

Psychological Fears and Their Association with Closed Magnetic Resonance Imaging (MRI).

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Abstract— This study aims to analyze the psychological fears associated with Magnetic Resonance Imaging (MRI), given their direct impact on patient experience, medical image quality, and examination compliance rates. The research adopted a descriptive-analytical approach, involving a review of relevant literature and the distribution of a questionnaire to a simple random sample of 50 individuals in Tripoli, Libya, in December 2023. The results showed that the percentage of male participants was 60% (30 individuals), while the percentage of females was 40% (20 individuals). The most represented age group was 55-65 years, accounting for 26%. It was also found that the most common educational qualification was university education at 40%, and 90% of the sample members had previously undergone an MRI scan. Furthermore, 70% of participants indicated feeling fear during the examination, with the most common symptom being fear of harm (50%), followed by fear of dark places (40%). Some fears were also linked to childhood experiences

Index Terms—Psychological Fears / MRI / Medical Image Quality / Patient Experience

I. INTRODUCTION

Closed Magnetic Resonance Imaging (MRI) is a diagnostic procedure that uses magnetic fields and radio waves to produce detailed images of tissues and organs inside the body. Despite the diagnostic benefits provided by MRI, it can trigger psychological fears in some individuals. [1]

MRI is a radiographic procedure that utilizes strong magnetic fields to capture images of the body's interior. It is used to detect cancer cells, identify the type, size, and location of tumors, and assist healthcare providers in planning care and assessing

treatment effectiveness. [2]

The MRI table is located on a track that slides into the machine. The device resembles a long tunnel open at both ends. Most MRI scans take approximately 30 to 45 minutes. [3]

You will need to lie still inside the MRI machine during the scan, which produces loud noises. Speak with your healthcare provider if this might make you feel uncomfortable or anxious, cause you pain, or if you suffer

from claustrophobia. They can assist you by following specific methods designed to provide comfort during the MRI procedure.

Psychological fears of MRI are among the most significant issues of the modern era. Therefore, this research is conducted to shed light on these fears and the complications arising from a lack of study in this area, to avoid them. This study aims to identify the causes of psychological fears regarding MRI, as well as to understand these fears and how to avoid them. [4]

II. PREVIOUS STUDIES

A study titled "Assessment of Anxiety Associated with MRI Examination among the General Population in the Western Region of Saudi Arabia."

A total of 465 participants who underwent MRI scans in the Western Region of Saudi Arabia were selected for this cross-sectional study.

The study concluded the following: Regarding anxiety symptoms, 82.8% of participants believed they had control over the event, 80.2% were anxious beforehand, 74% requested more specific information, only 48% experienced breathing difficulties, and 51% suffered from panic. In contrast, 57.4% felt safe, 56.8% felt calm, and 49.2% felt relaxed. The majority of participants (55.9%, 260) reported moderate anxiety associated with MRI. [3]

III. RESEARCH METHODOLOGY

- 1) **Defining the Research Problem:** Studying the psychological fears associated with MRI and their impact on patient experience and examination quality.
- 2) **Method Selection:** Adopting a descriptive-analytical approach to integrate theoretical and practical aspects.
- 3) **Theoretical Aspect:** Reviewing books, journals, and previous relevant research to form a comprehensive knowledge framework.

4) **Research Tool Design:** Preparing a questionnaire that includes quantitative questions to measure psychological fears and patient experiences.

5) Defining Research Population and Sample:

Population: Various groups of residents in Tripoli, Libya.

Sample: A simple random sample consisting of 50 individuals.

1) **Data Collection:** Distributing the questionnaire during December 2023 and obtaining direct data from participants.

2) **Data Analysis:** Using descriptive statistical methods (percentages, demographic distributions) to interpret the results.

3) Research Scope:

Spatial: Tripoli, Libya.

Temporal: December 2023.

Objective: Psychological fears associated with MRI.

IV. DISCUSSION AND RESULTS

Through the questionnaire we conducted, we obtained the following results:

A. Table 1 shows the distribution of cases by gender

TABLE I: DESCRIPTION OF TABLE

Gender	Number	Percentage
Male	30	60%
Female	20	40%
Total	50	100%

This table shows that the percentage of males (60%) was the highest, while the percentage of females (40%) was the lowest.

B. Table (2) shows the distribution of cases by age group

TABLE II: DESCRIPTION OF TABLE

Age	Number	Percentage
15 to less than 25 years	11	22%
25 to less than 35 years	9	18%
35 to less than 45 years	8	16%
45 to less than 55 years	7	14%
55 to less than 65 years	13	26%
65 to less than 75 years	2	4%
Total	50	100%

We note that 26% of the age groups ranged from (55 to less than 65 years), which was the highest percentage, while 4% of the age groups ranged from (65 to less than 75 years), which was the lowest percentage among the groups.

C. Table (3) shows the distribution of cases by educational qualification

TABLE III : DESCRIPTION OF TABLE

Educational Qualification	Number	Percentage
Uneducated	14	28%
Intermediate Education	16	32%
University Education	20	40%
Total	50	100%

This table illustrates that 28% of the sample members were uneducated, which was the lowest percentage. Meanwhile, 32% had an intermediate education, and 40% held a university degree. This indicates that the study population possesses a high level of educational competence. It is noteworthy that psychological fears associated with MRI are not limited to groups with lower education levels but also include educated individuals, highlighting that these fears are a general phenomenon, not solely linked to awareness or educational level.

D. Table (4) Have you previously undergone a closed MRI scan?

TABLE IV: DESCRIPTION OF TABLE

Answer	Number	Percentage
Yes	40	90%
No	10	10%
Total	50	100%

We note from the responses in this table that 90% of the sample members had previously undergone a closed MRI scan, the highest percentage, while 10% had not, the lowest.

E. Table (5). If you have previously undergone a scan, did you feel fear during the closed MRI examination?

TABLE V: DESCRIPTION OF TABLE

Answer	Number	Percentage
Yes	35	70%
No	15	30%
Total	50	100%

We observe from this table that the highest percentage of responses to the question was 70% (Yes), as the majority of the sample who had undergone a scan felt fear during the closed MRI examination. Meanwhile, 30% of the sample members answered (No), representing the lowest percentage.

F. Table (6) Symptoms that appear during the examination or imaging process with a closed MRI machine

TABLE VI: DESCRIPTION OF TABLE

Answer	Number	Percentage
Fear of harm	25	50%
Dizziness or headache	10	20%
Shortness of breath and feeling of suffocation	15	30%
Total	50	100%

We notice from this table that 50% of the sample members experienced symptoms of fear of harm during the examination process, which was the highest percentage. Meanwhile, 20% experienced dizziness or headache, which was the lowest percentage.

G. Table (7) Feeling of fear among the studied individuals

TABLE VII: DESCRIPTION OF TABLE

Description of Place	Number	Percentage
High places	9	18%
Narrow places	11	22%
Dark places	20	40%
Riding an elevator	10	20%
Total	50	100%

This table illustrates that 40% of the sample members have a fear of dark places, which was the highest percentage and is the most likely reason for patients' fear of closed MRI

machines. Meanwhile, 18% have a fear of high places, which was the lowest percentage.

H. Table (8) Have you been exposed to a childhood accident, for example?

TABLE VIII: DESCRIPTION OF TABLE

Reasons	Number	Percentage
Elevator door closing or elevator failure while inside	30	60%
Traffic accident	13	26%
Falling from high places	7	14%
Total	50	100%

We note from the responses in this table that 60% of the sample members were exposed to a childhood accident involving an elevator door closing or failure while inside. Meanwhile, 14% were exposed to falling from high places, which was the lowest percentage.

I. Table (9) Assessment of overall patient satisfaction with the examination experience

TABLE IX: DESCRIPTION OF TABLE

Answer	Number	Percentage
Not interested	8	16%
Dissatisfied	10	20%
Satisfied	32	64%
Total	50	100%

This table shows that 64% of the sample members were satisfied with their experience with the MRI scan, while 16% were not interested, representing the lowest percentage.

J. Table (10). Based on your experience, are there any recommendations to improve the imaging process?

TABLE X: DESCRIPTION OF TABLE

Answer	Number	Percentage
Recommend using an open MRI instead of a closed one	22	44%
Recommend improving communication quality by reassuring the patient and explaining the procedure	10	20%
Recommend using headphones to reduce noise	18	36%
Total	50	100%

We note from this table that 44% of the sample members recommend using an open MRI rather than a closed one, the highest percentage. Meanwhile, 20% recommend improving communication quality by reassuring the patient and explaining how the examination will be conducted, which was the lowest percentage.

V. OBSTACLES AND RECOMMENDATIONS BASED ON THE RESEARCH, WE RECOMMEND THE FOLLOWING:

- 1) **Good Preparation:** Learn more about MRI and what the procedure entails. Ask the doctor or the technician in charge for any information you need, and the workflow process. A good understanding of the procedure can help alleviate stress.
- 2) **Deep Breathing:** Practice deep breathing to calm the body and mind. Take a deep breath through the nose, hold it for a few seconds, then exhale slowly through the mouth. Repeat this process several times and try to focus only on breathing.
- 3) **Visualization and Imagery:** Try to imagine yourself in a quiet and comfortable place during the session. You might have a mental image of a peaceful beach or a green garden. Focus on the details and the feeling of relaxation and comfort.
- 4) **Communication with the Medical Team:** If you suffer from severe anxiety or distress, do not hesitate to speak with the medical team supervising the scan. They may be able to provide the necessary support and guidance to ease your anxiety.
- 5) **Comfortable Clothing:** Wear comfortable, non-restrictive clothing during the session. Wearing clothes that make you feel at ease can help reduce anxiety.

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