

The Digital Call to Action: Exploring the Nurses' and Clinicians' Lived Experiences with Sepsis Alert Systems in Pediatric Settings

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ABSTRACT

This study explored healthcare professionals' experiences and perceptions of sepsis alert systems and their influence on clinical decision-making and patient outcomes in pediatric care. A qualitative study was conducted in a local hospital in Qatar. Data were collected through semi-structured interviews and non-participant observations involving nurses and clinicians working in pediatric settings. Thematic analysis was used to identify recurring patterns and themes related to the use of sepsis alert systems in clinical practice. Five major themes emerged: clinical decision support and early intervention; influence on clinical decision-making and workflow; challenges in managing sepsis alerts; perceived effectiveness on patient outcomes; and recommendations for system improvement. Participants viewed the sepsis alert system as a valuable tool for enhancing early sepsis recognition, supporting timely interventions, and improving the prioritization of high-risk pediatric patients. The system also strengthened communication, teamwork, and coordination among healthcare professionals. However, challenges such as alert fatigue, false-positive alerts, workflow disruptions, and technical limitations affected system reliability and increased reliance on clinical judgment. Despite these challenges, participants reported that the system contributed to earlier detection, faster treatment, reduced disease severity, and shorter hospital stays. The study was conducted in a single pediatric healthcare setting, which may limit the transferability of findings. Future research should examine sepsis alert systems across multiple institutions and evaluate their impact on patient outcomes using mixed-methods approaches. Continuous system refinement, enhanced staff training, and improved workflow integration are recommended to optimize system performance and support high-quality pediatric care. This study provides context-specific insights into healthcare professionals' experiences with pediatric sepsis alert systems in Qatar, informing future improvements in digital clinical decision-support technologies.

Keywords: Sepsis alert system, pediatric care, clinical decision-making, early detection, qualitative research

INTRODUCTION

Sepsis remains a leading cause of morbidity and mortality among pediatric patients, posing a significant challenge in clinical practice due to its rapid progression and complex presentation. Early recognition and timely intervention are crucial in improving patient outcomes, yet many healthcare institutions struggle with delayed diagnosis and treatment (Miranda & Nadel, 2023). To address this issue, hospitals have integrated sepsis alert systems into electronic health records and monitoring protocols to support clinical decision-making. These systems aim to detect early warning signs and prompt healthcare providers to initiate appropriate management before the condition becomes critical.

Research Objectives

This study aimed to explore healthcare professionals' experiences and perceptions of sepsis alert systems and their impact on clinical decision-making and patient outcomes in pediatric care settings. Specifically, it sought to examine how healthcare professionals experience and utilize sepsis alert systems, how these systems influence clinical decision-making and workflow, and the challenges encountered in responding to and managing system-generated alerts. The study also explored healthcare providers' perceptions of the effectiveness of sepsis alert systems in improving patient outcomes and gathered recommendations for optimizing their use and integration in pediatric clinical practice.

Scope and Delimitations

The study explored healthcare professionals' experiences and perceptions of sepsis alert systems and their impact on clinical decision-making and patient outcomes in pediatric care settings. The participants were limited to nurses and physicians working in pediatric units who had experience using sepsis alert systems at a specific healthcare institution. As a qualitative study, the findings are based on participants' perspectives and may not be generalizable to other healthcare settings, populations, or sepsis alert system designs.

Review of Related Literature

Previous studies consistently demonstrate that electronic sepsis alert systems improve the early recognition and management of sepsis in pediatric patients. Research by Gibbs et al. (2021), Alanzi et al. (2022), and Balamuth et al. (2021) reported improvements in mortality rates, treatment timeliness, bundle compliance, and sepsis detection following the implementation of electronic alerts. These systems also enhanced interdisciplinary communication and clinical decision-making, leading to better patient outcomes. However, successful implementation depends on clinician acceptance, workflow integration, and ongoing optimization of alert accuracy, as highlighted by Joshi et al. (2022). Overall, the literature supports the value of sepsis alert systems as effective tools for improving pediatric sepsis care while emphasizing the need for continuous refinement and staff engagement.

Conceptual Framework

The conceptual framework proposes that technological competency, when combined with collaborative nurse-patient goal attainment and humanistic caring practices, enhances the quality of nursing care and patient outcomes. Nurses utilize technology as an expression of caring (Technological Competency as Caring in Nursing Theory), engage patients in shared decision-making and goal setting (Goal Attainment Theory), and provide compassionate, holistic care that preserves dignity and promotes well-being (Watson's Science of Caring Theory). The integration of these theories supports a nursing practice that is technologically proficient, patient-centered, and grounded in caring relationships.



METHODOLOGY

Research Design

This study employed a qualitative research design to explore healthcare professionals' experiences and perceptions of sepsis alert systems and their impact on clinical decision-making and patient outcomes in pediatric settings. It ensures that the voices of healthcare professionals are authentically represented, providing insights into both the benefits and challenges of integrating sepsis alert systems in pediatric practice.

Research Steps

This research began with an extensive literature review to explore healthcare professionals' experiences and perceptions of sepsis alert systems and their impact on clinical decision-making and patient outcomes in pediatric settings. Based on the review, the research objectives, questions, and qualitative study design were developed, and ethical approval was obtained prior to participant recruitment through purposive sampling. Data were collected through semi-structured interviews and non-participant observations from pediatric healthcare professionals experienced in using sepsis alert systems. The collected data were analyzed using thematic analysis, and the findings were interpreted through the Technological Competency as Caring in Nursing (TCCN) Theory by Locsin, the Goal Attainment Theory by Imogen King, and Watson's Science of Caring Theory.

Data Collection and Sample Selection

Data collection commenced after obtaining ethical approval and informed consent from all participants, ensuring confidentiality and voluntary participation. Semi-structured interviews were conducted and audio-recorded, while non-participant observations and field notes were used to capture healthcare professionals' responses during sepsis alert activations. Data collection continued until saturation was achieved, ensuring comprehensive insights into the influence of sepsis alert systems on pediatric clinical practice.

Data Analysis Methods

Data from interviews, observations, and field notes were analyzed using thematic analysis, with interview recordings transcribed verbatim, reviewed repeatedly, and coded to

identify significant patterns and themes. Reflexive notes and peer debriefing were employed throughout the analysis to enhance the transparency, credibility, and trustworthiness of the findings.

Research Hypotheses and Validation

The study hypothesized that sepsis alert systems positively influence healthcare professionals' clinical decision-making and improve patient outcomes in pediatric settings. Validation was achieved through triangulation of data obtained from interviews, observations, and field notes to ensure consistency and credibility of the findings. The emerging themes were further verified through peer debriefing and alignment with the study's conceptual framework and existing literature.

Study Limitations and Ethical Considerations

The study adhered to ethical protocols by obtaining informed consent from all participants, ensuring anonymity and confidentiality, and allowing participants to withdraw at any time. Furthermore, ethical issues encompassed the imperative to ensure the respectful portrayal of participants' views in the final analysis and reporting.

RESULTS AND DISCUSSION

The findings identified five major themes: Clinical Decision Support and Early Intervention; Influence on Clinical Decision-Making and Workflow; Challenges in Managing Sepsis Alerts; Perceived Effectiveness in Patient Outcomes; and Recommendations for System Improvement. Participants reported that sepsis alert systems support early recognition, timely intervention, patient prioritization, and team communication, thereby improving clinical decision-making and patient outcomes. However, challenges such as alert fatigue, false positives, workflow constraints, and technical limitations were also identified, highlighting the need for enhanced system accuracy, staff training, and workflow integration to optimize effectiveness.

SUMMARY

This study explored healthcare professionals' experiences and perceptions of sepsis alert systems and their impact on clinical decision-making and patient outcomes in pediatric settings. Findings showed that sepsis alert systems support early sepsis recognition, timely interventions, patient prioritization, and improved communication among healthcare teams. Participants also identified challenges, including alert fatigue, false-positive alerts, workflow constraints, and technical limitations that may affect system effectiveness. Overall, the findings suggest that while sepsis alert systems enhance patient safety and clinical outcomes, ongoing improvements in system accuracy, training, and workflow integration are needed to maximize their benefits.

CONCLUSIONS

This study concludes that sepsis alert systems play a significant role in supporting early sepsis recognition, enhancing clinical decision-making, and improving patient outcomes in pediatric care. While the system promotes timely intervention, patient prioritization, and effective team communication, challenges such as alert fatigue, false positives, and technical limitations may affect its overall effectiveness. Therefore, continuous system optimization,

staff training, and workflow integration are essential to maximize the benefits of sepsis alert systems and strengthen patient safety and quality of care.

RECOMMENDATIONS

Based on the findings of the study, it is recommended that sepsis alert systems be continuously enhanced to improve accuracy, reduce false-positive alerts, and support timely clinical decision-making through the integration of advanced technologies and patient-specific parameters. Ongoing training and competency development programs should be provided to healthcare professionals to strengthen clinical judgment, improve responses to alerts, minimize alert fatigue, and promote effective interdisciplinary collaboration. Healthcare organizations should also establish clear policies and standardized protocols to ensure consistent use of the system, optimize workflow integration, and support improved patient outcomes in pediatric care.

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AI DECLARATION STATEMENT:

AI-supported tools helped with grammar and structure in creating this article. No AI tools were used to collect, analyze, or interpret data; all authors are credited for their academic contributions.

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