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Use of Electronic Health Records and Documentation Burden Among Nurses in Acute and Critical Care

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Abstract. Nurses who provide the majority of hands-on care for hospitalized patients are disproportionately affected by the current state of electronic health records (EHRs), and little is known about their lived perception of EHR use. Using a mixed-methods research design, we conducted an in-depth analysis and synthesis of data from EHR usage log files, interviews, and surveys and assessed factors contributing to the nurse documentation burden in acute and critical at a large academic medical center. There remain substantial spaces where we can develop viable solutions for enhancing the usability of multi-component EHR systems.
Keywords. electronic health record; documentations; documentation burden; nurses; usability; evaluation; user interface

1. Introduction

The use of electronic health records (EHRs) has improved the quality of care and patient safety. Despite its potential, the user interface and workflow design of every EHR component do not adequately consider the needs of users in the clinical workflow. This has led to negative user outcomes including documentation burden and clinician burnout troubling adverse effects on patient outcomes[1,2]. Although nurses are disproportionately affected by the current state of EHRs, little is known about their lived perceptions of EHR use. We sought the input of actual users in real-world practice to understand everyday user experience with EHRs including the strengths and barriers to nurse documentation. The objective of this study was to examine nurses' current use of an EHR and identify factors that could contribute to the documentation burden in acute and critical care units at a large academic medical center.

2. Methods

A mixed-methods research design was used to explore nurses' current use of the key components of an EHR, *Flowsheets, Medication Administration Records (MAR)*, *Care*

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Plan, *Notes*, and *Admission-Discharge-Transfer (ADT) navigators*. We first conducted analyses of Epic usage log file data to identify acute and critical care units in which the nurse documentation burden could be the highest and then explored nurse perceptions of ease of use and usefulness of the EHR components with a convenience sample of 20 nurses from the five identified units via interviews and surveys. Guided by the Unified Theory of Acceptance and Use of Technology (UTAUT)[3], we conducted an in-depth analysis and synthesis of data from log files, one-on-one interviews, and surveys and assessed factors contributing to the nurse documentation burden.

3. Results

Our study showed that nurses acknowledged the importance of documentation at the point of care but perceived required documentation as being burdensome. Overall, nurses reported varied levels of documentation burden stemming from each EHR component. Possible factors contributing to the documentation burden included general barriers such as high patient-to-nurse staffing ratios, patient acuity, and suboptimal time management, and usability issues related to the design and features of the EHR components. Three EHR components, *Flowsheets, Care Plan,* and *ADT Navigators*, were found to be below acceptable usability score, 68, measured by the system usability scale (SUS) and the most cumbersome as >60% of nurses reported as "somewhat" to "extremely" burdensome for documentation, compared to *MAR* and *Notes*. As actionable strategies, providing "contextual autocomplete" features that can rank concepts by predicted probability and adding a search bar to be used for their needed information and decision-making into each component could assist the nurse with data entry using standard terminologies and also facilitate guiding nurses to document in similar situations using technology-based tools.

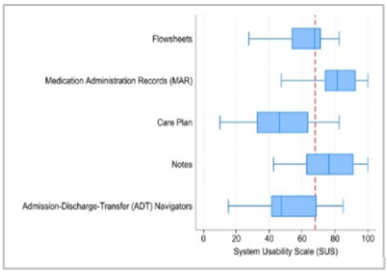

Figure 1. SUS scores per EHR component

4. Conclusions

Limitations to this study include the potentially limited generalizability of the results beyond inpatient units at a single medical center using a convenience sampling method; however, our study generated preliminary evidence for nurses' current pattern of EHR use and specific issues with documentation contributing to burden, which could provide practical insights applicable to improving patient care. There remain substantial spaces where we can develop viable solutions for improving the usability of multi-component EHR systems.

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