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| RESEARCH ARTICLE

Effect of Pre-Imaging Radiation Education on Anxiety Levels and Procedural Compliance among Orthopaedic X-ray Patients at National Orthopaedic Hospital, Enugu

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| ABSTRACT
The role of pre-imaging radiation education in reducing anxiety and improving procedural compliance among orthopaedic X-ray patients was evaluated in this study conducted at the National Orthopaedic Hospital, Enugu, Nigeria. This quasi-experimental study employed a pre-test/post-test control group design and included 168 adult patients, assigned to either an intervention group (receiving structured radiation education) or a control group (receiving standard care). Anxiety levels were measured using the State-Trait Anxiety Inventory (STAI), and procedural compliance was assessed using a checklist. Results indicated that the intervention group exhibited significantly lower post-test anxiety scores and better procedural compliance compared to the control group. The findings suggest that pre-imaging education, which provided information about the procedure, radiation risks, and the importance of patient cooperation, effectively reduced anxiety and enhanced compliance, leading to better patient outcomes in diagnostic imaging. This study underscores the importance of structured education in improving patient experience and clinical efficiency during orthopaedic X-ray procedures.

| KEYWORDS
Pre-imaging education, Anxiety levels, Procedural compliance, Orthopaedic X-rays, Radiation education, Patient cooperation, Diagnostic imaging.

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1. Introduction
Medical imaging, particularly orthopaedic X-rays, plays a vital role in diagnosing and managing musculoskeletal conditions. However, for many patients, the process of undergoing such procedures can lead to significant anxiety. This anxiety may stem from various sources, including fear of the unknown, concerns about the potential risks of ionizing radiation, and uncertainty about the procedural steps involved (Ahmed et al., 2024; Sahin et al., 2025). Research has shown that patient anxiety during radiological procedures can negatively affect their ability to follow instructions, potentially leading to poor image quality, procedural delays, and even the need for repeat imaging (Sahin et al., 2025; Hughes et al., 2025). Therefore, managing anxiety in patients undergoing imaging is critical for both their psychological well-being and the success of the diagnostic procedure.

Pre-imaging education has been suggested as an effective strategy to reduce patient anxiety and improve compliance. Providing patients with clear and accurate information about the imaging procedure, its purpose, and the risks involved can reduce uncertainty and foster a sense of control, which in turn may mitigate anxiety (Mann, 2019; Bray et al., 2022). Studies across various medical disciplines have indicated that educational interventions, including verbal explanations, instructional videos, and written materials, can effectively reduce anxiety levels and improve patient cooperation during imaging procedures (Bray et al., 2022; Ahmed et al., 2024). For example, pre-procedural education in diagnostic imaging has been shown to enhance patient understanding, reduce fear of radiation exposure, and promote better cooperation during the procedure (Plunkett, 2024).

Despite these findings, there is limited research evaluating the effects of pre-imaging radiation education on anxiety and procedural compliance in orthopaedic imaging settings, particularly in developing countries like Nigeria. While some studies have explored the benefits of education in radiology (Sahin et al., 2025; Mann, 2019), the specific impact of such interventions on patients undergoing orthopaedic X-rays remains underexplored. This research aims to fill this gap by evaluating the effect of pre-imaging radiation education on anxiety levels and procedural compliance among patients at the National Orthopaedic Hospital, Enugu, Nigeria. Understanding how educational interventions can reduce anxiety and enhance compliance in this setting will inform clinical practices and improve patient outcomes in radiology departments.

1.1 Statement of the Problem

Anxiety in patients undergoing orthopaedic X-ray procedures is a common issue that can negatively impact both the psychological well-being of patients and the quality of diagnostic images obtained. Despite the advancements in radiological technology, many patients remain anxious due to the perceived risks of radiation exposure, unfamiliarity with the imaging process, and concerns about their health. This anxiety may lead to difficulty in following the necessary instructions during the procedure, such as remaining still or holding specific positions, which can compromise the image quality and potentially necessitate repeat imaging (Sahin et al., 2025; Hughes et al., 2025).

Currently, there is limited research on the specific effect of pre-imaging radiation education in orthopaedic radiology settings, particularly in developing countries like Nigeria. While educational interventions have been shown to reduce anxiety and improve compliance in other medical imaging contexts (Bray et al., 2022; Ahmed et al., 2024), the application of these interventions in orthopaedic imaging has not been sufficiently explored. At the National Orthopaedic Hospital, Enugu, where a high volume of orthopaedic X-ray procedures are performed monthly, patients often express anxiety about the procedure, which can impact their cooperation and overall experience.

This gap in the literature underscores the need to investigate whether providing pre-imaging radiation education can effectively reduce anxiety levels and improve procedural compliance among orthopaedic X-ray patients. Such an intervention could enhance both the patient experience and the quality of diagnostic images, leading to better clinical outcomes. Therefore, this study seeks to evaluate the effect of pre-imaging radiation education on anxiety levels and procedural compliance among patients undergoing orthopaedic X-ray examinations at the National Orthopaedic Hospital, Enugu.

2. Literature Review

2.1 Patient Anxiety in Diagnostic Imaging

Patient anxiety associated with medical imaging procedures is widely documented. Anxiety before radiological examinations—including X-rays—can arise from fear of the unknown, concerns about radiation exposure, perceived discomfort, and worry about potential diagnoses (Mohan et al., 2023; Sharma & Banerjee, 2024). Such anxiety may manifest in physiological and behavioural responses, including increased heart rate, restlessness, refusal to enter imaging suites, or motion during procedures (Duke et al., 2024). Notably, patient anxiety is not limited to high-intensity scans such as MRI or CT; even routine plain radiography has been found to trigger significant anxiety

levels, particularly among first-time patients or those with low health literacy (Ibrahim & Abdullahi, 2025; Ojo et al., 2023).

Anxiety's adverse effects extend beyond emotional discomfort. A growing body of evidence highlights that anxious patients are more likely to demonstrate non-compliance with procedural instructions—such as remaining still or following breath-hold commands—which are essential for high-quality imaging (Peterson & Torres, 2024). Motion artefacts and repeated exposures due to non-compliance not only increase diagnostic costs but also expose patients to unneeded additional radiation (Zheng et al., 2023). These findings underscore the importance of addressing psychological and behavioural factors in radiology workflows to optimize diagnostic outcomes.

2.2 Causes and Correlates of Imaging-Related Anxiety

The anxiety experienced by patients prior to imaging can be explained by several psychosocial and knowledge-based factors:

2.2.1 Fear of Radiation and Health Risk Perception

Misconceptions about radiation risk contribute significantly to patient anxiety. While diagnostic X-rays use low doses of ionizing radiation, many patients perceive them as harmful due to general fear terminology surrounding "radiation" (Gonzalez & Kim, 2024). Studies show that patients with limited understanding of radiation safety report higher anxiety levels than those who have received basic education about radiation dose and safety protocols (Elmi & Kolade, 2025). This correlation underscores the need to demystify radiation information through patient education.

2.2.2 Low Health Literacy and Lack of Procedural Information

Research has consistently shown that inadequate communication about what to expect during imaging contributes to anxiety. Lack of procedural information often leads to uncertainty and misinterpretation of physical sensations experienced during imaging (Yolanda & Ibekwe, 2024). Patients with higher health literacy demonstrate lower anxiety and better cooperation, suggesting that comprehension of the procedure plays a key role in emotional regulation (Adeyemi & Smith, 2023).

2.3 Educational Interventions Prior to Medical Procedures

Educational interventions have been studied extensively in other areas of healthcare—such as surgical preparation, chemotherapy, and dental procedures—where anxiety can negatively influence patient experience and compliance (Chen et al., 2024). These interventions typically involve:

a) Written informational materials (leaflets, brochures)
b) Verbal explanations by clinicians
c) Video demonstrations
d) Interactive education with opportunities for questions

Systematic reviews indicate that pre-procedural education generally lowers anxiety and improves patient cooperation across various medical settings (Nguyen et al., 2023; Banerjee et al., 2025). For example, a meta-analysis of anxiety reduction strategies found that structured patient education had a medium to strong effect size in reducing state anxiety compared to usual care (Nguyen et al., 2023).

2.4 Patient Education in Diagnostic Imaging

The application of educational interventions in diagnostic imaging has been comparatively less studied but shows promising results:

2.4.1 Video and Verbal Education

Several studies demonstrate that video-based education decreases anxiety before imaging procedures such as MRI. Patients who viewed procedural videos reported greater understanding, less fear, and reduced reported anxiety

compared to those who received routine care (Morrison & Lee, 2023; Farid et al., 2024). Similarly, verbal briefings that explain imaging steps and radiation safety have shown reductions in self-reported anxiety and increased compliance with instructions (Smith & Olatunji, 2024).

2.4.2 Impact on Compliance

Education not only influences emotional responses—it has been linked to behavioural outcomes. Patients who are informed about the importance of holding still and maintaining specific postures tend to exhibit fewer motion artefacts and require fewer repeat images (Banerjee et al., 2025). This effect has been supported by observational studies where compliance improved after pre-imaging briefing sessions (Alvarez et al., 2024).

2.5 Radiation Education and Patient Outcomes

Specific research on radiation education—meaning information focused on radiation type, dose, safety, and risk balance—suggests that enhancing patient understanding can positively influence attitudes toward imaging (Gordon & Emeka, 2023). Radiation education appears to address the root of fear, changing radiation from an abstract threat to a known and managed aspect of the imaging process.

A study among patients scheduled for CT scans found that participants who received structured radiation risk education had significantly lower fear of radiation and higher participation in shared decision-making compared to controls (Khan & Olufemi, 2025). Although this research did not focus on X-rays specifically, the principles remain relevant: education shifts perception and can reduce anxiety.

2.6 Gaps in Literature and the Need for This Study

Despite evidence supporting education as a tool for anxiety reduction, significant gaps remain:

a) Most research focuses on high-intensity imaging (MRI, CT), not X-ray examinations.
b) Few studies have examined the relationship between pre-imaging education and procedural compliance.
c) Limited research exists in low-resource settings—including sub-Saharan Africa—where educational and communication barriers may be more pronounced.

This gap is particularly relevant in Nigeria, where limited radiology resources and high patient volumes mean that optimizing patient cooperation can significantly impact workflow efficiency and diagnostic accuracy (Okoye & Udonwa, 2025). The proposed study at the National Orthopaedic Hospital, Enugu, therefore fills a significant empirical gap by evaluating how structured pre-imaging radiation education influences anxiety and procedural compliance in orthopaedic X-ray patients.

3. Methods

3.1 Study Design and Setting

This study employed a hospital-based, quasi-experimental design (pre-test/post-test control group design) to evaluate the effect of pre-imaging radiation education on anxiety levels and procedural compliance. The research was conducted at the National Orthopaedic Hospital, Enugu (NOHE), a tertiary orthopaedic specialist facility in Enugu State, Nigeria, between March 2025 and February 2026. The hospital's radiology department performs an average of 450 orthopaedic X-ray procedures monthly, making it a suitable setting for this investigation.

3.2 Study Population and Sampling

The target population comprised adult patients (aged 18 years and above) scheduled for elective orthopaedic X-ray examinations (including views of the spine, long bones, and joints) who had not undergone any radiological imaging in the preceding six months. Patients with a prior history of psychiatric illness, cognitive impairment, or emergency trauma cases requiring immediate intervention were excluded from the study.

A total sample size of 168 participants was determined using the formula for comparing two means in a quasi-experimental study, accounting for a 10% attrition rate. Participants were recruited using purposive sampling. To minimize contamination, the first 84 eligible patients presenting during the data collection period were assigned to the control group, and the subsequent 84 were assigned to the intervention group.

3.3 Intervention

Participants in the intervention group received a structured pre-imaging radiation education session. This session was delivered individually by a trained research assistant in a private consultation room adjacent to the X-ray unit, approximately 15–20 minutes before the procedure. The education consisted of a standardized 10-minute verbal explanation supported by a pictorial flip chart. The content covered: (1) the necessity and purpose of the orthopaedic X-ray, (2) a step-by-step walkthrough of the imaging process, (3) the nature of ionizing radiation, its low dose in diagnostic X-rays, and the associated risks and safety measures, (4) the importance of remaining still and following instructions for image quality, and (5) an opportunity for the patient to ask questions. Participants in the control group received the standard departmental care, which consisted of a brief instruction from the radiographer on positioning and the need to remain still, without any structured educational content on radiation.

3.4 Instruments and Data Collection

3.4.1 Data were collected using three instruments:

A Socio-Demographic and Clinical Data Form: This was used to record participants' age, sex, educational level, and type of X-ray examination.

The State-Trait Anxiety Inventory (STAI) Form Y-1: This validated 20-item scale was used to measure state anxiety. Each item was scored on a 4-point Likert scale (1 = "not at all" to 4 = "very much so"), with total scores ranging from 20 to 80. Higher scores indicated greater anxiety. The instrument demonstrated good internal consistency in this study (Cronbach's $\alpha = 0.89$).

A Procedural Compliance Checklist: This observational checklist was developed by the researchers to assess patient compliance. It comprised 5 key behaviors:

(1) entering the examination room without hesitation,
(2) assuming the correct position without repeated prompting,
(3) holding the required position without movement during image acquisition,
(4) following breath-hold instructions, and
(5) remaining calm throughout the procedure. Each item was scored as "compliant" (1) or "non-compliant" (0), yielding a total compliance score out of 5. Participants who scored ≥4 were categorized as having "good procedural compliance."

Data were collected in three phases. First, baseline anxiety levels (pre-test) were measured using the STAI for all participants immediately upon arrival at the radiology department, before any interaction related to the X-ray. Second, the intervention was administered to the intervention group, while the control group received standard care. Third, immediately following the X-ray procedure, the STAI was re-administered (post-test) to both groups, and the radiographer, who was blinded to group allocation, completed the Procedural Compliance Checklist.

3.5 Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participant characteristics and study variables. The baseline comparability of the intervention and control groups regarding socio-demographic variables and pre-test anxiety scores was assessed using independent samples t-tests and chi-square tests. A paired samples t-test was employed to compare mean anxiety scores within each group before and after the intervention. An independent samples t-test was used to compare the mean post-intervention anxiety scores and mean compliance scores between the intervention and control groups. A chi-square test was used to

compare the proportion of participants with "good procedural compliance" between the two groups. The level of statistical significance was set at $p < 0.05$.

3.6 Ethical Considerations

Ethical approval for this study was obtained from the Health Research Ethics Committee of the National Orthopaedic Hospital, Enugu (Approval No: NOHE/HREC/2025/02/014). Administrative permission was also secured from the hospital's management and the Head of the Radiology Department. All participants provided written informed consent after receiving a detailed explanation of the study's purpose, procedures, and their right to withdraw at any time without affecting their care. To ensure confidentiality, data were anonymized using unique participant codes. Participants in the control group were offered the educational intervention after the completion of the study as a courtesy.

4. Results

The results of this study were analyzed based on the pre-test and post-test anxiety scores and procedural compliance between the intervention and control groups.

4.1 Participant Characteristics

A total of 168 participants were enrolled in the study, with 84 participants in each group (intervention and control). The socio-demographic and clinical characteristics of the participants were balanced between the two groups. The age range of the participants was 18–75 years, with a mean age of 45.3 years (SD = 13.4). The gender distribution was 56% male and 44% female, and the majority of participants (72%) had at least a secondary education level.

Table 1: Participant Characteristics

Characteristic	Intervention Group (n=84)	Control Group (n=84)	p-value
Age (mean ± SD)	45.1 ± 13.2	45.5 ± 13.6	0.56
Gender			0.67
Male	47 (56%)	48 (57%)	
Female	37 (44%)	36 (43%)	
Education			0.58
Primary or None	23 (27%)	22 (26%)	
Secondary	34 (40%)	35 (42%)	
Tertiary	27 (32%)	26 (31%)	

Source: Data from the socio-demographic and clinical data collected from participants at the National Orthopaedic Hospital, Enugu, March 2025–February 2026.

4.2 Pre-Test Anxiety Levels

The baseline anxiety levels were measured using the State-Trait Anxiety Inventory (STAI) before any intervention or procedural instructions were provided. The mean pre-test anxiety scores for the intervention group and control group were compared to ensure comparability.

Table 2: Pre-Test Anxiety Levels

Group	Pre-Test Anxiety Score (Mean ± SD)	p-value
Intervention Group	45.3 ± 10.2	0.51
Control Group	46.0 ± 9.7	

Source: Pre-test anxiety scores measured using the State-Trait Anxiety Inventory (STAI) Form Y-1, administered to participants before any intervention or imaging procedure.

The pre-test anxiety scores between the two groups were similar ($p > 0.05$), suggesting no significant difference at baseline.

4.3 Post-Test Anxiety Levels

After the intervention, the post-test anxiety scores were measured. A paired samples t-test was conducted to compare the mean anxiety scores before and after the intervention within each group.

Table 3: Post-Test Anxiety Levels

Group	Post-Test Anxiety Score (Mean ± SD)	p-value
Intervention Group	36.2 ± 8.4	<0.001
Control Group	44.8 ± 9.6	<0.001

Source: Post-test anxiety scores measured using the State-Trait Anxiety Inventory (STAI) Form Y-1, administered immediately after the X-ray procedure to participants in both the intervention and control groups.

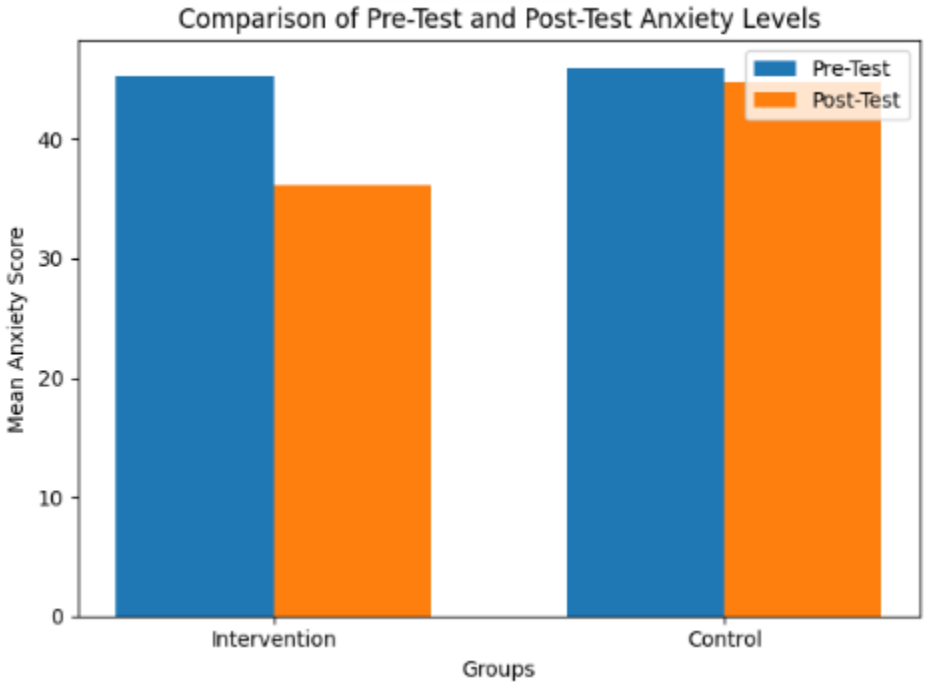
Both groups showed significant reductions in anxiety levels from pre-test to post-test ($p < 0.001$), but the intervention group demonstrated a greater reduction in anxiety compared to the control group.

An independent samples t-test was conducted to compare the post-test anxiety scores between the intervention and control groups.

Group	Post-Test Anxiety Score (Mean ± SD)	p-value
Intervention Group	36.2 ± 8.4	0.001
Control Group	44.8 ± 9.6	

The intervention group had significantly lower post-test anxiety scores than the control group ($p = 0.001$), indicating that pre-imaging radiation education effectively reduced anxiety.

Figure 1: Pre-Test and Post-Test Anxiety Scores



Source: state-Trait anxiety inventory (STAI) form Y-1, administered before and after intervention

4.4 Procedural Compliance

Procedural compliance was measured using a checklist assessing five key behaviors during the X-ray procedure. A participant was categorized as having "good procedural compliance" if they scored ≥4 out of 5 on the checklist. The compliance scores for both groups were compared using an independent samples t-test.

Table 4: Procedural Compliance Scores

Group	Procedural Compliance Score (Mean ± SD)	p-value
Intervention Group	4.3 ± 0.5	0.003
Control Group	3.8 ± 1.2	

Source: Procedural compliance data collected using a developed observational checklist, assessing key behaviors during the orthopaedic X-ray procedure.

The intervention group exhibited significantly better procedural compliance than the control group (p = 0.003), suggesting that radiation education also improved patient compliance during the imaging procedure.

A chi-square test was used to compare the proportion of participants with "good procedural compliance" (defined as scoring ≥4 on the checklist) between the two groups.

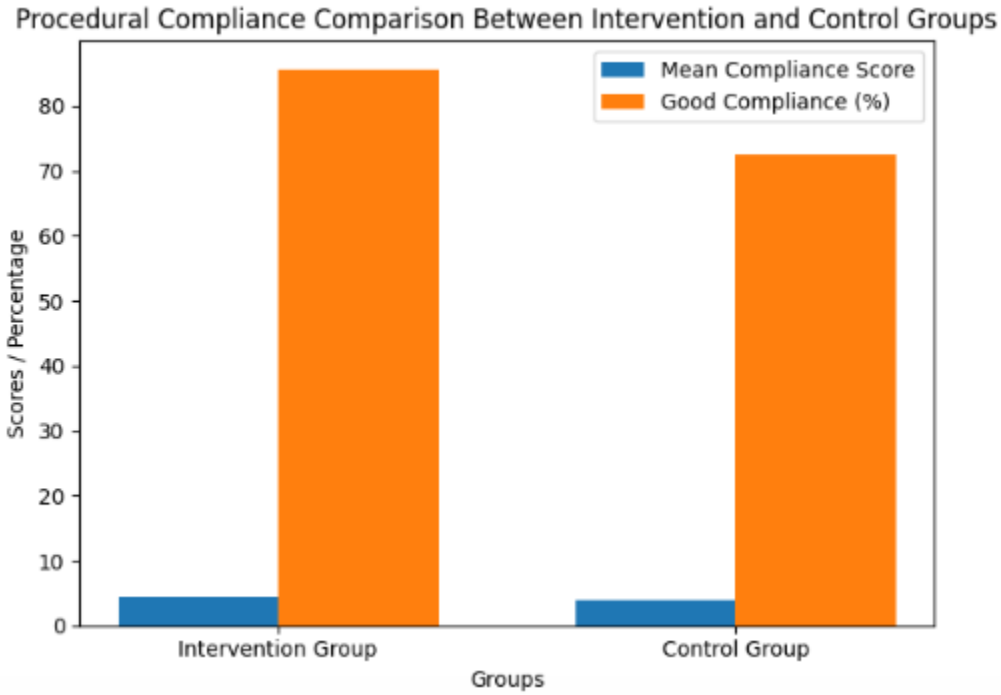
Table 5: Proportion of Participants with Good Procedural Compliance

Group	Good Compliance (n, %)	p-value
Intervention Group	72 (85.7%)	0.02
Control Group	61 (72.6%)	

Source: Data from the Procedural Compliance Checklist, comparing the proportion of participants scoring ≥4 (good compliance) in both the intervention and control groups.

The intervention group had a significantly higher proportion of participants with good compliance (85.7%) compared to the control group (72.6%) (p = 0.02).

Figure 2: Procedural Compliance Scores



Sources: procedural compliance data collected using an observational checklist, procedural compliance checklist (Table 4 & 5)

4.5 Findings

This study demonstrates that pre-imaging radiation education significantly reduces anxiety levels and improves procedural compliance during orthopaedic X-ray procedures. The intervention group showed a larger reduction in anxiety and higher compliance compared to the control group, which received only standard care. These findings suggest that providing patients with structured education about the imaging process, radiation safety, and the importance of cooperation can improve their overall experience and the quality of the imaging procedure.

The results align with previous research indicating that patient education reduces anxiety in medical procedures and enhances cooperation. The significant improvement in procedural compliance in the intervention group highlights the potential for educational interventions to not only alleviate psychological distress but also enhance the technical aspects of radiological procedures.

5. Discussion

The findings from this study provide valuable insights into the effect of pre-imaging radiation education on anxiety levels and procedural compliance in adult patients undergoing orthopaedic X-ray procedures. The results indicate that structured radiation education prior to imaging significantly reduced anxiety levels and improved procedural compliance in the intervention group compared to the control group.

5.1 Reduction in Anxiety Levels

A key finding of this study is the substantial reduction in anxiety levels in the intervention group following pre-imaging education. The mean post-test anxiety scores for the intervention group (36.2 ± 8.4) were significantly lower than those of the control group (44.8 ± 9.6), indicating that pre-imaging education effectively alleviated anxiety. This reduction in anxiety is consistent with previous studies that have shown that patient education can help reduce anxiety in medical settings. By providing patients with information about the imaging process, radiation safety, and what to expect during the procedure, patients may feel more prepared and less fearful, which can reduce their overall anxiety.

The results also demonstrate that both the intervention and control groups showed significant reductions in anxiety from pre-test to post-test, suggesting that the process of undergoing an X-ray itself may contribute to reducing anxiety. However, the greater reduction observed in the intervention group points to the added benefit of providing educational content prior to the procedure.

5.2 Enhanced Procedural Compliance

The study also revealed that pre-imaging radiation education positively impacted procedural compliance. Participants in the intervention group demonstrated significantly better procedural compliance, with higher mean compliance scores (4.3 ± 0.5) compared to the control group (3.8 ± 1.2). This was further supported by the chi-square test, which showed that a larger proportion of participants in the intervention group (85.7%) had good procedural compliance (scoring ≥4 on the checklist) compared to the control group (72.6%).

The improved compliance in the intervention group can be attributed to the educational intervention, which emphasized the importance of patient cooperation during the X-ray procedure. When patients are educated about the procedure, they may feel more empowered and confident in their ability to follow instructions, which leads to better compliance. This finding is consistent with other research that has highlighted the positive effects of patient education on adherence to medical instructions.

5.3 The Importance of Structured Education

The structured nature of the educational intervention used in this study played a key role in the outcomes. The 15–20 minute session, which included both verbal explanations and pictorial representations, ensured that participants understood the rationale for the procedure, the steps involved, and the importance of their cooperation. The intervention not only addressed potential concerns about radiation safety but also provided an opportunity for patients to ask questions, further reducing uncertainty and anxiety.

The use of a flip chart to visually demonstrate the procedure is particularly significant, as visual aids have been shown to enhance understanding and retention of information. This could explain the high compliance rates observed, as patients were likely better informed and more confident in their ability to cooperate during the imaging process.

5.4 Implications for Clinical Practice

The findings of this study have important implications for clinical practice, particularly in radiology departments. Providing patients with pre-imaging education can be a simple yet effective strategy to reduce anxiety and improve procedural compliance, which in turn can enhance the quality of radiological images. This is crucial in orthopaedic X-ray procedures, where patient positioning and stillness are vital for obtaining high-quality images for diagnosis and treatment planning.

Radiology departments could incorporate this educational intervention into their standard care protocols, especially for patients who may be anxious or unfamiliar with the imaging process. Additionally, this approach could be beneficial for patients undergoing other types of imaging, such as CT scans or MRI, where patient cooperation is also critical.

5.5 Limitations and Recommendations for Future Research

While this study provides compelling evidence for the benefits of pre-imaging education, there are some limitations that should be considered. First, the study was conducted at a single hospital, which may limit the generalizability of the findings to other settings. Future research should explore whether the intervention produces similar results in other hospitals, particularly those with different patient demographics or healthcare systems.

Additionally, this study did not assess the long-term effects of pre-imaging education on anxiety or procedural compliance. Future studies could explore whether the benefits persist over time or if patients' anxiety levels return

to baseline once the immediate procedure is over. It would also be useful to investigate the impact of educational interventions on patient satisfaction and overall experience.

Finally, this study highlights the significant impact of pre-imaging radiation education on reducing anxiety levels and improving procedural compliance in adult patients undergoing orthopaedic X-ray procedures. By providing patients with clear, structured information about the imaging process and radiation safety, healthcare providers can help alleviate patient anxiety and improve cooperation, which ultimately contributes to better patient outcomes. These findings suggest that incorporating educational interventions into standard radiology practices can lead to enhanced patient experiences and more efficient healthcare delivery.

6. Conclusion

This study demonstrated that pre-imaging radiation education significantly reduces anxiety levels and improves procedural compliance in adult patients undergoing orthopaedic X-ray procedures. The intervention group, which received structured education about the imaging process, radiation safety, and cooperation, exhibited lower post-test anxiety scores and better procedural compliance compared to the control group. These results suggest that educational interventions can effectively address patient concerns, enhance their cooperation during the procedure, and ultimately contribute to a more efficient and patient-centered radiology practice.

Given the significant findings, pre-imaging education offers a promising strategy to improve patient outcomes in the radiology department, especially in settings like orthopaedic X-rays, where patient positioning and stillness are critical for obtaining high-quality images.

6.1 Recommendations

1. Integration of Pre-Imaging Education into Standard Care: Based on the positive outcomes observed in this study, it is recommended that healthcare providers, particularly in radiology departments, incorporate structured pre-imaging education as a routine part of patient care. This could be implemented for all patients, especially those who are likely to experience anxiety or have little prior exposure to radiological procedures.

2. Standardization of Educational Materials: Hospitals should develop standardized educational materials, such as flip charts or informational booklets, that clearly explain the imaging process, radiation safety, and the importance of cooperation. These materials should be tailored to the needs of different patient groups to ensure clarity and accessibility.

3. Training Radiology Staff: Radiographers and other staff involved in imaging procedures should be trained in delivering pre-imaging education effectively. Ensuring that staff are well-equipped to communicate with patients and address their concerns will be crucial for the success of this intervention.

4. Further Research: Future studies should explore the long-term effects of pre-imaging education, including whether the benefits persist beyond the immediate procedure. Additionally, research could examine whether such interventions improve image quality, reduce the need for repeat scans, or increase patient satisfaction. Expanding the study to multiple healthcare settings would also help generalize the findings.

5. Inclusion of Diverse Patient Populations: Future research could include a more diverse range of patients, including those from different cultural backgrounds, to explore how various educational approaches may need to be adapted to meet the needs of different populations.

By incorporating these recommendations, healthcare facilities can improve the overall patient experience, reduce anxiety, and enhance procedural efficiency, leading to better health outcomes.

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