

# EVALUATING THE IMPACT OF AI-BASED CLINICAL DECISION SUPPORT SYSTEMS (CDSS) ON REDUCING MEDICATION ERRORS

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# Introduction & Background

- Medication errors remain a major preventable safety issue.
- CDSS provide real-time decision support to reduce errors.
- AI-enhanced CDSS improve alert specificity and accuracy.



# Research Problem & Purpose

- Medication errors persist despite digital health systems.
- Purpose: Evaluate effectiveness of AI-based CDSS.
- Identify barriers and facilitators to successful adoption.



# Research Questions

- RQ1: Effectiveness of CDSS in reducing medication errors?
- RQ2: Barriers and facilitators impacting CDSS adoption?
- RQ3: Impact of workflow, design, and user perception?



# Literature Review Summary

- CDSS evolved from rule-based alerts to AI-driven systems.
- CDSS reduce 30–50% medication errors across studies.
- Frameworks used: TAM, Socio-Technical Theory, Donabedian Model.



# Research Gaps Identified

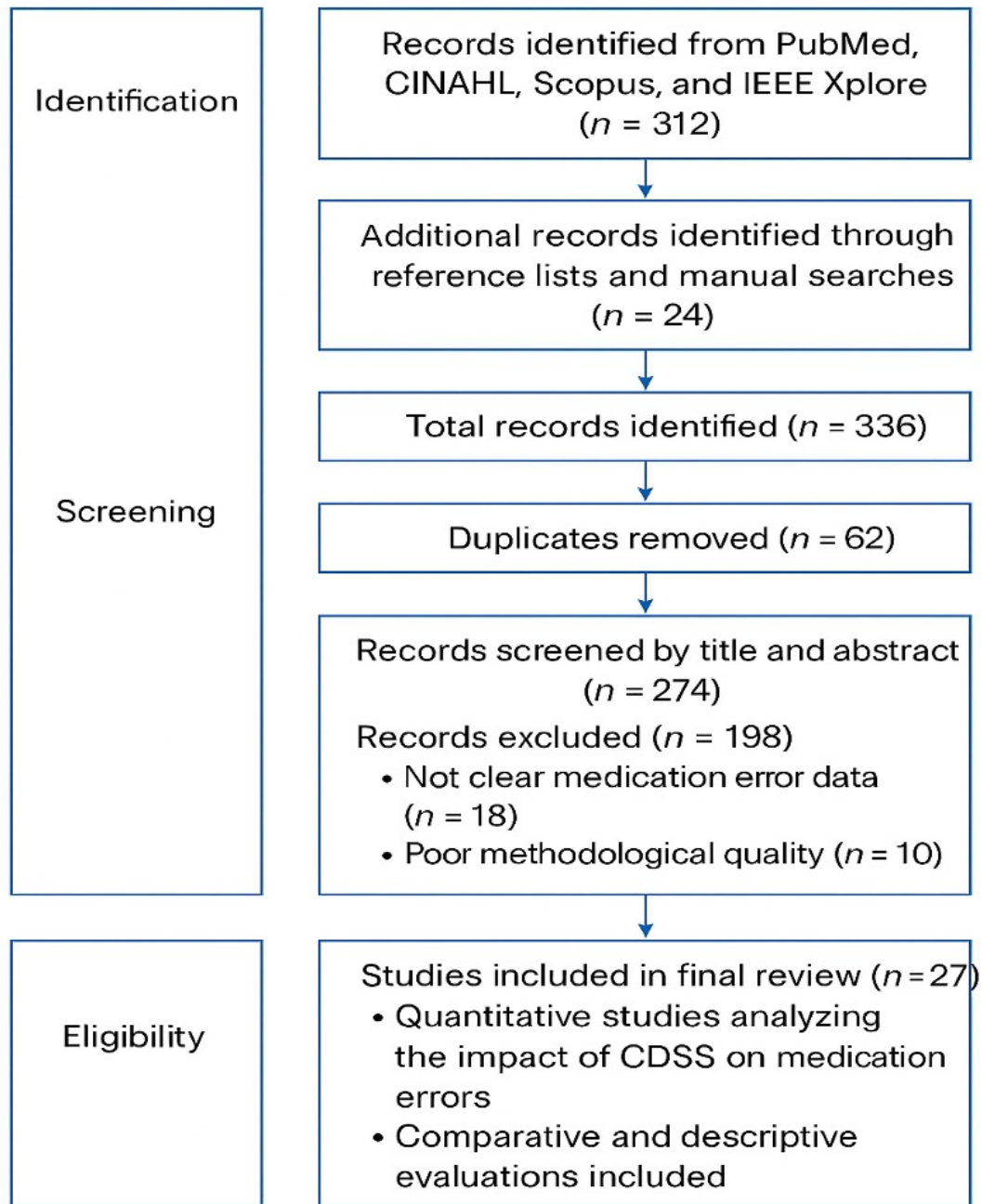
- Long-term outcomes underreported.
- Limited studies in low-resource settings.
- Ethical concerns: bias, transparency, accountability.



# Methodology Overview

- Integrative literature review (Whittemore & Knafl).
- Databases: PubMed, CINAHL, IEEE, ScienceDirect.
- Years included: 2015–2025.
- Final studies included: 24.

# PRISMA Flow Diagram



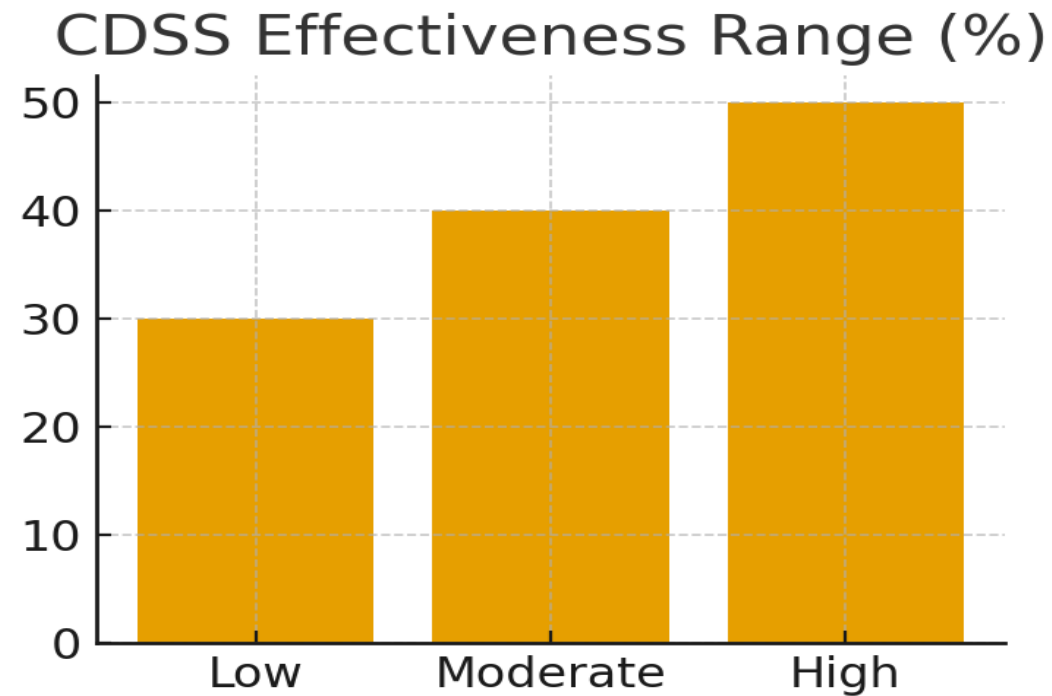




# Study Design Distribution

Study Design	Number	Percentage
Quantitative	12	50%
Qualitative	5	21%
Mixed Methods	7	29%

# CDSS Medication Error Reduction





# Key Findings

- CDSS reduce 30–50% medication errors.
- AI-enhanced CDSS improve alert accuracy.
- Clinician trust strongly linked with CDSS usage.



# Barriers and Facilitators

- Barriers: alert fatigue, workflow issues, interoperability gaps.
- Facilitators: leadership support, rule-set updates, user-centered design.



# Conclusions

- CDSS significantly reduce medication errors when properly integrated.
- AI enhances specificity and reduces false positives.
- Workflow alignment and user trust are essential.



# Implications for HlIM Practice

- Stronger governance and CDSS maintenance required.
- User-centered design improves adoption.
- Improving data quality and interoperability enhances outcomes.



# Future Research Directions

- Long-term CDSS impact studies needed.
- Research in rural/under-resourced hospitals.
- Ethical analysis of AI-enabled CDSS.



# References

- Bates et al. (2018)
- Li et al. (2023)
- Gleason et al. (2022)
- Patel & Han (2021)
- Nguyen et al. (2022)
- Sittig & Singh (2019)
- Ancker et al. (2017)
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- Whitemore & Knafl (2005)
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