

Prevalence and determinants of anxiety among patients undergoing MRI: Insights from a low-resource setting

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ABSTRACT

Introduction: MRI-related anxiety often leads to heightened patient discomfort, non-adherence, and compromised image quality. However, no study in Ghana has investigated specific factors associated with MRI-related anxiety. This study investigated prevalence of MRI-related anxiety and factors associated with elevated anxiety among Ghanaian patients.

Methods: This single-center, cross-sectional study was conducted between October 2024 and January 2025. Patient socio-demographic and clinical information were obtained with a pre-piloted questionnaire. A validated tool, the MRI-Anxiety Questionnaire (MRI-AQ), was used to assess patient anxiety levels immediately after their MRI. Relationship between anxiety levels and socio-demographic, clinical and pre-procedural factors were assessed by inferential statistics and post-hoc tests. A p-value <0.05 was considered statistically significant.

Results: Among the 182 enrolled patients, 59 (32.4%), 90 (49.5%) and 33 (18.1%) experienced low, moderate, and high anxiety, respectively. Increased anxiety was reported in females ($p = 0.011$), patients with chronic conditions ($p = 0.013$), first time MRI patients (adjusted $p < 0.001$) and patients without adequate MRI-procedural information ($p = 0.001$). Also, increased anxiety was reported in younger adults (≤ 40 years) compared with older adults (≥ 61 years) (adjusted $p = 0.023$), in patients with primary school education than in university graduates (adjusted $p = 0.008$) and in the unemployed than those in full-time employment ($p = 0.020$).

Conclusion: This study highlights certain socio-demographic, clinical and pre-procedural factors associated with heightened MRI-related anxiety. Female, young adult, unemployment, lower educational level, first time MRI, chronic conditions and lack of adequate MRI information are significant contributing factors.

Implications for practice: Identifying and understanding factors and drivers of MRI-related anxiety in a low-resource setting is crucial for the development of targeted patient-support strategies and improving the quality of clinical care.

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Introduction

Magnetic Resonance Imaging (MRI) is a non-invasive diagnostic imaging technique widely utilized in clinical practice for its ability to offer superior radiological images of internal organs and tissues.¹ However, the MRI environment, characterized by loud noises, enclosed spaces, and prolonged immobility, may induce various responses in patients, including anxiety, claustrophobia,

and discomfort.² Elevated anxiety levels often times result in heightened patient discomfort, non-adherence to scan instructions and treatment, and compromised image quality that may lead to repeated examinations.^{3,4}

Despite efforts to improve patient MRI experience and reduce anxiety, including the introduction of wider bore diameter and open MRI systems, MRI-related anxiety continues to persist in many clinical settings.² For instance, from a randomized controlled trial by Enders and colleagues,⁵ the authors concluded that there was no statistically significant difference in claustrophobic events between patients who underwent MRI in a short-bore scanner and

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those scanned with an open scanner. They therefore concluded that the design of MRI scanner alone does not completely eliminate MRI-related anxiety. These findings suggest that, beyond MRI equipment design, certain patient-related and clinically inherent factors may contribute to MRI-related anxiety. It is therefore crucial to continuously explore these factors that could trigger patient anxiety.

A recent systematic review and meta-analysis has shown that most studies investigating MRI-related anxiety has been predominantly conducted in high-resource settings.² While countries in sub-Saharan Africa have experienced some form of growth in the clinical use of MRI,⁶ there is limited evidence on patient, clinical and pre-procedural factors that influence anxiety among patients undergoing MRI in these settings. Even though general patient knowledge and perception of MRI have been investigated in Ghana,⁷ there remains a significant gap in the literature regarding socio-demographic and clinical factors that are associated with elevated anxiety in patients undergoing MRI. In addressing this gap, we explored the prevalence of MRI-related anxiety, as well as, socio-demographic, clinical and pre-procedural factors associated with increased anxiety among MRI patients in Ghana. By investigating these factors, this study could provide novel, and context-specific insights into how certain factors other than the MRI equipment influences MRI-related anxiety. Findings from this study can ultimately inform strategies to improve MRI service delivery and enhance patient comfort.

Methods

Ethics approval

Ethics approval was obtained from the University of XXX Institutional Review Board. Written informed consents were obtained from all participants prior to data collection.

Study design

This study adopted a cross-sectional design, with quantitative data collected using a standardized validated questionnaire.

Study setting

The study was conducted between October 2024 and January 2025 in the MRI unit of the Radiology Department of the University of Ghana Medical Center (UGMC), which is equipped with a Philips Ingenia Omega 1.5T wide-bore MRI system.

Study population

The study population consisted of outpatient adult males and females (age 18 years and above) scheduled for MRI examinations during the study period. Both first-time patients and those who have undergone MRI examinations in the past were eligible for inclusion. Additionally, patients undergoing MRI of any body part were eligible.

Patients undergoing other radiological examinations other than MRI at the radiology department were excluded. Furthermore, inpatients and patients in critical conditions were excluded.

Sample size determination

Records from the MRI unit of the Radiology department indicated that approximately 700 outpatients undergo MRI scans each quarter. Hence, using Slovin's formula,⁸ the required sample size was 255 participants, for a study intended to last for 4 months.

Sampling technique

Eligible patients were recruited into the study using simple random sampling as they presented for their MRI examination.

Data collection instrument and procedure

Prior to the start of the study, the questionnaire was pre-piloted among 25 patients over a period of three weeks in order to assess clarity, comprehension and feasibility. These participants in the pilot phase were not included in the final study sample. The pilot showed that even though the questions were generally understood, some items required clarification. For instance, respondents indicated that Question 7 was unclear regarding the meaning of "chronic condition". To improve clarity, explanatory examples such as hypertension, diabetes, and tumors were added in parentheses. Additionally, minor wording adjustments were made to simplify some of the questions to improve overall flow. The development of the final questionnaire was therefore informed by these modifications.

The final self-administered questionnaire was used to obtain relevant patient socio-demographic and clinically-related information. Anxiety level was assessed using the MRI-Anxiety Questionnaire (MRI-AQ),⁹ a validated questionnaire used for assessing MRI-related anxiety. The MRI-AQ consists of 12 items that specifically assess anxiety symptoms, each item rated on a 4-point Likert scale ranging from 0 – 'not at all' to 3 – 'very much so'. Study Questionnaire attached as [Supplementary Material 1](#).

Eligible participants were approached immediately after their MRI scans, and the purpose of the study was explained by a member of the research team. Those who agreed to participate provided written informed consent, after which the questionnaires were administered. By undertaking the assessment immediately following the MRI scan, real-time patient experiences were captured in order to mitigate the risk of recall bias.

Data analysis

Data were analyzed with R statistical software (version 4.5.1). Participants' socio-demographic, clinical and pre-procedural data were summarized using descriptive statistics. Categorical variables were expressed as frequencies and percentages. Prior to selecting the appropriate statistical tests, the normality of continuous variables was assessed visually using histograms and statistically with the Shapiro–Wilk test. Scores from the MRI-AQ items were summed up to obtain a total anxiety score for each participant, and categorized as either low (for score 0–11), moderate (for score 12–24), or high (for score 25–36).

Following normality testing, anxiety scores were found to be non-normally distributed; hence, they are reported as medians and corresponding interquartile ranges (IQR), rather than means and standard deviations. Furthermore, anxiety scores were evaluated against socio-demographic, clinical and MRI pre-procedural predictors using Mann–Whitney U and Kruskal–Wallis tests for two-group and multi-group comparisons, respectively. Where significant between-group differences were identified by the Kruskal–Wallis test, pairwise post-hoc comparisons using the Dunn's test with Bonferroni correction were performed to determine which specific groups significantly differed in anxiety scores. A p-value <0.05 was considered statistically significant.

Results

Of the 255 participants approached for this study, 182 consented to participate, yielding a 71.3% response rate.

Women comprised of 53.8% of the participants, while men accounted for 46.2%. Also, the majority of the participants were aged 41–60 years (47.8%), followed by those aged 18–40 years (30.2%) and ≥ 61 years (22.0%). Furthermore, the head/neck and spine were the predominant body parts scanned, representing 42.9% ($n = 78$) and 33.0% ($n = 60$), respectively (Table 1).

Overall, the median anxiety score was 13.0 (IQR:8.0–19.0), indicating an overall moderate level of anxiety within the study population, though closer to the lower end of this category. 59 participants (32.4%) reported low anxiety score with median anxiety score of 6.0 (IQR:4.0–8.0), 90 participants (49.5%) reported moderate anxiety with median anxiety score of 15.0 (IQR:12.75–17.25), while 33 participants (18.1%) reported high anxiety with median anxiety score of 29.0 (IQR:26.75–30.0) (Fig. 1).

Anxiety outcomes by socio-demographic factors

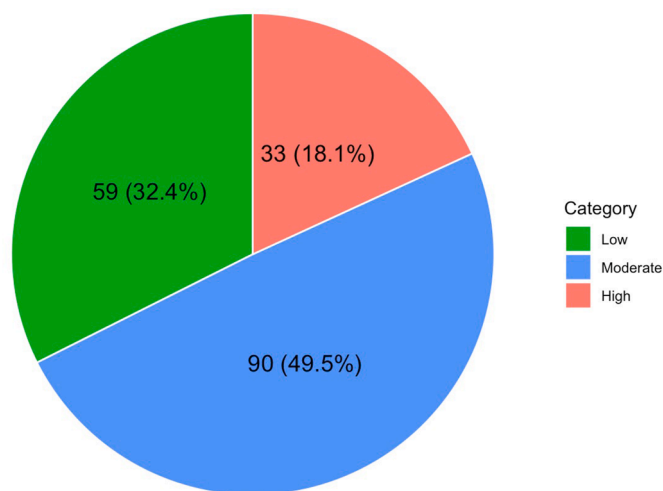
Amongst the study population, females demonstrated increased MRI-related anxiety levels, as compared to males (median anxiety score: 15.0 (IQR:11.0–21.75) vs 12.0 (IQR:7.0–17.0), $p = 0.011$) (Table 2). Also, increased anxiety was reported amongst younger adults (≤ 40 years) than in older adults (≥ 61 years) (median anxiety score: 15.0 (IQR:10.5–23.0) vs 12.0 (IQR:6.0–14.0), adjusted $p = 0.023$) (Fig. 2, Suppl. Table). Furthermore, patients with low educational level (less than high school) reported higher anxiety levels, compared to those with bachelor's degree (median anxiety score: 24.5 (IQR:13.5–28.25) vs 12.0 (IQR:8.0–15.25), adjusted $p = 0.008$) and those with postgraduate education (median anxiety score: 24.5 (IQR:13.5–28.25) vs 12.0 (IQR:6.0–17.0), adjusted $p = 0.017$) (Fig. 3, Suppl. Table). Patients that were unemployed demonstrated higher anxiety levels than those in full-

Table 1

Socio-Demographic, Clinical and MRI scan information of participants.

Socio-demographics characteristics	
Variable	n (%)
Gender	
Male	84 (46.2)
Female	98 (53.8)
Age (years)	
18–40	55 (30.2)
41–60	87 (47.8)
61 and above	40 (22.0)
Marital status	
Single	71 (39.0)
Married	96 (52.7)
Divorced	7 (3.9)
Widowed	8 (4.4)
Educational level	
Less than high school	25 (13.7)
High school graduate	54 (29.7)
Bachelor's degree	73 (40.1)
Postgraduate qualification	30 (16.5)
Employment status	
Self-employed	48 (26.4)
Full-time employment	65 (35.7)
Part-time employment	14 (7.7)
Unemployed	30 (16.5)
Retired	25 (13.7)
Clinical and MRI scan characteristics	
Body region scanned	
Head/neck	78 (42.9)
Spine	60 (33.0)
Abdomen	12 (6.6)
Pelvic	10 (5.5)
Breast	3 (1.6)
Cardiac	4 (2.2)
Musculoskeletal	11 (6.0)
Other	4 (2.2)
Presence of any chronic disease/condition prior to MRI scan	
Yes	118 (64.8)
No	64 (35.2)
Received education from referring doctor regarding reason for MRI scan in relation to disease condition	
Yes	126 (69.2)
No	56 (30.8)
Previous MRI scans in the past	
Never (first time being scanned)	98 (53.9)
Once	53 (29.1)
More than once	31 (17.0)
Received adequate information regarding the nature of the MRI scan	
Yes	117 (64.3)
No	65 (35.7)
Source of information	
Healthcare professionals (referring doctor, radiographer, nurse)	145 (79.7)
Relative	12 (6.6)
Friend	7 (3.8)
Internet and media	18 (9.9)

Distribution of Anxiety Levels

**Figure 1.** Overall anxiety distribution.

time employment (median anxiety score: 17.5 (IQR:13.0–25.5) vs 12.0 (IQR:7.0–16.0), adjusted $p = 0.020$) and those retired (median anxiety score: 17.5 (IQR:13.0–25.5) vs 12.0 (IQR:6.0–14.0), adjusted $p = 0.007$) (Fig. 4, Suppl. Table). However, marital status was not significantly associated with differences in anxiety levels experienced (Table 2).

Anxiety outcomes by clinical and pre-procedural factors

Patients undergoing MRI for the first time experienced significantly greater anxiety compared with those who have undergone MRI scans more than once (median anxiety score: 15.0 (IQR:12.0–23.0) vs 7.0 (IQR:6.0–14.0), adjusted $p < 0.001$) (Fig. 5, Suppl. Table). Also, patients with chronic conditions experienced higher anxiety levels, compared to those without chronic conditions (median anxiety score: 14.5 (IQR:10.0–22.25) vs 12.0 (IQR:7.0–16.75), $p = 0.013$) (Table 2). Furthermore, patients who did not receive adequate information regarding the nature of the MRI scan experienced higher anxiety levels than those who received adequate information (median anxiety score: 17.0 (IQR:12.0–26.25) vs 12.0 (IQR:7.0–17.0), $p = 0.001$) (Table 2). However, the body region scanned, source of information about the MRI scan, and receipt of education from healthcare team regarding the indication for the scan were not significantly associated with differences in anxiety levels (Table 2).

Discussion

Interpretation

In the study population, an overall moderate anxiety level related to MRI scans was observed, though skewed toward the lower end of this category, with many participants reporting low to moderate anxiety. This suggests that while MRI-related anxiety remains a persistent clinical issue, its severity may be lower within the study population.

Previous studies have consistently shown that women report higher levels of anxiety in medical and imaging-related procedures than men, including before MRI and other diagnostic scans and across varied healthcare contexts.^{3,10,11} This gender difference

has been attributed to factors such as heightened emotional response and greater procedural worry among women. These observations are consistent with our study, in which female participants exhibited significantly higher MRI-related anxiety than male participants.

We found that younger adults (≤ 40 years) exhibited higher MRI-related anxiety compared to older adults (≥ 61 years). This could be explained by the premise that younger adults may experience greater anxiety due to heightened sensitivity to diagnostic uncertainty and stronger emotional reactivity to perceived threats. These age-related disparities in the intolerance of uncertainty and anxiety responses have been widely reported in the literature.^{12,13} Our findings are similar to those from a recent study conducted in Saudi Arabia, where the authors reported increased anxiety levels in younger adult patients going for contrast-enhanced MRI.¹⁴

However, Delić et al.¹⁵ in a study conducted in southeastern Europe, reported no significant association between age and MRI-related anxiety. These conflicting findings suggests that the influence of age on MRI-related anxiety may be context-dependent. Our findings therefore contribute to the ongoing debate as to whether MRI-related anxiety across age groups is driven by underlying psychological factors or are largely context-dependent.

We observed that an individual's level of education influenced the level of MRI-related anxiety. Patients with university education (bachelor's or postgraduate) exhibited lower anxiety levels, as compared to patients with lower educational attainment (less than high school education). This may be attributed to lower health literacy levels among less educated patients, which can impede the comprehension of information related to hospital procedures.¹⁶ Consequently, a limited understanding of the MRI-related information could have heightened the state of anxiety amongst participants with lower educational level in our study. Our findings are consistent with a recent study that reported higher anxiety levels in patients with lower education undergoing MRI.¹¹

However, Farinha and colleagues¹⁷ observed the opposite pattern, where patients with higher education exhibited increased MRI-related anxiety. The authors attributed this to greater health literacy, which may lead these patients to overanalyze or overinterpret the information provided prior to the scan, resulting in heightened anxiety. Similarly, Alsharif et al.¹⁴ reported higher anxiety in highly educated patients, for which they suggested that increased information-seeking behavior, sometimes from unreliable sources, could possibly foster mistrust in the information provided by healthcare workers, thereby elevating anxiety during MRI.

Unemployment was significantly associated with increased MRI-related anxiety within the study population. This may be explained by heightened psychological vulnerability and reduced resilience, which are often associated with financial instability and concerns about health-related barriers to future employment.¹⁸ This underlying vulnerability to anxiety may further amplify anxiety related to the MRI examination. Consistent with findings reported by Masalma et al.¹¹ in a Palestinian cohort, our study identified unemployment as a factor associated with increased MRI-related anxiety.

Regarding the frequency of MRI scans in relation to anxiety levels, our findings revealed that patients undergoing MRI for the first time exhibited significantly increased anxiety as compared to those who have undergone the examination more than once. Our findings are similar to those reported in a recent study by Masalma et al.,¹¹ who reported elevated anxiety levels amongst first-time MRI patients. This may be due to unfamiliarity with the MRI environment, since first-time patients are more likely to

Table 2
Association between socio-demographic, clinical, and MRI-related procedural variables and anxiety levels.

Variable	n (%)	Anxiety level	p-value
		Median (IQR)	
Gender			
Male	84 (46.2)	12.0 (7.0–17.00)	0.01101 ^a
Female	98 (53.8)	15.0 (11.0–21.75)	
Age			
18–40	55 (30.2)	15.0 (10.5–23.0)	0.01095 ^a
41–60	87 (47.8)	12.0 (7.0–18.0)	
61 and above	40 (22.0)	12.0 (6.0–14.0)	
Marital status			
Single	71 (39.0)	14.0 (9.00–23.0)	0.07635
Married	96 (52.7)	13.5 (8.25–18.0)	
Divorced	7 (3.9)	13.0 (12.0–19.0)	
Widowed	8 (4.4)	6.5 (3.75–12.5)	
Educational level			
Less than high school	25 (13.7)	24.5 (13.5–28.25)	0.003418 ^a
High school graduate	54 (29.7)	15.0 (12.0–19.0)	
Bachelor's degree	73 (40.1)	12.0 (8.0–15.25)	
Postgraduate	30 (16.5)	12.0 (6.0–17.0)	
Employment status			
Self-employed	48 (26.4)	15.5 (11.75–25.25)	0.001955 ^a
Full-time employment	65 (35.7)	12.0 (7.00–16.0)	
Part-time employment	14 (7.7)	13.5 (7.25–17.75)	
Unemployed	30 (16.5)	17.5 (13.00–25.50)	
Retired	25 (13.7)	12.0 (6.00–14.0)	
Body region scanned			
Head/neck	78 (42.9)	15 (10.00–25.0)	0.2757
Spine	60 (33.0)	14 (8.00–19.0)	
Abdomen	12 (6.6)	12 (4.00–15.0)	
Pelvic	10 (5.5)	12 (8.00–16.0)	
Breast	3 (1.6)	23 (13.00–24.5)	
Cardiac	4 (2.2)	12 (11.75–13.5)	
Musculoskeletal	11 (6.0)	12 (6.50–12.5)	
Other	4 (2.2)	14 (8.00–19.0)	
Presence of any chronic disease/condition prior to MRI scan			
Yes	118 (64.8)	14.5 (10.0–22.25)	0.01285 ^a
No	64 (35.2)	12.0 (7.0–16.75)	
Received education from referring doctor regarding reason for MRI scan in relation to disease condition			
Yes	126 (69.2)	13.5 (7.75–21.0)	0.8685
No	56 (30.8)	12.5 (8.25–17.0)	
Previous MRI scan in the past			
Never (first time being scanned)	98 (53.9)	15.0 (12.0–23.0)	0.0003325 ^a
Once	53 (29.1)	12.0 (7.0–17.0)	
More than once	31 (17.0)	7.0 (6.0–14.0)	
Received adequate information regarding the nature of the MRI scan			
Yes	117 (64.3)	12.0 (7.0–17.0)	0.0008675 ^a
No	65 (35.7)	17.0 (12.0–26.25)	
Source of information			
Healthcare professionals (referring doctor, radiographer, nurse)	145 (79.7)	12.0 (7.00–16.5)	0.08996
Relative	12 (6.6)	14.5 (10.50–25.25)	
Friend	7 (3.8)	16.5 (16.25–16.75)	
Internet and media	18 (9.9)	21.0 (17.00–24.0)	

Abbreviations: MRI: Magnetic Resonance Imaging; IQR: Interquartile range.

^a Statistically significant at 5% level of significance.

experience uncertainty and fear of the unknown, including concerns regarding confinement and outcome of their MRI scans. Even more so in Ghana, the lack of pre-scan simulations and pre-scan tours of the MRI suite in many hospitals may contribute to increased anxiety among first-time MRI patients. Subsequently, as identified in our findings, the significant lower anxiety observed among patients who had undergone more than one MRI scan suggests that those with prior MRI experience may have developed coping strategies and a clearer understanding of the MRI environment and procedure. This highlights that mitigating steps such as providing first-time MRI patients with an opportunity to visit the MRI suite prior to their scans, in order to familiarize themselves with the MRI environment, may help reduce anxiety levels. Furthermore, the use of modern technologies such as virtual reality (VR) simulations, which have been shown to be

comparable to mock MRI scanning in terms of anxiety reduction,¹⁹ has the potential to reduce anxiety among first-time MRI patients. Particularly, in low-resource settings like Ghana where mock MRI scanning suites are unavailable, VR simulations may serve as an accessible and cheaper alternative in routine clinical care for orienting first-time MRI patients to the MRI environment.

Patients with chronic conditions exhibited higher levels of anxiety compared to those without such conditions. This is not an uncommon finding, since recent studies have shown that individuals with chronic illness, particularly those with multiple comorbidities, tend to have elevated symptoms of anxiety and depression, which may often go undiagnosed.^{20,21} Supporting this, Adu Bonsra et al.²² reported in a recent study conducted in Ghana that a considerable proportion of patients with diabetes exhibited significant levels of anxiety, depression and stress. These

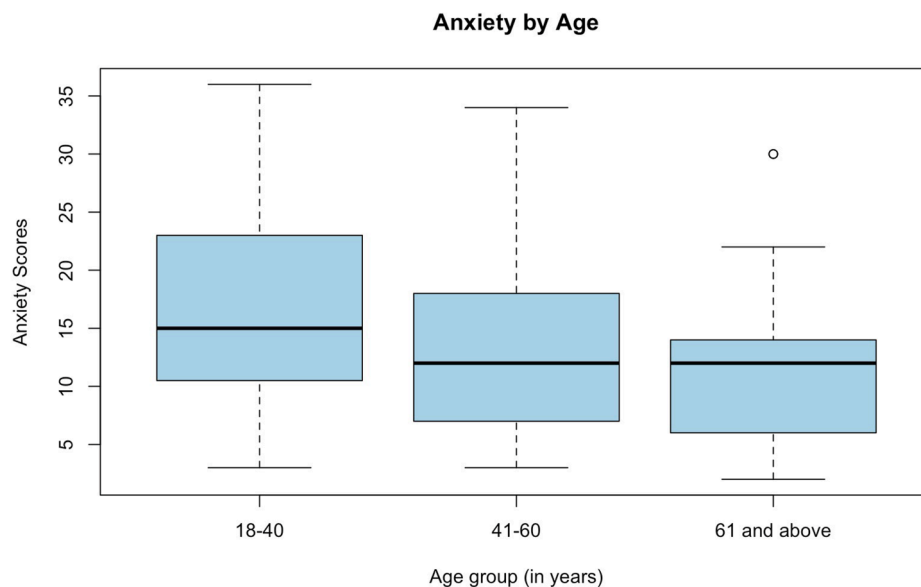


Figure 2e. Boxplot_Anxiety by age.

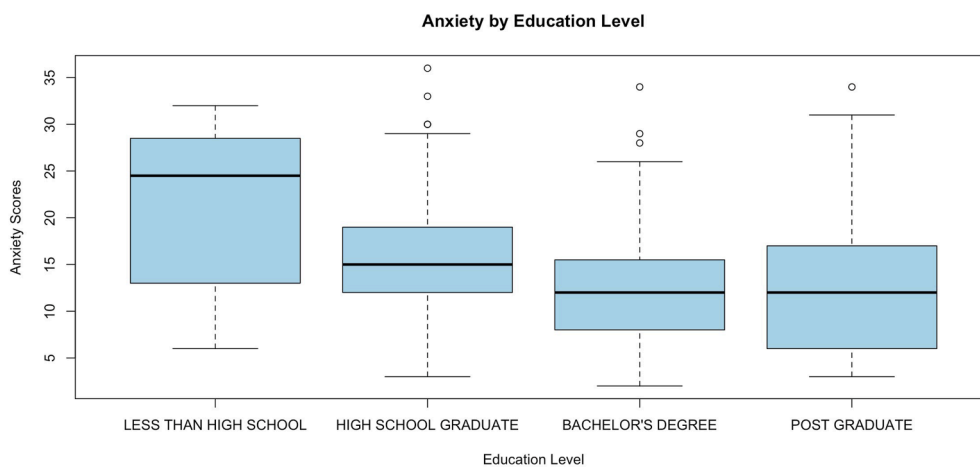


Figure 3. Boxplot_Anxiety by education level.



Figure 4. Boxplot_Anxiety by employment.

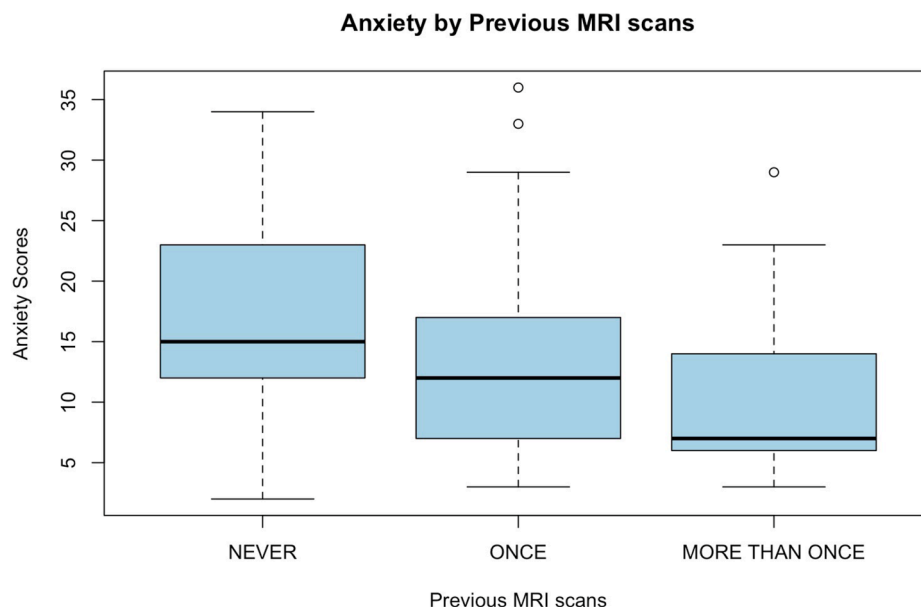


Figure 5. Boxplot_Anxiety by previous MRI scan.

psychological factors, combined with uncertainty surrounding imaging results, may further heighten anxiety among patients with chronic conditions undergoing MRI scans. In addition, the widespread availability of health information through the internet and social media may further contribute to this heightened anxiety. Given that much of this information is not medically verified, concerns about potential adverse findings during radiological examinations may be amplified, thereby further increasing anxiety among patients with known chronic conditions.

Regarding patient education and information prior to an MRI scan, although most patients (69.2%) admitted receiving some form of information from their referring clinician about the indication for their scans, anxiety levels did not differ significantly between those who received this information and those who did not ($p = 0.869$). This suggests that general information about the indication for the scan is insufficient, but rather the education specifically regarding the nature of the procedure of the MRI is more relevant. Consistent with this, patients who received adequate information about the MRI procedure itself demonstrated significantly lower anxiety compared to those who lacked such information ($p = 0.001$). This is further consistent with other studies from non-African contexts, where anxiety levels were lower in patients undergoing MRI scan who had received information regarding the nature of the MRI scan.^{3,14,17}

Although within the study population, there was no statistically difference in anxiety levels with regards to the body part scanned and source of information, certain category-specific trends in increased anxiety levels are worth discussing. For instance, regarding the body part scanned, we observed that patients undergoing head and neck MRI experienced moderate anxiety. This could be partly due to fact that the procedure involves immobilization of the head within confined coil close to the face, which is likely to intensify feelings of anxiety and loss of control. Furthermore, the head and neck region is associated with vital functions such as vision, swallowing and speech, which may increase patients' fear of serious underlying pathology, including brain malignancies. Subsequently, patients undergoing breast MRI experienced high levels of anxiety, which may be associated with the emotional sensitivity of imaging the breast, particularly fears

of breast cancer or other life-threatening diagnoses. However, this observation is limited by the small sample size ($n = 3$), hence should be interpreted with caution.

Regarding the source of information, 37 patients (20.3%) reported receiving information related to the MRI procedure from non-healthcare professional sources. Notably, although a small subgroup, patients who obtained information from internet and media ($n = 18$) experienced the highest levels of anxiety. This increased anxiety may be attributed to the fact that much of the health-related information available through these sources is not medically verified and often times only highlights rare adverse experiences, which tends to heighten fear associated with MRI scans. In addition, patients may not receive the pre-procedural reassurance typically provided by healthcare professionals, which may further lead to increased anxiety.

Strengths, limitations and recommendation for further studies

To the best of our knowledge, this is the first study conducted in Ghana to identify specific socio-demographic, clinical and pre-procedural predictors of MRI-related anxiety. This provides context-specific indicators for anxiety among patients undergoing MRI examinations. This study also utilized a standardized and validated tool that specifically assesses MRI-related anxiety levels among patients undergoing MRI in an outpatient setting.

Although the response rate was relatively high (75%), the relatively smaller final sample size, partly due to the short duration of the study, may be a limitation. This could affect the generalizability of the study findings. Future research with similar objectives should therefore consider longer study periods and a multi-center approach in order to achieve larger sample sizes. Additionally, the small size prevented the development of a multivariable prediction model. Future studies should therefore move beyond univariate analyses and aim to develop multivariable models with larger sample sizes, to better identify independent predictors of MRI-related anxiety. Another limitation of this study is that outcomes related to patient movement on scan completion and image quality in relation to heightened anxiety levels were not assessed.

Conclusion

This study provides a comprehensive overview of socio-demographic, clinical and pre-procedural factors associated with anxiety among patients undergoing MRI examination. Female gender, young adult, unemployment, low educational level and lack of prior MRI-scan experience were identified as significant contributing factors for elevated anxiety, alongside the presence of chronic conditions and insufficient MRI procedural information. Clinicians and medical imaging professionals should therefore integrate these findings into patient care by adopting targeted mitigating strategies to reduce anxiety before and during MRI examinations.

Ethics approval and consent to participate

Ethical approval for this study was obtained from the University of Ghana Medical Center Institutional Review Board (IRB No: UGMC/IRB/REVIEW/026/24).

Written informed consent was obtained for anonymized patient information to be published in this article.

Author contributions

JA: Conceptualization, methodology, writing – original draft, visualization, supervision.

PO: Data collection, data curation, writing – original draft.

OTS: Data collection, writing – review and editing.

GA: Data collection, writing – review and editing.

GN: Writing – review and editing.

Availability of data

Data required for this study may be made available by the corresponding author upon reasonable request.

Generative AI use

Not applicable.

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Conflict of interest statement

The authors declare that there are no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.radi.2026.103441>.

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