

AI and generative AI in health and medical libraries: a scoping review of present use and emerging potential

Shampa Sen

Barts Health NHS Trust, London, UK

Abstract

This scoping review explores the current use and potential of artificial intelligence (AI), particularly generative AI, in medical and health libraries. Through a comprehensive literature search, eleven studies were identified that illustrate how AI is being applied in areas such as event planning, content enhancement, literature searching, training promotion, and evidence synthesis. The findings suggest that while AI can enhance efficiency and user engagement, significant limitations – especially in high-stakes tasks like systematic searching – require continued human oversight. Overall, AI is best viewed as a supportive tool that, if implemented ethically and strategically, can extend the reach and quality of library services.

Key words: artificial intelligence; generative AI; medical libraries; health libraries.

Introduction

Artificial intelligence (AI) is rapidly transforming the landscape of information management across various sectors, including health and medical libraries. As digital technologies evolve, library professionals are increasingly exploring the integration of AI – particularly generative AI – to improve service delivery, streamline operations, and enhance user engagement.

The impetus for this review arises from the need to understand both the practical uses and strategic implications of AI technologies in environments where information accuracy, accessibility, and ethical responsibility are critical. By synthesising the current evidence base, this paper seeks to provide a comprehensive overview of AI's role in medical and health libraries, identify promising areas for future development, and offer insights into how these tools can be integrated responsibly and effectively into health information services.

Aim of the paper

The aim of this paper is to investigate how artificial intelligence (AI), particularly generative AI, is being utilised in health and medical libraries. In this scoping review, the primary objective was to synthesise insights from existing literature on the potential of AI and gen-

erative AI to enhance medical library services. The specific aims were to:

- provide a comprehensive overview of current knowledge on the applications of AI and generative AI in medical and health libraries;
- explore and evaluate the potential of AI and generative AI as tools for improving and advancing medical library services.

Limitations of the paper

This review focused exclusively on evidence related to the use of AI and generative AI within medical and health library settings. Although there is a substantial body of literature on the application of AI and generative AI in academic libraries more broadly, such studies were excluded from this review due to the specific aim of concentrating solely on the health and medical library context.

Methodology

Data collection

To address the research aim, a comprehensive literature search was carried out across multiple databases to identify relevant studies on the use of artificial intelligence (AI), including generative AI, in health and med-

Address for correspondence: Shampa Sen, Barts Health NHS Trust, Whitechapel Road, London E1 1FR London, UK.
E-mail: shampa.sen@nhs.net.

ical library settings. The databases searched included MEDLINE, EMBASE, PubMed, and Google Scholar.

Search strategy

The database searches were conducted on 27th May 2025. The following search terms were used in combination: “AI” OR “Artificial Intelligence” AND “Medical Libraries” OR “Health Libraries” OR “Hospital Libraries”. The search was restricted to studies published in the English language, but no date limitations were applied, in order to capture both recent developments and foundational studies in this area.

Inclusion criteria

- studies that discuss the use or implementation of AI or generative AI specifically within health and medical library settings;
- articles published in English;
- any study type (qualitative, quantitative, reviews, case studies) as long as it relates to the topic.

Exclusion criteria

- studies focused solely on AI/generative AI in general academic, public, or school libraries without a health or medical focus;
- non-English language articles;
- articles that mention AI in healthcare broadly but do not involve library services.
- duplicates or studies where full text was not accessible for screening.

Search results and screening process

A comprehensive literature search was conducted across four major electronic databases, yielding a total of 1166 records. These included 96 records from MEDLINE, 228 from EMBASE, 745 from Google Scholar, and 97 from PubMed. Before the screening process began, 102 duplicate records were identified and removed. Record screened 1064. During this initial screening phase, 982 records were excluded based on relevance and predefined inclusion criteria.

The remaining 82 full-text reports were retrieved for a more detailed eligibility assessment. Of these, 71 were excluded: 38 due to lack of relevance to the research question and 31 because they focused on academic libraries rather than health libraries, which was outside the scope of the review and removed 2 articles for AI policies in medical libraries. Ultimately, 11 studies met

all inclusion criteria and were included in the final synthesis, providing the basis for the review’s findings.

The overall screening and selection process is summarised and visually represented in a PRISMA flow diagram (*Figure 1*), outlining the number of records identified, screened, assessed for eligibility, and included in the final review.

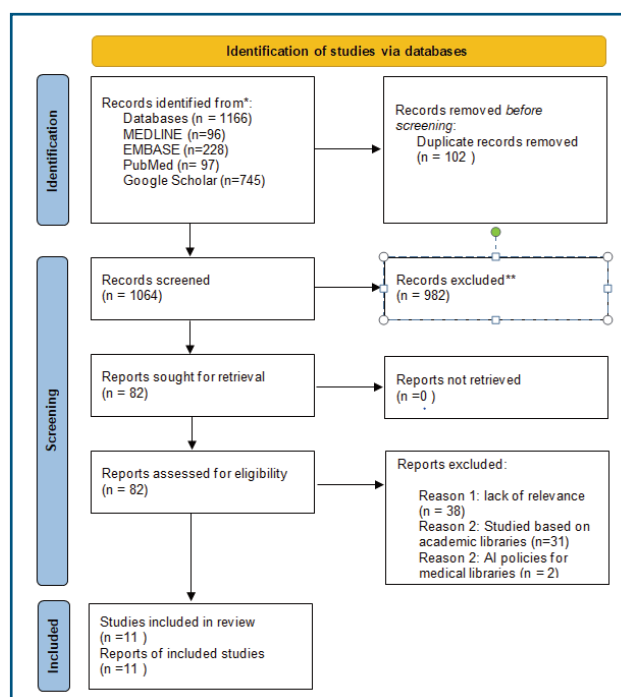


Fig. 1. PRISMA 2020 flow diagram

Key findings and interpretative analysis

The integration of artificial intelligence (AI) into medical and health libraries is shaping a new landscape for library services, operations, and user engagement. Across the reviewed articles, a common thread emerges: AI offers clear benefits in improving efficiency, enhancing user experience, and supporting decision-making, yet its success depends heavily on thoughtful implementation, human oversight, and ethical consideration.

One practical application of AI in medical libraries is in event planning, as demonstrated by the case study from Stanford’s Lane Medical Library. Here, AI tools such as ResearchRabbit and ChatGPT 4.0 were used throughout the entire event lifecycle – from identifying speakers and creating promotional materials to drafting

questions during events and compiling post-event communications. This integration significantly reduced manual workload and enabled a more streamlined process. However, the project team emphasised the importance of human input to ensure accuracy and contextual relevance, particularly when refining AI-generated outputs (1).

Similarly, *content enhancement* emerged as a valuable use case in the redesign of a dentistry LibGuide using Claude.ai. The AI tool helped restructure the guide, improve usability, and generate concise summaries, resulting in a 131% increase in access and positive feedback from students. This suggests that AI can play a transformative role in making library resources more user-friendly and discoverable. Nonetheless, the librarian involved in the project stressed the continued need for human validation of AI-generated content due to concerns about bias and misinformation (2).

AI's role in *literature searching* was examined in a randomised controlled trial comparing IRIS.AI to PubMed and Google Search. The study found that IRIS.AI performed on par with PubMed and outperformed general search engines, particularly benefiting non-specialist users. This indicates that AI tools can enhance research processes by increasing accessibility and efficiency, though the results also suggest that such tools are best used as complements rather than replacements for established databases and expert guidance (3).

Further exploring ChatGPT's capabilities, an *integrative review* of 29 studies highlighted its potential to augment library services such as reference support, cataloguing, and personalised assistance. The review identified advantages like multilingual support and rapid access to information, but it also outlined limitations – including susceptibility to misinformation and the inability to handle complex queries accurately. The authors recommended that ChatGPT be used to supplement, not supplant, the work of librarians, and called for structured frameworks for quality control and user education (4).

In the area of *collection development*, a study at Chapman University evaluated the effectiveness of various generative AI tools. While models like ChatGPT 4.0, Google Gemini, and Perplexity failed to reliably generate accurate citations or book titles, they showed more promise in identifying subject gaps and analysing collection coverage using Library of Congress classifi-

cations. This illustrates that although AI is not yet a dependable source for content recommendations, it can be used strategically to support librarians in identifying areas of need within the collection (5).

Another significant application of AI is in *automated screening for systematic reviews*, as explored in a systematic review and meta-analysis. The study found that AI tools can achieve high recall – meaning they are effective at identifying relevant studies – when optimised for sensitivity. However, this comes at the cost of lower precision, increasing the likelihood of irrelevant results. When optimised for precision, recall dropped significantly, posing the risk of missing important literature. The authors concluded that while AI can substantially reduce screening workloads, human involvement is still necessary, particularly during the initial and final screening phases (6).

From a broader policy perspective, the use of AI in *shaping healthcare information systems* across the European Union highlights its strategic potential. AI applications such as automated cataloguing, data analytics, and chatbots are improving library efficiency and fostering cross-border research collaboration. However, the article underscores the importance of ethical considerations, particularly around data privacy, algorithmic bias, and equitable access. It recommends coordinated policy development, librarian training, and partnerships with technology providers to ensure responsible and effective AI adoption (7).

In the ongoing conversation about AI in medical libraries, one recurring theme is the balance between innovation and responsibility. This is evident in the work by Orubebe *et al.*, who explored *how AI is reshaping core library functions* – from improving information retrieval to automating data management and enabling personalised user support. Their findings made it clear that while the opportunities are vast, the path forward isn't without obstacles. Ethical concerns, data privacy, staff readiness, and infrastructure gaps all stood out as key challenges. What their study emphasised most was the importance of a thoughtful, well-supported approach: one that combines strategic planning, investment, and ongoing training to ensure AI benefits are fully realised without compromising trust or quality (8).

Meanwhile, in Khyber Pakhtunkhwa, Tahira Bibi and Zakria took a closer look at *how AI is being applied in the medical libraries of developing regions in Pakistan*.

Their research, grounded in quantitative data, confirmed what many had suspected – AI has a tangible, positive impact on cataloging efficiency, user satisfaction, and administrative workflows. Tools like intelligent search systems and chatbots were especially valuable. But they also uncovered a significant hurdle: many library professionals lacked the technical skills needed to harness these tools effectively. For AI to make a lasting difference, they concluded, there needs to be a serious investment in training, infrastructure, and ethical standards tailored to local contexts (9).

As libraries continue to reimagine their roles in the digital age, another study explored the *broader potential of AI tools such as natural language processing, large language models, expert systems, and chatbots*. These technologies are pushing medical libraries toward greater accessibility and smarter services, allowing them to respond more efficiently to the needs of students, researchers, and clinicians. The study highlighted how these tools can help transform traditional library setups into dynamic, user-focused environments. But it also sounded a note of caution: while the technology is powerful, it still requires human oversight to ensure accuracy, fairness, and ethical use (10).

Adding to this evolving landscape, a unique perspective emerged around how librarians interact with AI itself. Instead of focusing on tools alone, one study turned its attention to how prompts – those carefully crafted instructions we give AI systems – can be refined for better outcomes. By blending the well-established *PICO framework* from evidence-based medicine with a structured model called TCEPFT (Task, Context, Example, Persona, Format, Tone), librarians were shown how to build more effective prompts that guide AI tools toward useful, relevant, and precise results. This method proved especially helpful in dealing with complex information requests. It reinforced the idea that, while AI can be powerful, the expertise of librarians in shaping the right questions remains just as vital as ever (11).

Future directions

The future of AI and generative AI in medical and health libraries are marked by both promising opportunities and critical limitations. As AI tools continue to evolve, their potential applications span literature searching, user services, training promotion, and evidence synthesis. However, findings from recent evalu-

ations – including a systematic review of generative AI use in evidence synthesis – highlight important concerns. While generative AI demonstrated some usefulness in tasks like data extraction and risk-of-bias assessment, it consistently underperformed in literature searching and screening, with error rates too high for reliable use without human oversight. The review concluded that current generative AI tools are not ready to replace expert-driven processes and should only be used to assist, not automate, evidence synthesis (12).

In parallel, initiatives using ChatGPT to promote information skills training in medical libraries have shown success in increasing engagement and improving communication, suggesting that generative AI can play a valuable role in outreach and education (13). These developments point to a future where AI is integrated strategically and ethically, enhancing library services while preserving the central role of professional expertise. With thoughtful implementation, generative AI can serve as a powerful tool to support and extend the reach of health and medical library services, rather than replace the human judgement and critical thinking they depend on.

Conclusion

This scoping review highlights the growing interest in and potential of artificial intelligence – particularly generative AI – within health and medical library settings. Across the reviewed literature, AI has shown its capacity to enhance operational efficiency, support information delivery, and improve user engagement through applications such as literature searching, event planning, content enhancement, and user training. However, the findings also reveal that the adoption of these tools must be approached with caution. While generative AI can streamline certain workflows, such as data extraction or promotion of library services, its limitations – especially in tasks requiring high precision like systematic searching and critical evaluation – underscore the necessity of human oversight and professional judgement.

The reviewed evidence strongly suggests that AI should serve as an augmentative tool rather than a replacement for librarians. Ethical considerations, including data accuracy, transparency, algorithmic bias, and user trust, must be at the forefront of implementation strategies. Moreover, successful integration will require

continuous staff training, user-centred design, and institutional policies that balance innovation with accountability. With ongoing evaluation, ethical vigilance, and strategic investment, generative AI can become a valuable ally in the future of health librarianship.

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