Prevalence and severity of claustrophobia in patients undergoing magnetic resonance imaging in Albania

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Abstract

Background: Claustrophobia during magnetic resonance imaging (MRI) represents a relevant psychological and clinical challenge, as it may compromise patient comfort, image quality, and even lead to incomplete examinations. Despite

its clinical importance, data regarding MRI-related claustrophobia in Albania are limited.

Objective: To assess the prevalence and severity of claustrophobic symptoms among patients undergoing MRI examinations in Albania and to evaluate their impact on examination completion.

Methods: This was a cross-sectional observational study conducted between September and October 2025 in a private diagnostic imaging center in Tirana, Albania. A total of 75 consecutive patients were included. Data were collected using a structured questionnaire addressing demographic characteristics, previous MRI experience, self-reported claustrophobia, anxiety during the examination, and post-examination difficulty on a numeric scale from 1 to 10. Descriptive statistical analysis was performed using Microsoft Excel. Patients under the age of 15 were excluded. The equipment used was a closed MRI, Siemens Magnetom Essenza 1.5T.

Results: Of the 75 patients, 40 (53.3%) were female and 35 (46.7%) male. Claustrophobic fear or significant anxiety during MRI was reported by 30 patients (40.0%). Moderate to very severe discomfort (difficulty score ≥ 5) was present in 33 patients (44.0%). Although a considerable proportion experienced anxiety, only 2 patients (2.6%) were unable to complete the examination. Most scans were completed with simple verbal reassurance, while 3 (4.0%) required sedation.

Conclusion: Claustrophobic symptoms during MRI examinations are common in the Albanian clinical setting, with almost half of patients experiencing moderate to severe discomfort. Nevertheless, the majority of scans can be successfully completed with appropriate support. These findings highlight the importance of patient education, communication, and supportive strategies to minimize anxiety and optimize MRI examination outcomes.

Keywords: Claustrophobia, MRI, Anxiety, Patient experience, Diagnostic imaging, Albania.

Introduction

Magnetic resonance imaging (MRI) has become an indispensable diagnostic modality in modern medicine thanks to its non-invasive nature, absence of ionizing radiation, and superior soft-tissue contrast compared to other imaging techniques. It is widely used in the evaluation of neurologic, musculoskeletal, abdominal, and cardiovascular pathology. However, despite its many clinical advantages, MRI remains a psychologically challenging procedure for a subset of patients, primarily due to the confined bore of the scanner, loud acoustic noise, and sometimes prolonged exam duration.

A major psychological concern associated with MRI is claustrophobia: an excessive or irrational fear of enclosed spaces, which may be triggered or exacerbated by the experience inside a closed-bore MRI scanner. Such claustrophobic reactions can result in intense anxiety, panic, or physiological stress responses, compromising patient comfort, diagnostic compliance and image quality (Hudson, Heales & Meertens, 2022).

Evidence from large cohort studies indicates that claustrophobia is not a negligible problem. In a landmark study including more than 55,000 patients undergoing MRI, the incidence of claustrophobic reactions was reported — with higher risk among female and middle-aged patients, and with head-first (e.g. brain) examinations posing a greater risk. Notably, the study demonstrated that newer MR systems with reduced acoustic noise and shorter bore significantly lowered claustrophobia rates (0.7% vs 2.1% in conventional scanners) suggesting that both patient- and scanner-related factors contribute to claustrophobic reactions.

More recent reviews and analyses converge on the fact that the prevalence and impact of claustrophobia during MRI vary widely depending on scanner design, patient selection, and institutional practices. For example, an analysis of scan-completion data between 2019 and 2021 showed an overall rate of incomplete MRI examinations due to claustrophobia of approximately 0.76%, with higher likelihood when using "open scan" protocols or head-first positioning, particularly in females and patients aged 45–64 years.

Nevertheless, even milder forms of anxiety or claustrophobic discomfort — short of full scan termination — remain clinically relevant. These sub-threshold reactions may lead to patient distress, motion artifacts, longer scan times, repeated appointments, and increased workload or resource use for the radiology department. Several studies emphasize that in actual practice, between 1% and 15% of scheduled MRI examinations worldwide may involve patients who refuse or cannot complete the scan due to claustrophobia or request sedation, depending on equipment and pre-scan screening protocols.

Factors contributing to claustrophobia in MRI are multifactorial. Scanner design clearly plays a major role: closed, narrow-bore machines with high acoustic noise significantly increase the risk, while "open" or "short-bore + noise-reduction" systems reduce it substantially. Patient-related factors are also important: female gender, mid-age, previous negative MRI experiences, inherent anxiety traits, and the anatomical region to be scanned (e.g. head, spine) have all been associated with higher claustrophobia rates.

From an operational and public-health perspective, MRI-related claustrophobia can have significant implications: increased scan interruptions or cancellations, need for sedation or anesthesia, repeated appointments, extended waiting times, higher cost, and reduced patient satisfaction and access to diagnostics (Nguyen & Tahir, 2021).

In many low- and middle-income countries — including the context of Albania — data regarding the prevalence, severity, and management of claustrophobia in MRI are scarce or absent. This lack of local evidence limits the ability to adapt international best practices to the regional context, where resources, scanner types, patient education and staff training may differ, possibly amplifying the impact of claustrophobia on diagnostic yield and patient care.

Therefore, the present study aims to fill this gap by assessing the prevalence and severity of claustrophobic symptoms among patients undergoing MRI in a private tertiary diagnostic imaging center in Albania, and by evaluating how demographic factors, scan type and clinical management strategies relate to claustrophobic outcomes. The findings are expected to provide valuable local evidence and support development of protocols to improve patient comfort, compliance, and diagnostic quality during MRI examinations.

Literature Review

Claustrophobia during magnetic resonance imaging (MRI) has been widely recognized as a significant barrier to successful image acquisition and patient compliance. Several studies have investigated its prevalence, underlying factors, and consequences for radiological practice.

One of the largest cohort studies on MRI-related claustrophobia was conducted by Dewey, Schink, and Dewey (2007), who analyzed over 55,000 patients undergoing MRI examinations. They found that approximately 2% of patients experienced severe claustrophobia leading to scan termination or refusal. The study demonstrated that female gender, middle age, and head-first positioning were significant risk factors. Furthermore, the introduction of short-bore MRI systems led to a marked reduction in claustrophobic events compared to conventional scanners.

Supporting these findings, Enders et al. (2011) conducted the "CLAUSTRO" trial, a randomized controlled study assessing the impact of scanner design and noise reduction on claustrophobia. Their results showed that wide-bore and noise-reduced MRI systems significantly decreased the incidence of claustrophobia and improved patient compliance, especially in neuroimaging procedures. They also highlighted the importance of environmental and technical factors, such as lighting, ventilation, and communication, in reducing patient anxiety.

Beyond scanner design, psychological and demographic factors play an important role. Thorpe et al. (2019) reported that patients with pre-existing anxiety disorders or negative prior MRI experiences had a significantly higher risk of claustrophobic reactions. The authors emphasized that anticipatory anxiety often begins before the scan, stressing the importance of pre-procedural education

and reassurance. The anatomical region examined also influences the severity of claustrophobic reactions. According to Munn et al. (2015), brain and cervical spine MRI are associated with higher levels of claustrophobia, as patients must enter the scanner head-first, which increases the perception of confinement. They reported that lumbar spine and extremity MRI have significantly lower claustrophobia rates in comparison.

From a clinical management perspective, various strategies have been proposed. Hudson et al. (2022) highlighted that verbal reassurance, clear communication, and visual/audio distraction techniques (music, mirrors, two-way intercom) can significantly reduce mild to moderate claustrophobic symptoms. However, in severe cases, pharmacological sedation or general anesthesia may be required, which increases cost, complexity, and risk.

In terms of healthcare system impact, Nguyen and Tahir (2021) demonstrated that claustrophobia contributes significantly to scan inefficiency, increased appointment times, and higher operational costs. They estimated that MRI-related anxiety and motion contributed to substantial financial losses in large radiology departments due to repeat scans and wasted scanner time.

While international literature on MRI-related claustrophobia is growing, data from low- and middle-income countries remain scarce. No published studies have systematically evaluated the prevalence and severity of MRI-related claustrophobia in the Albanian population. This lack of regional data prevents the development of tailored strategies suited to local infrastructure, cultural perceptions, and healthcare organization.

Therefore, the present study aims to address this gap by providing original data on the prevalence and clinical characteristics of claustrophobia among MRI patients in Albania, and by comparing the findings with international experience described in the literature.

Methodology

Study Design and Setting

This was a cross-sectional observational study conducted between September and October 2025 in a private diagnostic imaging center located in Tirana, Albania. The study was carried out during routine clinical magnetic resonance imaging (MRI) examinations and aimed to evaluate claustrophobia and anxiety among patients undergoing MRI.

Study Population

A total of 75 consecutive adult patients scheduled for MRI examinations were included in the study. Patients were recruited regardless of the type of MRI examination or referral diagnosis. Patients under the age of 15 were excluded. The equipment used was a closed MRI, Siemens Magnetom Essenza 1.5T. Patients with severe cognitive impairment or acute psychiatric conditions preventing meaningful communication were excluded.

Data Collection Procedure

Data were collected using a structured, paper-based questionnaire completed immediately after the MRI examination. The questionnaire was administered with the assistance of radiology technologists to ensure clarity and correct interpretation of questions. The following variables were recorded for each participant:

- Age
- Gender
- Type of MRI examination
- Previous MRI experience (yes/no)
- Self-reported history of claustrophobia (yes/no/unsure)
- Presence of fear or anxiety before or during the MRI (yes/no/unsure)
- MRI completion status (completed without interruption / completed with pause / completed with sedation / not completed due to refusal)
- Post-examination subjective difficulty level using a numerical rating scale from 1 (no discomfort) to 10 (extreme discomfort)

All personal identifiers were excluded to maintain patient anonymity.

Classification of Claustrophobia Severity

Claustrophobia severity was evaluated using a subjective numeric difficulty scale (1–10) completed by the patient after the examination. Based on this scale, patients were categorized into the following severity groups:

Score	Level
1–2	Very mild
3–4	Mild
5–6	Moderate
7–8	Severe
9–10	Very severe

A difficulty score of ≥5 was considered to represent moderate-to-severe claustrophobic response.

Management of Claustrophobic Patients

Patients showing signs of anxiety or claustrophobia were managed using a stepwise approach:

- Verbal reassurance and explanation of the procedure
- Temporary scan interruption or short break
- Pharmacological anxiolysis or sedation when necessary
- Exam postponement or cancellation in cases of persistent refusal

The applied intervention for each patient was documented in the questionnaire.

Data Analysis

Data were entered and analyzed using Microsoft Excel. Descriptive statistical methods were applied, including calculation of frequencies, percentages, and mean values where appropriate. No inferential statistical modeling was performed, as the study was primarily descriptive in nature.

Ethical Considerations

The study was conducted in accordance with ethical principles for research involving human subjects. Patient anonymity was fully preserved and no identifiable data were collected. All participants provided verbal informed consent prior to participation in the questionnaire, and the study was conducted in compliance with institutional clinical practice policies.

Results

Demographic characteristics

A total of 75 patients undergoing diagnostic MRI examinations between April and October 2025 were included in this study. Of these, 40 were female (53.3%) and 35 were male (46.7%).

The age of participants ranged from 15 to 80 years. Patients underwent a variety of MRI examinations including brain, spine, abdomen, joints, pelvis, and pituitary imaging.

Prevalence of claustrophobic symptoms

Out of the total sample, 30 patients (40.0%) reported experiencing a subjective sense of fear or anxiety before or during the MRI examination.

A personal history of claustrophobia (self-declared) was present in 13 patients (17.3%), while the remaining 62 patients (82.7%) did not report a known history of claustrophobic disorder.

Severity of claustrophobia

The subjective level of discomfort was assessed using a numeric difficulty scale from 1 to 10. The distribution of severity was as follows:

Severity level	Score range	n	%
Very mild	1–2	15	20.0%
Mild	3–4	26	34.7%
Moderate	5–6	15	20.0%
Severe	7–8	12	16.0%
Very severe	9–10	6	8.0%
Total	—	75	100%

Overall, 33 patients (44.0%) experienced moderate to very severe discomfort (score ≥ 5).

Severity of claustrophobia
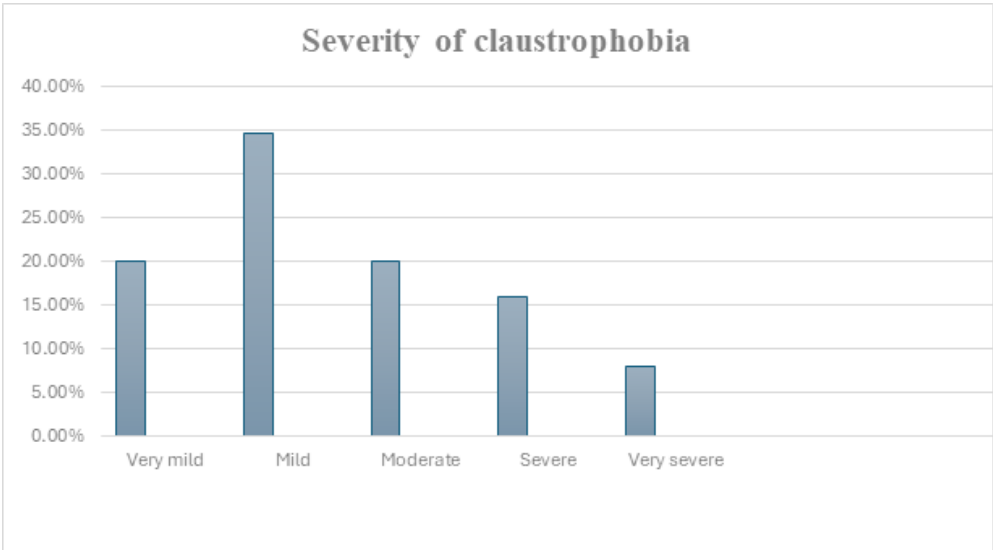
MRI completion and management strategies

Most of the examinations were completed successfully:

Outcome	n	%
Completed without interruption	62	82.7%
Required short pause	8	10.7%
Required sedation/anesthesia	3	4.0%
Refused to complete	2	2.6%
Total	75	100%
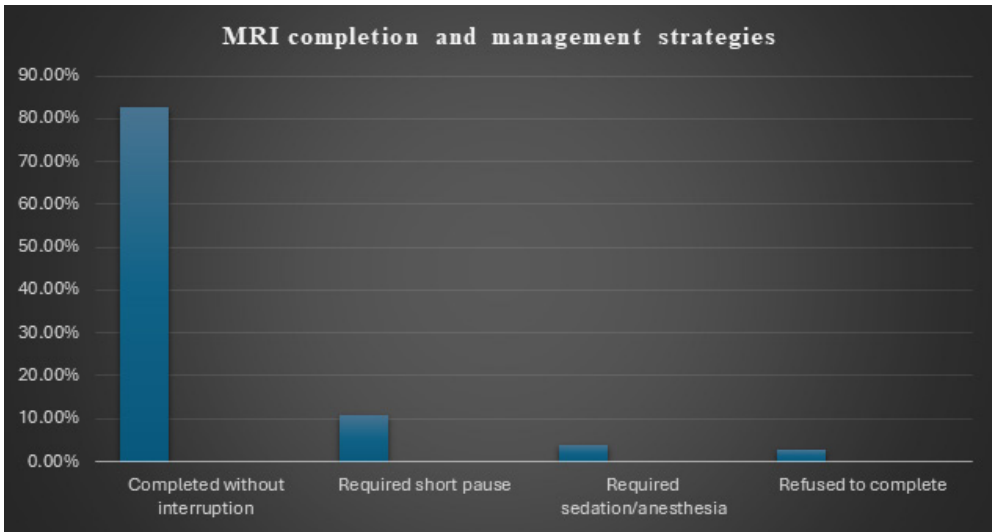
The rate of incomplete MRI examinations due to claustrophobia was therefore 2.6%. Patients requiring sedation or abandoning the examination had significantly higher discomfort scores (≥9), while patients who completed without interruption mostly reported mild or moderate discomfort.

Gender and claustrophobia

Claustrophobic fear was slightly more common among female patients, with 17 out of 40 females (42.5%) reporting fear, compared with 13 out of 35 males (37.1%).

Discussion

The present study evaluated the prevalence and severity of claustrophobic symptoms among patients undergoing MRI examinations in a private diagnostic imaging setting in Albania. To the best of our knowledge, this represents one of the first structured attempts to document MRI-related claustrophobia in the Albanian clinical context.

Our findings indicate that 40% of patients experienced some degree of fear or anxiety during MRI, while 44% reported moderate to very severe discomfort (score ≥5). This percentage is considerably higher than the rates of severe claustrophobic reactions reported in large international cohort studies, where scan termination or major claustrophobic events occur in approximately 1–3% of patients (Dewey et al., 2007). However, it is important to distinguish between clinically disabling claustrophobia leading to scan interruption and the broader concept of subjective distress during MRI, which includes mild to moderate anxiety that does not necessarily prevent scan completion.

Indeed, while a high proportion of patients in our cohort experienced discomfort, only 2.6% refused or were unable to complete the examination, which aligns closely with international data. For example, Dewey et al. (2007), in their cohort of over 55,000 patients, reported a claustrophobia-induced termination rate between 1% and 2%, depending on scanner type and patient positioning. Similarly, Enders et al. (2011) demonstrated that modern scanner designs significantly reduce severe claustrophobic reactions, but milder anxiety remains relatively common.

The relatively high prevalence of subjective discomfort in our population may reflect several factors. Firstly, public awareness and familiarity with MRI in Albania is still evolving, and many patients may undergo their first MRI examination with limited prior knowledge of the procedure. In our cohort, patients undergoing MRI for the first time showed a higher tendency toward anxiety and claustrophobic sensations, a finding consistent with previous studies showing that unfamiliarity with MRI contributes significantly to pre-scan anxiety (Thorpe et al., 2019).

Secondly, cultural and psychosocial factors may play a role. In some populations, anxiety related to medical procedures is exacerbated by lower levels of pre-procedural counseling, limited access to information, or negative experiences with other diagnostic methods. While our study did not formally measure health literacy or cultural attitudes, it is reasonable to hypothesize that these factors contributed to the relatively high levels of self-reported distress.

Another important finding of this study concerns the distribution of claustrophobia severity across different MRI examination types. Consistent with

the international literature, we observed that moderate to severe claustrophobia was more frequently associated with brain and cervical spine MRI compared with lumbar spine, abdominal, or peripheral joint imaging. This observation is in agreement with Munn et al. (2015), who showed that head-first positioning and the involvement of the head and neck region significantly increases the perception of confinement, which acts as a key trigger for claustrophobic reactions.

In contrast, examinations such as knee or shoulder MRI, where the patient's head remains outside or near the entrance of the scanner bore, were associated with lower levels of discomfort and anxiety. These findings underscore the importance of personalized patient preparation based on the type of MRI examination being performed.

From a gender perspective, female patients in our study reported slightly higher rates of claustrophobic fear compared to male patients. Although the difference was not extreme, this trend is consistent with previous research, which has repeatedly shown that women report higher levels of anxiety in medical settings, including MRI environments (Dewey et al., 2007; Hudson et al., 2022). Future studies with larger sample sizes and formal anxiety scales could further explore this aspect in the Albanian population.

An important clinical aspect highlighted by our study is the effectiveness of non-pharmacological interventions. The majority of patients who experienced anxiety were able to complete the scan with simple measures such as verbal reassurance, short pauses, or better communication with the MRI technologist. Only a small proportion of patients required sedation or were unable to complete the scan. This finding supports the recommendations of Enders et al. (2011) and Hudson et al. (2022), who emphasized that environmental adaptation, communication, and patient-centered care can significantly reduce the need for pharmacological anxiolysis or anesthesia.

However, the relatively high proportion of patients reporting moderate to very severe discomfort indicates that there is still room for improvement in patient preparation and support. Strategies such as providing brief educational materials before the examination, offering guided breathing or relaxation techniques, and allowing patients to see or familiarize themselves with the scanner before the procedure could potentially reduce anxiety levels even further.

From a health systems perspective, reducing MRI-related claustrophobia has important implications. Even when scans are completed, high anxiety levels can lead to motion artifacts, longer scan times, and reduced image quality, potentially necessitating repeat imaging. This results in increased costs for healthcare facilities and inconvenience for patients. Nguyen and Tahir (2021) demonstrated that patient anxiety and motion significantly contribute to inefficiencies and economic losses in MRI departments. Therefore, addressing claustrophobia is not only a matter of patient comfort but also of system efficiency and diagnostic quality.

This study has several limitations. First, the sample size is relatively small and limited to a single diagnostic center, which may limit the generalizability of the results to other settings in Albania. Second, claustrophobia and anxiety were assessed using a self-reported scale rather than standardized psychometric tools such as the State-Trait Anxiety Inventory (STAI). Third, certain variables such as previous psychiatric history or use of anxiolytic medication were not systematically recorded.

Despite these limitations, the present study provides novel and valuable data on MRI-related claustrophobia in an underrepresented population. It serves as a pilot investigation that could pave the way for larger, multicenter studies in the future, incorporating standardized psychological assessments and evaluating the impact of structured interventions aimed at reducing claustrophobia.

In conclusion, claustrophobia and anxiety during MRI examinations are common among patients in Albania, with a substantial proportion experiencing moderate to severe discomfort. Although most patients are able to complete the examination, targeted interventions focusing on patient education, communication, and environmental adaptation could significantly improve the overall MRI experience. These findings highlight the importance of integrating psychological considerations into routine radiological practice.

Conclusion

This study demonstrates that claustrophobia and anxiety during MRI examinations are frequent among patients in Albania, with a substantial proportion reporting moderate to severe levels of discomfort. Despite this, the rate of incomplete examinations caused by claustrophobia remains relatively low, indicating that appropriate staff intervention and patient support can effectively manage most cases.

The results emphasize the importance of integrating basic psychological support strategies into routine radiological practice, including clear communication, patient reassurance, and pre-examination education. Such measures may significantly reduce anxiety, improve patient cooperation, enhance image quality, and optimize the overall efficiency of MRI services.

Further multicenter studies with larger patient populations and standardized anxiety assessment tools are recommended to better characterize MRI-related claustrophobia in Albania and to develop evidence-based interventions tailored to local healthcare settings.

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