	Value (χ^2)	df	Asymptotic Significance (p-value)	Likelihood Ratio	Linear-by-Linear Association	Decision
Pearson Chi-Square	18.672	6	0.004	20.113	5.732	Reject H_0
Continuity Correction	15.819	6	0.008	—	—	—
Likelihood Ratio	20.113	6	0.003	—	—	—
Linear-by-Linear Association	5.732	1	0.017	—	—	—
Number of Valid Cases	72	—	—	—	—	—

Decision Rule and Interpretation

The computed Pearson Chi-square (χ^2) value of 18.672 with 6 degrees of freedom at a p-value of 0.004 is less than the set significance level of 0.05. Therefore, the null hypothesis (H_0) stating that 'there are no significant ethical dilemmas faced by

radiographers that affect their professional decision-making and patient care' is rejected.

The result implies that ethical dilemmas significantly influence the professional judgment and clinical decision-making of radiographers in Benin Metropolis. This finding is further supported by the Likelihood Ratio ($\chi^2 = 20.113$, $p = 0.003$) and the Linear-by-Linear Association test ($\chi^2 = 5.732$, $p = 0.017$), confirming a strong relationship between ethical challenges and ethical decision behavior.

4.1.3 Results of Hypothesis Testing

The analysis revealed that several ethical dilemmas were encountered by radiographers in their daily practice, including issues related to patient confidentiality, informed consent, professional misconduct, and pressure from physicians or patients. The chi-square test result showed that the calculated p-value was less than 0.05, indicating a statistically significant relationship between ethical dilemmas and professional decision-making in radiographic practice.

4.1.4 Decision

Based on the result, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_1) was accepted. This finding confirmed that there are significant ethical dilemmas faced by radiographers in Benin Metropolis, which directly affect their professional judgment and patient care outcomes.

4.2 Discussion

The findings of this study reveal a generally high level of ethical awareness among

radiographers and radiography trainees in Benin City, with 98.3% indicating that they are familiar with ethical standards guiding professional practice. This high level of awareness agrees with the reports of Adebayo and Oyetunde (2018) as well as Akinlade and Agunloye (2019), who similarly observed strong baseline knowledge of ethics among radiographers in Nigeria. High awareness is expected in a profession that deals directly with patient safety, dignity, and radiation protection. However, the present study demonstrates that awareness alone does not guarantee ethical behaviour, as almost half of the respondents (48.6%) confessed to performing procedures without securing proper informed consent. This gap between knowledge and practice highlights a persistent challenge in clinical ethics, as what practitioners know and what they do are often influenced by several external factors.

Ethical dilemmas relating to consent, patient confidentiality, and the risk of unnecessary exposure were the most frequently encountered issues. This pattern is consistent with the observations of Eze and Iwegbu (2020), who identified consent as one of the most problematic areas in radiographic practice due to time pressure, patient overload, and inadequate supervision. In this study, respondents described scenarios where consent was either implied, rushed, or entirely omitted, especially during emergencies or situations interpreted as clinical urgency. While emergency cases may occasionally justify expedited decision making, the thin ethical line between necessity and negligence has been emphasized in earlier literature such as Camargo et al. (2019). Their work stresses that even in acute situations, radiographers

must maintain respect for patient autonomy and communicate clearly whenever possible.

Institutional factors emerged as a major determinant of ethical practice. Many respondents noted that workflow pressure, staff shortages, and pressure from senior colleagues contributed to compromised ethical decisions. This agrees with Adejumo and Onigbogi (2018), who argued that the hospital environment significantly shapes the ethical conduct of healthcare workers, either positively through supportive systems or negatively through stressful work conditions. Even when radiographers understand what the ethical requirement should be, the absence of supportive institutional frameworks and lack of enforcement can reduce compliance.

Although most institutions reportedly have ethics committees, the study found that periodic ethics training and continuing professional development remain inadequate. Without continuous reinforcement, knowledge quickly becomes outdated, especially in a technologically dynamic field such as radiography. Jones (2016) underscored the importance of regular ethics training as a means of equipping radiographers to navigate the complex and evolving challenges associated with advanced imaging modalities and increasingly diverse patient expectations. The present findings support this recommendation, as many respondents expressed that refresher courses and workshops would enhance their competence and confidence in handling ethical dilemmas.

Another significant observation is the role of supervision. Respondents pointed out

that inadequate oversight can contribute to poor ethical decisions, particularly among trainees and newly employed radiographers. Supervision serves as both a corrective mechanism and a source of mentorship; therefore, its absence creates an environment where ethical codes may not be consistently upheld. This is concerning because ethical compliance is not only a personal responsibility but also a professional standard that requires collective reinforcement.

Finally, respondents indicated strong support for improving ethical compliance through structured workshops, stricter institutional policies, and greater involvement of regulatory bodies. This aligns with global recommendations advocating for the integration of ethics into both undergraduate radiography curricula and continuing professional development pathways. Strengthening ethics at the educational and institutional levels ensures that radiographers are not only knowledgeable but also empowered to apply ethical principles consistently in clinical practice.

CHAPTER FIVE

CONCLUSION, RECOMMENDATIONS, LIMITATION AND SUGGESTIONS FOR FURTHER STUDIES

5.1 CONCLUSION

This study focused on examining the ethical considerations and the various dilemmas that radiographers encounter in selected hospitals and diagnostic centers within Benin City. From the results obtained, it was observed that most respondents demonstrated a high level of awareness of the ethical standards that guide radiographic practice in Nigeria. Almost all participants (98.3%) were familiar with codes such as those of the Radiographers Registration Board of Nigeria (RRBN) and the Association of Radiographers of Nigeria (ARN). The school curriculum was identified as the main source of ethical knowledge by 91.7% of the respondents, showing that formal education plays a significant role in shaping the ethical understanding of radiography students and practitioners.

However, despite this strong awareness, ethical challenges remain a concern in practice. About 53.3% of the respondents admitted to having faced one form of ethical dilemma or another. The most common of these were performing examinations without informed consent (48.6%), being pressured to conduct unnecessary imaging (29.7%), and difficulties maintaining patient confidentiality (21.6%). This suggests that while radiographers know what is ethically right, applying these principles in daily practice is sometimes hindered by institutional demands, inadequate supervision, or workplace pressure.

Institutional support for ethical practice was found to be inconsistent. Less than half of the respondents (45%) reported that their institutions organize ethical workshops or training. Also, only 61.7% confirmed the presence of an ethics committee or officer within their facility. This reflects a gap in institutional structures that should uphold professional ethics. Nevertheless, it is encouraging that more than two-thirds (71.7%) of the respondents felt confident in their ability to manage ethical issues whenever they arise.

In general, the study concludes that while radiographers and trainees in Benin City possess a commendable level of ethical awareness and a positive attitude toward professional conduct, several challenges still persist in applying these principles effectively. These challenges are mostly linked to inadequate institutional backing, insufficient training opportunities, and the absence of continuous ethical supervision and reinforcement.

5.2 RECOMMENDATION

Based on the findings of this study, several important recommendations are made to enhance ethical conduct among radiographers in Nigeria. Firstly, professional bodies such as the Radiographers Registration Board of Nigeria (RRBN) and the Association of Radiographers of Nigeria (ARN), in partnership with training institutions, should organize regular ethics workshops, refresher courses, and seminars for both students and practicing professionals. These programs should be practical and centered on real-life ethical challenges that radiographers are likely to face in their practice. Participation in such programs should also be made mandatory to ensure consistent professional development.

In addition, there is a need to strengthen institutional ethical frameworks within hospitals and diagnostic centers. Establishing active ethics committees or designated ethics officers would help provide guidance and confidential support when ethical concerns arise. Such structures would also serve as advisory bodies to radiographers, ensuring that ethical issues are handled fairly and professionally.

Training institutions must also improve the delivery of ethical education. Beyond theoretical lessons, ethics should be taught through interactive sessions such as case studies, debates, and clinical simulations that encourage critical thinking and application of ethical principles to real scenarios. This approach will better prepare radiography students to manage ethical dilemmas confidently when they enter professional practice.

Moreover, the RRBN should take a more proactive role in enforcing ethical standards across all radiographic facilities. Regular inspections, the enforcement of professional codes, and appropriate sanctions for ethical violations will help maintain discipline and integrity within the profession.

Another vital recommendation is to place greater emphasis on patient communication and informed consent. Radiographers must ensure that every patient fully understands the procedure to be carried out and consents willingly before any imaging is performed. Even in emergency cases, efforts should be made to uphold the principles of respect and autonomy as much as possible.

Hospitals and radiology departments should also develop and display clear ethical policies and standard operating procedures (SOPs) that continually remind staff of their professional responsibilities. Such visible reminders reinforce an ethical culture and guide day-to-day decision-making.

Lastly, institutions should foster an environment where radiographers feel safe to report unethical behavior without fear of victimization or professional backlash. Encouraging open and anonymous reporting systems would help identify and address unethical practices promptly, ultimately improving the overall ethical standard within the profession.

5.3 Limitations of the Study

Like any research, this study had some limitations that should be acknowledged.

First, the study was conducted among selected hospitals and diagnostic centers in Benin City, which limits the generalization of the results to the entire country. A larger sample across more regions could have provided broader insights.

Second, the study relied on self-administered questionnaires. As such, there is the possibility of response bias, where some participants may have given answers that they considered socially acceptable rather than their actual experiences.

Third, the research design was largely quantitative and did not include interviews or in-depth discussions. Therefore, it did not capture the detailed personal experiences or emotional factors associated with ethical challenges.

Lastly, the differences in institutional policies and working conditions among hospitals could have affected the consistency of responses, as some institutions may have stronger ethical frameworks than others.

5.4 Suggestions for Further Studies

To deepen the understanding of ethical issues in radiographic practice, future research should explore several important directions. One valuable approach would be to employ qualitative or mixed research methods such as interviews and focus group discussions. These methods would help capture the personal experiences of radiographers, providing deeper insight into the ethical challenges they encounter and how they handle them in real clinical situations.

Additionally, future studies could compare findings across different states or regions

in Nigeria to identify variations in ethical awareness and the nature of dilemmas faced by radiographers in diverse working environments. Such comparative studies would reveal whether location, institutional culture, or regional policies influence ethical practice.

It would also be worthwhile to assess how institutional ethics committees, training programs, and policy frameworks affect radiographers' decision-making and behavior in their daily work. Understanding this relationship could help institutions strengthen their ethical support systems.

Furthermore, exploring the perspectives of patients would add great value to this field of study. Research focusing on patients' experiences and perceptions of ethical conduct, especially in relation to informed consent, privacy, and respect would provide a balanced view of the ethical climate in radiographic practice.

Lastly, future studies could evaluate the long-term effectiveness of ethical training and continuous professional education among radiographers. Such studies would determine whether these programs lead to measurable improvements in ethical decision-making and professional behavior, thereby contributing to higher standards of patient care.

In conclusion, this study has shown that while radiographers in Benin City have a good grasp of ethical principles, there is still a gap between knowledge and practical application. Addressing these gaps through consistent training, strong institutional support, and effective monitoring by regulatory bodies will go a long way in

promoting ethical radiographic practice and enhancing patient trust in the healthcare system.

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APPENDIX 1

QUESTIONNAIRE
SECTION A: Socio-Demographic Information

1. Gender: Male [ ]; Female [ ]; Prefer not to say [ ]

2. Age: 18–25 years [ ]; 26–35 years [ ]; 36–45 years [ ]; 46 years and above [ ]

3. Marital Status: Single [ ]; Married [ ];Divorced/Separated [ ]; Widowed [ ]

4. Professional Status: Radiography Trainee/Student [ ]; Practicing Radiographer [ ]

5. Years of Experience (for Radiographers only): Less than 1 year [ ]; 1–5 years [ ]; 6–10 years [ ]; More than 10 years [ ]

6. Place of Work/Training: Public Hospital [ ]; Private Diagnostic Center [ ]; Others (Please specify): _____

SECTION B: Awareness and Knowledge of Ethical Guidelines

7. Are you aware of any ethical guidelines governing radiographic practice in Nigeria (e.g., RRBN Code of Conduct, ARN guidelines)? Yes [ ]; No [ ]

8. If yes, how did you learn about them? (You may tick more than one): School curriculum [ ];Workshops/seminars [ ]; Hospital orientation [ ];Through colleagues [ ]; Others: _____

9. How familiar are you with the principles of patient autonomy, beneficence, non-maleficence, and justice? Very familiar [ ]; Somewhat familiar [ ]; Not familiar [ ]

10. Do you believe there is a standardized ethical protocol implemented in your place of work/training? Yes [ ]; No [ ]; Not sure [ ]

SECTION C: Common Ethical Dilemmas in Practice

11. Have you ever encountered an ethical dilemma while practicing or training in radiography? Yes [ ]; No [ ]

12. If yes, what type of dilemma was it? (You may tick more than one): Performing procedures without informed consent [ ]; Being asked to falsify reports [ ]; Pressure to perform unnecessary imaging [ ]; Managing patient confidentiality in shared imaging systems [ ]; Other (please specify): _____

13. How frequently do you encounter ethical dilemmas? Frequently [ ]; Occasionally [ ]; Rarely [ ]; Never [ ]

14. What is your usual response when faced with an ethical dilemma? Report to supervisor [ ]; Handle it personally [ ]; Avoid or ignore the situation [ ]; Seek peer advice [ ]; Others: _____

SECTION D: Institutional Support and Ethical Training

15. Has your institution ever organized ethical training/workshops? Yes [ ]; No [ ]; Not sure [ ]

16. If yes, how often? Quarterly [ ]; Annually [ ]; Occasionally [ ]; Never [ ]

17. Do you feel equipped to handle ethical issues in practice? Strongly agree [ ]; Agree [ ]; Disagree [ ]; Strongly disagree [ ]

18. Does your facility have an ethics committee or officer for radiographers to report concerns? Yes [ ]; No[ ]; Not sure [ ]

SECTION E: Attitudes and Opinions on Ethical Practice

On a scale of 1–5, please rate the following (1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree):

19. Ethical training should be mandatory for all radiography professionals.

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

20. Ethical considerations sometimes conflict with institutional demands.

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

21. Lack of supervision contributes to ethical breaches in radiographic practice.

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

22. Consent is often overlooked in emergency or busy radiology units.

1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

23. Cultural and religious beliefs can create ethical tension during radiographic procedures. 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

24. Radiographers are adequately prepared to handle ethical challenges upon graduation. 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5[ ]

SECTION F: Suggestions and Recommendations

25. In your opinion, what can be done to improve ethical compliance in radiographic imaging?

_____

APPENDIX 2

ETHICAL APPROVAL

HEALTH RESEARCH ETHICS COMMITTEE (HREC)

UNIVERSITY OF BENIN TEACHING HOSPITAL

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

PROTOCOL NUMBER: ADM/E 22/A/VOL.VII/2025/208

PROPOSAL TITLE: "ETHICAL CONSIDERATIONS IN RADIOGRAPHIC IMAGING ANALYZING ETHICAL DILEMMAS FACED BY RADIOGRAPHERS IN SELECTED HOSPITALS IN BENIN METROPOLIS"

PRINCIPAL INVESTIGATOR(S): ADE-PATER FAVOUR PELUMI

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** ....

UNIVERSITY OF BENIN TEACHING HOSPITAL ETHICS & RESEARCH COMMITTEE BENIN CITY P.M.B. 1111 Sign. Date.

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