

Patient-Facing Artificial Intelligence for Diabetes Self-Management: An Integrative Review



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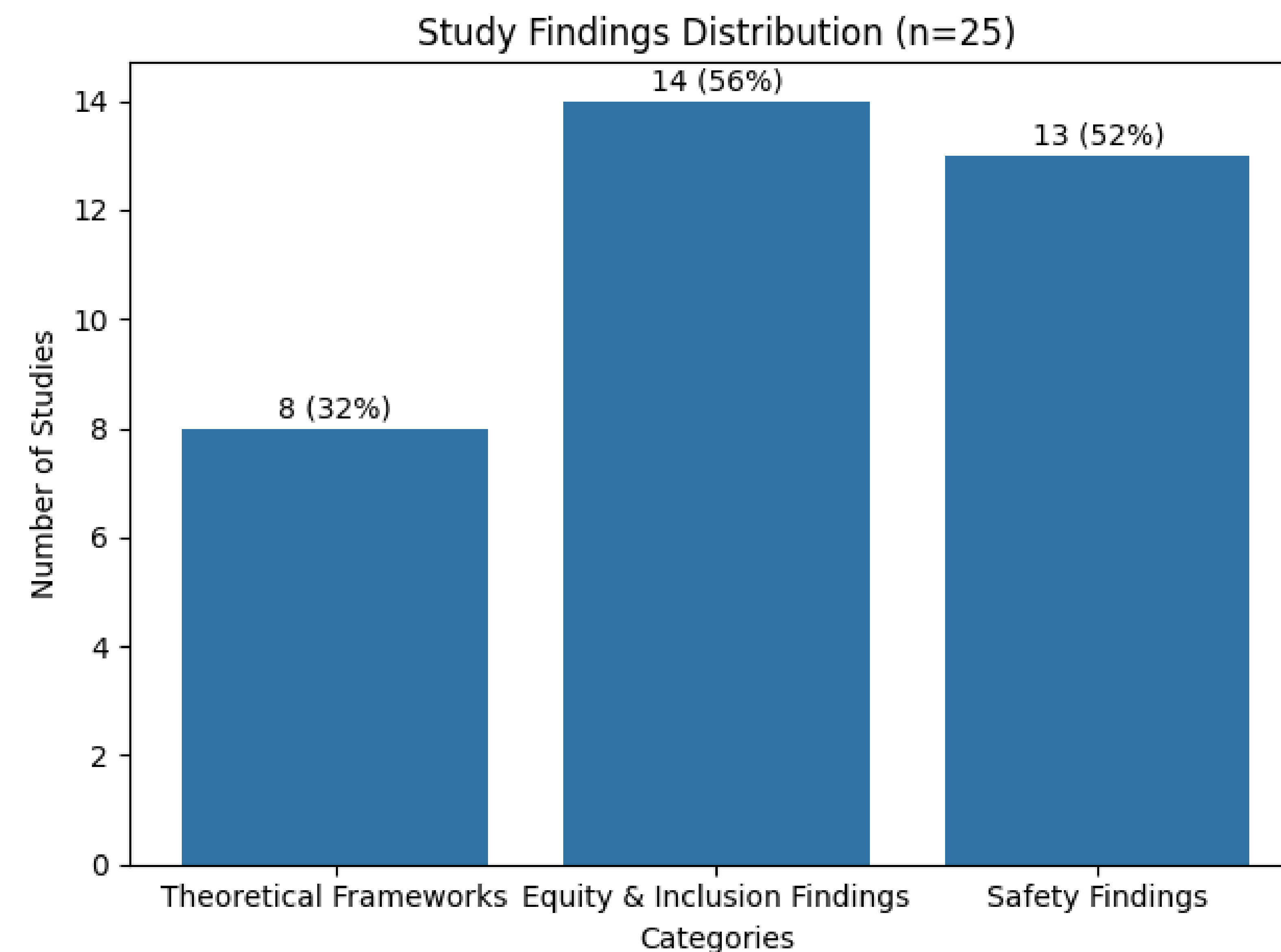
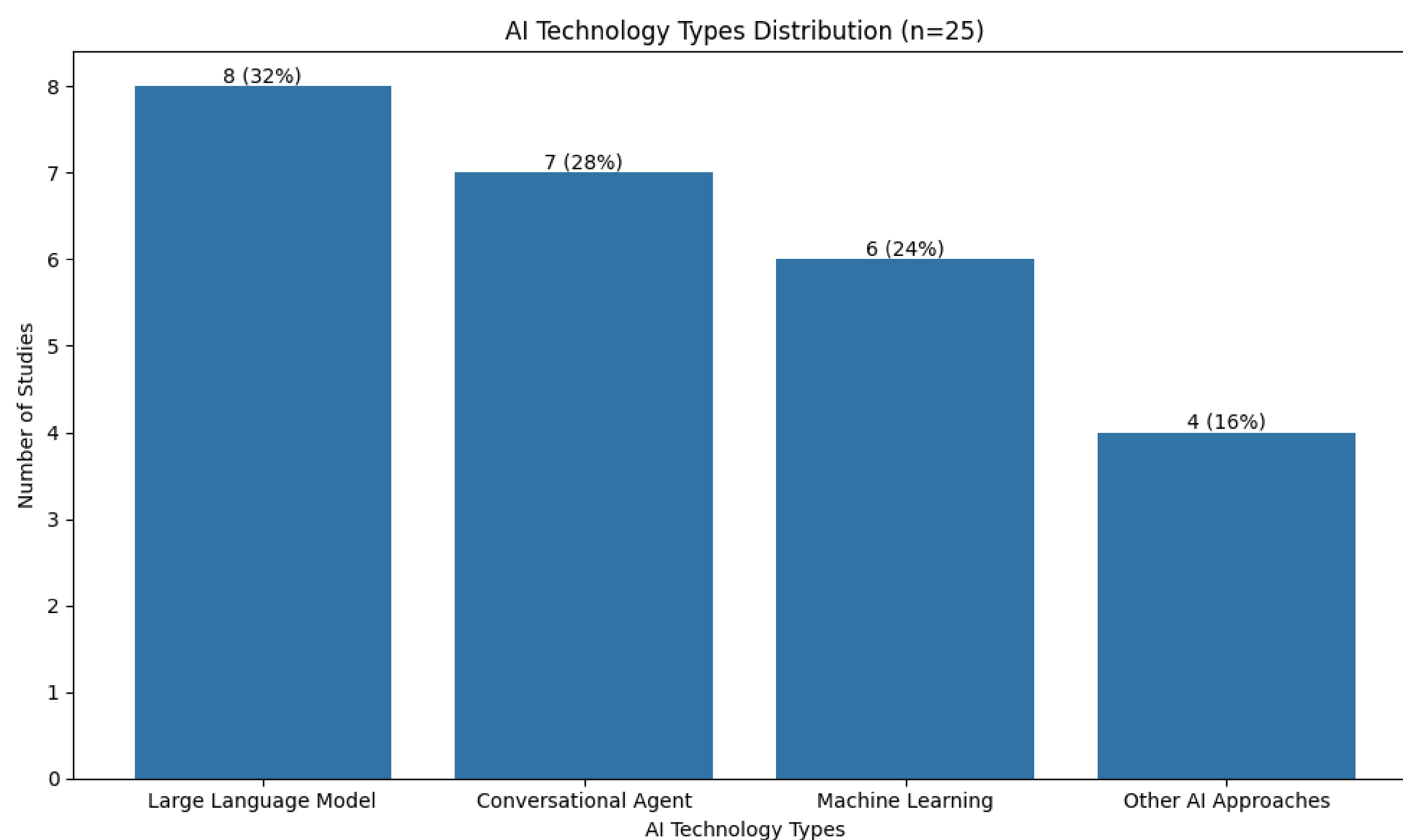
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AI-driven tools for diabetes self-management show promising benefits for clinical and behavioral outcomes, but gaps in safety, equity, and evaluation highlight the need for inclusive research to guide patient-centered implementation.

Background

Artificial intelligence (AI) tools for diabetes self-management are expanding rapidly since the emergence of large language models (LLMs) and other advanced AI architectures.

Purpose

This integrative review aims to provide a comprehensive synthesis of evidence on AI-driven patient-facing tools, decision support systems, and nursing-led interventions for diabetes management, with attention to focus on effectiveness, safety, health outcomes, and equity considerations across diverse populations, intervention types, and care contexts.

Methods

Following Whittemore and Knafl's (2005) integrative review methodology and adhering to PRISMA 2020 guidelines, this study progressed through five stages: (1) problem identification, (2) literature search (screening), (3) data evaluation (extraction), (4) data analysis (synthesis), and (5) presentation.

Literature search was conducted in multiple databases that covers core biomedical, nursing, psychological, engineering, and computer science literature (including MEDLINE, Embase, CINAHL, PsychINFO, Cochrane Library, IEEE Xplore, and ACM Digital Library) complemented by grey literature searches to capture emerging evidence not yet peer-reviewed or indexed.

Screening and extraction were managed in a collaborative software platform, with each record independently reviewed by two team members. Discrepancies were resolved through discussion, with the lead reviewer serving as arbiter.

Conclusion

This review provides a detailed mapping of AI intervention types and effects across clinical, behavioral, safety, and equity domains.

The findings map the landscape of patient-facing AI for diabetes management, identify gaps in safety and equity evaluation, and inform the design of inclusive, patient-centered AI interventions.

Equity focused on language accessibility, literacy, and access to technology, usually with older people and those with low resources.

Safety findings for LLMs included misinformation, inappropriate recommendations, and hallucinations, while machine learning had issues with reliability and validation.

The findings identify evidence gaps and provide recommendations to guide future research, clinical practice, and policy development for equitable, patient-centered AI tools in diabetes care.