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Educating Patients and the Community on Overcoming Anxiety During MRI (*Magnetic Resonance Imaging*) Examinations at the Radiology Department of RSI.Siti Rahmah

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***Abstract*:** *Magnetic Resonance Imaging (MRI) examinations often cause significant anxiety in patients due to unfamiliar surroundings, loud noises, confined spaces, and a lack of understanding about the procedure. This anxiety can trigger uncontrolled movement during the scan, which affects image quality and causes artifacts. This Community Service Activity (PKM) aims to educate patients, the community, and radiographers on techniques for managing anxiety before and during MRI examinations. Participatory methods through counseling, interactive discussions, and relaxation technique simulations were implemented at the Radiology Installation of RSI Siti Rahmah Padang. Evaluation using pre-tests and post-tests on 15 radiographers showed an increase in average understanding from 45% to 85% (a 40% increase). A satisfaction survey of 25 participants (radiographers, patients, and companions) showed that an average of 94.5% of respondents were satisfied with the material, methods, and benefits of the activity. These results confirm the effectiveness of interactive education in improving the competence of radiographers and the psychological readiness of patients, which ultimately contributes to improving the quality of radiology services based on patient-centered care.*
Keywords: MRI, Patient Anxiety, Radiology

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INTRODUCTION

Magnetic Resonance Imaging (MRI) is one of the most advanced medical imaging modalities widely used in diagnosing various soft tissue disorders in detail and non-invasively. However, despite its high diagnostic accuracy, the MRI procedure often causes anxiety in patients. Factors such as the enclosed examination room environment, loud machine noise, the relatively long examination time, and patients' lack of knowledge about the procedure are the main triggers for anxiety. This condition not only disrupts patient comfort but can also affect the quality of imaging results due to uncontrolled body movement during the scanning process.

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Studies show that anxiety levels in patients who have never undergone an MRI are high, and even cause some patients to cancel their examinations. This situation poses a challenge for radiographers in radiology departments, particularly in creating a conducive and optimal examination environment.

Based on initial observations and interviews at the Radiology Department of RSI. Siti Rahmah Padang, it was found that some patients feel afraid and anxious when undergoing an MRI examination. In fact, there have been cases of patients stopping the examination process because they felt unable to stay in the MRI room. On the other hand, radiographers as the examination officers do not yet have a structured communication and education strategy to help patients manage their anxiety. A preliminary evaluation through a pre-test of 15 radiographers showed that the average level of understanding of techniques for managing MRI patient anxiety was only 45%.

This Community Service Activity (PKM) is unique because it specifically focuses on empowering radiographers and directly educating patients and the community on how to manage anxiety before and during MRI examinations. The activity was carried out through interactive education methods in the form of counseling, discussions, and practical application of simple techniques for overcoming anxiety. Post-activity evaluation results showed a significant increase in understanding, with an average post-test score of 85%, reflecting a 40% increase in radiographers' knowledge of anxiety management techniques. In addition, a post-activity satisfaction survey revealed that 90% of radiographer participants felt more confident in handling patients experiencing anxiety.

This activity not only benefited patients but also increased the professional capacity of radiographers in providing more humane and communicative services.

This paper aims to document the implementation of community service activities related to anxiety management education in MRI examinations. In addition, this paper also aims to provide an overview of the impact of education on patients' emotional readiness and the important role of radiographers in creating a more comfortable and quality examination experience. Hopefully, this activity can be a model or reference for implementing similar education in other health facilities that provide MRI services.

METHODOLOGY

This community service activity was carried out using a participatory educational approach, which involved the active participation of participants (radiographers, patients, and the community) in the counseling process and interactive discussions. This method was chosen because it was believed to be able to encourage changes in understanding and behavior directly through reflective and applicable learning experiences.

The activity was held on Tuesday, March 5, 2024, from 10:00 a.m. to 12:00 p.m. Western Indonesian Time, at the Radiology Unit of RSI. Siti Rahmah Padang. This activity involved 15 radiographers working at the Radiology Unit of RSI. Siti Rahmah, as well as 10 patients and their companions who were present on the day of the activity. A total of 25 people participated in the event.

The PKM activity was carried out in the following stages:

1. Presentation of Material
   The resource person gave a presentation on the importance of managing anxiety in MRI patients, the factors that cause anxiety, and its impact on examination results.
2. Interactive Discussion and Question and Answer Session
   Participants were given the opportunity to share their experiences, obstacles, and questions related to patient anxiety during MRI examinations.
3. Simulation of Anxiety Management Techniques

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Radiographers were given examples of simple techniques such as deep breathing, supportive communication, and the use of soothing verbal instructions.

Evaluation Tools To measure the effectiveness of the activity, the following evaluation instruments were used:

1. Pre-test and Post-test
   A knowledge questionnaire containing 10 multiple-choice questions about communication techniques and anxiety management for MRI patients was given to radiographers before and after the activity. The aim was to measure the increase in understanding.
2. Satisfaction Survey
   A feedback form using a 1–5 Likert scale is given to all participants (radiographers, patients, and companions) to assess the quality of the material, delivery methods, and benefits of the activity.
3. Qualitative Documentation
   Reflections and responses from participants during discussions are recorded to complement the quantitative data.

RESULTS AND DISCUSSION

These community service activities were attended by 15 radiographers and 10 patients and their companions, for a total of 25 participants. The activities were evaluated to measure the improvement in the radiographers' understanding and to assess the overall satisfaction of the participants.

Evaluation Results

1. Pre-test and Post-test Results of Radiographers' Knowledge To measure the effectiveness of the education, pre-tests and post-tests were conducted using the same knowledge questionnaire containing 10 questions. The results are presented in Table 1.

Table 1. Comparison of Pre-test and Post-test Average Scores for Radiographer Knowledge (n=15)

Assessment Aspects	Pre-test Average Score	Post-test Average Score	Improvement
Empathetic Communication Techniques	40%	87%	47%
Causes of Anxiety MRI	50%	88%	38%
Strategies for Calming Patients	45%	80%	35%
Overall Average	45%	85%	40%

The data in Table 1 shows a significant increase in understanding in all aspects measured. The highest increase occurred in understanding empathetic communication techniques.

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2. Participant Satisfaction Survey Results

A satisfaction survey using a Likert scale (1-5) was given to all participants (n=25) to assess the quality of the activities. The results are summarized in Table 2.

Table 2. Participant Satisfaction Survey Results (% of Participants Who Agreed/Strongly Agreed)

Statement	Radiographers (n=15)	Patients & Companions (n=10)	Overall Average
The material presented was easy to understand	100%	90%	96%
The delivery method was interesting and interactive.	93%	90%	92%
I feel more confident about undergoing an MRI scan	90%	100%	94%
This activity was useful for improving radiology services.	100%	90%	96%

The satisfaction survey revealed that most participants responded very positively to all aspects of the activity.

The Effectiveness of Education in Improving Radiographers' Knowledge

According to (Ahlander et al., 2016), factors causing anxiety during MRI include loud machine noise, cramped examination rooms, long examination times, and patients' lack of knowledge about the process they are about to undergo. This anxiety can have a direct impact on the patient's physiological condition, such as increased heart rate, rapid breathing, and muscle tension, which causes the patient to be unable to remain still during the examination.

The finding of a 40% overall increase in post-test scores (Table 1) proves that structured educational interventions significantly improve radiographers' knowledge. These results are consistent with previous studies. (Tugwell, J. R., & Goulden, 2019) which states that structured communication training significantly improves radiographers' knowledge and skills in providing psychological support, with an average knowledge score increase of 35%. The highest increase in empathetic communication techniques (47%) indicates that this aspect is a major skill gap that was previously not adequately addressed in routine radiographer training. These findings are reinforced by (Munn, Z., & Jordan, 2013) which in its systematic review concluded that empathetic communication from radiology staff is a key factor in shaping a positive patient experience.

Educational Intervention as an Effort to Reduce Anxiety Providing education prior to examination is one effective method for reducing patient anxiety. In this activity, educational-participatory counseling was conducted with the aim of equipping patients and radiographers with strategies to reduce anxiety through empathetic communication and verbal education. The education included explanations of the

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MRI procedure, the time required, the sensations that patients might experience during the examination, and the importance of remaining calm and still. Research conducted by (George et al., 2018) states that pre-procedural education can significantly reduce MRI patient anxiety levels and increase compliance with instructions during examinations. Education also helps patients feel more involved and in control of the situation, which is key to anxiety management. The highest increase in empathetic communication techniques (47%) indicates that this aspect is a major need that may have been overlooked in routine radiographer training.

The Impact of Education on Self-Confidence and Participant Satisfaction

The high percentage of participant satisfaction, especially regarding statements about increased self-confidence (94% on average, Table 2), is an indicator of the success of the activity not only in the cognitive realm but also in the affective realm. For radiographers, this increase in confidence is crucial because it reduces the anxiety they feel when dealing with stressed patients, enabling them to communicate more effectively.

In this activity, radiographers are also taught simple techniques such as allowing time for adaptation, guiding patients with a soothing tone of voice, and using positive instructions that can motivate patients. Radiographers, as practitioners, play an important role in bridging communication between the technology system and patient comfort. As emphasized by (Scaglione, 2014), Radiographers are not only technical operators, but also facilitators of communication between technology and humans.

Meanwhile, for patients and their companions, this education successfully reduced fear of the unknown, which is a major trigger of anxiety as identified by (Ericsson, E., Ahlander, B.-M., & Engvall, 2020). By understanding simple relaxation procedures and techniques, patients feel more in control of the situation, which ultimately reduces their anxiety. These findings are consistent with studies described by (Carlsson & Carlsson, 2013) which found that supportive interaction from radiographers is a major contributing factor in helping patients undergo MRI examinations. This is in line with research (Tornqvist, E., Månsson, Å., Larsson, E. M., & Hallström, 2006) which proves that providing comprehensive written information prior to MRI significantly reduces anxiety and motion artifacts in patients.

Implications for Radiology Services

The results of this activity reinforce the evidence that investment in soft skills training for radiographers should not be considered secondary. The integration of therapeutic communication and patient anxiety management materials into the education and continuing training curriculum for radiographers is a must. As stated by most radiographers in the discussion, they previously focused more on technical aspects, but now realize that a humanistic approach is an integral part of quality radiology services. When patient anxiety is successfully managed, patients become more cooperative, which directly impacts the reduction of motion artifacts and improvement in image quality, as stated by (Nuraini et al., 2017).

Research (Eshed, I., Althoff, C. E., Hamm, B., & Hermann, 2007) providing empirical evidence by showing that interventions to reduce anxiety can decrease the rate of premature termination of MRI examinations. This directly results in a reduction in motion artifacts and an improvement in image quality and time efficiency, as stated by (Eshed, I., Althoff, C. E., Hamm, B., & Hermann, 2007) in his review. In addition, a study by (Ayyıldız, S., & Kaya, 2021) found that educational interventions in the form of informational videos prior to MRI not only significantly reduced anxiety and symptoms of

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claustrophobia, but also increased overall patient satisfaction with the service, reflecting the findings of the satisfaction survey in this activity. Support also came from the local context, where research (Zaiton, A., & Sari, 2020) in Indonesia shows that audiovisual education effectively reduces the anxiety levels of MRI patients, confirming that similar educational approaches can be adapted and widely implemented in national health facilities.

CONCLUSION

Based on the results of the evaluation that has been conducted, it can be concluded that the community service activity themed "Education on Overcoming Anxiety in Patients and the Community during MRI Examinations at the Radiology Department of RSI. Siti Rahmah Padang" has successfully achieved its objectives. This activity significantly increased radiographers' knowledge in managing MRI patient anxiety by 40%, as evidenced by an increase in the average post-test score to 85% compared to the pre-test score of 45%. Additionally, participant feedback indicated a very high level of satisfaction, with an average of 94.5% for aspects such as ease of understanding the material, quality of delivery methods, increased confidence, and the benefits of the activity for radiology services.

The interactive education provided proved effective not only in improving radiographers' cognitive competence but also in building their confidence and that of their patients. These findings confirm that an empathetic communication approach and pre-procedural education are key components in creating a more humane MRI examination experience and reducing technical barriers such as motion artifacts.

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