

Usability of Clinical Decision Support for Adult Sepsis Detection

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Abstract. This review summarized current literature investigating the usability of computerized clinical decision support (CCDS) systems for the early detection of sepsis in adult inpatients. Ten databases were systematically searched, identifying nine studies. Overall, the lack of good usability testing and the critical need for setting-specific testing were highlighted, as each different CCDS and unique hospital environment brings a diverse range of usability concerns that must be managed for CCDS systems to effectively improve patient care.

Keywords. Sepsis, usability, computerized clinical decision support

1. Introduction

Use of computerized clinical decision support (CCDS) systems to assist with early detection of sepsis in hospitals has the potential to improve sepsis identification and management. However, the usability of such systems is understudied. Our review aimed to summarize the current literature investigating the usability of CCDS systems for the early detection of sepsis in adult hospital patients.

2. Methods

Detailed methodology can be found in the published protocol for this review [1]. Ten databases were searched. All relevant study context, design, and usability data were extracted and analyzed through narrative synthesis and grouped thematically.

3. Results

Nine journal articles met our inclusion criteria after screening (Table 1). Survey was the most common study design (n=7). Response rates and sample sizes varied across the studies [2-10]. The reported usability of sepsis CCDS systems was diverse, with studies reporting positive, negative, and mixed responses across four themes.

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4. Conclusions

This comprehensive review highlights the importance of usability testing to facilitate more effective integration of sepsis CCDS systems into the complex hospital environment. Furthermore, our findings emphasize the value of tailoring usability testing for different CCDS systems and clinical circumstances.

Table 1. Study characteristics and usability themes reported

Author (Year)	Study Design	Study Participants	Response rate	Usability themes reported [#]			
				(i)	(ii)	(iii)	(iv)
Aakre (2017)	Survey	Clinicians	12/50 (24%)	✓	✓	✓	
Downing (2019)	Survey	Clinicians	42/63 (67%)		✓	✓	
Dziadzko (2016)	Survey	Clinicians	23/40 (58%)			✓	✓
Guidi (2015)	Survey	Clinicians & nurses	232/494 (47%)	✓	✓	✓	✓
Harrison (2017)	Survey	Clinicians	12/40 (30%)			✓	✓
Huff (2019)	Survey	Nurses	47/157 (30%)		✓		✓
Miller (2017)	Survey	Nurses	151/284 (53%)	✓	✓		✓
Pertiwi (2018)	Heuristic evaluation	3 evaluators	NR	✓		✓	
Rincon (2017)	Focus groups	Nurses	NR	✓	✓	✓	✓

[#]Usability themes: (i) the overall CCDS usability, (ii) the usefulness and accuracy of the system, (iii) timing, alert interface, and delivery, and (iv) changes in workload and fatigue. NR = Not reported.

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