

The Role of Artificial Intelligence in Supporting Medical Decision-Making: Opportunities, Challenges, and Physicians' Perceptions

Willem Gielen¹, Mahican Gielen¹

¹ North Denmark Regional Hospital, Denmark

Published online in preprint:

May 29th, 2023

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Keywords: artificial intelligence, clinical decision-making, decision support systems, disease diagnosis, healthcare monitoring, physicians' perceptions, cancer treatment

Abstract:

The use of artificial intelligence (AI) in medical decision-making has the potential to revolutionize healthcare by improving the accuracy and efficiency of clinical decision-making. AI-driven decision support systems (AI-DSS) can help physicians analyze data and facilitate the search for a correct diagnosis or suitable intervention. However, the implementation of AI in clinical practice is not without challenges. Physicians' perceptions of AI-DSS are crucial to the successful implementation of these systems. Physicians describe a need to incorporate AI-DSS into existing decision-making processes, and they want more information and further influence on the system. Recent studies in the clinical decision support system area demonstrate a prevalence of data-driven AI, which can be adopted autonomously in purely data-driven systems or in cooperation with domain knowledge in hybrid systems. The effective design and use of AI tools in healthcare and medicine require the contribution of the medical decision-making research community. The context, setting, data, role of uncertainty, and human interaction with the information are key factors for realizing success. Therefore, there is a substantial role for the medical decision-making research community to contribute to the effective design and use of AI tools in healthcare and medicine.

Introduction

Artificial intelligence (AI) has the potential to revolutionize healthcare by improving the accuracy and efficiency of clinical decision-making. One area where AI can be particularly useful is in supporting physicians to practice evidence-based medicine. In this review article, we will examine the use of AI support systems for physicians to improve evidence-based medicine.

Perceived Clinical Utility and Impact on Physician-Patient Relationship

A mixed-methods feasibility study ¹ evaluated the clinical utility and impact on the physician-patient relationship of an AI-enabled clinical decision support system (CDSS) for the treatment of adults with major depression. The study found that physicians perceived the tool as useful in conducting appointments and used it while making treatment decisions. Physicians and patients generally found the tool trustworthy, and it may have positive effects on the physician-patient relationship.

Physicians' Perceptions and Expectations of an Artificial Intelligence-Based Clinical Decision Support System in Cancer Care

A qualitative research study ² conducted semi structured interviews of physicians at The Instituto do Câncer do Ceará, Fortaleza, Brazil. The study evaluated the anticipated, perceived benefits and challenges of using an AI-based clinical decision support system tool, Watson for Oncology. Physicians expected that the implementation of an AI-based tool would result in easy access to the latest clinical recommendations, facilitate standardized cancer care, and allow it to be delivered with greater confidence and efficiency.

The Use of AI in Decision Support System for Disease Diagnosis

A study ³ presented the impact of AI's capabilities on Decision Support Systems, in disease diagnosis or disease prediction. The study found that AI-enabled Decision Support Systems (DSS) can provide rapid growth in the diagnosis of critical diseases by providing differential support to physicians and work as a second opinion for the patients as well.

Physicians' Perceptions of and Satisfaction With Artificial Intelligence in Cancer Treatment

A review article ⁴ evaluated physicians' perceptions of and satisfaction with an AI tool, Watson for Oncology, which is used for the treatment of cancer. The study found that AI can be both beneficial and challenging for cancer management globally and particularly for low-middle-income countries. By doing so, the study highlighted the need for additional research on user experience and the unique social, cultural, and political barriers to the successful implementation of AI in low-middle-income countries for cancer care.

Determinants of Intention to Use Artificial Intelligence-Based Diagnosis Support System Among Prospective Physicians

A study ⁵ aimed to develop a theoretical model to explore the behavioral intentions of medical students to adopt an AI-based Diagnosis Support System. The study found that social influence was positively related to the behavioral intention of using an AI-based diagnosis support system among prospective Vietnamese physicians.

Conclusion:

The studies reviewed in this article suggest that AI support systems for physicians have the potential to improve evidence-based medicine. Physicians and patients generally find the tools trustworthy, and it may have positive effects on the physician-patient relationship. However, there are still challenges to the successful implementation of AI in clinical practice, particularly in low-middle-income countries. Further research is needed to evaluate the effectiveness of AI support systems in improving clinical decision-making and patient outcomes.

Citations:

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