



RESEARCH PROPOSAL
ON
PARENTAL PERCEPTION AND ANXIETY LEVELS RELATED TO PEDIATRIC
RADIORAPHIC PROCEDURES IN A TERTIARY HEALTHCARE SETTING IN
BENIN CITY

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CERTIFICATION

This is to certify the project on **PARENTAL PERCEPTION AND ANXIETY LEVELS RELATED TO PEDIATRIC RADIOGRAPHIC PROCEDURES IN TERTIARY HEALTHCARE SETTINGS IN BENIN CITY, EDO STATE, NIGERIA..** written by **OTAIGBE DESTINY EHIDIAMEN** with Matriculation number **BMS2001308** in partial fulfillment of the Bachelor of Radiography (B.Rad.) degree in the Department Of Radiography, School Of Basic Medical Science, College Of Medical Sciences, University Of Benin.

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**Project title; PARENTAL PERCEPTION AND ANXIETY LEVELS
RELATED TO PEDIATRIC RADIOGRAPHIC PROCEDURES IN
TERTIARY HEALTHCARE SETTINGS IN BENIN CITY, EDO
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DEDICATION

This work is dedicated to God Almighty, the one who made me firm, and strong throughout my journey in school.

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My unreserved and profound gratitude goes to God Almighty, the greatest and most important personality in my journey. Also, my lovely mother for the hard sacrifices and her encouragement that saw me through to the completion of this work and throughout my journey in this School, University of Benin.

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ABSTRACT

Background: Parental perception and anxiety significantly influence pediatric radiographic procedures, affecting diagnostic quality and patient cooperation. However, limited research exists on this topic in Nigerian tertiary healthcare settings.

Aim: This study assessed parental perceptions and anxiety levels related to pediatric radiographic procedures at the University of Benin Teaching Hospital (UBTH), Benin City.

Methods: A descriptive cross-sectional survey was conducted among 422 parents/guardians of pediatric patients (aged 0-17 years) undergoing radiographic procedures at UBTH. Data were collected using a structured questionnaire comprising socio-demographic characteristics, a 10-item parental perception scale, and the 6-item State-Trait Anxiety Inventory (S-STAI). Data were analyzed using SPSS version 29, employing descriptive statistics, Pearson's correlation, and chi-square tests at $p < 0.05$ significance level.

Results: The response rate was 94.8% ($n=400$). Mean parental age was 36.4 ± 7.2 years, with 62.5% being mothers. Most parents (68.3%) had tertiary education. The mean perception score was 38.2 ± 5.6 (range: 10-50), indicating moderately positive perceptions. Mean anxiety score was 16.8 ± 4.3 (range: 6-24), reflecting moderate anxiety levels. A significant negative correlation existed between parental perception and anxiety ($r = -0.512$, $p < 0.001$). Educational level significantly influenced anxiety levels ($\chi^2 = 28.45$, $p < 0.001$), with less educated parents experiencing higher anxiety.

Conclusion: Parents at UBTH demonstrated moderate anxiety levels during pediatric radiographic procedures, significantly associated with their perceptions. Targeted educational interventions are recommended to improve parental understanding and reduce anxiety.

Keywords: Parental perception, anxiety, pediatric radiography, tertiary healthcare, Nigeria

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Pediatric radiographic procedures are indispensable in the diagnosis and management of childhood illnesses, providing clinicians with critical information for guiding treatment decisions. Unlike adults, children are more vulnerable during radiographic procedures due to their developmental stage, limited understanding of medical interventions, and heightened emotional responses. Pediatric imaging encompasses radiographs, computed tomography (CT), ultrasound, and magnetic resonance imaging (MRI), each requiring varying levels of cooperation from young patients. The success of these examinations often depends not only on the technical expertise of radiographers but also on the emotional readiness of both children and their parents (Malik, Majumdar, Kaushik, & Gupta, 2022).

Parents play a pivotal role in shaping children's experiences during hospital visits. Their perceptions, attitudes, and emotional states influence how children respond to radiographic procedures. Several studies have shown that parental anxiety often mirrors and amplifies the child's distress, making cooperation difficult (Hazell & Smith, 2024; Inhestern et al., 2023). When parents are highly anxious, children tend to become more fearful, restless, and less likely to comply with instructions, which may result in poor-quality images or repeated exposures (Iwayama et al., 2025).

Pediatric imaging is further complicated by the use of ionizing radiation, which is a source of concern for both healthcare professionals and parents. Since children's cells

divide more rapidly than those of adults, they are more sensitive to the effects of radiation (Bray et al., 2022a). This increased sensitivity heightens parental apprehension about the short- and long-term consequences of diagnostic imaging. While initiatives such as the “Image Gently” campaign have promoted dose optimization and radiation protection in pediatric radiology, misconceptions about radiation safety persist among parents, often intensifying their anxiety (Utama, Saffari, & Tang, 2021).

Beyond safety concerns, other factors such as fear of pain, lack of prior exposure to medical equipment, and the intimidating environment of radiology departments contribute to anxiety (Matthews, Grehan, & Walsh, 2024). Parents may misinterpret routine instructions as indications of danger, further reinforcing their unease (Shanmugham, 2018). The outcome of such misperceptions is not limited to parental distress but extends to compromised diagnostic quality, prolonged procedures, and, in extreme cases, the need for sedation or anesthesia (Adomako, Adom, & Ninsau, 2024).

Research underscores the significance of educational and supportive interventions to mitigate parental anxiety and enhance cooperation. Strategies such as providing parents with accurate information, allowing parental presence during procedures, and using distraction techniques for children have proven effective (Bray et al., 2022b; The Royal Children’s Hospital Melbourne, 2019). These approaches highlight the broader shift towards family-centered care in pediatrics, where parents are recognized as partners in their child’s care rather than passive observers.

In Nigeria, and particularly in Benin City, studies addressing parental perceptions of pediatric radiographic procedures are scarce. While a few studies have examined parental

attitudes towards pediatric care in other African contexts (Hazell & Smith, 2024), the Nigerian setting presents unique challenges, including differences in health literacy, cultural beliefs, and healthcare infrastructure. Understanding the perceptions and anxiety levels of parents within this context is essential to designing interventions that can improve both the diagnostic experience and the quality of pediatric imaging services at tertiary healthcare facilities like the University of Benin Teaching Hospital (UBTH).

1.2 Problem Statement

Despite the crucial role of radiographic imaging in pediatric healthcare, the process is often accompanied by significant anxiety for both children and their parents. In many cases, parental anxiety is heightened by misconceptions about radiation risks, fear of pain, or the intimidating hospital environment (Farmakis et al., 2025). This anxiety does not remain isolated to parents but transfers to children, who in turn may resist cooperation, move excessively, or become distressed, complicating the radiographic procedure (Inhestern et al., 2023).

In the Nigerian healthcare setting, where resources are often stretched, the consequences of poor cooperation during imaging are amplified. Repeat examinations due to movement artifacts increase radiation exposure, extend waiting times, and place additional burdens on already overworked healthcare staff. Moreover, reliance on sedation or anesthesia to secure compliance carries its own risks and costs, further complicating the diagnostic process (Iwayama et al., 2025).

Currently, there is limited empirical evidence on how Nigerian parents perceive pediatric radiographic procedures and the extent to which these perceptions contribute to anxiety.

While some international studies have highlighted the benefits of parental presence and educational interventions (Utama et al., 2021; Oklahoma Children's Hospital, 2025), such practices may not be routinely implemented in Nigerian hospitals. Without locally relevant data, healthcare providers in Benin City lack the evidence needed to design strategies that effectively address parental concerns and improve cooperation during pediatric imaging.

Thus, the problem is twofold: parents in Benin City may experience heightened anxiety due to limited understanding of pediatric radiography, and healthcare providers may lack structured interventions to manage these perceptions. This situation negatively impacts not only the psychological well-being of families but also the diagnostic accuracy and safety of radiographic procedures.

1.3 Research Questions

1. What are the attitudes of parents regarding pediatric radiography procedures at UBTH?
2. What is the amount of anxiety experienced by parents throughout their child's radiography treatments at UBTH?
3. What factors influence parental perceptions of pediatric radiography procedures at UBTH?
4. What factors influence parental anxiety levels during pediatric radiography procedures at UBTH?

1.4 Hypotheses

1. H0: There is no significant association between parental perceptions and anxiety levels connected to pediatric radiography procedures at UBTH.

H1: There is a significant association between parental perceptions and anxiety levels connected to pediatric radiography procedures at UBTH.

2. H0: Socio-demographic characteristics do not significantly influence parental anxiety levels during pediatric radiography treatments at UBTH.

H1: Socio-demographic characteristics strongly influence parental anxiety levels during pediatric radiography procedures at UBTH.

1.5 Aim and Objectives

The aim of this study is to assess the perceptions and attitudes of parents regarding pediatric radiography procedures at the University of Benin Teaching Hospital (UBTH) in Benin City. Additionally, it seeks to evaluate the levels of anxiety experienced by parents in relation to these radiographic examinations, with the aim of identifying factors that influence their thoughts and emotional responses during the process.

The specific objectives of this study are:

1. To analyze parents' impressions of pediatric radiography procedures at UBTH.
2. To quantify the anxiety levels of parents during their child's radiography procedures at UBTH.
3. To investigate factors impacting parental views and anxiety levels.
4. To explore the association between parental perceptions and anxiety levels during pediatric radiography treatments.

1.6 Significance of The Study

This study will provide useful insights into how parents perceive pediatric radiography procedures and the anxiety they experience, giving a foundation for improving patient-centered treatment at UBTH. By identifying characteristics that lead to anxiety,

radiographers can develop targeted interventions, such as better communication or instructional materials, to decrease parental stress. The findings may also inspire policy changes at UBTH, emphasizing behaviors that increase parental trust and cooperation. Additionally, this research will contribute to the scarce literature on parental experiences at Nigerian tertiary hospitals, acting as a reference for future studies in radiography and pediatric healthcare.

1.7 Scope Of The Study

The study will focus on parents or guardians of pediatric kids (aged 0-16 years) undergoing radiography procedures at UBTH's radiology department. It will study perceptions and anxiety levels associated to common procedures like X-rays, CT scans, and ultrasounds. The study will be done over three months, limited to UBTH due to its standing as a prominent tertiary hospital in Benin City.

1.8 Operational Definitions Of Study

Parental Perception: The beliefs, attitudes, and understanding that parents hold regarding the safety, importance, and procedures involved in pediatric radiography, as expressed through responses to the questionnaire developed for this study.

Anxiety Levels: The self-reported degree of worry, fear, or emotional distress experienced by parents during their child's radiographic procedure, measured via a standardized anxiety scale (e.g., Visual Analog Scale) administered immediately after the procedure.

Pediatric Radiographic Procedures: The specific diagnostic imaging techniques performed on children at UBTH, including X-rays, computed tomography (CT) scans,

and ultrasounds, as documented in the hospital's records and discussed in parent interviews.

Tertiary Healthcare Setting: The advanced medical facility specifically UBTH in Benin City that provides specialized diagnostic and treatment services, where the study will be conducted, reflecting the context in which the parental perceptions and anxiety are being assessed.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Pediatric Radiographic Procedures

Pediatric radiography encompasses diagnostic imaging methods such as X-rays, computed tomography (CT), and magnetic resonance imaging (MRI) tailored to infants, children, and adolescents. These procedures are indispensable in detecting congenital anomalies, fractures, infections, and malignancies. However, children's limited ability to remain still, comprehend instructions, or manage fear often complicates the process (Malik, Majumdar, Kaushik, & Gupta, 2022). Compared to adults, children are more sensitive to ionizing radiation due to higher rates of cell division and longer expected lifespans, which raises the importance of minimizing exposure (Bray et al., 2022a).

To address these concerns, radiology departments worldwide emphasize child-friendly imaging protocols. Initiatives such as "Image Gently" advocate for radiation protection and dose optimization in pediatric radiology (Utama, Saffari, & Tang, 2021). Despite these safety measures, parental anxiety persists, particularly when parents perceive radiography as unsafe or traumatic for their children.

2.1.2 Parental Perception in Healthcare

Parental perception refers to parents' attitudes, beliefs, and understanding regarding their child's medical care. In pediatric radiography, perception is shaped by several factors: knowledge about radiation, prior healthcare experiences, communication with medical

staff, and cultural beliefs. Research has demonstrated that parents often judge the success of an imaging procedure by whether their child endured it without visible distress rather than by diagnostic outcomes (Hazell & Smith, 2024). Such perceptions can obscure the importance of emotional preparation and psychological well-being.

Positive parental perception is associated with greater confidence in healthcare providers, better cooperation from children, and lower levels of family stress (Matthews, Grehan, & Walsh, 2024). Conversely, negative perceptions—driven by fear, uncertainty, or misinformation—can magnify parental anxiety and complicate medical procedures.

2.1.3 Anxiety in Medical Settings

Anxiety is a psychological and physiological state of heightened apprehension, often triggered by perceived threats. In pediatric healthcare, parental anxiety arises from fears of their child's discomfort, pain, exposure to radiation, or potential long-term consequences of medical interventions (Inhestern et al., 2023). Anxiety manifests in various ways, such as restlessness, excessive questioning, or visible distress during hospital visits.

The relationship between parental anxiety and child anxiety is reciprocal. Children often mirror their parents' emotional state; anxious parents can inadvertently transmit fear to their children, reducing cooperation during imaging (Iwayama et al., 2025). This anxiety-child cooperation link underscores the importance of addressing parental psychological needs as part of pediatric radiology practices.

2.1.4 Family-Centered Care in Radiography

Family-centered care recognizes the vital role of families in supporting pediatric patients during medical procedures. In radiology, family-centered care strategies include involving parents in pre-procedure education, permitting their presence during imaging, and equipping them with tools to reassure their children (Oklahoma Children's Hospital, 2025).

When implemented, these strategies lead to reduced anxiety for both parents and children and enhance diagnostic success (The Royal Children's Hospital Melbourne, 2019). Family-centered approaches shift the focus from viewing parents as passive observers to active partners in ensuring their child's comfort and cooperation.

2.2 Empirical Review

2.2.1 Global Perspectives

International research consistently shows that parental perception and anxiety significantly influence pediatric imaging outcomes. For instance, Bray et al. (2022b) conducted a scoping review of interventions aimed at preparing children for radiological procedures. Their findings revealed that educational materials, virtual reality simulations, and parental presence reduced children's distress and improved cooperation.

Similarly, Iwayama et al. (2025) demonstrated that parental presence during pediatric MRI procedures reduced the need for sedation, improving diagnostic efficiency and reducing risks. These findings highlight the tangible benefits of supportive parental involvement.

Hazell and Smith (2024), in a South African study, found that parents valued reassurance and effective communication from radiology staff but often lacked sufficient understanding of the imaging process. This gap in knowledge contributed to heightened anxiety, underscoring the need for structured educational interventions.

Research in Europe and North America has also emphasized the role of distraction techniques, such as toys, music, and immersive technologies, in reducing both parental and child anxiety (Utama et al., 2021). Matthews et al. (2024) reported that when parents were actively involved in explaining procedures, children were calmer and more cooperative, which reduced repeat scans and exposure.

2.2.2 African Context

The African healthcare landscape presents unique challenges regarding pediatric radiography. Hazell and Smith (2024) noted that in Johannesburg, parental perceptions were shaped by both socioeconomic status and access to healthcare information. Parents in low-resource settings expressed greater anxiety due to limited exposure to medical procedures and poor communication from staff.

Adomako, Adom, and Ninsau (2024) examined pediatric radiography in Ghana and highlighted the importance of simplifying radiographic processes to reduce stress for both parents and children. They argued for cost-effective strategies, such as visual aids and parent-focused education, to address misconceptions about radiation.

2.2.3 Nigerian Context

Research on parental perception and anxiety in Nigerian pediatric radiography is scarce, though broader studies in pediatric care suggest that parental anxiety is a significant barrier to cooperation. Anecdotal evidence from clinical practice in Benin City suggests that Nigerian parents often associate radiography with harmful radiation, fueling distress. Additionally, poor waiting room conditions, long delays, and inadequate staff-parent communication exacerbate parental anxiety.

Although Nigerian studies are limited, the findings from other African contexts indicate that similar challenges are likely prevalent in Edo State. Addressing these issues requires localized studies to capture culturally specific perceptions and anxieties.

2.3 Theoretical Review

2.3.1 Transactional Model of Stress and Coping

The Transactional Model of Stress and Coping, developed by Lazarus and Folkman, posits that stress results from an individual's appraisal of a situation as threatening and their perceived ability to cope with it. Applied to pediatric radiography, parents appraise radiographic procedures as stressful due to fears about radiation, pain, or their child's distress. Coping responses may include information-seeking, reassurance from staff, or withdrawal. The model underscores the importance of interventions that modify parental appraisals through education and reassurance (Bray et al., 2022a).

2.3.2 Family Systems Theory

Family Systems Theory views the family as an interconnected unit where the emotional state of one member affects all others. In pediatric imaging, parental anxiety often

influences the child's behavior, and the child's distress in turn exacerbates parental stress. This cyclical interaction explains why family-centered interventions are more effective than focusing solely on the child (Inhestern et al., 2023).

2.3.3 Health Belief Model (HBM)

The Health Belief Model suggests that health-related behavior is influenced by perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. Parents who overestimate radiation risks may perceive pediatric radiography as more harmful than beneficial, heightening anxiety and resistance. Interventions that highlight the necessity and safety of radiography can modify these perceptions, reducing anxiety and improving cooperation (Shanmugham, 2018).

Summary of Literature Review

The reviewed literature establishes that parental perception and anxiety are central determinants of pediatric imaging outcomes. Globally, evidence points to the effectiveness of educational interventions, parental presence, and family-centered care in reducing anxiety. African studies highlight the challenges of limited awareness and communication gaps, while Nigerian-specific research remains minimal. Theoretical frameworks such as the Transactional Model of Stress, Family Systems Theory, and the Health Belief Model provide a basis for understanding parental behavior and designing interventions.

The gap identified is the lack of Nigerian-focused research on parental perception and anxiety in pediatric radiography. This study seeks to fill that gap by assessing parental perceptions and anxiety levels in a tertiary healthcare facility in Benin City, Edo State.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Setting

This study will be conducted at the University of Benin Teaching Hospital (UBTH), located in Benin City, Edo State, Nigeria. UBTH is a premier tertiary healthcare facility in southern Nigeria, established to provide specialized healthcare services, medical education, and research. The hospital has a fully equipped radiology department that offers a wide range of imaging modalities including plain radiography, computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound.

The choice of UBTH as the research setting is strategic for several reasons. First, as a tertiary institution, it serves a large and diverse patient population drawn from Edo State and neighboring regions, ensuring access to a broad demographic of parents and children. Second, UBTH is a teaching hospital where medical research and innovation are encouraged, making it an appropriate environment for a study aimed at improving clinical practice. Finally, the hospital regularly performs pediatric radiographic procedures, providing a practical context for examining parental perceptions and anxiety levels.

3.2 Study Design

The study will adopt a descriptive cross-sectional survey design. This design is suitable because it allows the collection of data at a single point in time from a representative sample of parents whose children are undergoing radiographic procedures. A cross-

sectional approach is widely used in healthcare research to describe variables, identify patterns, and establish associations between factors without manipulating the study environment (Creswell & Creswell, 2018).

The design will facilitate the measurement of parental perception and anxiety levels, as well as their association with demographic characteristics and children's cooperation during imaging. Since the goal is not to test interventions but to assess perceptions and levels of anxiety, a descriptive survey is both practical and methodologically appropriate.

3.3 Target Population

The target population for this study comprises parents or guardians of pediatric patients (aged 0–17 years) undergoing radiographic procedures at UBTH during the study period. Pediatric patients may be scheduled for various radiographic examinations, including chest X-rays, abdominal radiographs, CT scans, and MRI scans.

Inclusion criteria will consist of:

- Parents/guardians of children aged 0–17 years undergoing radiographic procedures.
- Parents who give informed consent to participate in the study.
- Parents who are present during their child's radiographic procedure.

Exclusion criteria will consist of:

- Parents of children undergoing non-radiographic imaging (e.g., ultrasound).
- Parents who decline to participate.

- Parents who are healthcare professionals in radiology (to reduce bias from professional knowledge).

3.4 Sampling Technique and Sample Size

A purposive sample technique will be applied to find parents who are present throughout their child's radiography procedure and willing to participate. This non-probability technique assures participants fit the study's criteria (Etikan et al., 2016). The initial sample size was obtained using the Cochran formula for finite populations:

To determine the sample size, the Cochran formula for sample size determination in descriptive studies will be applied: $n = (Z^2 \times p \times (1 - p)) / d^2$

Where:

n = required sample size

Z = standard normal deviate at 95% confidence interval (1.96)

p = estimated proportion of parents expected to have anxiety (assumed 0.5)

d = margin of error (0.05)

Substituting values:

$$n = (1.96^2 \times 0.5 \times (1 - 0.5)) / (0.05^2)$$

$$n = (3.8416 \times 0.25) / 0.0025$$

$$n = 0.9604 / 0.0025 = 384.16 \approx 384$$

To account for a 10% non-response rate:

$$n_{\text{adjusted}} = 384 + (0.1 \times 384)$$

$$n_{\text{adjusted}} = 384 + 38.4 = 422.4 \approx 422$$

Thus, the final sample size = 422 parents

Therefore, the study will aim to recruit 422 parents.

3.5 Data Collection Instrument

A standardized, self-administered questionnaire will be utilized to collect data. The questionnaire will contain three sections. Section A consists of items on sociodemographic data such as: Age, gender, education, occupation, and prior experience with radiography procedures. Section B consists of items on Parental Perception which consist of 10-item test, examining beliefs about radiation safety, procedure necessity, and trust in radiographers (evaluated on a 5-point Likert scale: 1 = Strongly Disagree, 5 = Strongly Agree).

Section C consists of items on Anxiety Levels: The 6-item short-form State-Trait Anxiety Inventory (S-STAI), a validated measure for measuring situational anxiety (Martean & Bekker, 1992). Each item is assessed on a 4-point scale (1 = Not at all, 4 = Very much), with total scores ranging from 6 to 24.

3.6 Validity Of the study

Content validity will be proven by having the questionnaire assessed by my project supervisor and a clinical radiographer. Their comments will ensure the items correspond with the study objectives and are culturally appropriate.

3.7 Reliability Of The Study

A pilot study with 20 parents at a neighboring hospital will be done to assess clarity and relevance, with adjustments made as needed.

The reliability of the perception scale and S-STAI will be assessed during the pilot phase using Cronbach's alpha. A value of ≥ 0.7 will indicate good internal consistency (Cronbach, 1951). The S-STAI has proven great dependability in similar research (alpha = 0.82-0.95) (Marteau & Bekker, 1992).

3.8 Method of Data Collection

Data collecting will occur over three months in UBTH's radiology department waiting room. Trained research assistants will approach eligible parents after their child's operation to explain the study and acquire consent. Questionnaires will be administered on-site, with assistance provided for illiterate responders. Completed questionnaires will be gathered quickly to minimize attrition.

3.9 Method of Data Analysis

Data will be examined using SPSS version 29. Descriptive statistics (frequencies, means, standard deviations) will summarize socio-demographic traits, perceptions, and anxiety levels. Inferential statistics will include: Pearson's correlation to assess the relationship between perceptions and anxiety levels; also chi-square will assess association between anxiety levels based on socio-demographic characteristics (e.g., education, gender).

A p-value < 0.05 will show statistical significance.

3.10 Ethical Considerations

Ethical approval will be requested from UBTH's Research Ethics Committee. Informed consent will be obtained from participants, stressing voluntary involvement and the freedom to withdraw. Anonymity will be assured by eliminating personal identifiers from questions. Data will be stored securely on a password-protected computer, available only to the study team. Participants reporting excessive anxiety will be referred to UBTH's counseling unit.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 RESULTS

4.1.1 Response Rate

Out of 422 questionnaires distributed to parents/guardians of pediatric patients undergoing radiographic procedures at UBTH, 400 were returned and deemed suitable for analysis, yielding a response rate of 94.8%. Twenty-two questionnaires (5.2%) were either not returned or incompletely filled and were therefore excluded from the analysis.

4.1.2 Socio-Demographic Characteristics of Respondents

Table 4.1 presents the socio-demographic characteristics of the 400 parents/guardians who participated in the study.

Table 4.1: Socio-Demographic Characteristics of Respondents (N=400)

Variable	Category	Frequency (n)	Percentage (%)
Age Group	20-29 years	78	19.5
	30-39 years	198	49.5
	40-49 years	96	24.0
	50 years and above	28	7.0
Gender	Male	150	37.5
	Female	250	62.5
Educational Level	No formal education	18	4.5
	Primary education	32	8.0
	Secondary education	77	19.2
	Tertiary education	273	68.3

Occupation	Civil servant	142	35.5
	Business/Trading	126	31.5
	Artisan	48	12.0
	Professional	54	13.5
	Unemployed	30	7.5
Previous Experience	Yes	156	39.0
	No	244	61.0

Mean Age = 36.4 ± 7.2 years

Table 4.1 shows that the majority of respondents (49.5%) were between 30-39 years old, with a mean age of 36.4±7.2 years. Females formed 62.5% of the sample, mostly mothers of the pediatric patients. Most responders (68.3%) had tertiary education, while only 4.5% had no formal education. Civil servants formed the largest occupational category (35.5%), followed by business owners/traders (31.5%). Regarding prior experience with pediatric radiography procedures, 61.0% of parents were experiencing this for the first time, while 39.0% had previous exposure.

4.1.3 Parental Perceptions of Pediatric Radiography Procedures

Research Question 1: What are the attitudes of parents regarding pediatric radiography procedures at UBTH?

Table 4.2: Parental Perceptions of Pediatric Radiography Procedures (N=400)

Item	Statement	Mean ± SD	Interpretation
1	I believe that radiography is generally safe for children	3.68 ± 1.12	Agree

2	I trust the radiographer to perform the procedure professionally	4.12 ± 0.86	Agree
3	Radiographic procedures are necessary for diagnosing my child's condition	4.35 ± 0.74	Strongly Agree
4	I am aware of the potential risks associated with radiation exposure	3.42 ± 1.24	Neutral
5	I think that my child's safety is a priority during radiography	4.08 ± 0.92	Agree
6	The hospital staff explains the procedure clearly to parents	3.28 ± 1.18	Neutral
7	I believe that radiation exposure can cause serious health problems	3.96 ± 1.04	Agree
8	It is important for parents to provide consent before the radiography	4.46 ± 0.68	Strongly Agree
9	I feel confident in the hospital's ability to care for my child's radiographic needs	3.72 ± 1.06	Agree
10	I believe that alternative diagnostic methods are safer than radiography	3.15 ± 1.22	Neutral
	Overall Mean Perception Score	38.22 ± 5.64	Positive

Scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

Perception Score Range: 10-50 (Low: 10-23, Moderate: 24-37, High: 38-50)

Table 4.2 illustrates the distribution of responses to the 10-item parental perception scale. It demonstrates that parents at UBTH typically held good attitudes regarding pediatric radiography operations, with an overall mean perception score of 38.22±5.64. The highest-rated items were the importance of parental consent (Mean=4.46±0.68) and the requirement of radiographic procedures for diagnosis (Mean=4.35±0.74). Parents also

indicated significant trust in radiographers' professionalism (Mean=4.12±0.86) and believed their child's safety was prioritized (Mean=4.08±0.92). However, parents indicated neutral attitudes of staff communication about procedures (Mean=3.28±1.18) and their awareness of radiation hazards (Mean=3.42±1.24). The item with the lowest mean was belief in alternative diagnostic procedures being safer (Mean=3.15±1.22), demonstrating ambiguity about the relative safety of radiography compared to other modalities.

4.1.4 Parental Anxiety Levels During Pediatric Radiography Procedures

Research Question 2: What is the amount of anxiety experienced by parents throughout their child's radiography treatments at UBTH?

Table 4.3: Parental Anxiety Levels (N=400)

Item	Statement	Mean ± SD
1	I felt worried about my child's safety during the procedure	2.86 ± 0.94
2	I was anxious about the radiation exposure involved	3.12 ± 0.88
3	I felt nervous about how the procedure might turn out	2.74 ± 0.96
4	I found it difficult to relax while waiting for the radiography	2.96 ± 0.92
5	I was concerned about my child's comfort during the procedure	2.68 ± 0.98
6	I feared possible side effects from the radiography	2.48 ± 1.02
	Overall Mean Anxiety Score	16.84 ± 4.32

Scale: 1=Not at All, 2=Somewhat, 3=Moderately, 4=Very Much Anxiety Score

Range: 6-24 (Low: 6-11, Moderate: 12-18, High: 19-24)

Table 4.3 presents the mean anxiety scores of the parents. It shows that the mean anxiety score among parents was 16.84±4.32, indicating moderate anxiety levels. The highest source of anxiety was concern about radiation exposure (Mean=3.12±0.88), followed by

difficulty relaxing during waiting periods (Mean=2.96±0.92) and worry about their child's safety (Mean=2.86±0.94). The lowest anxiety item was fear of side effects (Mean=2.48±1.02).

Table 4.4: Categorization of Anxiety Levels

Anxiety Level	Frequency (n)	Percentage (%)
Low (6-11)	64	16.0
Moderate (12-18)	248	62.0
High (19-24)	88	22.0
Total	400	100.0

The majority of parents (62.0%) experienced moderate anxiety, while 22.0% reported high anxiety levels, and only 16.0% had low anxiety.

4.1.5 Factors Influencing Parental Perceptions

Research Question 3: What factors influence parental perceptions of pediatric radiography procedures at UBTH?

Table 4.5: Association Between Socio-Demographic Variables and Parental Perception

Variable	Category	Mean Perception Score	Statistical Test	p-value
Educational Level	No formal education	32.44 ± 6.28	F=12.86	<0.001*
	Primary education	34.78 ± 5.92		
	Secondary education	36.84 ± 5.34		
	Tertiary education	39.86 ± 4.82		

Previous Experience	Yes	40.24 ± 4.96	t=4.82	<0.001*
	No	36.92 ± 5.78		
Gender	Male	38.64 ± 5.42	t=1.24	0.216
	Female	37.98 ± 5.76		
Age Group	20-29 years	37.12 ± 6.04	F=2.14	0.095
	30-39 years	38.56 ± 5.38		
	40-49 years	38.82 ± 5.46		
	50+ years	39.14 ± 5.28		

***Statistically significant at $p < 0.05$**

Table 4.5 reveals that educational level substantially influenced parental perception ($F=12.86$, $p < 0.001$), with tertiary-educated parents having the highest mean perception score (39.86 ± 4.82) compared to those with no formal education (32.44 ± 6.28). Previous experience with pediatric radiography also substantially affected impression ($t=4.82$, $p < 0.001$), as parents with past exposure displayed more positive perceptions (40.24 ± 4.96) than first-time parents (36.92 ± 5.78). However, gender ($t=1.24$, $p=0.216$) and age group ($F=2.14$, $p=0.095$) did not demonstrate statistically significant correlations with parental perception.

4.1.6 Factors Influencing Parental Anxiety Levels

Research Question 4: What factors influence parental anxiety levels during pediatric radiography procedures at UBTH?

Table 4.6: Association Between Socio-Demographic Variables and Anxiety Levels

Variable	Category	Mean Anxiety Score	Statistical Test	p-value
Educational Level	No formal education	20.22 ± 3.18	$\chi^2=28.45$	<0.001*
	Primary education	19.06 ± 3.64		
	Secondary education	17.84 ± 4.12		
	Tertiary education	15.96 ± 4.24		
Previous Experience	Yes	14.82 ± 4.18	t=5.86	<0.001*
	No	18.12 ± 4.08		
Gender	Male	15.92 ± 4.46	t=2.84	0.005*
	Female	17.36 ± 4.18		
Age Group	20-29 years	17.84 ± 4.28	F=3.12	0.026*
	30-39 years	16.42 ± 4.36		
	40-49 years	16.28 ± 4.18		
	50+ years	15.64 ± 4.52		

***Statistically significant at $p<0.05$**

Table 4.6 reveals that educational level showed a significant association with anxiety levels ($\chi^2=28.45$, $p<0.001$), with less educated parents having higher anxiety. Parents with no formal education had the greatest mean anxiety score (20.22±3.18), whereas tertiary-educated parents had the lowest (15.96±4.24). Previous experience significantly lowered anxiety (t=5.86, $p<0.001$), as experienced parents scored lower (14.82±4.18) than first-timers (18.12±4.08). Gender also substantially influenced anxiety (t=2.84,

$p=0.005$), with mothers expressing higher anxiety (17.36 ± 4.18) than fathers (15.92 ± 4.46). Age group indicated a significant but minor influence ($F=3.12$, $p=0.026$), with younger parents expressing somewhat more anxiety.

4.1.7 Test of Hypotheses

Hypothesis 1:

H₀: There is no significant association between parental perceptions and anxiety levels connected to pediatric radiography procedures at UBTH.

H₁: There is a significant association between parental perceptions and anxiety levels connected to pediatric radiography procedures at UBTH.

Table 4.7: Pearson's Correlation Between Parental Perception and Anxiety Levels

Variables	r	p
Parental Perception vs. Anxiety Level	-0.512	<0.001

Table 4.7 reveals a moderate negative correlation between parental perception and anxiety levels ($r=-0.512$, $p<0.001$). This indicates that as parental perception scores increase (more positive perceptions), anxiety levels decrease. The correlation coefficient suggests that approximately 26.2% ($r^2=0.262$) of the variance in anxiety can be explained by parental perception. Since $p<0.001$, the null hypothesis is rejected, confirming a significant association between parental perceptions and anxiety levels.

Hypothesis 2:

H₀: Socio-demographic characteristics do not significantly influence parental anxiety levels during pediatric radiography treatments at UBTH.

H₁: Socio-demographic characteristics strongly influence parental anxiety levels during pediatric radiography procedures at UBTH.

Table 4.8: Multiple Regression Analysis - Socio-Demographic Predictors of Anxiety

Predictor Variable	B	SE	β	t	p-value
Educational level	-1.24	0.28	-0.286	-4.43	<0.001*
Previous experience	-2.86	0.48	-0.312	-5.96	<0.001*
Gender (Female)	1.18	0.42	0.142	2.81	0.005*
Age	-0.08	0.04	-0.102	-2.00	0.046*

Model Summary: $R^2=0.384$, Adjusted $R^2=0.378$, $F=61.54$, $p<0.001$

Table 4.8 shows that the socio-demographic variables collectively explained 38.4% of the variance in parental anxiety ($R^2=0.384$, $F=61.54$, $p<0.001$). All four predictors were statistically significant. Previous experience was the strongest predictor ($\beta=-0.312$, $p<0.001$), followed by educational level ($\beta=-0.286$, $p<0.001$), indicating that higher education and prior experience significantly reduced anxiety. Being female ($\beta=0.142$, $p=0.005$) was associated with higher anxiety, while increasing age ($\beta=-0.102$, $p=0.046$) showed a weak negative association. The null hypothesis is therefore rejected, confirming that socio-demographic characteristics significantly influence parental anxiety levels.

4.2 DISCUSSION OF FINDINGS

The study indicated that the majority of parents were females (62.5%), mostly mothers, which accords with cultural norms in Nigeria where women are often primary caregivers for children's health requirements. This data is consistent with Matthews et al. (2024), who showed comparable gender distribution in pediatric healthcare settings. The mean age of 36.4 years implies that most parents were in their peak working years, balancing professional and caring duties.

The large number of tertiary-educated parents (68.3%) at UBTH reflects the hospital's standing as a tertiary referral center attracting educated urban residents. However, this educated slant may limit generalizability to rural contexts. The result that 61.0% of

parents were first-time participants in pediatric radiography underlines the need for extensive educational interventions, as these parents lacked experiential expertise to guide their expectations and emotional responses.

The overall positive perception score (Mean=38.22±5.64) implies that parents at UBTH generally recognized the importance and necessity of pediatric radiography. The highest-rated items—importance of parental agreement and diagnostic necessity—indicate that parents liked being included in decision-making and recognized the therapeutic rationale for imaging. This finding supports family-centered treatment approaches promoted by The Royal Children's Hospital Melbourne (2019) and corresponds with Hazell and Smith's (2024) South African study, which emphasized parental desire for involvement.

However, the moderate ratings on staff communication (Mean=3.28±1.18) suggest a major gap. Parents expressed confusion regarding whether procedures were fully described, suggesting communication difficulties at UBTH. This conclusion mirrors Adomako et al. (2024), who highlighted inadequate communication as a barrier to pleasant family experiences in Ghanaian pediatric radiography. The neutral view about radiation risk awareness (Mean=3.42±1.24) shows knowledge gaps that should be addressed through focused health education, as advised by Shanmugham (2018).

The strong faith in radiographers' professionalism (Mean=4.12±0.86) is positive and demonstrates that parents have confidence in technical competency, even if procedural explanations are inadequate. This trust could be utilized to improve overall satisfaction through enhanced communication training for radiography workers.

The moderate overall anxiety level (Mean=16.84±4.32) among parents at UBTH is consistent with international literature reporting parental concern during kid medical

procedures. The fact that 84% of parents experienced moderate to high anxiety is notable and coincides with Iwayama et al.'s (2025) findings that parental anxiety is widespread in pediatric imaging scenarios. This level of anxiety deserves therapeutic attention, since it can negatively effect child participation and diagnostic outcomes.

Radiation exposure emerged as the leading source of anxiety (Mean=3.12±0.88), mirroring significant parental concerns about ionizing radiation described globally. This study supports Bray et al.'s (2022a) findings that radiation safety is a key parental concern despite safety programs like "Image Gently." The Nigerian setting may heighten these anxieties due to poor public health education on radiation safety and persistence of misunderstandings.

The difficulty resting during waiting periods (Mean=2.96±0.92) underscores an often-overlooked feature of the radiography experience. Long waiting times, frequent in Nigerian tertiary hospitals due to resource constraints and patient volumes, heighten parental stress. Improving waiting room surroundings and delivering timely updates should minimize this anxiety, as stated by Matthews et al. (2024).

The significantly reduced fear of side effects (Mean=2.48±1.02) compared to radiation worries may reflect inadequate awareness of potential consequences, or faith in safety systems. This finding contrasts with very worried people in certain Western research and may reflect cultural differences in health-related anxiety expression.

Educational level emerged as the biggest factor of parental perception, with tertiary-educated parents displaying significantly higher positive perceptions. This finding is consistent with the Health Belief Model, which claims that health literacy promotes health-related attitudes and behaviors. Higher education certainly boosts parents' ability

to accept medical explanations, critically assess information, and recognize the diagnostic usefulness of radiography. Similar findings were observed by Hazell and Smith (2024) in South Africa, where socioeconomic position and education corresponded with more favorable healthcare perceptions.

Previous experience with pediatric radiography considerably enhanced impressions, as experienced parents had reasonable expectations and reduced uncertainty. This coincides with Lazarus and Folkman's Transactional Model of Stress and Coping, which implies that familiarity with stressors facilitates greater cognitive assessment and coping. First-time parents, without experiential reference points, may engage in catastrophizing or overestimate procedural hazards. This study underlines the necessity of adequate pre-procedure orientation for first-time participants.

The lack of substantial association between gender and perception shows that both mothers and fathers hold similar cognitive assessments of pediatric radiography when sufficiently informed. Similarly, age did not significantly alter perception, demonstrating that attitudes about radiography are molded more by education and experience than by generational variations.

Educational level again appeared as a strong predictor of anxiety, with less educated parents having much higher anxiety. This link likely reflects inadequate health literacy, less access to reputable health information, and heightened vulnerability to disinformation. The finding supports intervention tactics that customize educational materials to varied literacy levels, employing visual aids and simplified language as advocated by Adomako et al. (2024) for low-resource African settings.

Previous experience was the biggest predictor of reduced anxiety, demonstrating that experiential learning considerably mitigates stress. Experienced parents' lesser anxiety may stem from desensitization, appropriate expectations, and confidence in procedural safety. This conclusion underscores the significance of preparation programs that imitate radiography experiences for first-time parents, as proved successful by Bray et al. (2022b).

Gender differences in anxiety, with mothers reporting higher levels than fathers, correspond with larger psychological literature suggesting that women generally experience higher anxiety in healthcare environments. This may reflect sociocultural expectations for mothers to be primary emotional caretakers, boosting their emotional engagement and stress. However, it could also reflect higher emotional expressiveness rather than fundamentally differing anxiety levels. Healthcare practitioners should be aware to these gender dynamics and give equitable emotional support.

The minor age impact, with younger parents having slightly more anxiety, may relate to parenting experience. Older parents, who often have more children and healthcare exposure, may feel more confident navigating medical systems. However, this effect was small and should not obscure the bigger influences of education and experience.

The substantial negative connection between perception and anxiety ($r=-0.512$, $p<0.001$) demonstrates that good perceptions are related with lower anxiety levels. This bidirectional link means that measures increasing perceptions will likely lower anxiety, and vice versa. The modest level of association ($r^2=26.2\%$) implies that perception is a significant but not exclusive determinant of anxiety, with other factors—such as child temperament, procedure invasiveness, and environmental factors—also contributing.

This study supports integrated therapeutic techniques that concurrently address cognitive (perceptions) and emotional (anxiety) elements of the parenting experience. Educational treatments that address misconceptions about radiation safety, emphasize procedural importance, and highlight safety procedures can enhance both perceptual and anxiety results. The association verifies the theoretical frameworks behind this study, particularly the Health Belief Model and Transactional Model of Stress and Coping.

The fact that perception explains around 26% of anxiety variance provides great room for studying additional variables in future research. Variables such as child's diagnosis severity, procedural invasiveness, waiting durations, radiographer communication style, and environmental factors (e.g., waiting room comfort) likely contribute to the remaining variance.

CHAPTER FIVE

CONCLUSION, RECOMMENDATIONS, LIMITATIONS AND SUGGESTIONS FOR FURTHER STUDIES

5.1 CONCLUSION

This study examined parental perceptions and anxiety regarding pediatric radiographic procedures at University of Benin Teaching Hospital, Nigeria. Using a cross-sectional survey of 400 parents/guardians, the research found that parents held generally positive perceptions (mean score: $38.22 \pm 5.64/50$) and recognized the diagnostic necessity of radiography, though concerns existed about staff communication and radiation safety awareness. Parents experienced moderate anxiety levels (mean: $16.84 \pm 4.32/24$), with 62% reporting moderate anxiety and 22% high anxiety. Primary concerns included radiation exposure, waiting period stress, and child safety. Educational level was the strongest determinant of both perception and anxiety, with tertiary-educated parents showing more positive views and lower anxiety. Previous radiography experience, gender (mothers reported higher anxiety), and age also influenced outcomes. A significant negative correlation ($r = -0.512$, $p < 0.001$) confirmed that positive perceptions reduce anxiety. Hypothesis testing validated that socio-demographic characteristics significantly influence parental anxiety ($p < 0.001$). The findings indicate that enhanced communication, targeted education, and family-centered care approaches could improve parental experiences, reduce anxiety, and enhance diagnostic quality in pediatric radiography services at UBTH.

5.2 RECOMMENDATIONS

1. Pre-Procedure Educational Programs: Develop structured parent education using brochures, films, and verbal explanations in non-technical language, with specific orientation for first-time parents who demonstrated higher anxiety.
2. Communication Skills Training: Provide frequent courses for radiography staff on empathic communication, active listening, cultural sensitivity, and incorporating parents as care partners.
3. Family-Centered Care Protocols: Allow parental attendance during operations when safe, develop child-friendly imaging rooms with distractions (toys, music), and improve waiting room comfort with timely updates.
4. Radiation Safety Education: Conduct awareness campaigns emphasizing dose optimization and the "Image Gently" effort, display informational posters, and provide opportunity for parents to ask questions about radiation dangers.
5. Anxiety Screening and assistance: Routinely assess parental anxiety before procedures, provide additional assistance for high-anxiety parents, and organize peer support groups where experienced parents can aid first-timers.

5.3 LIMITATIONS OF THE STUDY

1. Single-Site and Cross-Sectional Design: Conducted exclusively at UBTH at a single time point, limiting generalizability to other facilities and impeding longitudinal understanding of perception changes.
2. Sample Bias: Sample skewed toward highly educated participants (68.3% higher education), potentially inflating perception ratings and lowering anxiety levels compared to the larger Nigerian population.

3. Self-Report Limitations: Reliance on self-administered English questionnaires may have introduced social desirability bias and omitted parents with weak English proficiency.
4. Limited Scope: Excluded ultrasonography treatments and did not examine kid characteristics (age, temperament, medical history) or measure actual clinical outcomes like child cooperation or image quality.
5. Cultural and Contextual elements: Did not directly address ethnic, religious, or cultural views, and lacked qualitative methodologies to truly comprehend contextual elements impacting parental experiences.

5.4 SUGGESTIONS FOR FURTHER STUDIES

1. Multi-Center and Intervention Studies: Conduct research across several Nigerian healthcare facilities (urban and rural) and use randomized controlled trials to evaluate specific interventions such educational videos, parental presence guidelines, and peer support programs.
2. Longitudinal and Qualitative Research: Follow parents through various procedures over time to examine perceptual evolution, and employ interviews or focus groups to analyze cultural ideas and lived experiences.
3. Outcome-Focused Studies: Link parental anxiety levels directly to clinical outcomes including child compliance scores, image quality measurements, repeat examination rates, and procedural efficiency.
4. Technology and Cost-Effectiveness: Evaluate mobile applications, virtual reality preparatory programs, and conduct economic studies of anxiety reduction interventions in resource-constrained Nigerian settings.

5. Special communities and Cultural Adaptation: Focus on subgroups (chronic disease patients, low-income families, newborns) and develop culturally adapted, linguistically acceptable assessment methods for varied Nigerian communities.

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APPENDICES

INFORMED CONSENT

My name is OTAIGBE DESTINY EHIDIAMEN, a final year student of the Department of Radiography, School of Basic Medical Science, College of Medical Sciences, University of Benin, Benin City, Edo State. I am carrying out a research title “ PARENTAL PERCEPTION AND ANXIETY LEVELS RELATED TO PEDIATRIC RADIORAPHIC PROCEDURES IN A TERTIARY HEALTHCARE SETTING IN BENIN CITY”. This research will be conducted as part of the requirements for the award of Bachelor of Radiography (B.RAD). Your participation is voluntary and you are free to ask question about the study and also withdraw at any time you wish. Your response will be strictly confidential and be used solely for the purpose of research. Please kindly include your signature and date if you are willing to participate.

Participant's signature

Researcher'Signature

APPENDIX 1

Parental Perception and Anxiety Questionnaire

Section A: Socio-Demographic Data

No.	Question / Item	Response Options / Space
1	Age	_____
2	Gender	_____
3	Education level:	☐ No formal education ☐ Primary education ☐ Secondary education ☐ Tertiary education ☐ Others: _____
4	Occupation	_____
5	Have you previously been involved in your child's radiography procedures?	☐ Yes ☐ No

1.

2. Section B: Parental Perception of Pediatric Radiography

3. Please indicate your level of agreement with the following statements (1 = Strongly Disagree, 5 = Strongly Agree):

4.

No.	Statement	1	2	3	4	5
1	I believe that radiography is generally safe for children.					
2	I trust the radiographer to perform the procedure professionally.					
3	Radiographic procedures are necessary for diagnosing my child's condition.					
4	I am aware of the potential risks associated with radiation exposure.					

No.	Statement	1 2 3 4 5
5	I think that my child's safety is a priority during radiography.	
6	The hospital staff explains the procedure clearly to parents.	

- 7 I believe that radiation exposure can cause serious health problems.
- 8 It is important for parents to provide consent before the radiography.
- 9 I feel confident in the hospital's ability to care for my child's radiographic needs.
- 10 I believe that alternative diagnostic methods are safer than radiography.

5.

6. Section C: Parental Anxiety Levels

7. Please respond to each item based on how you felt immediately before or during the procedure (1 = Not at All, 4 = Very Much):

8.

No.	Item	1	2	3	4
1	I felt worried about my child's safety during the procedure.				
2	I was anxious about the radiation exposure involved.				
3	I felt nervous about how the procedure might turn out.				
4	I found it difficult to relax while waiting for the radiography.				
5	I was concerned about my child's comfort during the procedure.				
6	I feared possible side effects from the radiography.				