

Artificial Intelligence in Literature Search and Evidence Synthesis: Applications, Opportunities, Challenges, and Ethical Considerations: A Systematic Review Protocol

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ABSTRACT

The exponential growth of scientific publications across academic disciplines has significantly increased the complexity of literature searching and evidence synthesis. Traditional systematic review processes are rigorous but frequently require extensive time, human resources, and methodological expertise. Artificial intelligence (AI) technologies, including machine learning, natural language processing (NLP), and large language models (LLMs), are increasingly being integrated into literature review workflows to improve efficiency, scalability, and decision-making during evidence synthesis. Emerging evidence suggests that AI-assisted methods may reduce reviewer workload, accelerate screening processes, and enhance evidence identification. However, substantial concerns remain regarding transparency, reproducibility, algorithmic bias, academic integrity, over-reliance on automated outputs, and ethical governance. This systematic review aims to synthesise evidence regarding the applications, effectiveness, opportunities, challenges, and ethical implications of artificial intelligence in literature search and evidence synthesis.

This protocol was developed in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 guideline. A comprehensive search will be conducted in PubMed/MEDLINE, Scopus, Web of Science, Google Scholar, arXiv, and SciSpace from database inception to April 2026. Eligible studies will include empirical studies, methodological investigations, validation studies, reviews, ethical analyses, and framework papers examining AI-assisted literature review processes. Two independent reviewers will conduct study selection, data extraction, and quality assessment. Narrative synthesis will be the primary synthesis method, while meta-analysis will be performed where quantitative homogeneity permits. Ethical findings will undergo thematic and framework synthesis. Ethical approval is not required because this review will synthesise data from previously published and publicly accessible sources. Findings will be disseminated through peer-reviewed publication, academic conferences, institutional seminars, and open-access repositories. The protocol will be registered with the Open Science Framework (OSF) and PROSPERO.

Keywords: Academic Integrity; Ai Ethics; Artificial Intelligence; Evidence Synthesis; Large Language Models; Literature Search; Machine Learning; Natural Language Processing; Research Methodology; Systematic Review

Abbreviations: AI: Artificial Intelligence; NLP: Natural Language Processing; LLM: Large Language Models; PRISMA-P: Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols; OSF: Open Science Framework

Introduction

Systematic literature review constitutes a foundational component of academic research and evidence-based practice. Literature reviews assist researchers in identifying knowledge gaps, synthesising current evidence, evaluating methodological trends, and guiding future investigations (Page, et al. [1]). Traditional evidence synthesis approaches, particularly systematic reviews and meta-analyses, are widely recognised as rigorous methods for consolidating scientific evidence; however, they are frequently resource-intensive and time-consuming (Borah, et al. [2]). The rapid expansion of scientific publications has created substantial challenges for researchers attempting to conduct comprehensive and up-to-date evidence synthesis. It has been estimated that millions of scientific articles are published annually across multiple disciplines, resulting in increasing difficulties in managing literature identification, screening, extraction, and synthesis processes (Johnson, et al. [3]). Consequently, systematic review teams often encounter reviewer fatigue, delayed completion timelines, duplication of effort, and difficulties maintaining methodological consistency. Artificial intelligence (AI) technologies have increasingly emerged as transformative tools capable of improving efficiency and scalability within literature review workflows. AI applications in evidence synthesis include machine learning-assisted

screening, natural language processing for information extraction, automated citation mapping, predictive prioritisation algorithms, and large language models capable of generating summaries and supporting analytical tasks (Hamel, et al. [4,5]). AI-powered systems such as ASReview, Rayyan, Covidence, SciSpace, Semantic Scholar, Elicit, and ChatGPT are increasingly being used by researchers to support literature searching and review management. Several studies have reported that AI-assisted screening systems may substantially reduce manual reviewer workload while maintaining acceptable sensitivity and specificity in identifying eligible studies (Gates, et al. [6,7]). Furthermore, AI tools may improve accessibility for researchers in low-resource settings by reducing the time and technical burden associated with conventional evidence synthesis methods.

Despite these potential advantages, increasing integration of AI into academic research has generated important methodological and ethical concerns. Researchers have raised concerns regarding algorithmic bias, hallucinated references, reduced transparency in AI decision-making processes, plagiarism risks, diminished critical appraisal, and excessive dependence on automated outputs (Cierco Jimenez, et al. [8,9]). Ethical debates also continue regarding authorship attribution, accountability for AI-generated content, data privacy, and the preservation of scholarly integrity in AI-assisted research environ-

ments (Lund [10]). Although previous studies have explored selected applications of AI in evidence synthesis, much of the available literature remains fragmented across disciplines and technologies. Existing reviews frequently focus on individual AI tools or specific review stages without comprehensively examining broader methodological opportunities, implementation challenges, and ethical implications associated with AI-assisted literature review processes (Ramo, et al. [11,12]). This systematic review therefore seeks to provide a comprehensive synthesis of current evidence regarding the applications, opportunities, challenges, effectiveness, and ethical implications of AI technologies in literature search and evidence synthesis.

Rationale for the Review

The growing integration of AI technologies into academic research workflows necessitates a comprehensive evaluation of their methodological implications and ethical consequences. While AI-assisted systems may improve efficiency and scalability, inappropriate dependence on automated outputs may compromise scholarly rigour, transparency, and critical thinking. This review is important for several reasons. First, researchers and evidence synthesis teams require evidence-based guidance regarding the selection and responsible implementation of AI tools. Second, academic institutions and journals increasingly require policies regarding AI disclosure, authorship attribution, and ethical governance. Third, the rapid evolution of AI technologies has created an urgent need for updated methodological guidance capable of supporting responsible adoption while minimising risks associated with algorithmic bias, hallucination, and over-reliance. The findings from this review are expected to contribute to methodological innovation, ethical governance, institutional policy development, and future research on AI-assisted evidence synthesis.

Objectives

Primary Objective

To systematically synthesise evidence on the applications, effectiveness, opportunities, challenges, and ethical implications of artificial intelligence in literature search and evidence synthesis.

Secondary Objectives

1. To identify AI technologies and platforms currently used in literature review processes.
2. To evaluate the effectiveness and efficiency of AI-assisted evidence synthesis methods.
3. To examine methodological challenges and implementation barriers associated with AI integration.
4. To explore ethical concerns relating to transparency, academic integrity, algorithmic bias, and over-reliance.
5. To identify best practices and recommendations for responsible AI adoption in academic research.

Research Questions

This review will address the following research questions:

1. What AI technologies and platforms are currently applied in literature search and evidence synthesis?
2. How effective are AI-assisted review methods compared with traditional manual approaches?
3. What opportunities and benefits does AI offer for evidence synthesis?
4. What methodological challenges and implementation barriers are associated with AI-assisted reviewing?
5. What ethical concerns arise from the integration of AI into literature review processes?
6. What strategies can support responsible and transparent AI adoption while maintaining scholarly rigour and critical thinking?

Methods

Protocol Design and Reporting Guideline

This protocol was developed in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 statement (Moher, et al. [13]). The final review will additionally follow the PRISMA 2020 reporting guideline for systematic reviews (Page, et al. [1]).

Eligibility Criteria

Studies will be eligible for inclusion if they:

- Examine artificial intelligence applications within literature searching or evidence synthesis processes.
- Include AI technologies such as machine learning, natural language processing, large language models, automated screening systems, text mining, or AI-assisted extraction tools.
- Report empirical findings, methodological analyses, ethical discussions, implementation experiences, or framework development.
- Involve academic or scholarly research settings.
- Are published as journal articles, conference proceedings, preprints, technical reports, reviews, or framework papers.

Studies will be Excluded if they:

- • Focus solely on AI applications unrelated to literature review or evidence synthesis.
- • Discuss general AI development without application to academic literature review workflows.

- Are editorials or opinion papers without substantive methodological or ethical analysis.
- Lack accessible full text.

Information Sources

A comprehensive literature search will be conducted in the following electronic databases and platforms:

- PubMed/MEDLINE
- Scopus
- Web of Science
- Google Scholar
- arXiv
- SciSpace

Additional searches will include:

- Reference list screening
- Citation tracking
- Grey literature searching
- Institutional repositories
- Preprint servers
- Professional guidelines and policy documents

The search period will extend from database inception to April 2026.

Search Strategy

The search strategy will combine controlled vocabulary terms and free-text keywords relating to:

1. Artificial intelligence
2. Literature review and evidence synthesis
3. Academic research and methodology
4. Ethical considerations

Example search concepts will include:

- “Artificial intelligence”
- “Machine learning”
- “Large language models”
- “Systematic review”
- “Evidence synthesis”
- “Literature search”
- “AI ethics”

- “Academic integrity”

Detailed database-specific search strategies will be provided as supplementary materials.

Study Selection

All identified records will be imported into Zotero and screened for duplicates. Following deduplication, two independent reviewers will conduct title and abstract screening using Covidence or Rayyan. Potentially eligible studies will undergo full-text assessment. Disagreements between reviewers will be resolved through discussion or consultation with a third reviewer. The study selection process will be documented using a PRISMA 2020 flow diagram.

Data Extraction

A standardized data extraction form will be developed and pilot tested prior to full extraction. Data items will include:

- Bibliographic information
- Study design
- AI technology type
- Review stage addressed
- Outcomes relating to effectiveness and efficiency
- Ethical considerations
- Challenges and limitations
- Recommendations and best practices

Two reviewers will independently extract data to ensure consistency and accuracy.

Risk of Bias Assessment

Appropriate appraisal tools will be used depending on study design. These may include:

- RoB 2 for randomised studies
- ROBINS-I for non-randomised studies
- AMSTAR 2 for systematic reviews
- MMAT for mixed-methods studies
- AGREE II for guideline papers

Two reviewers will independently assess methodological quality and resolve disagreements through consensus.

Data Synthesis

Narrative synthesis will constitute the primary method of evidence synthesis due to anticipated heterogeneity in study designs and outcomes. Where appropriate, quantitative findings will be synthesized using meta-analysis with random-effects modelling. Heterogeneity will be assessed using Cochran’s Q and the I^2 statistic.

Qualitative findings relating to ethical considerations and user experiences will undergo thematic synthesis.

Ethical Considerations

This review will specifically examine ethical concerns associated with AI-assisted evidence synthesis, including:

- Algorithmic bias
- Transparency and explainability
- Academic integrity
- Hallucinated references
- Over-reliance on AI-generated outputs
- Authorship attribution
- Accountability
- Data privacy and security

Ethical findings will be synthesised using established AI ethics frameworks, including UNESCO AI ethics principles and the AI4People framework (Floridi, et al. [14,15]).

Use of AI During this Review

AI-assisted tools may be used to support language refinement and administrative tasks during the review process; however, all eligibility decisions, data extraction, interpretation, and synthesis will be conducted and verified by human reviewers.

Confidence in Evidence

The certainty of evidence for major findings will be assessed using the GRADE approach (Guyatt, et al. [16]).

Ethics and Dissemination

Ethical approval is not required because this review will analyse data from previously published and publicly accessible studies.

Findings from this review will be disseminated through:

- Peer-reviewed journal publication
- Academic conferences
- Institutional seminars
- Open-access repositories
- Professional workshops and presentations

Expected Contribution of the Review

This systematic review is expected to provide an important evidence base regarding the evolving role of artificial intelligence in literature search and evidence synthesis. The review will contribute to:

- Improved understanding of AI-assisted evidence synthesis methodologies

- Identification of opportunities and implementation challenges
- Ethical governance of AI-assisted academic research
- Development of institutional and journal policies
- Promotion of responsible AI integration within scholarly research environments

The findings may also inform future methodological research and capacity-building initiatives relating to AI-assisted systematic review practice.

Limitations

Potential limitations of this review may include:

- Rapid evolution of AI technologies during the review period
- Methodological heterogeneity across included studies
- Potential publication bias
- Variable reporting quality
- Language and accessibility limitations
- Differences in AI implementation across disciplines

These limitations will be considered during evidence interpretation and synthesis.

Conclusion

This systematic review protocol outlines a comprehensive approach for synthesising evidence regarding artificial intelligence applications in literature search and evidence synthesis. As AI technologies continue to transform academic research practices, there is increasing need for rigorous evaluation of their methodological effectiveness, ethical implications, and impact on scholarly integrity. The review will provide evidence-based insights into opportunities, challenges, and responsible implementation strategies for AI-assisted reviewing. Findings are expected to support researchers, institutions, journals, policymakers, and evidence synthesis teams in promoting transparent, ethical, and methodologically rigorous use of AI in academic research.

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