



Attitudes and Perceptions of Physicians in Israel Towards Clinical Decision Support Systems, with Emphasis on Systems Based on Artificial Intelligence

Hadar Samuel Tal Norman

Editor (Hebrew): Ronit Cohen Ben-Nun
English translation (Abstract): David Simmer
Graphic design: Efrat Speaker

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Myers JDC Brookdale Institute

P.O.B. 3886, Jerusalem 9103702, Israel

Tel: 02-6557400

brookdale.jdc.org.il/en | brook@jdc.org

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Abstract

Background

Clinical decision support systems (hereinafter: CDSS), especially those based on artificial intelligence (hereinafter: AI-CDSS), are expected to be widely adopted across various medical fields in the coming years, altering physicians' work patterns. Questions such as how these systems can be integrated into doctors' routines, the barriers to their successful implementation, and factors that could facilitate their adoption have not been sufficiently addressed in Israel. Understanding doctors' attitudes towards CDSS in general, and AI-CDSS in particular, is crucial to overcoming barriers to their optimal implementation and use in Israel.

Objectives

1. To examine the extent to which physicians in Israel are familiar with CDSS and their experience using these systems.
2. To describe the current usage patterns of these systems by physicians.
3. To present physicians' perceptions and attitudes regarding the use of CDSS in general, and AI-CDSS in particular.
4. To identify barriers to optimal implementation and use of CDSS and to suggest possible strategies to address them, based on insights from the field.

Methods

The study was conducted using a qualitative method and included semi-structured in-depth interviews with 26 medical professionals, including specialists, residents, and managers from various fields of medicine. Data collection took place between January and July 2023. The physicians were asked about their familiarity with CDSS, their experience using these systems, their perceptions and attitudes towards their use, and the barriers they believe hinder their optimal implementation and usage, as well as possible solutions.

Main Findings

The familiarity of physicians with CDSS and their experience in using these systems varies across medical fields and healthcare institutions in Israel. The use of risk calculators, information systems, and expert systems that provide access to up-to-date research knowledge is common and accepted among physicians in Israel. However, the use of AI-CDSS is much less prevalent and is primarily concentrated in the field of radiology.

The physicians interviewed in the study expressed positive attitudes towards CDSS and AI-CDSS, viewing them as systems that can support their work throughout the clinical care continuum, contribute to reducing various types of human error, and alleviate the workload associated with administration, time management, and care management. However, they also raised concerns regarding the impact of adopting AI-CDSS on their work and about the lack of transparency regarding the quality of information, the rationale, and the functioning of the algorithms underlying these systems. The interviewees emphasized the need for ongoing validation of these systems over time and the need to establish clear guidelines regarding the clinical and legal responsibilities of physicians in relation to these systems and the healthcare organizations that employ them.

The barriers that may hinder the integration of AI-CDSS in healthcare organizations in Israel are related to technological infrastructure, the implementation processes within the organizations, the characteristics and perceptions of the physicians, and the characteristics of the systems themselves. Accordingly, the factors that are expected, according to the physicians interviewed, to assist in optimal implementation are related to:

- **System design** so that they are user-friendly, tailored to physicians' needs, inspire trust, and address real needs without adding to physicians' day-to-day workload;
- **Implementation processes within the organizations** including dedicated training for the specific systems and ongoing research validation processes for accuracy and reliability;
- **Regulation** of the relationships between physicians and healthcare organizations concerning the mandatory use of these systems and the boundaries of legal responsibility imposed on physicians when using them.

Recommendations

Recommendations to healthcare organizations adopting CDSS

- Ensure that AI-CDSS development involves physicians from the specialty that the system is intended to serve.
- Verify that the accuracy and reliability of the systems are maintained when transitioning from training and development data to Israeli population data and develop mechanisms for ongoing validation over time.
- Ensure that the assimilated systems address a genuine need among physicians, are user-friendly, and do not unduly add to the day-to-day workload. It is recommended to continue monitoring the system's ability to meet this need throughout the usage period.
- Support the assimilation of the systems with dedicated training, provide physicians with specific time to experiment with their use, and incentivize physicians to do this experimentation.
- Clarify to physicians the organization's expectations regarding the use of the systems and adherence to its recommendations.

Recommendations to the Ministry of Health

- Draft guidelines that will ensure the responsible and safe implementation of AI-CDSS, including the definition of legal boundaries of responsibility for physicians using these systems.
- Conduct regular and systematic evaluations of the use of these systems in various domains, institutions, and healthcare professions.
- Randomly assess the effectiveness of the systems in different hospitals.

Recommendations for further research

- Validate the findings of this study with a quantitative study among physicians in Israel in order to assess the extent to which the barriers identified in this research apply to the physician community as a whole; evaluate the degree to which the proposed solutions satisfy the respondents; and determine the extent to which they contribute to the willingness to use CDSS, with emphasis on AI-CDSS.
- Conduct a survey of attitudes and satisfaction among physicians currently working with AI-CDSS in order to determine their usage patterns and assess the relationship between these patterns and important aspects of their work, such as quality and safety of care and job satisfaction.
- Conduct studies similar to the current one among other healthcare professions (nursing, pharmacists, nutritionists, etc.).