Journal of Global Information Management
Volume 34 • Issue 1 • January-December 2026

Unpacking Technological Frames in AI-Enabled Hearing Care:
A Mixed-Methods Causal Analysis of Adoption Barriers

Hadeel Alsaleh
Department of Communication Sciences, College of Health and Rehabilitation Sciences, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia

Abhishek Bhushan Singhal
https://orcid.org/0000-0003-0757-6371
Institute of Management Studies (IMS) Ghaziabad - B School, India

Reeti Agarwal
Jaipuria Institute of Management, Lucknow, India

Attila Kurucz
https://orcid.org/0000-0003-3122-8174
Kautz Gyula Faculty of Business and Economics, Department of Corporate Leadership and Marketing, Széchenyi István University, Hungary

Manlio Del Giudice
Gnosis: Mediterranean Institute for Management Science, School of Business, University of Nicosia, Cyprus & HSE University, Russia & Department of Management and Economics, Pegaso Digital University, Italy
Received: September 14th, 2025 | **Accepted:** January 23rd, 2026

ABSTRACT

Artificial intelligence-enabled diagnostics promise to transform hearing healthcare, yet real-world adoption remains limited. This study identifies and prioritizes barriers to AI integration in clinical audiology through a three-phase mixed-methods approach. Phase I reviewed literature, surfacing 20 obstacles across workflow, infrastructure, culture, and ethics. Phase II involved expert interviews, refining these into nine context-specific barriers. In Phase III, a fuzzy-DEMATEL survey and thematic coding revealed a causal hierarchy: algorithmic inaccuracy, privacy concerns, and lack of training erode clinician trust and widen the knowledge gap. Cost, integration issues, and resource limitations add systemic stress, while ethical concerns emerge downstream. Cluster analysis groups the barriers into three blocs: Clinical Workflow, Governance and Trust, and Tech Infrastructure. This is the first study to apply fuzzy-DEMATEL to AI barriers in audiology, producing a causal map and cluster framework that offer both theoretical insights and practical guidance for adoption strategies.

KEYWORDS

Artificial Intelligence, Hearing Healthcare, Audiology, Barriers to Adoption, Fuzzy DEMATEL, Thematic Analysis, Mixed Methods

DOI: 10.4018/JGIM.400760

INTRODUCTION

Artificial intelligence (AI) is rapidly advancing into hearing care domains, evolving from novelty to clinical readiness. Reviews of the AI literature show applications in audiological assessment, hearing aid and cochlear implant fitting, and rehabilitation workflows. For example, AI models are in development that will automate audiogram interpretation, automatically optimize hearing aid gain on-the-fly and in situ, and provide adaptive noise suppression in everyday environments (AlSamhori et al., 2024; Frosolini et al., 2024; Van Eeckhoutte et al., 2024). These capabilities show that hearing care services will soon, if they have not already, move from being device centric to data centric and immediate and involve personalized support (Liu et al., 2023).

Even though AI has potential, its uptake in hearing care clinics has been profoundly uneven. Some tertiary clinics, for example, have noted an improvement concerning the accuracy of fitting, or in less time spent counseling the patient, but many practices remain hesitant, or have stalled, because of governance, technical infrastructure, and complex clinician workflow challenges (Pokorny et al., 2025; Taylor & Jensen, 2023). In low- and middle-income contexts, resourcing challenges, including poor connectivity, lack of access to a specialist device, or misalignment of reimbursement, compound the issues of using it (Nishan et al., 2024). The patterns of mismatch between technical capacity and the actual use of AI indicate that the issue is less about more sophisticated algorithms and more about organizational readiness and alignment for interpretation.

To better understand this gap, in this study we drew on technological frames theory (TFT; Orlikowski & Gash, 1994). TFT argues that actors within organizations understand new technologies by relying on *frames*, which consist of assumptions, expectations, and perceived prescriptive consequences (Criado & de Zarate-Alcarazo, 2022; Orlikowski & Gash, 1994). TFT argues that misalignment occurs when stakeholders—including clinicians, engineers, and managers—hold differently constructed frames (e.g., what the technology is for, how the technology should work, what it means to be most effective). Misalignment of these frames creates friction, increases perceived risks, and slows adoption rates. For example, in the case of hearing care AI, engineers may have a frame in which algorithmic accuracy and data pipelines are prioritized; clinicians may have a frame that is focused on workflow burden and liability; and institutional leaders may have a frame that prioritizes cost, procurement, and governance. Divergent frames increase barriers, and thus deployment stalls.

The situation is even more complicated than this. Barriers are not mutually exclusive; they interact and have a cascading effect. In typical adoption models, such as the technology acceptance model or the unified theory of acceptance and use of technology, factors like cost, trust, and ease of use are considered independent predictors. However, empirical research in health information technology (IT) has shown chain reactions; for example, a data security incident leads to lowered trust and decreased use and then raises perceived cost risk (Kalimouttou et al., 2026; Lin et al., 2012). In the case of hearing care, we are not aware of any research that has systematically unpacked these causal links between AI adoption in hearing and barriers to this.

This research fills a gap in knowledge by combining technological framework theory (TFT) with a Decision-Making Trial and Evaluation Laboratory (DEMATEL) modeling approach in order to not only identify which barriers are important but also to understand how these barriers relate to one another and how interpretive frames modulate those relationships. In this regard, we addressed three research question (RQ)s:

RQ1: Which barriers are considered to have the highest overall influence on AI adoption in hearing health care context?
RQ2: How are the barriers causally linked to each other in the sociotechnical system?
RQ3: How does expert storytelling affirm, challenge, or elaborate the causal hierarchy found in DEMATEL data?