



Research Article

EFFECTIVENESS AND USAGE OF WRITTEN AND VERBAL COUNSELLING INFORMATION ON ANXIETY IN MRI AT A TERTIARY CARE HOSPITAL IN CHENNAI

Harish Kannapan¹, Subhashini^{2*}, Abhishri Lakshmi¹

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ABSTRACT

Background: Many people have considerable anxiety when having magnetic resonance imaging (MRI). Fear during an MRI causes the process to drag on longer and the quality of the images to decline, which increases expenses and requires labor loss. **Objective:** This study sought to determine how vocal and written information affected patients' anxiety during MRI procedures. **Materials and Methods:** A prospective cross-sectional study with 300 participants was conducted. The investigation occurred in March and April of 2022 at the tertiary care hospital's radiology department. Three participant groups were formed: group 1 received textual material, group 2 served as the control group, and so on; and group 3 learned about counseling. The State-Trait Anxiety Inventory (STAI), a measure of anxiety levels, was used to determine the people's traits and state of anxiety. **Results:** The three groups' trait anxiety scores did not significantly differ ($p = 0.20$) from each other's demographic features. Statistically speaking, group 3's state anxiety levels were lower than those of group 2 and the control group. Group 2's state anxiety levels were statistically lower ($p < 0.001$) than those of the control group. **Conclusion:** Verbal and written information can help to lessen MRI anxiety. Written information may not be as good at lowering MRI anxiety as verbal information.

INTRODUCTION

The greatest advancement in medicine during the past 25 years has been magnetic resonance imaging (MRI). As the use of magnetic resonance imaging for diagnostic purposes has increased, so too have the sensations of claustrophobia and anxiety in MRI patients [1]. Anxiety is a severe health problem because of its increased prevalence in recent years. Stress, a lack of focus and attention, trouble learning, a higher chance of

making mistakes in work and actions, a breakdown in interpersonal connections, and a decrease in work efficiency are all consequences of anxiety [2].

Anxiety hurts people's daily lives as well as their health because it raises the risk of a number of illnesses, including cardiovascular problems. Because of this, medical personnel

¹Department of Pathology, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India

²Department of Radiology, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India

***For Correspondence:** drsubha_path@rediffmail.com

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should take every precaution to keep patients free from stress and anxiety. According to research, between 10% and 70% of people in society suffer from an anxiety illness or its symptoms [3].

Being admitted to the hospital, going through diagnostic and therapeutic procedures, and being a patient can all have adverse side effects, such as stress, anxiety, and resentment. MRI procedures are another thing that makes patients anxious. Anxiety in patients is known to be brought on by loud noise, pain phobia, the feeling of losing control, a lengthy examination, and the confined atmosphere of the MR tunnel [4]. One of the most crucial diagnostic methods in several medical specialties nowadays is magnetic resonance imaging or MRI. Numerous studies have revealed that 5–10% of patients are unable to complete an MRI because of claustrophobia, and 37% of patients, even those who claim they are not claustrophobic, experience considerable anxiety before their scan [5].

Patients feel "buried alive" or "abandoned," which prevents them from cooperating effectively. As a result, movement-induced artifacts degrade image quality and increase processing time. Many strategies can help lower anxiety during an MRI, including lying prone rather than supine, sedation, practicing with an MRI simulator beforehand, information, and relaxation techniques. Despite the benefits of all three techniques, brain or spinal imaging may not be appropriate when under sedation or lying prone [6]. The study determined how patients' anxiety levels during MRI procedures were influenced by spoken and written information.

Contributions

- The present work identifies and attempts to address the prevalent issue of heightened anxiety experienced by individuals undergoing MRI procedures.
- We gathered details with a sample size of 300 participants to enhance the robustness of its findings by providing a comprehensive representation of persons having MRI.
- The research employs a systematic approach by categorizing individuals into control, written information, and verbal counselling groups to evaluate the effects of various ways of information delivery.
- The research design entails the methodical gathering of data at a certain moment, which improves the dependability of its outcomes.

MATERIALS AND METHODS

Research Design and Population

The study was conducted in the tertiary care hospital's radiology department between March 2022 and May 2022. Before participating in the trial, all subjects who met the inclusion criteria had to sign a written consent form.

Patients included in the study were those who had their first MRI. The following were the criteria for study inclusion: (i) being older than eighteen, (ii) undergoing an MRI for the first time, and (iii) receiving an MRI of the abdomen and torso.

Conversely, the disqualification standards were: (i) suffering from neurological and mental conditions that impair cognitive abilities, (ii) possessing an anxiety disorder, (iii) usage of sedative drugs or substances, (iv) experiencing claustrophobia, (v) Lack of literacy and (vi) undergoing MRI before [7].

Choice and Sample Dimensions

Patients scheduled for MRIs at the university hospital comprised the study's population.

The formula ($n = t^2 p q/d^2$) was used to determine the appropriate sample size for the investigation. Since anxiety was found to constitute 30% of the population during MRIs, 300 persons were the estimated sample size. There were three participant groups intended for the study. Group 1 (control group), Group 2 (the group given textual material regarding MRI), and Group 3 were the study's intended groupings (Group with verbal counselling Information about MRI). It was designed for each group to have at least 100 participants, considering the sample size. The study included participants who requested an MRI and received an appointment date. The study did not accept any individuals who did not have an appointment. As a result, we had 300 volunteers overall and 100 patients in each group. Randomly assigned groups were created from among the participants.

When participants in Group 1 were informed of the study's goal, they completed the State Anxiety Inventory (SAI) and Trait Anxiety Inventory (TAI) in addition to a demographic questionnaire. Written MRI informational pamphlets were created for group 2 participants.

Written pamphlets were given to each member of Group 2 following their initial notification of the study. The participants were expected to read the pamphlets. After distributing the

pamphlets, each participant was asked to complete the study's sociodemographic, SAI, and TAI questionnaires. Group 3 participants received visual counseling material that was identical in content to the written information form. Group 3 participants were made aware of the study.

Following the verbal counseling session, the participants were given questionnaires (sociodemographic, SAI, and TAI forms). Six individuals who provided erroneous or incomplete answers to the questionnaires at the end of the data collection process were excluded from the research. Three groups of 294 participants, group 1 (n = 97), group 2 (n = 100), and group 3 (n = 97), were enrolled and given textual information about MRIs. Before the MRI, each of these procedures was finished in the waiting room.

Data Gathering

Researchers used the State-Trait Anxiety Inventory (STAI) and a systematic survey developed after we evaluated the literature to gather research data. Each participant received forms for the State-Trait Anxiety Inventory (STAI) and demographic information (sex, age, marital status, and education level). Each subdivision's score can range from 20 to 80, and higher numbers indicate greater worry. All participants completed the STAI form in English, the language of the region. In its initial research, STAI demonstrated validity and reliability [8]

Counseling

Information Method

Clinical personnel provided all patients with the standard radiology clinic information protocol before their MRI. Except for the regular radiology clinic procedure, written pamphlets, and verbal counseling sessions were created to inform the attendees.

The textual information booklet and the verbal counseling session shared similar educational information. This included details regarding the MRI, safety measures to be taken, how long it would take, what the staff did throughout the procedure, whether any discomfort was involved, and whether sound would be present in both cases. The same researcher provided the information for the study, and it was composed of the same messages for both information methods:

- The MRI method is safe and painless; the patient is in a small tunnel.

- Officials are standing outside, observing the patients.
- Although there will be noise during the process, this is a normal sound during an MRI.
- MRIs take roughly 20 minutes.

Statistical Analysis

The IBM SPSS 22 statistics software application was used to evaluate the data statistically. The Shapiro-Wilk test was employed to search for indications of a normal distribution in the data. The descriptive statistics of the data were presented as mean $\pm$ standard deviation for continuous variables that were normally distributed, as for variables that were not normally distributed, and as a percentage (n (%)) for categorical variables. When comparing more than two independent groups, the Kruskal Wallis and Dunn tests were utilized for post-hoc analysis, and the LSD and One-Way ANOVA test was used for normally distributed continuous data.

The Pearson chi-square test was employed to examine the category data. $\alpha = 0.05$ is the significance level. The significance of the statistical values in the tables is shown by bolding them.

RESULTS

In the study, 294 patients were involved. Group 2 comprised one hundred patients who received written information, Group 3 had 97 patients who received verbal information, and Group 1 included 97 control patients.

The average age of the study participants was 42.99 ± 3.44 years. Men comprised 49.3% (n = 49.3) of the participants, while women comprised 50.7% (n = 149). Regarding age, education level, marital status, gender, and chronic illness status, there was no statistically significant variation in the demographic characteristics between the three groups (Table 1). This table presents a detailed breakdown of patients' sociodemographic characteristics in three study groups (Group 1, Group 2, and Group 3) undergoing MRI.

The information includes age distribution, gender representation, marital status, income levels, educational background, and the presence of long-term illness. Statistical tests, such as Kruskal Wallis and Pearson Chi-square, were applied to analyze the significance of differences among groups, providing valuable insights into the demographic composition of the study participants.

Table 1: Overview of patients' sociodemographic characteristics across study groups

	Group 1 n (%)	Group 2 n (%)	Group 3n (%)	Total N (%)	P Value
Age	40.00(21-75)	41.00(18-70)	40.00(18-75)	42.00(18-75)	KW: p=0.52*
Male	4 (32.47)	5 (35.21)	4 (32.47)	14(49.35)	41.00(18-70)
Female	5 (33.60)	4(32.99)	5(33.60)	14(50.79)	
Marital Status					
Married	8(35.03)	8(35.03)	7(30.01)	23(80.67)	χ^2 :5.30p
Single/divorced	1(24.64)	1(29.87)	2(45.66)	57(19.4)	=0.07
Income Level					
Sufficient	7(31.09)	9(36.12)	8(32.94)	25(86.75)	
Insufficient	1(42.92)	5(17.9)	1(39.31)	28(9.5)	
Education					
Good	6(54.5)	3(27.3)	2(18.2)	11(3.7)	
Elementary School	4(35.24)	4(35.24)	3(29.67)	12(42.55)	
Highschool	5(31.43)	5(33.16)	6(35.50)	95(32.3)	
College	28	23	23	74(25.3)	
Long-term Illness					
Have	4(33.90)	4(33.90)	3(32.28)	11(40.18)	
Have not	5(32.47)	6(34.10)	5(33.59)	17(59.96)	

n: number, %: percent, * Kruskal Wallis test statistic (KW), **Pearson Chi-square test statistic (χ^2)

Each research participant's trait anxiety states were evaluated. The following were the participants' trait anxiety scores: group 1 scored 42.63 7.87, group 2 scored 44.466.89, and group 3 scored 44.077.70. The subjects' trait anxiety scores in the three groups did not differ statistically significantly (p=0.20) (Table 2).

Table 2: Comparison of trait anxiety scores among study groups and Analysis of Variance (ANOVA) results

Groups	p Value *	p Value**
Group1 (n= 97)		F=1.071–2:0.09***
Group2 (n=100)	F=1.61 p=0.20	F=1.081–3:0.18***
Group3 (n=97)		F=1.073–3:0.74***

*Multiple comparison *p*-value, ** binary comparison *p*-value, ***ANOVA test statistic for one way

Each participant's anxiety was assessed both before and after the case group received spoken or written materials, and after the control group received no information at all. Group 1 had a state anxiety score of 56.00 (30.0-74.0), group 2 had a score of 44.00 (30.0-62.0), and group 3 had a score of 34.00 (20.0-60.07), respectively. The state anxiety score varied statistically significantly (p<0.001) throughout the three participant groups. Participants who received written and verbal information had lower state anxiety scores than those who did not (p< 0.001). Individuals who received verbal information reported lower

levels of state anxiety than participants who received written information (Table 3).

Table 3: Comparative analysis of anxiety levels among participants in different study groups using the Kruskal-Wallis Test and multiple comparison results

Groups	p Value *	p Value**
Group 1	-	KW:6.021–2:<0.001***
Group 2	KW:105.27 p<0.001***	KW:12.181–3:<0.001***
Group 3	-	KW:5.792–3:<0.001***

*Multiple comparison *p*-value, **Binary comparison *p*-value, *** Kruskal-Wallis test statistic

DISCUSSION

The primary objective of this study was to investigate the impact of textual and verbal information on anxiety levels during Magnetic Resonance Imaging (MRI) procedures. By utilizing the State Anxiety Inventory (SAI) to measure anxiety, participants were categorized into study groups, each receiving specific information interventions, while a control group remained uninformed. However, the discussion in the original text lacked clear subsections, making it challenging to follow key points. We have restructured the discussion to provide a clearer flow, breaking down each aspect into sections related to objectives and results.

Anxiety in Medical Procedures

Previous studies have highlighted the association between anxiety during medical procedures, such as MRI and Brain Testing (BT), and undesirable outcomes like movement artifacts and compromised processing efficiency (Hollenhorst et al., 2001). The prolonged and frequent operation of MRI procedures can lead to diminished diagnostic efficacy and degraded image quality, impacting overall efficiency and resource utilization (Nguyen et al., 2020). Therefore, our interventions aimed to alleviate anxiety during MRI procedures [9, 10].

Impact of Textual Information on Anxiety

Our findings indicate that providing patients with both verbal and written information significantly reduced anxiety levels during MRIs. This aligns with earlier studies where informational booklets distributed before MRI procedures demonstrated decreased anxiety levels (Kutluturkan et al., 2010). This is consistent with independent trials in gastroscopy, where written information proved effective in reducing anxiety compared to a control group [11].

Impact of Verbal Information on Anxiety

In parallel, our study delved into the impact of verbal information on anxiety levels. Two distinct studies, Acay et al. (2017) and Tazegul et al. (2015), demonstrated that verbal information significantly decreased anxiety during MRI procedures. Our results align with their findings, showing that the verbal information group exhibited substantially lower SAI ratings than the control group [12, 13].

Comparative effectiveness of verbal and written information

Contrary to our expectations, our study found that the group receiving verbal information demonstrated statistically lower state anxiety levels than the group receiving written information. This observation contrasts with existing literature, suggesting that verbal information may be more effective in reducing anxiety during MRI procedures.

Holistic Approach: Combining Verbal and Written Information

A unique aspect of our study is the combination of verbal and written information, aiming to provide a holistic understanding. While existing literature has explored the impact of specific cues, our study contributes by comprehensively integrating both modalities to address anxiety reduction during MRI procedures.

Clinical Implications

The clinical implications of our findings extend to enhancing patient experience and optimizing resource utilization in healthcare settings. Effective communication strategies encompassing verbal and written information could contribute to a more positive patient experience during MRI procedures. This not only improves patient well-being but also holds the potential to enhance the efficiency of MRI operations.

Limitations

However, it is crucial to acknowledge the limitations of our study. The specific context of a tertiary care hospital in Chennai may limit the generalizability of our findings to diverse populations and healthcare settings. Additionally, while our study considered the combined impact of verbal and written information, we did not explore potential interactions between various demographic factors and anxiety levels, which could influence the effectiveness of interventions.

Future Directions

Future research could address these limitations by exploring diverse populations and healthcare settings to generalize our findings further. Investigating potential correlations between demographic factors and anxiety levels during MRI procedures would provide valuable insights into the personalized effectiveness of information interventions. Moreover, exploring additional measures beyond the State Anxiety Inventory (SAI) could enhance the robustness of anxiety assessments, considering the multifaceted nature of anxiety.

In summary, our study sheds light on the nuanced effectiveness of verbal and written information in alleviating anxiety during MRIs. By discussing each objective and result distinctly, we aim to clarify and facilitate a more comprehensive understanding of our study's implications for clinical practice and future research. Through a clearer presentation, our discussion underscores the significance of effective communication strategies in improving patient outcomes during medical procedures.

CONCLUSIONS

In conclusion, the findings of our research, which had a sample size of 294 participants, demonstrate that the utilization of written and vocal information may be a practical approach to reducing anxiety experienced by individuals through MRI treatments. Notably, spoken counselling has been seen to have a

greater effect in reducing pre-MRI anxiety as compared to the provision of written information. The similarity in demographic attributes among the three groups enhances the reliability and validity of our research outcomes. The implementation of these cost-effective information approaches has the potential to optimize the efficiency of MRI processes, hence reducing manpower loss and decreasing the related financial burdens. This highlights the need to integrate patient education initiatives, including verbal counselling, in order to enhance the overall MRI experience and enhance the utilization of healthcare resources. The short period of the experiment may have prevented it from capturing long-term impacts. Specific characteristics and medical institutions may restrict generalizability. Further studies might delve into the examination of individualized anxiety-reducing methodologies and the integration of technology to improve patient comfort during MRI operations.

FINANCIAL ASSISTANCE

Nil

CONFLICT OF INTEREST

The authors declare no conflict of interest

AUTHOR CONTRIBUTION

All the authors contributed to conceptualizing the manuscript. Subhashini wrote the first draft of the manuscript. Harish Kannapan edited the manuscript and analyzed the data. Abhishri Lakshmi collected the data. All the authors edited and approved the final draft of the manuscript.

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