THE PERCEIVED IMPACT OF PATIENT CENTERED RADIOLOGY ON ANXIETY AMONG MAGNETIC RESONANCE IMAGING PATIENTS AT RAYTOUCH DIAGNOSTICS, BENIN CITY

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CERTIFICATION

This is to certify that this research project by **PATRICK ESEWI JANE** with a matriculation number of **BMS2005214** has been examined and approved for the award of Bachelors of Radiography in the department of Radiography, School of Basic Medical Science, University of Benin, Benin City.

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EXTERNAL EXAMINER Date

DECLARATION

This is to declare that this research project titled " **THE PERCEIVED IMPACT OF PATIENT CENTERED RADIOLOGY ON ANXIETY AMONG MAGNETIC RESONANCE IMAGING PATIENTS AT RAYTOUCH DIAGNOSTICS, BENIN CITY"** in partial fulfillment of the requirement for the award of degree of "**Bachelor of Radiography"** in **BASIC MEDICAL SCIENCE FROM UNIVERSITY OF BENIN, BENIN CITY,** is record of my own work.

Further I declare that this is my original work and the analysis and the findings are for academic purpose only.

MATRICULATION NUMBER: BMS2005214

Signature: _____

Date: _____

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ABSTRACT

Anxiety, manifesting through emotional, cognitive, and physical symptoms, is primarily triggered by factors like fear of the results, procedural demands (such as having to lie still), and environmental stressors (loud noises). The framework proposed that these triggers can be counteracted by a comprehensive patient centered radiology (PCR) approach, which includes Effective Communication (like the AIDET framework), Patient Education, ensuring Physical Comfort, and Redesigning Radiology Processes to manage waiting times. Using an analytical cross-sectional design involving 113 MRI patients, the findings confirmed that anxiety is highly prevalent, with 68.1% of patients reporting distress upon learning they needed the scan. The most potent anxiety triggers identified were worry about scan results (82.3%), fear of lying still (74.4%), and anxiety over loud noises (66.4%). Crucially, the study uncovered significant deficits in the delivery of patient-centered care: nearly 40% of patients felt the procedure was not clearly explained, and over 43% reported insufficient emotional support. This lack of structured PCR directly impacted the patient experience, leading to only moderate overall satisfaction. The study concluded that while technical quality may be high, the absence of systematic, human-centric protocols intensifies anxiety. It strongly recommends that MRI facilities implement and enforce structured communication tools and integrate emotional support and efficient wait-time management to reduce patient anxiety, enhance compliance, and ultimately improve the quality of diagnostic imaging

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Anxiety among patients is a widespread issue in radiology departments globally, affecting those who are undergoing diagnostic imaging treatments. Patients frequently have heightened anxiety levels when they enter an unfamiliar place and have concerns about the operation and potential repercussions. A wide spectrum of patients encounters anxiety levels during invasive procedures, including X-rays, MRIs, and other routine diagnostic tests. This anxiety can appear in different ways, ranging from slight unease to intense anguish, and can have a negative impact on patient participation, image quality, and overall satisfaction with the healthcare experience (Forshaw et al., 2018).

Identifying and dealing with patient anxiety is crucial in radiology environments, as it not only impacts the patient's emotional state but can also impact the effectiveness of imaging treatments. Heightened levels of worry can result in patient agitation, elevated heart rate, superficial respiration, and general unease, all of which have the potential to undermine the quality of images and the accuracy of diagnoses. Moreover, increased anxiety can cause a reduction in patient compliance, necessitating additional imaging and extending the overall duration of the procedure.

Magnetic Resonance Imaging (MRI) is a vital tool in modern healthcare, allowing doctors to capture detailed images of the body's internal structures. While highly effective for diagnosis, the experience of undergoing an MRI scan can be emotionally challenging for many patients (Weiner, 2019). This emotional distress, often called "anxiety" refers to

the stress, fear, and worry people feel before, during, and even after imaging procedures, especially when waiting for results (Bauml et al., 2016).

Anxiety can significantly affect a patient's healthcare experience. It may reduce their ability to stay calm and still during the scan, lower their willingness to return for follow-up appointments, and harm their overall mental well-being. An MRI scan typically involves lying still inside a large, enclosed scanner for an extended period while loud noises are produced by the machine. The tight space, noise, and need to remain motionless can cause discomfort and anxiety, especially for those with claustrophobia (Artykbayeva, 2020).

In recent years, patient-centered care has gained significant traction in the healthcare industry, with radiology departments recognizing the need to prioritize patient experiences and outcomes. While technological advancements have revolutionized medical imaging, the human element remains crucial in delivering compassionate and effective care. Patient-centered radiology focuses on individualized care, clear communication, emotional support, and including patients in decisions about their scans. It encourages radiologists and imaging staff to move beyond their technical roles and actively participate in the patient's journey to create a more compassionate, human-focused experience (Gerteis et al., 1993).

This study, therefore, aims to explore how patient-centered care in MRI settings can influence anxiety and also to identify strategies that improve comfort and reduce emotional distress.

1.2 Statement of the Problem

Despite advancements in radiologic technology, many MRI facilities still operate with minimal patient-centered practices, leading to heightened anxiety levels due to inadequate communication and preparation (Bauml et al., 2016). The presence of anxiety can affect patients' cooperation during MRI procedures and may even lead to postponed or canceled appointments, ultimately compromising diagnostic accuracy and treatment timelines (Gerteis et al., 1993).

Radiologists have traditionally been characterized as "doctor-to-doctor" consultants who are distanced from patients and work within a culture that does not value patient centeredness. As medicine becomes more patient driven and the trajectory of health care is toward increasing patient self-reliance, radiologists must change the perception that they are merely consultants and become more active participants in patient care by embracing greater patient interaction. The traditional business model for radiology practices, which devalues interaction between patients and radiologists, must be transformed into a patient-centered model in which radiologists are reintegrated into direct patient care and imaging processes are reorganized around patients' needs and preferences. Expanding radiology's core assets to include direct patient care may be the most effective deterrent to the threat of commoditization. As the assault on the growth of Medicare spending continues, with medical imaging as a highly visible target, radiologists must adapt to the changing landscape by focusing on their most important consumer: the patient. This may yield substantial benefits in the form of improved quality and patient safety, reduced costs, higher-value care, improved patient outcomes, and greater patient and provider satisfaction.

1.3 Aim & Objectives of the Study

The aim of this research is to carry out a study on the impact of patient centered radiology on anxiety among Magnetic Resonance Imaging Patients.

Below are the Specific Objectives:

1. To assess the level of anxiety experienced by MRI patients prior to and during radiological procedures.

2. To examine the role of patient-centered communication in reducing anxiety among MRI patients.

3. To identify factors that trigger anxiety in patients.

1.4 Significance of the Study

Radiographers and radiologists will find the study valuable in understanding how empathetic communication and patient engagement can improve patient cooperation, reduce motion artifacts, and result in higher-quality imaging outcomes.

Healthcare providers and hospital administrators can use the findings to support the implementation of patient-centered policies and staff training programs that improve both patient satisfaction and clinical efficiency.

For medical researchers and academic institutions, adding to the growing body of knowledge on the psychological aspects of diagnostic imaging and the role of personalized care in radiology.

Lastly, the study serves as a learning resource for **medical students and trainees,** encouraging them to integrate compassionate, patient-centered practices into their future professional conduct.

1.5 Research Questions

1. What is the level of anxiety experienced by MRI patients prior to and during radiological procedures?

2. How does patient-centered communication influence the reduction of anxiety among MRI patients?

3. What are the factors that trigger anxiety in patients?

1.6 Hypotheses

Null Hypothesis(H0): Patients who receive patient-centered care before undergoing MRI scans will report lower levels of anxiety compared to those who do not.

Alternative Hypothesis(H1): Patients who do not receive patient-centered care before undergoing MRI scans will report higher levels of anxiety compared to those who receives.

1.7 Scope of the Study

This study was conducted within the Radiology Department of Raytouch Diagnostics, located in Benin City. It will encompass all categories of patients scheduled to undergo Magnetic Resonance Imaging (MRI) procedures at the facility.

1.8 Operational Definition of Terms

1. **Magnetic Resonance Imaging (MRI):** Magnetic Resonance Imaging (MRI) is a non-invasive medical imaging technique that uses a strong magnetic field and radio waves to create detailed images of the organs and tissues inside the body, aiding in the diagnosis and monitoring of various medical conditions.

2. **Anxiety:** Anxiety refers to the distress and worry patients experiences before, during and after an imaging test.

3. **Patient Centered Care:** Patient-centered care is a healthcare approach structured around the needs and preferences of patients, fostering collaboration between healthcare providers, patients, and their families.

4. **Radiology:** Radiology is the branch of medicine that uses imaging techniques, like X-rays, CT scans, MRIs, and ultrasounds, to diagnose and treat diseases.

5. **Raytouch Diagnostics:** is a tertiary healthcare facility saddled with the responsibility of providing quality healthcare services.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Concept of Magnetic Resonance Imaging

Magnetic Resonance Imaging (MRI) is a vital tool in modern healthcare, allowing doctors to capture detailed images of the body's internal structures. While highly effective for diagnosis, the experience of undergoing an MRI scan can be emotionally challenging for many patients.

An MRI scan typically involves lying still inside a large, enclosed scanner for an extended period while loud noises are produced by the machine. The tight space, noise, and need to remain motionless can cause discomfort and anxiety, especially for those with claustrophobia (Artykbayeva, 2020).

2.1.2 Concept of Anxiety

Definition

Anxiety refers to the stress, fear, and worry people feel before, during, and even after imaging procedures (Bauml et al., 2016), especially when waiting for results. Anxiety can significantly affect a patient’s healthcare experience. It may reduce their ability to stay calm and still during the scan, reduce their willingness to return for follow-up appointments, and harm their overall mental well-being.

A wide spectrum of patients encounters anxiety levels during invasive procedures, including X-rays, MRIs, and other routine diagnostic tests. Anxiety manifests in various ways, including emotional, cognitive, and physical symptoms. Emotionally, it can trigger fear, unease, repetitiive negative thoughts, difficulty concentrating, and even depersonalization. Physiological responses may include increased heart rate, rapid breathing, changes in body temperature, and fluctuations in blood pressure (Weiner, 2019).

Causes/Triggers of Anxiety in Patients

Anxiety related to medical imaging, can be triggered by various factors, including:

1. A major cause of anxiety is the apprehension stemming from uncertainty. A significant number of patients lack knowledge about the imaging process, the apparatus employed, and the anticipated experience throughout the treatment (Eltawil et al, 2023)

2. The clinical setting of radiology departments, which is distinguished by new apparatus, sterile surroundings, and procedural procedures, might intensify patients' emotions of anxiety and susceptibility.

3. Anxiety might arise from certain procedural factors, such as worries of radiation exposure and related health hazards

4. Insufficient knowledge or misunderstandings about radiation safety precautions and methods to reduce radiation exposure can lead to increased anxiety and unwillingness to undergo important medical imaging tests.

5. According to (Woolen et al., 2018), patients may undergo feelings of anxiety due to the ambiguity of the imaging outcomes and the potential consequences for their well-being. anxiety levels can be heightened before and after the imaging procedure due to the fear of receiving a serious diagnosis or the requirement for additional medical measures.

Effects of Anxiety on Patient Outcomes

1. Compromised Imaging Accuracy - Anxiety can cause restlessness and involuntary movement during imaging procedures like MRI or CT scans, leading to motion artifacts. These distortions can obscure anatomical structures, reduce image quality, and compromise diagnostic accuracy. As a result, patients may require repeat scans, leading to delayed diagnoses, higher medical costs, and increased frustration (Kolokythas & Amin, 2022).

2. Physiological Risks During Imaging - Anxiety triggers physiological responses such as increased heart rate, shallow breathing, and elevated blood pressure. For individuals with pre-existing conditions, these changes can heighten the risk of adverse events, including irregular heart rhythms, hypertensive episodes, or respiratory distress. This is particularly concerning for vulnerable populations, such as the elderly and those with cardiovascular or respiratory conditions. Proper management of anxiety is crucial to ensuring patient safety and minimizing health complications during imaging procedures (Weiner, 2019).

3. Delayed or Avoided Medical Care - Patients who experience severe anxiety may postpone or entirely avoid follow-up imaging and routine screenings due to past distressing experiences or fear of potential diagnoses. This reluctance can lead to missed early detection of medical conditions, increasing disease progression, morbidity rates,

and reducing the chances of successful treatment. Addressing anxiety effectively is essential for improving patient adherence to necessary medical evaluations and optimizing health outcomes.

2.1.3 Concept of Patient Centered Radiology

Definition of Patient Centered Care

Patient-centered care is care organized around the patient, a model in which health care providers partner with patients and families to identify and satisfy patients' needs and preferences. In this model, providers respect patients' values and preferences, address their emotional and social needs, and involve them and their families in decision making. Health care services are coordinated such that critical information is reliably passed on to all members of the clinical care team, and clinical support services are designed around patients' needs rather than physicians' needs.

Health care providers treat patients respectfully and use patient-centered communication skills, such as encouraging patients to talk about psychosocial issues and providing information and counseling. Patients are encouraged to ask questions and obtain the information necessary to help them make informed decisions about their health care, promoting an open and honest doctor-patient relationship in which patients are primarily responsible for their own health.

Providing a conceptual framework that helps us understand the patient's experience of illness and health care is a prerequisite to redesigning radiology specific processes around patients' needs and preferences. (Gerteis et al, 1993)

Dimensions Of Patient-Centered Radiology

1. Effective Communication - Effective communication is very vital and fundamental to a successful patient-radiologist relationship; shifting the communication model to be more patient centered has been shown to improve both quality of care and patient satisfaction (Reynolds et al, 2009) it includes taking histories, verifying patients' identity and the procedure to be performed, screening for safety, providing instructions and ensuring that patients understand all instructions, answering questions promptly and accurately, explaining postexamination care, and coordinating patient care with efficient and effective use of resources.

The acronym AIDET (acknowledge, introduce, duration, explanation, thank you) refers to a set of skills that can be used to improve communication between patients and health care providers in a radiology department. Trust is the foundation of the doctor-patient relationship, and disclosure of medical errors through honest and open communication is a fundamental aspect of patient-centered radiology. (Scott, 2007)

2. Patient Education - The Radiological Society of North America (RSNA) and American College of Radiology (ACR) developed RadiologyInfo.org to improve public awareness (RSNA & ACR, 2023) of radiologic procedures. Covering nearly 200 exams in English and Spanish, the site helps patients, families, and physicians access crucial information. As online health research grows, radiologists must actively contribute to reliable educational resources to ensure informed patient decision-making.

3. Physical Comfort - Aggressive pain management is essential in patient centered radiology. Factors that contribute to the difficulty observed in adequately managing acute pain include patients' awareness and effective communication about pain to health care providers (Cohen, 1980). General strategies that can improve pain management include

educating patients about their right to pain relief; encouraging patients to take an active role in communicating and managing their pain; making pain assessment data more visible to caregivers; and educating staff about pain control protocols (Puntillo, 1990).

4. Involvement of Family and Friends - Family plays a vital role in patient care. They offer support and ensure adherence to treatment. Radiologists should involve family members in discussions about procedures, risks, and follow-ups. While privacy concerns exist, Health Insurance Portability and Accountability Act (HIPAA) allows information-sharing with designated caregivers, reinforcing emotional support and improving patient outcomes.

5. Redesigning Radiology Processes - This involves optimizing key performance metrics such as accessibility, wait times, scheduling, registration, procedure appropriateness, and patient satisfaction to foster a more patient-centered environment.

Role of Patient Centered Radiology in Minimizing Anxiety

1. Effective Communication

Accurate and compassionate communication helps reduce patient fears and uncertainty. Using strategic and structured approaches like the AIDET framework (Acknowledge, Introduce, Duration, Explanation, Thank You) ensures transparency, while empathetic listening fosters trust. Providing clear explanations about procedures, risks, and expected outcomes, along with active listening, helps address patient concerns and fears.

2. Patient Education

Educating patients about imaging procedures minimizes fear of the unknown. Resources like RadiologyInfo.org provide accessible information in multiple languages, helping patients understand their exams, risks, and benefits.

3. Physical and Environmental Comfort

Addressing pain and discomfort during imaging procedures enhances the patient experience. Regular pain assessments, proper positioning, and a relaxing environment contribute to reducing physical stress. Designing imaging rooms with calming aesthetics, soft colors, and nature-inspired themes, along with soothing sounds and warm lighting, promotes relaxation.

4. Family and Friend Involvement

Encouraging family presence during imaging procedures provides emotional stability. Including them in discussions about procedures and results enhances patient confidence and reduces isolation. While privacy concerns exist, designated caregivers can receive essential information (Health Education England, 2017), ensuring additional support.

5. Redesigning Radiology Processes and Creating a Healing Environment

Streamlining scheduling, registration, and wait times improves patient experiences. Reducing procedural inefficiencies minimizes stress related to delays. A comfortable radiology environment (Hyde & Hardy, 2023)—featuring natural lighting, calming colors, and quiet spaces—fosters relaxation and a sense of safety

2.2 Empirical Review

A study on the relationship between anxiety levels and radiological investigation,was conducted by Lo Re G & Co (2016). In this study, he aimed to evaluate the impact of different radiological examination on anxiety levels and to explore factors that influence anxiety. He used a prospective single center study with about 343 participants with the STAI (State-Trait Anxiety Inventory) tool. In this study, he found out that 91% of patients experience anxiety with higher anxiety in patients awaiting MRI procedure and in uneducated couple. Diagnostic imaging exams cause significant emotional stress particularly due to uncertainty.

Another study on Anxiety among Adults with Cancer was conducted by Derry Vick and Glesby (2023). It reviewed different literature on anxiety to assess measures, correlates and consequences to guide future interventions. The study employed a scoping review with only adult participants (18+) who are to undergo cancer related imaging. This study porved that anxiety is common before, during and after scans- and is triggered by scan procedures and fear about results with variable effect on follow up adherence. anxiety is multifaceted and clinically significant. Pre scan and results waiting times are key intervention points.

In a study conducted by Ogbeide, S.E., Ofuani, A.P., & Eboreime, A. (2023), to determine the effect of pre-examination information on anxiety level of patients undergoing MRI procedure. It employed a quasi experimental study design and

participants included 120 MRI patients in a tertiary healthcare facility in Nigeria. It established the fact that pre exam information significantly reduces anxiety.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

This study employed an analytical cross-sectional design. This design is appropriate for research that aims to analyze the impact of an exposure on an outcome across a specific population at a single point in time.

In this case, the focus is on Magnetic resonance imaging patients and their experience of radiological examinations. An analytical cross-sectional study allows the researcher to systematically collect and analyze data to examine association between variables - such as characteristics, behaviors and perceptions at a particular point in time without manipulating any variable.

This cross-sectional approach ensures that data is collected synchronously from all respondents providing a glimpse of their views and experiences of patient cantered care in Radiology. It allows for the identification of potential relationships between anxiety and patient centered care contributing to analytical understanding. This design was chosen because it is time efficient, cost effective allows one to explore relationships or trends.

3.2 Research Setting

This study was conducted at Raytouch Diagnostics, which is located in Benin City, Edo state in the South South geopolitical zone of Nigeria. The study will focus solely on Magnetic Resonance Imaging Patients at Raytouch Diagnostics. It included all patients

who had gone through one or more magnetic resonance imaging procedures for any region of the body.

3.3 Sampling Technique

A convenience sampling technique was employed in this study. Participants were selected based on their availability, accessibility and willingness to participate. This technique simplified the efficient recruitment of participants who were readily accessible such as patients present during the data collection period. By capturing data from patients actively involved in Magnetic Resonance Imaging service utilization, convenience sampling provided timely insights into real world perceptions and behaviors. Although this technique has the limitation of generalizability of findings, it allowed for the inclusion of participants across different experiences, offering value and relevance to the research context.

Furthermore, this technique supported rapid data collection within the constraints of available time and resources, making it more suited for exploratory analysis in healthcare settings.

3.4 Sample Size

The sample size for this study was determined using Yamane Taro's simplified formula for finite populations. The calculation was performed as follows:

Formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = the sample size

N = the total population size of magnetic resonance imaging patients at Raytouch Diagnostics.

e = the margin of error (0.05 for 95% confidence level)

The total population will be gotten from the monthly attendance at Raytouch Diagnostics and will be calculated within the duration of 3 months.

Assuming that the total population at the end of the third month is 139. The overall total population will be 139.

Therefore, the sample size is:

$n = 139/ (1 + 139(0.05)^2)$

$n = 139 / (1 + 139 \times 0.0025)$

$n = 139/ (1 + 0.3475)$

$n = 139 / 1.3475$

$n = 103.2$

Therefore, the minimum sample size is approximately 103.

To compensate for non-response or incomplete data, an additional 10% of the calculated sample size was added:

10% of 103 = 10.3

$103 + 10.3 = 113.4 \approx 113$

Thus, the final sample size used for this study will be 113 respondents.

3.5 Instrument for Data Collection

The primary instrument for Data Collection was a structured self administered questionnaire combining a patient centered care scale and a validated anxiety scale. The questionnaire will be divided into the following sections:

Section A: Socio-demographic Information

This section gathered information on the respondents age, gender, marital status, educational level, education level, occupation and type of MRI examination undergone.

Section B: Patient Centered Radiology Experience

This section assessed how patient centered the MRI service was. A validated scale was used to assess aspects such as communication, empathy, respect, involvement in decision making and comfort during the procedure.

Section C: MRI Procedure Anxiety Scale

This section assessed the patient's anxiety before, during and after their MRI examination.

- **SECTION D: MRI Anxiety Trigger Factors**

This section gathered information concerning those factors that caused anxiety before, during and after the procedure.

The questionnaire used a mix of close ended questions (such as multiple choice and likert scale items) to quantify responses, along with a few open ended questions to allow participants to provide more detailed insights. The instrument will be designed to be clear, concise and easy to understand to ensure accurate and reliable responses.

3.6 Validity of the instrument

The validity of the research instrument was ensured through face validity and content validity. To establish face validity, the questionnaire was reviewed by experts in the field of radiography. These experts will evaluate the instrument for clarity, relevance, and appropriateness in measuring the relationship between patient centered care and anxiety.

For content validity, the instrument was assessed by subject matter experts, including experienced radiographers, educators (the supervisor and Head of Department) to confirm that it adequately covers all aspects of the research topic. Their feedback will be used to further improve the questionnaire, ensuring that it accurately measures the intended variables and provides comprehensive data for analysis.

3.7 Reliability of the Instrument

The reliability of the research instrument was assessed using Cronbach's alpha coefficient, which measured the internal consistency of the questionnaire. A pilot study was conducted among a small group of patients who are not part of the main study sample. This pre-test allowed for the calculation of Cronbach's alpha, ensuring that the items in

the questionnaire are consistent and reliable in measuring the relationship between patient centered care and anxiety in MRI patients.

A Cronbach's alpha value of 0.70 or higher was considered acceptable, indicating that the instrument has adequate reliability for the study. In the case that the reliability coefficient falls below this threshold, the instrument was reviewed by removing or modifying problematic items to improve its consistency. The pre-test also helped identify any ambiguities or unclear questions, which was gotten from MRI patients at Raytouch Diagnostics.

3.8 Method of Data Collection

Data for this study was collected using a self-administered questionnaire. The questionnaire was distributed to Magnetic Resonance Imaging patients, ensuring that all participants were given clear instructions on how to complete the instrument. The researcher personally distributed and collected the questionnaires at Raytouch Diagnostic Center. For patients who were unable to complete the questionnaire on-site, an online version of the questionnaire was provided through a secured platform. This ensured convenience and accessibility, especially for those patients who had a busy day ahead of them.

A brief orientation was conducted prior to data collection to ensure that the participants understood the purpose of the study and how to fill out the questionnaire. This orientation explained the study objectives, ensured informed consent, and emphasized the voluntary nature of participation. Participants were encouraged to answer all questions honestly and to complete the questionnaire within the specified time frame.

3.9 Method of Data Analysis

Data collected were coded and entered into Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics (frequencies, percentages, mean, and standard deviation) were used to summarize the data.

3.10 Ethical Considerations

This study adhered strictly to ethical principles guiding research involving human participants. Prior to data collection, ethical approval was obtained from the appropriate Research Ethics Committee. All participants were fully informed about the nature, purpose, and procedures of the study through a clear and concise informed consent form. Participation was entirely voluntary, and respondents were assured that they could withdraw at any stage without any consequences.

Confidentiality and anonymity was maintained throughout the research process. Personal identifiers such as names or contact details were not collected, and all responses were handled with strict confidentiality. The data collected was used solely for the purpose of this academic research and was not disclosed to any third party.

All data were securely stored, and electronic files password-protected to prevent unauthorized access. The study respected the rights, dignity, and autonomy of all participants, ensuring that no harm, discrimination, or discomfort was caused in the course of the research.

CHAPTER FOUR

RESULTS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents the analysis and interpretation of data collected from 113 Magnetic Resonance Imaging (MRI) patients at Raytouch Diagnostic Center, Benin City. The data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics including frequencies, percentages, and cumulative percentages were used to summarize the data. The results are presented in tables corresponding to the sections of the questionnaire: socio-demographic characteristics, patient-centered radiology experience, anxiety levels, and factors contributing to anxiety.

4.2 Data Presentation and Analysis

4.2.1 Socio-Demographic Characteristics Of Respondents

Table 4.1: Distribution of Respondents by Age Group

Age Group	Frequency	Percent
18-29 years	25	22.1
30-39 years	44	38.9
40-49 years	18	15.9
50 and above	26	23.0
Total	**113**	**100.0**

Table 4.1 shows that the majority of respondents (38.9%) were within the 30-39 years age group, followed by those aged 50 and above (23.0%), 18-29 years (22.1%), and 40-49 years (15.9%). This indicates that MRI services were predominantly utilized by young and middle-aged adults

.

Table 4.2: Distribution of Respondents by Gender

Gender	Frequency	Percent
Male	64	56.6
Female	49	43.4
Total	**113**	**100.0**

Table 4.2 reveals that 56.6% of the respondents were male while 43.4% were female, showing a fairly balanced gender distribution with a slight male predominance.

Table 4.3: Distribution of Respondents by Marital Status

Marital Status	Frequency	Percent
Single	22	19.5
Married	66	58.4
Divorced	17	15.0
Widowed	8	7.1
Total	**113**	**100.0**

Table 4.3 shows that the majority of respondents (58.4%) were married, while 19.5% were single, 15.0% divorced, and 7.1% widowed. This suggests that married individuals constituted the largest proportion of MRI patients in the study.

Table 4.4: Distribution of Respondents by Religion

Religion	Frequency	Percent
Christianity	76	67.3
Islam	29	25.7
Other	8	7.1
Total	**113**	**100.0**

Table 4.4 indicates that Christianity was the predominant religion among respondents (67.3%), followed by Islam (25.7%) and other religions (7.1%).

Table 4.5: Distribution of Respondents by Education Level

Education Level	Frequency	Percent
No formal education	8	7.1
Primary	4	3.5
Tertiary	39	34.5
Postgraduate	62	54.9
Total	**113**	**100.0**

Table 4.5 reveals that the majority of respondents (54.9%) had postgraduate education, followed by tertiary education (34.5%). Only 7.1% had no formal education and 3.5% had primary education. This indicates a highly educated sample population.

Table 4.6: Distribution of Respondents by Previous MRI Experience

Previous MRI Experience	Frequency	Percent
No	48	42.5
Yes	65	57.5
Total	**113**	**100.0**

Table 4.6 shows that 57.5% of respondents had previous MRI experience while 42.5% were undergoing the procedure for the first time. This suggests that a significant proportion of the sample had prior exposure to MRI examinations.

Table 4.7: Distribution of Respondents by Type of MRI Examination

Type of MRI Examination	Frequency	Percent
Not specified	2	1.8
Brain	28	24.8
Musculoskeletal	19	16.8
Spine	15	13.3
Pelvis	14	12.4
Spine, Abdomen	9	8.0
Abdomen	7	6.2
Abdomen, Pelvis	5	4.4
Chest	4	3.5
Pelvis, Legs	3	2.7
Other combinations	11	9.7
Total	**113**	**100.0**

Table 4.7 shows that brain MRI was the most common examination type (24.8%), followed by musculoskeletal (16.8%), spine (13.3%), and pelvis (12.4%). Various combination examinations were also performed, reflecting the diverse diagnostic needs of patients.

4.2.2 Patient-Centered Radiology Experience

Table 4.8: Patient Experience with Radiographer Communication and Care

Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
	n (%)	n (%)	n (%)	n (%)	n (%)
The Radiographer explained the procedure clearly	11 (9.7)	33 (29.2)	45 (39.8)	24 (21.2)	113 (100)
The Radiographer treated me with respect and courtesy	11 (9.7)	21 (18.6)	40 (35.4)	41 (36.3)	113 (100)
The Radiographer showed concern for my comfort	8 (7.1)	20 (17.7)	50 (44.2)	35 (31.0)	113 (100)
My privacy and dignity were maintained	14 (12.4)	24 (21.2)	33 (29.2)	42 (37.2)	113 (100)
I felt comfortable asking questions	16 (14.2)	29 (25.7)	45 (39.8)	23 (20.4)	113 (100)
The Radiographer helped me feel calm and relaxed	14 (12.4)	33 (29.2)	31 (27.4)	35 (31.0)	113 (100)

Table 4.8 presents patients' experiences with radiographer communication and care. The majority of respondents agreed or strongly agreed that radiographers treated them with respect and courtesy (71.7%), showed concern for their comfort (75.2%), and maintained their privacy and dignity (66.4%). However, 38.9% disagreed or strongly disagreed that the procedure was clearly explained, and 41.6% felt the radiographer did not adequately help them feel calm and relaxed.

Table 4.9: Patient Experience with Radiology Department Environment and Overall Satisfaction

Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
	n (%)	n (%)	n (%)	n (%)	n (%)
The radiology department environment was comfortable and welcoming	7 (6.2)	15 (13.3)	45 (39.8)	46 (40.7)	113 (100)
I felt emotionally supported throughout the experience	25 (22.1)	24 (21.2)	35 (31.0)	29 (25.7)	113 (100)
Overall, I am satisfied with my radiology experience	6 (5.3)	31 (27.4)	42 (37.2)	34 (30.1)	113 (100)
I would recommend this radiology department to others	11 (9.7)	32 (28.3)	38 (33.6)	32 (28.3)	113 (100)

Table 4.9 shows that 80.5% of respondents found the radiology department environment comfortable and welcoming. However, 43.3% felt they did not receive adequate emotional support. Overall satisfaction was moderate, with 67.3% reporting satisfaction, though 38.0% indicated they would not recommend the department to others.

4.2.3 Anxiety Levels Related to MRI Procedures

Table 4.10: Pre-Procedure and Anticipatory Anxiety

Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
	n (%)	n (%)	n (%)	n (%)	n (%)
I felt anxious when I learned I needed an MRI	14 (12.4)	22 (19.5)	46 (40.7)	31 (27.4)	113 (100)
I was worried about being in the enclosed MRI scanner	8 (7.1)	39 (34.5)	48 (42.5)	18 (15.9)	113 (100)
I felt nervous about the loud noises the MRI machine makes	10 (8.8)	28 (24.8)	59 (52.2)	16 (14.2)	113 (100)
I was anxious about lying still for a long period	10 (8.8)	19 (16.8)	41 (36.3)	43 (38.1)	113 (100)
I felt worried about what the MRI results might show	10 (8.8)	24 (21.2)	44 (38.9)	35 (31.0)	113 (100)

Table 4.10 reveals that 68.1% of respondents experienced anxiety upon learning they needed an MRI. Specific concerns included worry about loud noises (66.4%), anxiety about lying still (74.4%), and fear about results (69.9%). Notably, 58.4% were worried about the enclosed scanner space.

Table 4.11: Physical and Procedural Anxiety

Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
	n (%)	n (%)	n (%)	n (%)	n (%)
I experienced physical symptoms of anxiety before the MRI	25 (22.1)	26 (23.0)	52 (46.0)	10 (8.8)	113 (100)
I was concerned about feeling claustrophobic during the scan	8 (7.1)	39 (34.5)	39 (34.5)	27 (23.9)	113 (100)
I felt anxious while waiting for the MRI procedure to begin	10 (8.8)	24 (21.2)	58 (51.3)	21 (18.6)	113 (100)
I was worried about experiencing discomfort during the MRI	6 (5.3)	20 (17.7)	68 (60.2)	19 (16.8)	113 (100)
I felt nervous about the overall MRI experience	15 (13.3)	31 (27.4)	39 (34.5)	28 (24.8)	113 (100)

Table 4.11 shows that 54.8% of respondents experienced physical symptoms of anxiety before the MRI. Waiting time anxiety was particularly high (69.9%), as was worry about discomfort during the procedure (77.0%). Claustrophobia concerns affected 58.4% of patients, while 59.3% felt nervous about the overall MRI experience.

4.2.4 Factors Contributing to Anxiety

Table 4.12: Physical and Procedural Factors Contributing to Anxiety

Factor	No	Yes	Total
	n (%)	n (%)	n (%)
Enclosed space of MRI scanner	39 (34.5)	74 (65.5)	113 (100)
Loud noises during scanning	41 (36.3)	72 (63.7)	113 (100)
Need to lie still for extended period	33 (29.2)	80 (70.8)	113 (100)
Injection of contrast dye	75 (66.4)	38 (33.6)	113 (100)
Uncomfortable positioning	46 (40.7)	67 (59.3)	113 (100)

Table 4.12 identifies key physical and procedural anxiety triggers. The need to lie still for extended periods was the most significant factor (70.8%), followed by the enclosed space (65.5%), loud noises (63.7%), and uncomfortable positioning (59.3%). Interestingly, contrast dye injection was a concern for only 33.6% of respondents.

Table 4.13: Psychological Factors Contributing to Anxiety

Factor	No	Yes	Total
	n (%)	n (%)	n (%)
Fear of claustrophobia	67 (59.3)	46 (40.7)	113 (100)
Worry about scan results	20 (17.7)	93 (82.3)	113 (100)
Previous negative medical experience	75 (66.4)	38 (33.6)	113 (100)
General fear of medical procedures	54 (47.8)	59 (52.2)	113 (100)
Fear of being alone during procedure	59 (52.2)	54 (47.8)	113 (100)

Table 4.13 reveals that worry about scan results was the most prevalent psychological anxiety factor (82.3%), followed by general fear of medical procedures (52.2%) and fear of being alone during the procedure (47.8%). Previous negative medical experiences contributed to anxiety in 33.6% of cases, while claustrophobia was a concern for 40.7%.

Table 4.14: Communication and System-Related Factors Contributing to Anxiety

Factor	No	Yes
	n (%)	n (%)
Insufficient explanation of procedure	76 (67.3)	37 (32.7)
Long waiting time	46 (40.7)	67 (59.3)
Unclear instructions from staff	60 (53.1)	53 (46.9)
Being away from family/support person	63 (55.8)	50 (44.2)
Financial concerns about procedure cost	59 (52.2)	54 (47.8)

Table 4.14 shows that long waiting times were the most significant system-related anxiety factor (59.3%), followed by financial concerns (47.8%), unclear instructions (46.9%), and separation from family or support persons (44.2%). Insufficient procedural explanation contributed to anxiety in 32.7% of cases.

4.3 Discussion Of Findings

4.3.1 Socio-Demographic Profile of Respondents

The study sample comprised 113 MRI patients with a mean age predominantly within the 30-39 years category, reflecting active healthcare-seeking behavior among young and middle-aged adults. The slight male predominance (56.6%) aligns with findings from Forshaw et al. (2018), who reported similar gender distributions in radiological settings. The high proportion of married respondents (58.4%) and those with tertiary or postgraduate education (89.4%) suggests that the study captured a relatively educated and socially stable population. This educational profile may influence health literacy, anxiety perception, and expectations of patient-centered care.

The religious composition, predominantly Christian (67.3%), reflects the demographic characteristics of Benin City and the South-South region of Nigeria. Notably, 57.5% of respondents had previous MRI experience, which may have influenced their anxiety levels and expectations. Research by Lawal et al. (2023) indicates that prior exposure to MRI procedures can either alleviate or exacerbate anxiety, depending on the nature of previous experiences.

The variety of MRI examination types, with brain imaging being most common (24.8%), followed by musculoskeletal (16.8%) and spine examinations (13.3%), reflects typical referral patterns in tertiary healthcare facilities. This diversity strengthens the generalizability of findings across different patient populations and anatomical regions.

4.3.2 Patient-Centered Radiology Experience and Its Impact

The findings reveal a mixed picture of patient-centered care delivery at the facility. While the majority of respondents (71.7%) reported being treated with respect and courtesy, and 75.2% felt radiographers showed concern for their comfort, significant gaps remain in communication and emotional support. Notably, 38.9% of patients felt the procedure was not clearly explained, and 41.6% indicated that radiographers did not adequately help them feel calm and relaxed.

These findings align with Reynolds (2009), who emphasized that effective communication is fundamental to patient-centered radiology and significantly influences patient satisfaction and anxiety reduction. The gap in procedural explanation identified in this study contradicts the principles outlined in the AIDET framework (Acknowledge, Introduce, Duration, Explanation, Thank You), which emphasizes clear communication as essential to patient care (UMC Health System, 2012).

The department environment received positive ratings (80.5% found it comfortable and welcoming), suggesting that physical infrastructure supports patient comfort. However, emotional support remained inadequate, with 43.3% reporting insufficient emotional support throughout their experience. This finding is concerning, as Gerteis et al. (1993) noted that emotional support is a core dimension of patient-centered care and directly impacts patient anxiety and overall satisfaction.

Overall satisfaction stood at 67.3%, with 38.0% of respondents indicating they would not recommend the facility to others. This suggests that while basic technical services may be satisfactory, the absence of comprehensive patient-centered approaches diminishes the overall patient experience. This supports the argument by Enes (2011) that patient-

centered care models in radiology must integrate both technical excellence and compassionate human interaction.

4.3.3 Anxiety Levels and the Phenomenon of Anxiety

The study confirmed that anxiety is prevalent among MRI patients, with 68.1% experiencing anxiety upon learning they needed the procedure. This finding is consistent with Bauml et al. (2016), who coined the term "anxiety" to describe the distress associated with medical imaging, particularly the fear surrounding diagnostic uncertainty and procedural discomfort.

Specific anxiety triggers identified include worry about loud noises (66.4%), anxiety about remaining still (74.4%), and fear about results (69.9%). These findings support Lo Re et al. (2016), who found that 91% of patients experience anxiety related to radiological examinations, with MRI procedures generating particularly high anxiety levels due to their enclosed nature and duration.

Physical manifestations of anxiety were reported by 54.8% of respondents, including increased heart rate, restlessness, and tension. This aligns with Weiner (2019), who described how anxiety triggers physiological responses that can compromise image quality and patient compliance. Additionally, 69.9% experienced anxiety while waiting for the procedure, highlighting the importance of minimizing wait times and providing adequate pre-procedure support.

The study also revealed that 59.3% of respondents felt nervous about the overall MRI experience, while 77.0% worried about experiencing discomfort. These findings underscore the multifaceted nature of anxiety, which encompasses procedural,

environmental, and psychological dimensions. Derry Vick and Glesby (2023) similarly noted that anxiety is particularly pronounced during pre-scan and results-waiting periods, identifying these as critical intervention points.

4.3.4 Physical, Psychological, and System-Related Anxiety Triggers

Physical and Procedural Factors

The need to lie still for extended periods emerged as the most significant physical anxiety factor (70.8%), followed by the enclosed scanner space (65.5%) and loud noises (63.7%). These findings corroborate Artykbayeva (2020), who identified confinement, noise, and immobility as primary sources of discomfort in MRI procedures. Uncomfortable positioning contributed to anxiety in 59.3% of cases, suggesting the need for improved patient positioning protocols and comfort measures.

Interestingly, only 33.6% identified contrast dye injection as an anxiety trigger, which may reflect either effective pre-procedure communication about contrast safety or lower contrast usage in the study population. Nevertheless, this remains an important consideration for patient education initiatives.

Psychological Factors

Worry about scan results was overwhelmingly the most significant psychological anxiety factor (82.3%), emphasizing the diagnostic uncertainty component of anxiety. This finding supports Woolen et al. (2018), who noted that anticipation of test results generates substantial emotional distress, often exceeding procedural anxiety itself.

General fear of medical procedures affected 52.2% of respondents, while 47.8% feared being alone during the procedure. This highlights the importance of family involvement

and emotional support, as advocated by Health Education England (2017), which recommends including family members in care discussions to enhance patient confidence and reduce isolation.

Claustrophobia was a concern for 40.7% of patients, consistent with Lawal et al. (2023), who found that claustrophobic patients require specialized support strategies, including open MRI options, relaxation techniques, and gradual exposure protocols. Previous negative medical experiences contributed to anxiety in 33.6% of cases, underscoring the lasting impact of prior healthcare encounters on current anxiety levels.

Communication and System-Related Factors

Long waiting times were identified as the most significant system-related anxiety trigger (59.3%), followed by financial concerns (47.8%) and unclear instructions (46.9%). These findings highlight systemic inefficiencies that exacerbate patient anxiety independently of the procedure itself. As noted by Eltawil et al. (2023), organizational factors such as wait times, scheduling efficiency, and administrative processes significantly influence patient anxiety and satisfaction.

The fact that 32.7% cited insufficient procedural explanation as an anxiety trigger directly links to the patient-centered care gaps identified earlier. This reinforces the need for structured communication protocols, such as the AIDET framework, to ensure consistent and comprehensive patient education.

Separation from family or support persons contributed to anxiety in 44.2% of cases, while financial concerns affected 47.8%. The latter is particularly relevant in the Nigerian healthcare context, where out-of-pocket healthcare spending is significant. Addressing

financial transparency and providing cost information upfront may help alleviate this source of anxiety.

4.3.5 Linking Patient-Centered Care to Anxiety Reduction

The findings demonstrate a clear relationship between patient-centered care deficits and elevated anxiety levels. Patients who received inadequate procedural explanations, limited emotional support, and unclear instructions reported higher anxiety across multiple dimensions. This supports the hypothesis that patient-centered care interventions can significantly reduce anxiety.

Research by Ogbeide et al. (2023) established that pre-examination information significantly reduces anxiety among MRI patients in Nigerian tertiary healthcare settings. The present study extends this by identifying specific patient-centered care components—communication, emotional support, environmental comfort, and family involvement—as critical anxiety reduction strategies.

The study's findings align with the patient-centered care framework proposed by Gerteis et al. (1993), which emphasizes respect for patients' values, coordination of care, information and education, physical comfort, emotional support, and involvement of family and friends. Implementing these dimensions systematically in radiology departments could substantially improve patient experiences and clinical outcomes.

CHAPTER FIVE

SUMMARY, CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS FOR FUTURE STUDIES

5.1 Summary

This study investigated the relationship between the provision of patient centered care and the incidence of anxiety experienced by patients going through MRI procedure. To accomplish the aim of the study, three research questions were raised which were also answered during the course of the course of the study. The population for this study was made up of 113 Magnetic Resonance Imaging patients at Raytouch Diagnostics, Benin City, Edo State. The sample size for this study was 113 Magnetic Resonance Imaging Patients at Raytouch Diagnostics.

An analytical cross-sectional design was adopted for the study. The instrument that was used for data collection was a structured self administered questionnaire. The questionnaire was presented to the Project supervisor and Radiography Ethical Committee to confirm for content validity. Their suggestions and opinions were inputted into the work before it was administered to the respondents. Data collected were analyzed using Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics including frequencies and percentages.

Key Findings from the study includes;

1. Incidence of anxiety: Majority of respondents(68.1%) experienced anxiety upon learning they needed an MRI examination, confirming that anxiety is highly prevalent. Specific anxiety factors were procedural (74.4% worried about lying still), environmental (66.4% worried about loud noises emanating from the MRI

scanner) and psychological (82.3% worried about scan results). The long waiting time (59.3%) was the most cited system-related anxiety trigger.

2. Gaps in Patient Centered Care: Despite the fact that most patients reported been treated with respect, the study highlighted major deficits in key dimensions of patient centered care. 38.9% of patients felt the procedure was not clearly explained (Communication), 43.3% reported receiving insufficient emotional support throughout their experience (Emotional Support). These gaps led to only 67.3% overall patient satisfaction with 38.0% refusing to recommend the department.

3. Link Between Patient Centered Care Deficits and Anxiety: The findings highlighted a clear link, revealing that patients who received insufficient procedural explanations, limited emotional support and unclear instructions reported increased anxiety across multiple dimensions The findings emphasized that a systematic incorporation of Patient Centered Care Components especially clear communication, emotional support and efficient wait time management is crucial for reducing anxiety and enhancing overall patient outcomes. The study confirmed that the absence of comprehensive patient centered approaches reduces the overall patient experience and intensify anxiety levels.

5.2 Implications of the Study to Radiography

The findings of this study carry immediate practical implications for clinical practice within diagnostic radiography especially in the managements of patient's experience during MRI procedures. The study absolutely demonstrated that anxiety increases with

inadequate patient centered care practices, primary areas of failure includes insufficient procedural explanation (38.9%) and lack of emotional support (41.6%). This implies that radiographers should not just focus on their technical duties but also incorporate all aspects of therapeutic communication. Also, Radiography profession must formally adopt and enforce structured communication protocols such as the AIDET framework to ensure every patient receives comprehensive and clear information before, during and after scan. Furthermore, since the need to lie still and the enclosed space were identified as major factors that trigger anxiety, the radiographer's role must evolve to incorporate non-pharmacological anxiety reduction strategies. The study strongly suggests that placing premium on emotional support is an important factor in improving patient cooperation and ultimately enhancing the technical quality of the diagnostic image. Also, the study's findings presents key policy implications for the management of radiography departments. The department must recognize that improving patient flow and reducing scheduling delays is not just an administrative goal but a direct component of patient centered care.

5.3 Limitations

This study had some limitations. Firstly, the study was conducted within a limited geographical scope and among a small sample size of patients, this limits the generalizability of the findings to all patients and healthcare centers in Benin City or Nigeria. Secondly, the reliance on self reported data introduces the possibility of response bias. Thirdly, the sample exhibited a notably high level of education (89.4% with tertiary or postgraduate education), this educational bias may have influenced health literacy, communication preferences and the ability to handle anxiety, potentially under-

representing the experiences of patients with lower formal education. Lastly, the cross-sectional design only establishes associations but cannot determine causality.

5.4 Conclusion

This study demonstrated that while MRI is non invasive and a necessity in diagnosis, it is also a profound source of anxiety, validating the need for structured patient centered care protocols. The comprehensive analysis proved that anxiety related to MRI procedures is prevalent across the patient population irrespective of their demographic factors. The leading triggers of anxiety were clearly identified across psychological, procedural and environmental areas. Notably, the major concern for patients was the fear of what the scan results might reveal. It was also accompanied by procedural discomforts such as the need to lie still for an extended period and environmental stressors like the loud noise emanating from the MRI scanner. Inasmuch as patients generally reported a positive perception of courtesy and respect, the key findings pointed out measurable deficits in the implementation of patient centered care components. A large proportion of patients indicated that radiographers did not clearly explain the procedure or sufficiently provided emotional support to help them feel at ease, system related inefficiencies particularly long wait times were noted as external factors the aggravated the patient's overall anxiety levels. The study therefore concludes that failure to effectively manage all dimensions of patient centered care transforms the MRI experience into a source of psychological distress which eventually diminishes the quality of care and negatively impacts image quality. This necessitates that radiology departments transcends basic technical excellence and incorporate patient centered protocols as standard operating procedure.

5.5 Recommendations

Compulsory Pre-examination communication protocol: Radiology departments should implement a standard compulsory checklist for radiographers to use before every MRI examination. The checklist should focus on empathetic and clear communication.

Emotional Support Training: Radiology centers should implement practical training for all radiographers on emotional support techniques including reflective listening and basic anxiety-reduction cues.

Proactive Management of Environmental and Procedural Stressors: The stressors identified in the study should be addressed.

System Efficiency and Waiting Time Reduction: The management should carry out an inspection process to identify delay factors that leads to long waiting time and provide measures to enhance scheduling efficiency.

Policy Review by Healthcare Regulatory Bodies: Professional bodies (e.g Radiographers Registration Board of Nigeria) should review professional standards for practice to formally include Patient Centered Radiology Protocols as a key metric for quality assurance in diagnostic imaging centers.

5.6 Suggestions for Future Studies

Intervention-Based Study (Pre- and Post Test Design): Future studies should move beyond descriptive correlations and employ a randomized control clinical trial design

which would involve a protocolized intervention to a test group and comparing the reduction in anxiety levels to that of a control group.

Multi-Center Study: To improve generalizability, future study should conducted across different radiology centers (both public and private) in different geopolitical zones and should include patients across various educational background to provide a better understanding of how literacy influences perception of communication and anxiety.

Objective Measurement of Compliance: Future studies could correlate patient reported anxiety with objective measures of technical quality such as motion artifacts and rates of repeats to quantitatively demonstrate the clinical costs of high anxiety levels.

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APPENDIX I

DEPARTMENT OF RADIOGRAPHY

SCHOOL OF BASIC MEDICAL SCIENCES

UNIVERSITY OF BENIN, BENIN CITY.

Dear respondents,

I am **PATRICK ESEWI JANE,** an undergraduate student in the above-named Department. As part of the requirement for the programme, I am conducting a research on **The perceived impact of patient centered radiology on anxiety among magnetic resonance imaging patients.** In this regard, you have been randomly selected as a sample. I also wish to assure you that your answers will be treated with utmost confidentiality and used for academic purpose only. Please read each question and carefully answer honestly based on your experience with your recent MRI examination.

Thank you for your cooperation.

Section A: Demographic Information

(Instruction: Please tick (✓) the most appropriate option or fill the blank where applicable.)

Age: 18–29 years ( ) 30–39 years ( ) 40–49 years ( ) 50 and above ( )

Gender: Male ( ) Female ( )

Marital Status: Single ( ) Married ( ) Widowed ( ) Divorced ( )

Religion: Christianity ( ) Islam ( ) Others ( )

Educational Level: No formal education ( ) Primary ( ) Secondary Tertiary ( ) Postgraduate ( )

Occupation: _____

Have you done MRI Examination in the past? Yes ( ) No ( )

Type of MRI Examination: Brain ( ) Spine ( ) Abdomen ( ) Pelvis ( ) Musculoskeletal ( ) Other: _____

Section B: Patient-Centered Radiology Experience

Response Scale: 1 = Strongly Disagree | 2 = Disagree | 3 = Agree | 4 = Strongly Agree

Item	Statement	1	2	3	4
1	The Radiographer explained the procedure clearly before it began				
2	The Radiographer treated me with respect and courtesy				
3	The Radiographer showed concern for my comfort during the procedure				
4	My privacy and dignity were maintained throughout the procedure				
5	I felt comfortable asking questions about the procedure				
6	The Radiographer helped me feel calm and relaxed				
7	The radiology department environment was comfortable and welcoming				
8	I felt emotionally supported throughout the radiology experience				
9	Overall, I am satisfied with my radiology experience today				
10	I would recommend this radiology department to others				

Section C: MRI Procedure Anxiety Scale (MPAS)
Response Scale: 1 = Strongly Disagree | 2 = Disagree | 3 = Agree | 4 = Strongly Agree

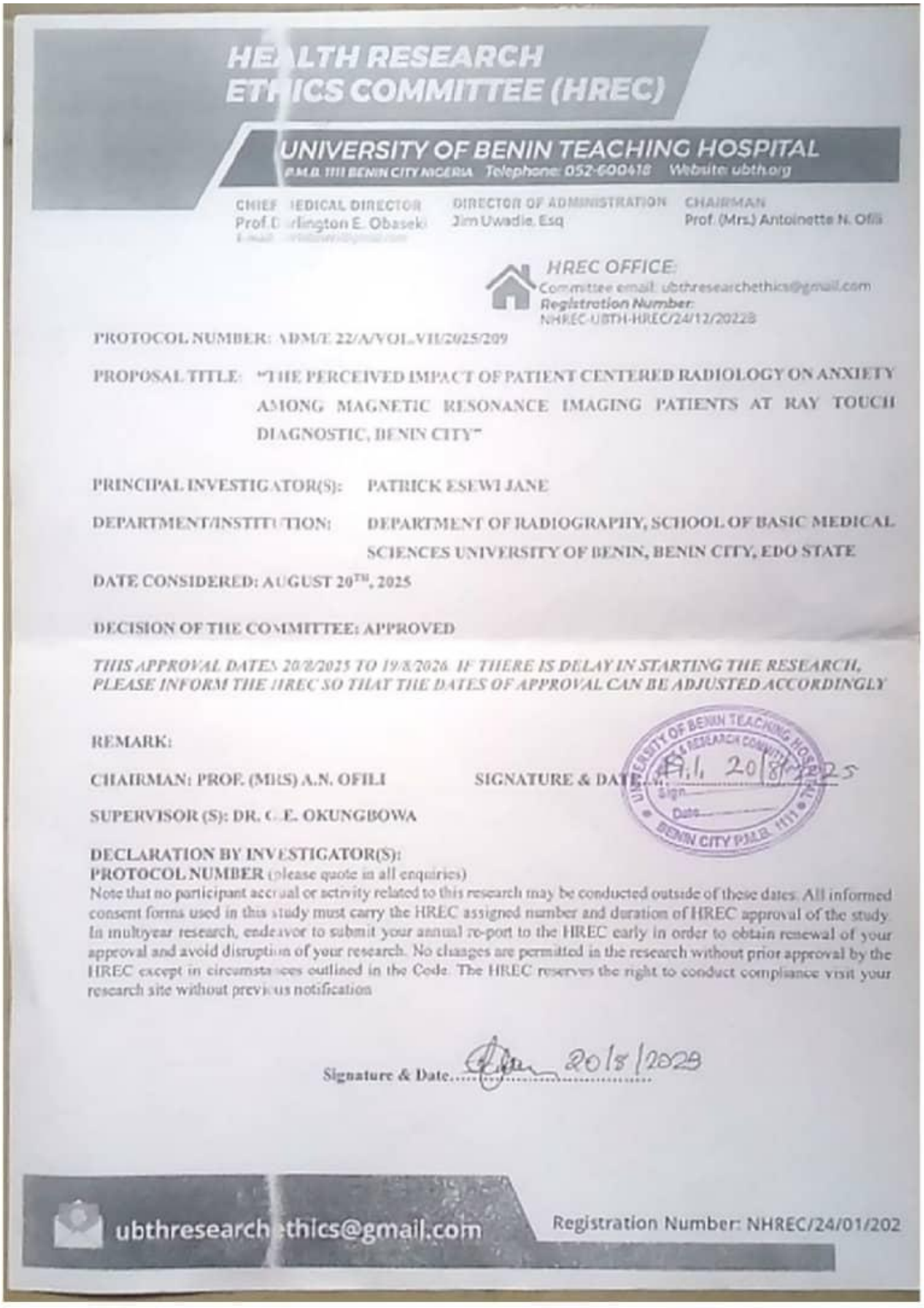
Item	Statement	1	2	3	4
1	I felt anxious when I learned I needed an MRI				
2	I was worried about being in the enclosed MRI scanner				
3	I felt nervous about the loud noises the MRI machine makes				
4	I was anxious about lying still for a long period of time				
5	I felt worried about what the MRI results might show				
6	I experienced physical symptoms of anxiety before the MRI				

7	I was concerned about feeling claustrophobic during the scan				
8	I felt anxious while waiting for the MRI procedure to begin				
9	I was worried about experiencing discomfort during the MRI				
10	I felt nervous about the overall MRI experience				

Section D: MRI Anxiety Trigger Factors
Check Yes or No for each factor

Trigger Factors	**Yes**	**No**
Physical/Environmental		
Enclosed space of the MRI scanner		
Loud noises during scanning		
Need to lie still for extended period		
Injection of contrast dye (if applicable)		
Uncomfortable positioning		
Psychological		
Fear of claustrophobia		
Worry about scan results		
Previous negative medical experience		
General fear of medical procedures		
Fear of being alone during procedure		
Communication/Logistical		
Insufficient explanation of procedure		
Long waiting time		
Unclear instructions from staff		
Being away from family/support person		
Financial concerns about procedure cost		

APPENDIX II



HEALTH RESEARCH ETHICS COMMITTEE (HREC)

UNIVERSITY OF BENIN TEACHING HOSPITAL

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Registration Number:
NHREC-UBTH-HREC/24/12/2022B

PROTOCOL NUMBER: ADMIT 22/A/VOL.VII/2025/209

PROPOSAL TITLE: "THE PERCEIVED IMPACT OF PATIENT CENTERED RADIOLOGY ON ANXIETY AMONG MAGNETIC RESONANCE IMAGING PATIENTS AT RAY TOUCH DIAGNOSTIC, BENIN CITY"

PRINCIPAL INVESTIGATOR(S): PATRICK ESEWI JANE

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

DATE CONSIDERED: AUGUST 20TH, 2025

DECISION OF THE COMMITTEE: APPROVED

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

REMARK:

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

SUPERVISOR (S): DR. C. E. OKUNGBOWA

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

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 report to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification

Signature & Date: 20/8/2025

ubthresearchethics@gmail.com Registration Number: NHREC/24/01/202