How much time does artificial intelligence really save in evidence synthesis? A systematic literature review

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Objective

To understand the extent to which Artificial Intelligence (AI) can save time and workload in the conduct of literature reviews (LRs).

Background

- Traditional LRs are time- and resource-intensive, process-driven projects.
- The emergence of generative AI models has sparked considerable interest in whether they could expedite the conduct of LRs.
- At the same time, concerns about hallucinations and quality (critical in LRs) mean evidence synthesists approach AI with caution.
- A human-in-the-loop is required to verify the outputs of AI models, which raises questions about whether meaningful time savings can actually be achieved.
- To explore this, we conducted a systematic LR to assess whether AI can truly save time in the review process while maintaining sufficient levels of quality.

Methods

- MEDLINE and Embase were searched in June 2025. Records were reviewed at title and abstract by two experienced reviewers and at full text by a single reviewer. We included primary research studies that reported time or workload saved from applying AI to a specific aspect of a LR, compared with humans. LRs were hand-searched and excluded.
- Data was extracted and synthesised qualitatively due to heterogeneity in outcome reporting. Where possible, hours saved per study were calculated; if ranges were reported, midpoints were used. Authors' conclusions were subjectively categorised as "positive", "cautiously positive" or "neutral/negative" regarding the AI-generated efficiencies in LRs.

Results

- Searches produced 2,091 unique hits; 2,011 records were removed after title/abstract review. Ultimately, 56 studies were included (**Figure 1**). Studies used proprietary tools (19 tools in 29 studies), widely available general AI tools like ChatGPT (12 tools in 16 studies) or a trained, bespoke algorithm (n=11 studies) (**Figure 2**).
- Most time savings were reported for study selection at title/abstract stage (n=45 studies), with fewer studies reporting time saved on quality assessments (n=6), extractions (n=2) or deduplication, feasibility assessment, or search strategy generation (n=1 each). Authors were more often positive (n=27) or cautiously positive (n=17) than negative (n=12) about the potential of AI to help conduct LRs (**Figure 3**).
- The median workload saved was 65% (n=27 data points) (**Figure 4**).
- The median time saved was 60% (n=8 data points, data not shown) and median time saved per study was 1.02 minutes (n=30 data points) (**Figure 5**).
- Assumptions on time taken by a human reviewer appear unrealistic in some studies, creating outliers. E.g. one study reported saving 15.5 hours per a risk of bias assessment,[1] when the average for the RoB 2.0 tool is no more than 1–2 hours by a reviewer with 1–2 years' experience (internal experience).

Conclusion

Most benefits of AI are currently observed at the screening stage of a LR, with far fewer demonstrated at data extraction or quality assessment stages. However, comparisons across studies are hampered by the lack of a unified outcome measure to assess AI performance, both in terms of precision and efficiencies gained. There is also a risk that AI benefits could be inflated by assuming an unrealistically long time taken for tasks by humans.

FIGURE 1

Prisma flow diagram

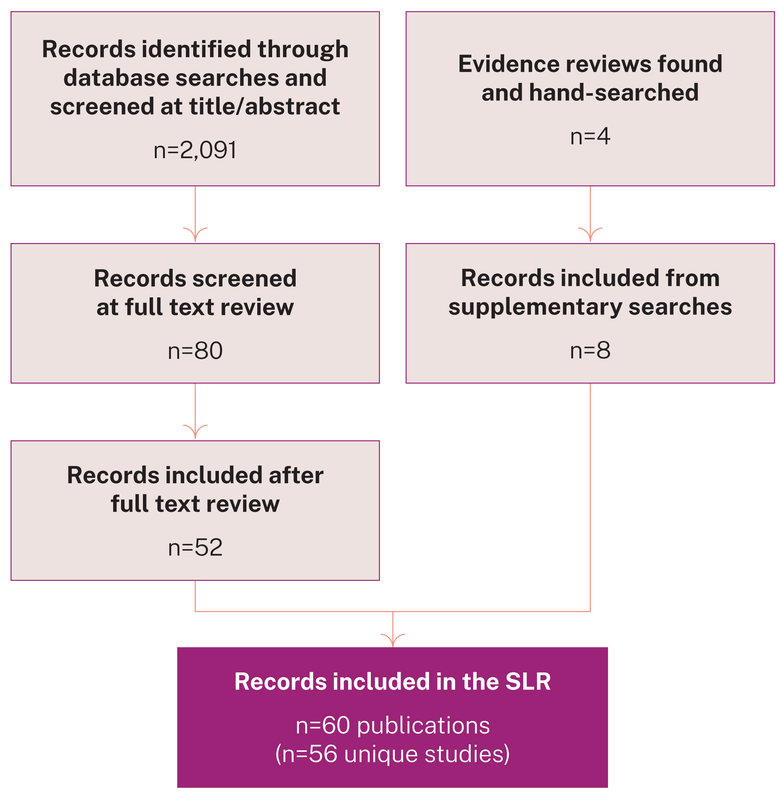
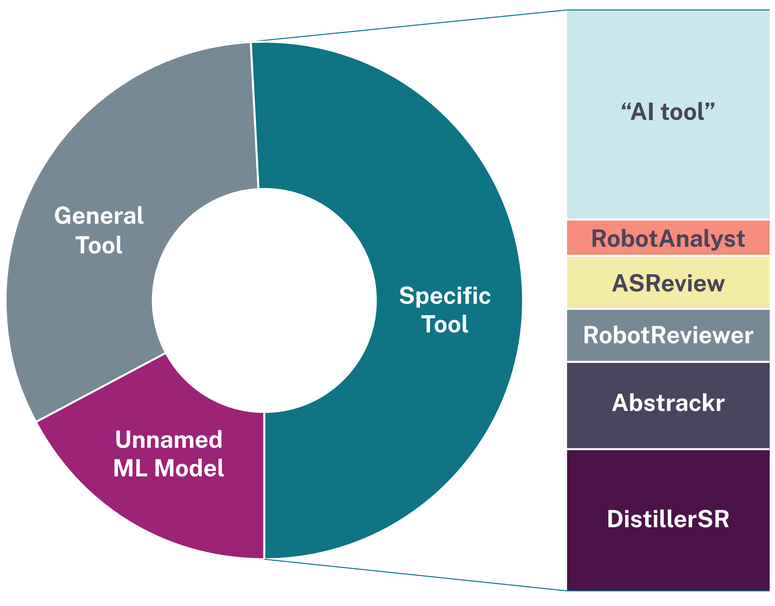


FIGURE 2

Tools used



AI tool category contains tools with only 1 study reporting each.

FIGURE 3

Outlook on the usefulness of AI by stage of review

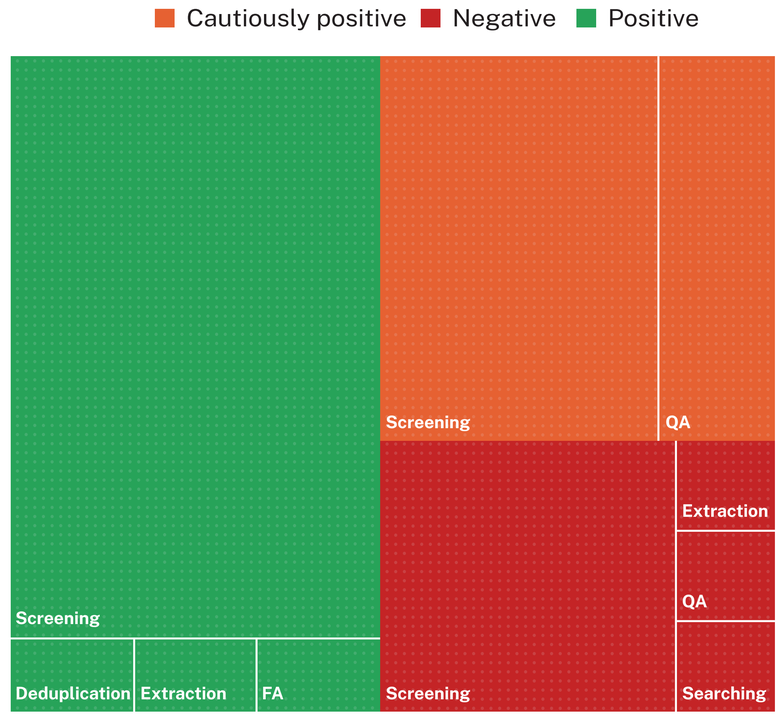
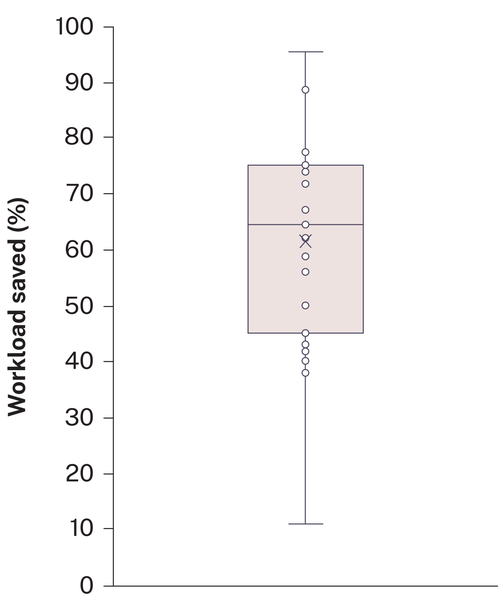


FIGURE 4

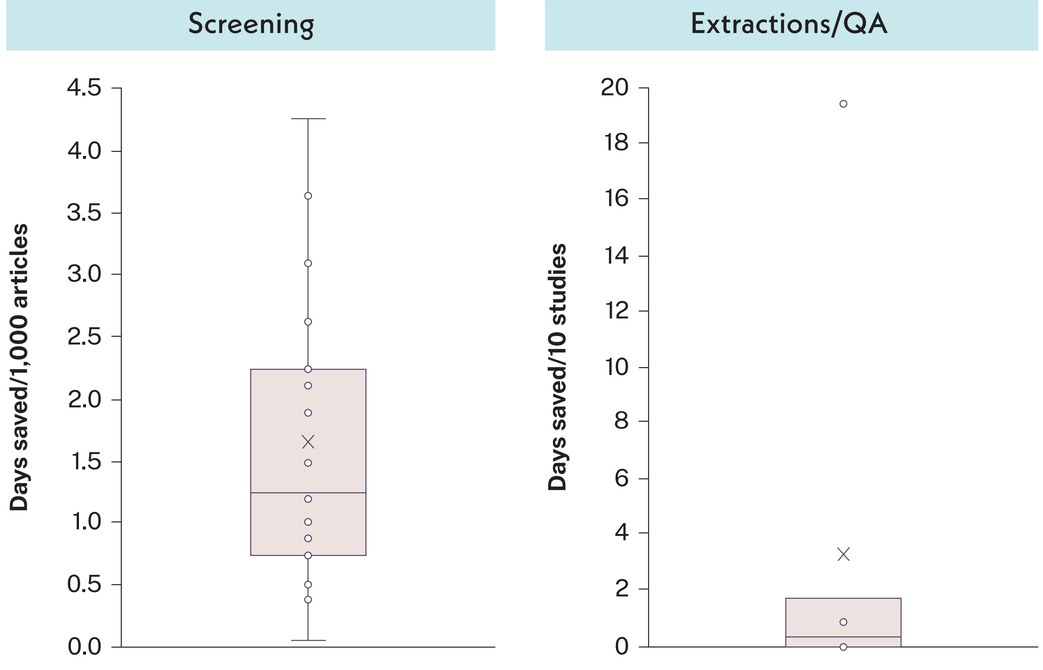
Percent workload saved



The mean is shown by the cross and the median by the horizontal line.

FIGURE 5

Time saved



Left panel: time saved with AI in screening stages of a review, presented as days per 1,000 articles screened.
Right panel: time saved with AI in QA or extraction stages of a review, presented as days saved per 10 studies.
The mean is shown by the cross and the median by the horizontal line.

Abbreviations: AI: artificial intelligence; **FA:** feasibility assessment; **LR:** literature review; **PRISMA:** Preferred Reporting in Systematic reviews and Meta-Analyses; **QA:** quality assessment; **RoB 2.0:** risk of bias version 2.0; **SLR:** systematic literature review.

References: [1]Aggarwal S, Kumar S, Topaloglu O. MSR174 Leveraging Chat-GPT for Conducting Systematic Literature Reviews. Value in Health. 2024 Dec 1;27(12):S472.
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