INVESTIGATING MRI INTERPRETATION DISCREPANCIES: A QUALITATIVE STUDY WITH THE PUBLIC

[1]Nilesh Kumar*

[1]Assistant Professor, Narayana Paramedical College, India.

Corresponding Author: Nilesh Kumar

ABSTRACT

Introduction: MRI, a pivotal diagnostic tool, faces persistent misconceptions, hindering medical care. This study delves into these misunderstandings, aiming to bridge the gap between public understanding and MRI technology, empowering patients and enhancing MRI procedures. **Objective:** To explore prevalent misconceptions about MRI, understand patient perspectives, and propose strategies for improved communication and patient education. **Methods and Materials:** A qualitative inquiry was conducted among paramedical students, utilizing a validated survey to assess MRI knowledge and perceptions. Data analysis involved descriptive statistics and visual representations. **Results:** 148 participants (mean age 30) showed varying levels of MRI knowledge. Common misconceptions included fear of the unknown and confusion about MRI safety. **Discussion:** Discrepancies in MRI interpretation can impact patient care. Understanding patient perspectives and enhancing communication is crucial for improving MRI experiences. **Conclusion:** Increased awareness and education can empower patients, improve communication, and enhance overall MRI experience. Future research should focus on targeted interventions and education initiatives.

Keyword: MRI, Misconceptions, Patient perspectives, Communication, Education, Healthcare.

Article Received: April-30, 2024	Acceptance: May-24, 2024	Published: June-20, 2024

INTRODUCTION

MRI, a pivotal diagnostic tool in modem clinical medicine, generates detailed anatomical images using radio waves and magnetism based on Nuclear Magnetic Resonance principles. Despite its proven efficacy since its introduction in 1997, misconceptions about MRI equipment persist, leading to anxiety and hindrances in seeking medical care. This qualitative inquiry delves into the prevalent misunderstandings surrounding MRI technology, aiming to uncover the underlying causes of these misconceptions. By exploring beliefs, concerns, and experiences through interviews and qualitative analysis, this study seeks to bridge the gap between public understanding and the genuine essence of MRI technology. Through increased awareness and education, the goal is to empower patients with accurate information, dispel unwarranted fears, and facilitate informed decision-making during MRI procedures. Improved communication between healthcare providers and patients can enhance patient comfort, safety, and overall experience with MRI examinations.

Magnetic Resonance Imaging (MRI) has revolutionized diagnostic imaging by providing detailed, non-invasive images of internal organs and tissues. Its widespread use has significantly impacted clinical decision-making, treatment planning, and patient outcomes. However, despite its advantages, discrepancies in MRI interpretation can occur, potentially leading to diagnostic errors and uncertainties in patient management [1]. Discrepancies in MRI interpretation can have profound implications for patient care. Misinterpretation of MRI findings may result in incorrect diagnoses, delayed treatments, or unnecessary interventions, leading to patient harm and increased healthcare costs [2]. MRI

interpretation requires specialized training and expertise due to the complexity of imaging techniques and the variability of anatomical structures. Factors such as image artifacts, motion artifacts, and variations in image quality can contribute to interpretation discrepancies among radiologists and other healthcare professionals [3].

While much attention has been focused on technical aspects of MRI interpretation, there is a growing recognition of the importance of understanding patient perspectives. Patients' comprehension of MRI results, their trust in healthcare providers, and their ability to interpret medical information can influence how they perceive and respond to discrepancies in MRI findings [4]. Health literacy plays a significant role in patients' understanding of MRI results and their ability to navigate healthcare decisions. Patients with limited health literacy may struggle to comprehend complex medical terminology, leading to misunderstandings or misinterpretations of MRI findings [5].

OBJECTIVES: This qualitative study seeks to understand the general population's perspectives on MRI interpretation, including how patients and non-specialists perceive MRI results, the impact of interpretation discrepancies on patient trust and healthcare decisions, and the role of health literacy in understanding MRI findings and communicating with healthcare providers.

METHODS AND METHODOLOGY

A prospective research project was carried out among paramedical students, where a validated survey comprising 18 questions was distributed to evaluate their understanding and views on Magnetic Resonance Imaging (MRI). Out of 230 participants, 148 participants completed the questionnaire. The study specifically targeted paramedical students, excluding those from other programs or departments. The questionnaire was structured into three parts: demographic details, multiple-choice queries related to MRI knowledge, and an assessment of participants' perceptions. Prior to participation, participants were briefed about the study's objectives, and their anonymity was maintained during the survey process. The gathered data underwent analysis using Microsoft Excel. Descriptive statistics were employed to scrutinize both the demographic data and participants' responses across various sections of the questionnaire. Microsoft Excel's charting functionalities were leveraged to generate visual representations of significant findings, thereby improving the clarity and comprehensibility of the results.

RESULT

A study was conducted among paramedical students, focusing on their socio-demographic characteristics, knowledge about MRI, and perceptions regarding MRI safety and patient demographics' associations with MRI knowledge and safety perception. The study included 148 participants (99 males, 49 female) (Fig-I) with a mean age of 30 years.

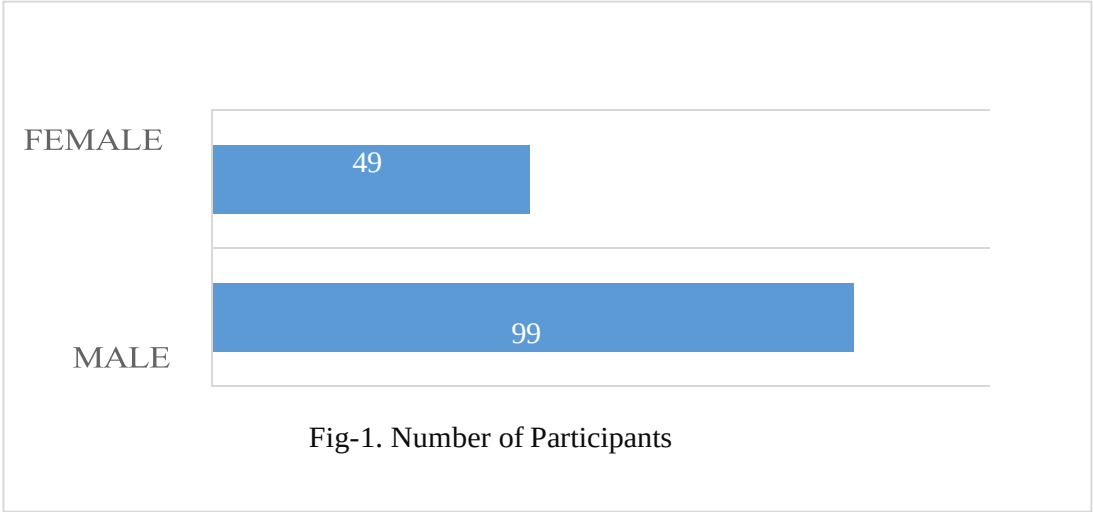

Fig-1. Number of Participants

Majority of participants (94%) were in the 28-34 age group. Regarding MRI knowledge, 85 participants had excellent knowledge, 15 had good knowledge, 30 had insufficient knowledge, and 18 had poor knowledge. Most participants correctly understood MRI's purpose in creating detailed internal body images (92.1%). Advantages of MRI over other modalities were recognized, with better soft tissue resolution being the most acknowledged benefit (72%). Common misconceptions included fear of the unknown (66%) and confusion about MRI- friendly metals, such as titanium (23.4%). Participants were aware of claustrophobia risks (72.3%) but showed varied understanding regarding MRI safety for pregnant women, ionizing radiation use, and MRI invasiveness. Coping strategies during MRI scans, particularly for children, included music (25.6%) and sleeping (48.24%).

DISCUSSION

The discussion begins with acknowledging MRI's critical role in modem clinical medicine. It highlights how MRI generates detailed anatomical images using radio waves and magnetism based on Nuclear Magnetic Resonance principles. Despite its efficacy since its introduction in 1997, misconceptions about MRI equipment persist, leading to anxiety and hindrances in seeking medical care. The study delves into the prevalent misunderstandings surrounding MRI technology, aiming to uncover the underlying causes of these misconceptions. It explores beliefs, concerns, and experiences through interviews and qualitative analysis, aiming to bridge the gap between public understanding and the genuine essence of MRI technology. Discrepancies in MRI interpretation can have profound implications for patient care, leading to incorrect diagnoses, delayed treatments, or unnecessary interventions [6-7]. The discussion emphasizes the need for specialized training and expertise in MRI interpretation due to the complexity of imaging techniques and anatomical variations. Understanding patient perspectives is crucial in MRI interpretation. Patients' comprehension of MRI results, trust in healthcare providers, and health literacy influence how they perceive and respond to discrepancies in MRI findings [8-9]. Limited health literacy may lead to misunderstandings or misinterpretations of MRI results.

CONCLUSION

Through increased awareness and education, this study aims to empower patients with accurate information about MRI technology. By dispelling unwarranted fears and facilitating informed decision-making during MRI procedures, improved communication between healthcare providers and patients can enhance patient comfort, safety, and overall experience with MRI examinations. The study recommends incorporating patient education programs and enhancing communication strategies to improve patients' understanding of **MRI** results and alleviate anxiety associated with MRI procedures. Additionally, ongoing training and professional development for healthcare providers in MRI interpretation can minimize discrepancies and improve patient outcomes.Future research can focus on developing targeted interventions to address specific misconceptions identified in this study, such as fear of the unknown or confusion about MRI- friendly metals. Longitudinal studies can also assess the effectiveness of education and communication initiatives in improving patient outcomes and reducing anxiety related to MRI procedures.

ETHICAL STATEMENT

Ethical Approval: Yes
Source of Funding: There is no financial support or sponsorship involved in this study.
Conflict of Interest: There are no conflicts of interest to declare.

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