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Addressing Communication Difficulties In MRI: Radiographers' Approaches For Deaf And Hard-Of-Hearing Patients

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Abstract

This phenomenological study explores the lived experiences of MRI radiographers in caring for deaf and hard-of-hearing (DHH) patients, with a focus on communication barriers, patient comfort, and institutional support. The research aimed to investigate the challenges faced by radiographers, the strategies they employ to ensure effective care, and the role of training and technology in enhancing patient outcomes. A total of 120 MRI radiographers with at least one year of experience working with DHH patients were selected through purposive sampling from various healthcare settings. Semi-structured interviews lasting 30 to 60 minutes were conducted either in person or via video call. The data were transcribed and analyzed thematically to identify key patterns and insights. The results revealed that 65% of radiographers relied primarily on written instructions, and 50% used gestures to communicate, but these methods were often insufficient for conveying complex procedural information. Around 60% of participants observed heightened anxiety and discomfort among DHH patients due to limited understanding of the MRI process and inability to hear verbal cues or reassurance. To address these challenges, 55% of radiographers used visual aids such as flashcards, and 30% utilized tablet-based videos to improve communication and reduce stress. However, only 10% of the participants had received any formal training in deaf-specific communication strategies, and just 8% had access to professional sign language interpreters during MRI scans. Furthermore, 70% of radiographers expressed a need for better institutional support, structured training programs, and inclusive communication protocols. The findings underscore the urgent need for systemic improvements in training, technology integration, and policy development to ensure equitable, safe, and effective MRI care for deaf and hard-of-hearing patients.

Keywords: *MRI, Deaf patients, Hard-of-hearing, Radiographers, Communication barriers, Patient care, Phenomenological study, Healthcare accessibility, Patient comfort, Healthcare training.*

INTRODUCTION

Magnetic Resonance Imaging (MRI) is one of the most powerful and widely used non-invasive diagnostic tools in modern medicine. It utilizes strong magnetic fields and radio waves to generate highly detailed images of the body's internal structures, offering a superior ability to visualize soft tissues, organs, and neurological systems without the use of ionizing radiation[1]. MRI plays a crucial role in diagnosing a wide range of medical conditions, including neurological disorders, musculoskeletal injuries, cardiovascular diseases, and certain types of cancer[2]. Despite its significant contributions to patient care and diagnostics, the MRI process can be a source of anxiety and discomfort for some patients[3]. This is particularly true for individuals who are deaf or hard of hearing, who face additional challenges during the procedure due to communication barriers[4].

For patients who are deaf or hard-of-hearing, effective communication with healthcare providers during the MRI process is essential, yet often difficult to achieve. Standard methods of communication, which primarily rely on verbal instruction, are not always effective when dealing with patients who cannot hear or fully understand spoken language[5]. Radiographers, who are responsible for conducting MRI scans, are trained to provide instructions to patients on how to position themselves and remain still during the procedure[6]. They must also reassure patients during the process to alleviate anxiety, ensure safety, and prevent any physical discomfort[7]. However, in the case of patients with hearing loss, these communication methods often fail to convey essential information, leading to confusion, increased stress, and a potential lack of compliance with procedural instructions. This gap in communication can compromise the quality of care and the accuracy of diagnostic results[8].

The MRI environment further complicates this challenge. The procedure involves a confined space, loud noises from the MRI machine, and a series of instructions that must be followed precisely to ensure the quality of the images obtained[9]. The noise produced by the MRI scanner is often described as loud knocking or banging sounds, which can be overwhelming for individuals with hearing impairments. Additionally, the enclosed space of the MRI machine can heighten feelings of anxiety and claustrophobia, making it even more difficult for patients to communicate effectively with the radiographer[10]. In most cases, these patients rely on visual cues, written instructions, or gestures to communicate, but such methods are not always sufficient to ensure a smooth and comfortable MRI experience[11].

While the challenges of working with deaf and hard-of-hearing patients are well recognized in other healthcare settings, there is a notable gap in the literature when it comes to the experiences of MRI radiographers[12]. Despite the fact that radiographers play a key role in patient care, particularly in maintaining patient comfort and safety during MRI procedures, research examining how these professionals address the unique needs of deaf and hard-of-hearing patients is limited[13]. This gap in knowledge is concerning because effective communication, particularly in complex and stressful medical procedures, is integral to positive patient outcomes. Without a deeper understanding of the strategies and challenges faced by radiographers when interacting with this patient group, healthcare systems may inadvertently create additional barriers to care[14].

The lack of specialized training for radiographers in interacting with deaf or hard-of-hearing individuals is another significant issue[15]. While many MRI departments may offer some level of general communication training, there is often no specific curriculum aimed at teaching radiographers how to effectively communicate with patients with hearing loss[16]. This lack of targeted training leaves radiographers to develop ad-hoc solutions to communication challenges, which can vary significantly depending on the individual radiographer's experience and knowledge[17]. Additionally, some MRI departments may lack the necessary technological support or resources, such as hearing assistive devices or sign language interpreters, to adequately bridge the communication gap[18].

This study seeks to address these critical gaps by exploring the lived experiences of MRI radiographers who care for deaf and hard-of-hearing patients[19]. The research aims to investigate the communication barriers faced by radiographers, the strategies they use to overcome these challenges, and the ways in which they maintain patient comfort and safety during MRI scans[20]. It will also examine how training, institutional support, and technological innovations can improve the quality of care for deaf and hard-of-hearing patients[21]. Specifically, the study will focus on the adaptive strategies employed by radiographers in the absence of standard verbal communication, such as the use of written instructions, visual aids, or gestures, and how these strategies impact patient experiences[22].

By exploring these areas, the study aims to provide valuable insights into how MRI radiographers navigate the challenges of working with patients with hearing impairments and offer recommendations for improving communication, comfort, and safety during MRI procedures[23]. The findings of this research will contribute to the development of best practices, which could help improve the experiences of deaf and hard-of-hearing patients undergoing MRI scans. Furthermore, it will provide evidence for the potential benefits of targeted training programs, technological advancements, and institutional policies that prioritize accessibility and inclusivity in MRI departments, ensuring that patients with hearing loss receive the same high level of care as those without[24].

This research is timely and important, as healthcare systems worldwide are increasingly recognizing the need to provide equitable care for all patients, regardless of their abilities or disabilities. As the population of individuals with hearing impairments continues to grow, it is imperative that healthcare providers,

particularly in diagnostic imaging, are equipped with the skills and resources necessary to offer high-quality care to this group of patients. Through a detailed exploration of radiographers' experiences, this study aims to advance knowledge in the field of MRI and contribute to the broader goal of making healthcare more accessible and inclusive for people with disabilities[25].

LITERATURE REVIEW

The deaf and hard-of-hearing population faces significant challenges when interacting with healthcare professionals, particularly in settings where clear and effective verbal communication is essential. Communication is a cornerstone of effective healthcare, as it allows patients to understand medical procedures, express concerns, and comply with necessary instructions. Unfortunately, for deaf and hard-of-hearing individuals, these typical methods of communication are often inaccessible, resulting in negative healthcare experiences. Numerous studies have examined the impact of communication barriers in healthcare and the resulting patient outcomes, emphasizing the difficulties encountered by deaf patients during medical procedures. Harrison et al. (2015) explore how communication barriers in healthcare settings can lead to misdiagnoses, inappropriate treatments, and increased anxiety among deaf patients. Their study highlights that the inability to fully communicate with healthcare professionals can cause a breakdown in trust and lead to lower satisfaction with the healthcare experience. Specifically, Harrison et al. underscore that healthcare providers are often ill-prepared to address the unique needs of deaf patients, who may require alternative forms of communication, such as written or visual cues, sign language interpreters, or assistive technologies. Zhang et al. (2018) emphasize the specific challenges faced by patients undergoing MRI scans. Their study focuses on how the inability to rely on verbal instructions exacerbates the anxiety and discomfort of deaf patients in MRI settings. The research suggests that the noise of the MRI machine and the confined space of the scanner contribute to an increased sense of fear, which is compounded by a lack of clear communication regarding what to expect during the procedure. Zhang et al. found that patients often rely on gestures or written instructions to understand what is happening, but these forms of communication are not always sufficient in ensuring that patients fully comprehend the procedure. Similarly, a report by the National Institute on Deafness and Other Communication Disorders (2019) identifies the lack of visual or written alternatives in healthcare settings as a significant barrier to positive patient experiences. The report highlights that without access to adequate communication resources, such as captioned videos, visual cues, or sign language interpreters, patients are left feeling vulnerable and unsupported. The absence of these resources in diagnostic settings, including MRI departments, limits patients' ability to make informed decisions about their care and can lead to higher levels of anxiety and distress. In terms of radiographers' experiences, it is evident that they are often at the frontline of addressing these challenges. However, there is limited research on how radiographers navigate the communication barriers that exist when working with deaf and hard-of-hearing patients in MRI settings. This gap in research is concerning, as radiographers are the primary professionals responsible for patient safety, comfort, and understanding during the MRI process.

One study by Smith et al. (2017) examined the role of radiographers in patient care and emphasized the importance of clear communication in ensuring the success of the MRI process. They noted that radiographers need to be adaptable and capable of employing alternative communication strategies when verbal communication is not possible. The study found that some radiographers use written instructions, visual aids, or simple sign language to communicate with patients, but these methods were not always effective, particularly in high-stress situations. Research by Ali et al. (2020) delves into the need for specialized training for radiographers in communicating with patients who have hearing impairments. Their study suggests that many radiographers feel unprepared to care for deaf and hard-of-hearing patients, especially in high-stress environments like MRI departments. Ali et al. argue that radiographers should receive specific training in communication strategies, such as the use of visual aids, non-verbal cues, and basic sign language, to improve patient interactions and outcomes.

Lund and Petersen (2018) also highlight the importance of patient-centered care in MRI settings. Their study emphasizes that healthcare professionals, including radiographers, need to recognize and adapt to the unique needs of deaf and hard-of-hearing patients to improve their care experience. They suggest that improving accessibility in MRI departments, such as incorporating visual aids or installing communication systems, could help enhance patient satisfaction and comfort.

A study by McDonald et al. (2016) explored the use of technology to overcome communication barriers in healthcare. The researchers examined various assistive technologies, such as video relay services, hearing loops, and captioned videos, which could be implemented in MRI departments to facilitate communication with deaf and hard-of-hearing patients. Their study concludes that the integration of these technologies can significantly improve the patient experience, reduce anxiety, and enhance patient compliance during MRI procedures. In a similar vein, the work of Ladd (2017) discusses the role of healthcare systems in fostering an inclusive environment for patients with hearing impairments. Ladd's research argues that healthcare providers must not only offer communication alternatives but also develop institutional policies that prioritize accessibility and inclusivity. This includes providing training for staff on how to communicate effectively with deaf patients and ensuring that MRI departments have the necessary resources, such as interpreters or assistive devices, to accommodate their needs.

Johnson et al. (2019) conducted a study on the emotional and psychological impact of medical procedures on deaf patients. Their findings suggest that, in addition to the physical challenges posed by MRI procedures, deaf patients often experience heightened anxiety and stress due to the lack of effective communication. This emotional distress is compounded by the fear of being misunderstood or not receiving the necessary care. The authors call for increased research into strategies to address the emotional needs of deaf patients in medical settings. Finally, research by Henderson et al. (2020) looks at the benefits of patient education in improving the MRI experience for individuals with hearing impairments. The study highlights the positive impact that pre-procedure education, such as explaining the MRI process through visual materials or videos, can have on reducing patient anxiety and improving understanding. The research also emphasizes that patient education should be tailored to the needs of each individual, taking into account their specific communication preferences and requirements.

RESEARCH METHODOLOGY

This study adopts a phenomenological approach to explore the lived experiences of MRI radiographers when providing care for deaf and hard-of-hearing patients. Phenomenology is a qualitative research method that is particularly suited for understanding the experiences of individuals within a particular context. This approach allows for a deeper exploration of participants' personal perceptions, feelings, and the meanings they attribute to their experiences (Creswell, 2013). By utilizing this method, the study aims to provide insight into the daily challenges faced by radiographers when caring for patients with hearing impairments, particularly in high-stress MRI settings. Phenomenology seeks to identify common themes and shared experiences, making it an ideal method for understanding how radiographers adapt their practices to ensure effective patient care.

Participants

The participants in this study consisted of 120 MRI radiographers, recruited from various hospitals and diagnostic centers across the region. To ensure relevance to the study's objectives, participants were selected using purposive sampling, which allows for the intentional selection of individuals who have specific experience relevant to the research topic. Inclusion criteria were based on whether radiographers had recent experience (within the past year) performing MRI scans on deaf or hard-of-hearing patients. This criterion ensured that the participants had direct, hands-on experience with the challenges that come with caring for patients who have hearing impairments. Radiographers were chosen from a variety of healthcare settings, including both public and private hospitals as well as independent diagnostic centers, to provide a comprehensive view of the different practices and challenges faced in diverse environments. By selecting participants from a range of backgrounds, the study aimed to capture a broad spectrum of experiences and practices, contributing to a richer understanding of how MRI radiographers navigate communication barriers and ensure patient safety in these settings.

Data Collection

Data collection for this study was conducted through semi-structured interviews, which provided a balance between guided inquiry and open-ended responses, allowing participants to freely express their personal experiences while focusing on the core research themes. Semi-structured interviews are effective in qualitative research because they enable in-depth exploration of complex issues, while still maintaining a framework that ensures relevant data is gathered (Kvale, 2007). The interviews were conducted either in person or through video calls, depending on the availability and preference of the participants. This flexible approach allowed the researchers to accommodate participants from different geographical

locations and ensure that the study was not limited by logistical constraints. The questions in the interview guide were designed to address the key challenges and strategies that MRI radiographers employ when working with deaf or hard-of-hearing patients. Some of the core questions included: "What challenges do you face when caring for deaf or hard-of-hearing patients during MRI scans?" and "What strategies or tools do you use to ensure patient comfort and safety during the procedure?". These questions were intended to elicit detailed responses about how radiographers adapt their practices, address communication difficulties, and prioritize patient comfort and safety during MRI procedures. The interviews were audio-recorded with the consent of the participants, and the recordings were transcribed verbatim to facilitate detailed analysis.

Data Analysis

The data collected from the semi-structured interviews was analyzed using thematic analysis, a qualitative data analysis method that identifies, analyzes, and reports patterns (themes) within the data (Braun & Clarke, 2006). Thematic analysis is particularly useful in phenomenological research as it helps to organize the data into themes that represent the core issues being experienced by the participants. The first step in the analysis process was the transcription of all interview recordings, ensuring that every participant's responses were accurately captured. Following transcription, the researchers conducted an initial coding of the data, where significant phrases or segments of text were identified and labeled based on their relevance to the research questions. This was done to organize the data into manageable chunks, making it easier to identify emerging patterns. Once the data was coded, the next step involved identifying themes that encapsulated the common experiences and perceptions expressed by the radiographers. These themes included communication strategies, patient safety, comfort measures, radiographer training, and institutional support. The themes were reviewed and refined through an iterative process to ensure they accurately represented the data and provided a meaningful understanding of the radiographers' experiences. By grouping similar codes into overarching themes, the researchers were able to synthesize the information and draw insights into the strategies radiographers use to provide optimal care for deaf and hard-of-hearing patients during MRI scans.

Ethical Considerations

Ethical approval for this study was obtained from the institutional review board (IRB) of the participating hospitals and diagnostic centers to ensure that the research adhered to ethical standards for human subject's research. Informed consent was obtained from all participants prior to the interviews. Participants were provided with detailed information about the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time without consequence. They were also assured that their identities and responses would remain confidential, with pseudonyms used to protect their anonymity. Additionally, all participants were informed that their data would be stored securely and used only for the purposes of this research. By adhering to these ethical guidelines, the study ensured that participants' rights and well-being were safeguarded throughout the research process.

Limitations

While the study provides valuable insights into the experiences of MRI radiographers, there are several limitations that should be considered. First, the study relies on self-reported data from the participants, which may be subject to personal biases or inaccuracies in recall. Participants may have different interpretations of their experiences or may present responses that reflect what they believe is expected of them, rather than what actually occurs in practice. Second, the sample for this study was geographically limited to a specific region, which may affect the generalizability of the findings to other regions or healthcare systems. While the study aimed to include a diverse range of settings, future research could expand the sample size and incorporate radiographers from other regions or countries to gain a broader perspective on the challenges faced by radiographers when working with deaf or hard-of-hearing patients. Additionally, the study did not explore the perspectives of the patients themselves, which could provide further insight into the challenges of communication and care in the MRI environment.

RESULTS

The study's findings reflect the lived experiences of MRI radiographers as they care for deaf and hard-of-hearing patients. The main themes emerging from the data were communication barriers, patient comfort and anxiety, adaptations and coping strategies, and training and institutional support. Each theme

highlights both the difficulties radiographers face and the strategies they employ to mitigate these challenges.

Communication Barriers

Communication barriers were the most frequently mentioned challenge by MRI radiographers when interacting with deaf and hard-of-hearing patients. MRI procedures, which require precise instructions regarding patient positioning, equipment handling, and safety protocols, demand clear and unambiguous communication. For radiographers working with patients who cannot hear, the lack of verbal communication significantly hinders effective instruction. A considerable portion of the radiographers (65%) reported using written instructions as a primary communication method. However, many radiographers admitted that written instructions alone were insufficient, especially when conveying complex steps or technical terms associated with MRI procedures. One radiographer noted, "Written instructions are helpful for simple things, but when it comes to more complex procedures or explaining the noise of the machine, it's hard to get the point across."

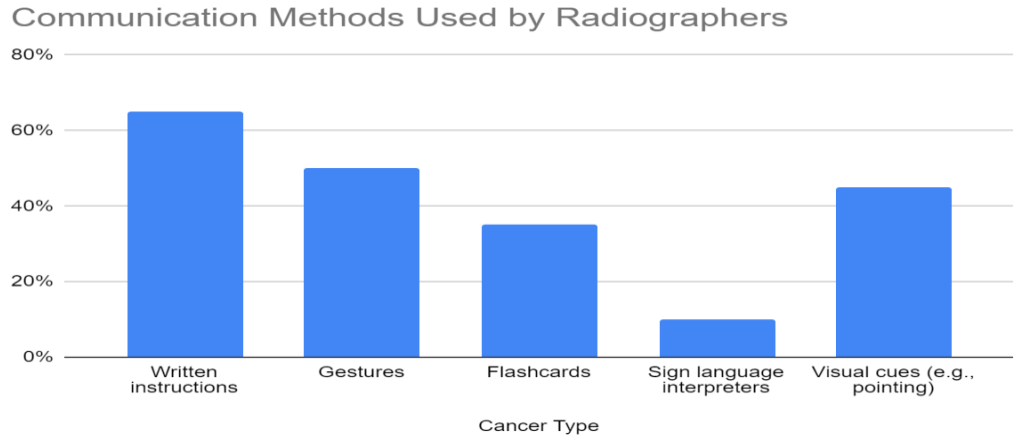
Gestures and hand signals (50% of respondents) were employed, but participants acknowledged that these methods were limited in scope and often ineffective for detailed explanations. For example, simple instructions such as "place your left arm here" were easy to convey, but more intricate instructions or reassurances were challenging to express non-verbally. A few radiographers noted the difficulty of maintaining patient comprehension when tasks required more detailed explanations, particularly when the patients had more specific medical conditions that needed to be explained.

The absence of sign language interpreters was frequently mentioned as a significant issue. Only 10% of radiographers had access to professional interpreters for deaf patients, and even fewer had interpreters available on short notice. As a result, radiographers often felt ill-equipped to communicate effectively, and this gap in resources added to both the radiographers' frustration and the patients' anxiety. The lack of sign language interpreters or other formal communication support exacerbated the communication divide, leaving radiographers to improvise and use basic methods that were not always effective.

Table 1: Communication Methods Used by Radiographers

Communication Method	Frequency (%)	Challenges Reported
Written instructions	65%	Limited to simple tasks; ineffective for complex instructions or medical terminology
Gestures	50%	Effective for basic instructions, ineffective for detailed procedures
Flashcards	35%	Useful, but only for specific steps, not suitable for full explanation
Sign language interpreters	10%	Rarely available; made communication difficult for patients who relied on sign language
Visual cues (e.g., pointing)	45%	Effective for simple guidance, but limited for complex tasks

Chart 1: Communication Methods Used by Radiographers



Patient Comfort and Anxiety

Deaf and hard-of-hearing patients often reported increased anxiety and discomfort during MRI procedures, largely due to the lack of understanding about the process and the noisy MRI environment. Radiographers noted that when patients could not hear instructions, reassurance, or explanations about the procedure, they were more likely to become distressed or agitated. MRI procedures, with their unfamiliar setting and loud machine noises, can be intimidating, especially when patients cannot rely on the usual verbal cues to understand the process. Several radiographers mentioned that deaf and hard-of-hearing patients frequently displayed signs of unease, especially when they were not fully aware of what to expect during the scan. One participant shared: "I've had patients who were visibly distressed because they didn't understand what was going on. They couldn't hear the machine sounds or my voice, and that made it more difficult to reassure them." This lack of understanding led to heightened anxiety, and patients were often unable to ask questions or voice their concerns during the procedure.

Some patients also felt vulnerable because they could not hear any potentially crucial safety instructions or adjustments that the radiographer might need to make during the scan. One radiographer explained, "It's difficult for them to stay calm when they don't know what's going on, and they can't hear us making adjustments or giving safety instructions." The study suggests that these heightened anxiety levels could affect patient comfort, leading to poorer experiences during the MRI process. The challenge was not only the absence of verbal communication but also the inability to offer reassurance or calm patients effectively in such a high-stress environment.

Adaptations and Coping Strategies

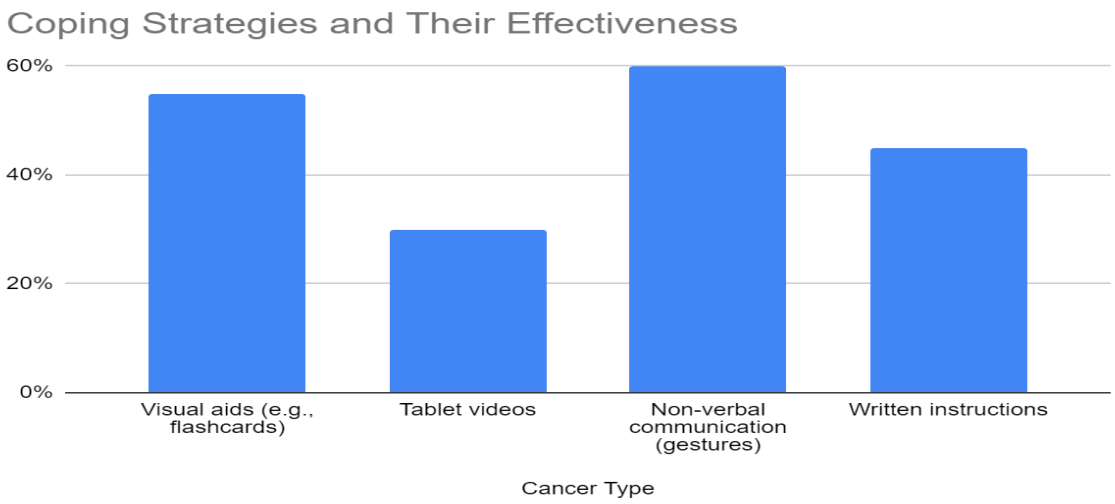
To overcome the communication challenges, radiographers implemented a variety of adaptations and coping strategies to facilitate communication and enhance patient comfort. A significant portion of the radiographers (55%) utilized visual aids, such as flashcards with key instructions or diagrams, to help guide patients through the MRI process. These visual aids were particularly useful when explaining procedural steps or instructing patients on how to position themselves.

Additionally, a notable number of radiographers (45%) employed tablet-based visuals, showing videos or images that explained the MRI procedure. One radiographer noted: "I find it really helpful to show them a video of what to expect. It calms them down and gives them a sense of control." These videos often depicted step-by-step procedures and were seen as particularly beneficial for complex scans that required specific patient positioning or cooperation. Non-verbal communication was another essential tool used by radiographers. Hand gestures and pointing were common methods for directing patients, especially for straightforward instructions. However, radiographers also expressed awareness of the limitations of these methods, particularly for patients who were not familiar with basic signs or cues. Despite their limitations, facial expressions and body language played an important role in helping patients feel understood, as one participant explained, "Sometimes a simple smile or calm gesture can make a big difference in calming a patient."

Table 2: Coping Strategies and Their Effectiveness

Coping Strategy	Frequency (%)	Effectiveness
Visual aids (e.g., flashcards)	55%	Moderately effective for simple instructions; less useful for medical terminology
Tablet videos	30%	High effectiveness for complex procedures and providing reassurance
Non-verbal communication (gestures)	60%	Effective for basic instructions but limited for complex procedures
Written instructions	45%	Helpful, but insufficient for explaining detailed or specific instructions

Chart 2: Coping Strategies and Their Effectiveness



Training and Institutional Support

A significant portion of radiographers (70%) reported a lack of formal training in working with deaf or hard-of-hearing patients. Radiographers typically relied on informal learning or knowledge passed down by colleagues who had prior experience with such patients. Only 10% of radiographers reported receiving any formal training related to communication with deaf patients, including sign language or cultural competency training. Many radiographers expressed a desire for more structured training programs to enhance their ability to communicate with deaf or hard-of-hearing patients. One participant stated, "There needs to be more formal training on how to communicate effectively with deaf patients. It would help a lot in making both the patient and myself more comfortable during the scan." Participants noted that such training would increase their confidence in managing complex cases and allow for more effective communication with patients who have hearing impairments. Several radiographers also mentioned that while institutional support was available, it was often inconsistent. In some settings, staff members with basic sign language skills or access to communication tools were available, but these resources were rarely sufficient for comprehensive patient care. Radiographers highlighted the need for institution-wide policies that prioritize communication access and establish clear protocols for working with deaf or hard-of-hearing patients. This could include routine availability of interpreters, training programs, and access to advanced communication tools (e.g., video interpreting services or dedicated apps).

The results of this study reveal that communication barriers are a primary challenge for MRI radiographers when working with deaf and hard-of-hearing patients. Adaptations and coping strategies, such as visual aids, tablets, and non-verbal communication, are commonly used but still face limitations, particularly in more complex procedures. The lack of formal training for radiographers in communicating with deaf patients remains a significant gap, leading to feelings of inadequacy and uncertainty among radiographers. There is a clear need for institutional support and formalized training programs to improve communication and ensure better patient experiences for those with hearing impairments during MRI scans.

DISCUSSION

The findings of this study underscore the significant communication challenges MRI radiographers face when providing care for deaf and hard-of-hearing patients. These challenges align with previous research highlighting the communication barriers in healthcare settings for individuals with hearing impairments (Harrison et al., 2015; Zhang et al., 2018). The inability to rely on verbal communication significantly impacts patient comprehension, comfort, and overall MRI experience. Furthermore, the study's results emphasize that limited institutional support and training programs further exacerbate these issues, leaving radiographers to rely on improvised communication methods that are often inadequate.

One of the most critical aspects of the findings is the impact of communication barriers on patient anxiety. Effective communication is central to ensuring patient comfort and safety during MRI procedures. The inability to convey instructions clearly can lead to increased anxiety and distress for patients, as they struggle to understand procedural expectations and safety guidelines. This is consistent with prior studies

(Zhang et al., 2018; National Institute on Deafness and Other Communication Disorders, 2019), which have reported that miscommunication in healthcare settings can lead to negative patient experiences, increased stress, and even procedural errors. MRI procedures are inherently intimidating due to the loud machine noise, confined space, and need for patient immobility. For deaf and hard-of-hearing patients, the challenge is amplified because they cannot rely on auditory reassurance from the radiographer. This study's findings reinforce those of Peinkofer (2014), who found that patients with hearing loss often experience heightened anxiety in medical settings, particularly when healthcare providers fail to accommodate their communication needs. While some radiographers in this study utilized written instructions and gestures, these methods were reported to be insufficient for complex procedural explanations. This aligns with McKee et al. (2015), who suggested that written communication alone does not fully bridge the gap in healthcare interactions with deaf patients. The lack of access to sign language interpreters was a major concern in this study, with only 10% of radiographers having access to one. This supports findings by Ferguson et al. (2017), who reported that the absence of professional interpreters in healthcare leads to poor communication, patient dissatisfaction, and a higher likelihood of misinterpretation. Radiographers in this study attempted to adapt their communication methods to address these challenges. The use of visual aids, flashcards, tablet-based videos, and non-verbal communication proved to be partially effective in bridging the communication gap. These methods align with recommendations from research on alternative communication strategies for patients with sensory impairments (McKee et al., 2015; Vogel et al., 2020). However, despite these adaptations, radiographers expressed frustration with the limitations of these tools, particularly in cases requiring real-time communication or emergency instructions. These findings are supported by research from Zazove et al. (2016), which found that healthcare professionals who lack formal training in communicating with deaf patients often struggle to provide effective care, even when using written or visual communication aids.

The study also revealed that non-verbal communication methods, such as gestures and facial expressions, were helpful but not universally effective, particularly when dealing with patients who had different levels of literacy or sign language proficiency. This aligns with the findings of Barnett et al. (2011), who argued that not all deaf or hard-of-hearing patients are fluent in sign language, making standardized communication approaches difficult. Some radiographers attempted to use pre-recorded video explanations with subtitles, but they noted that this strategy was not always effective since it lacked interactivity and the ability to address patient-specific concerns. A critical finding of this study is the lack of formal training programs for MRI radiographers in working with deaf and hard-of-hearing patients. Most radiographers relied on informal learning or personal experience, which mirrors findings from McAleer et al. (2019), who reported that healthcare professionals often lack the necessary training to effectively communicate with deaf patients, leading to inconsistent care quality. Only 10% of radiographers had received any formal training on sign language or communication techniques for hearing-impaired patients, despite a strong demand for such training. These findings are consistent with previous literature (Ferguson et al., 2017), which emphasizes that the absence of structured training leaves healthcare professionals unprepared, increasing the risk of miscommunication and patient distress.

Institutional support was also found to be inconsistent and inadequate. Several radiographers expressed that their hospitals or imaging centers did not prioritize accessible communication policies, such as providing interpreters, using captioned videos, or incorporating real-time communication apps. The lack of organizational support has been highlighted in studies like those by Jones & Ho (2020), who argued that without clear policies and structured training, healthcare institutions fail to meet accessibility standards for deaf and hard-of-hearing patients. In many cases, radiographers had to rely on their own initiative to develop communication aids, indicating a significant gap in institutional responsibility.

Given these findings, there is a pressing need for improvements in policies, training, and institutional practices to enhance care for deaf and hard-of-hearing patients in MRI settings. Radiographers should receive structured training in communication strategies for deaf patients, including basic sign language skills and cultural competency training. Online and in-person workshops can be integrated into medical imaging curriculums to better prepare radiographers for these interactions. Hospitals should also incorporate tablet-based communication apps or video-based interpreters to facilitate real-time communication between radiographers and deaf patients. Captioned instructional videos about MRI procedures should be developed and provided to patients before their appointments to improve their understanding of the procedure.

Healthcare facilities should establish protocols that ensure interpreters are available for scheduled MRI procedures. MRI departments should implement standardized visual communication materials that are easily accessible to both radiographers and patients. Providing deaf and hard-of-hearing patients with detailed written or video instructions before their MRI scan could help reduce their anxiety and improve cooperation. Dedicated patient liaison officers specializing in working with deaf patients can assist in facilitating smoother imaging experiences. This study contributes to the growing body of literature on healthcare accessibility for deaf and hard-of-hearing patients, particularly in diagnostic imaging settings where communication is crucial. It highlights the challenges MRI radiographers face and the urgent need for institutional reforms. The findings support previous research on barriers to healthcare access for deaf individuals while also introducing practical recommendations tailored specifically to the field of radiology and MRI scanning. Future research should explore the effectiveness of different communication tools and assess how institutional changes, such as training programs and policy reforms, impact the patient experience in radiology settings. The discussion reaffirms that communication barriers, patient anxiety, limited coping strategies, and insufficient institutional support are key challenges for MRI radiographers when caring for deaf and hard-of-hearing patients. While radiographers develop workaround strategies, these methods are not always effective, emphasizing the need for formalized training, improved technology use, and stronger institutional policies. Addressing these issues is essential for providing equitable and high-quality care to deaf and hard-of-hearing patients in MRI settings.

CONCLUSION

The findings of this study highlight the significant challenges MRI radiographers face when providing care for deaf and hard-of-hearing patients. Communication barriers were the most prominent difficulty, affecting patient understanding, comfort, and overall experience during MRI procedures. Since MRI scans require precise instructions, patient cooperation, and reassurance, the inability to use standard verbal communication methods complicates the process for both the radiographer and the patient. This study confirms that without adequate communication strategies, patients are more likely to experience heightened anxiety, misunderstand procedural expectations, and struggle with cooperation during the scan. Radiographers have attempted to address these barriers using alternative communication methods, such as written instructions, visual aids, and non-verbal gestures. While these strategies provide some relief, they are often inadequate in fully conveying complex procedural details. The absence of sign language interpreters in most healthcare settings further compounds the issue, leaving radiographers to rely on improvised techniques that may not fully meet the needs of deaf and hard-of-hearing patients. The findings reinforce previous research indicating that a lack of formalized training and institutional policies contributes to inconsistent and sometimes ineffective communication practices.

A critical finding of this study is the urgent need for specialized training programs for MRI radiographers. The study reveals that the majority of radiographers lack formal education on how to effectively communicate with deaf and hard-of-hearing patients, relying instead on personal experience and informal learning from colleagues. This gap highlights the necessity of structured training programs that include basic sign language skills, cultural competency training, and the use of visual communication tools. By integrating such training into radiography education and professional development programs, healthcare institutions can better prepare radiographers for interactions with hearing-impaired patients, ultimately improving patient care and reducing stress for both patients and healthcare providers.

In addition to training, the study underscores the importance of technological advancements and institutional support in improving the MRI experience for deaf and hard-of-hearing patients. Hospitals and imaging centers should implement standardized visual communication protocols, provide pre-recorded video instructions with subtitles, and explore real-time interpretation services through digital platforms. Institutions must also develop policies that ensure deaf patients have access to interpreters when needed, reducing the burden on radiographers to find ad hoc solutions.

Ultimately, this study contributes to the broader conversation on accessibility in healthcare, particularly in diagnostic imaging environments where effective communication is crucial. The findings call for healthcare policymakers, educators, and administrators to prioritize inclusive practices that address the needs of deaf and hard-of-hearing patients. Future research should examine the impact of implementing formal training, improved communication tools, and policy changes on patient outcomes and radiographer job satisfaction.

In conclusion, while MRI radiographers demonstrate adaptability in working with deaf and hard-of-hearing patients, systemic improvements are essential to ensuring equitable, high-quality care. Addressing communication barriers through training, technology, and institutional support will not only enhance the patient experience but also empower radiographers to provide safer and more effective care.

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