

Understanding the Technical Implementation of a Clinical Decision Support SmartApp: A Qualitative Analysis

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Abstract. CONCERN is a SmartApp that identifies patients at risk for deterioration. This study aimed to understand the technical components and processes that should be included in our Implementation Toolkit. In focus groups with technical experts five themes emerged: 1) implementation challenges, 2) implementation facilitators, 3) project management, 4) stakeholder engagement, and 5) security assessments. Our results may aid other teams in implementing healthcare SmartApps.

Keywords. Qualitative, implementation, technical, clinical decision support

1. Introduction

Nurses will increase their surveillance when they suspect a patient is deteriorating [1]. COmmunicating Narrative Concerns Entered by Registered Nurses (CONCERN) is an early warning system for hospitalized patients at risk of deterioration implemented as a Smart on Fast Healthcare Interoperability Resources clinical decision support app (SmartApp) at two hospital sites in the United States. To support the spread of CONCERN, we are developing and validating the CONCERN Implementation Toolkit. We conducted focus groups with technical experts to understand their experience and recommendations for future implementation. The objective of this study was to understand the technical components and processes that should be included in the Toolkit.

2. Methods

Study procedures were approved by the Institutional Review Board (IRB). We used convenience sampling to recruit technical experts who participated in CONCERN implementation. Focus groups took place from July 2022 – September 2022. Discussions took place over Zoom for 60 minutes. We used Word transcription services to create the transcripts. We used NVivo qualitative software to conduct our analysis. MH and JW

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analyzed the transcripts to identify emerging themes. Results were iteratively refined until consensus was met. Subthemes were mapped to resources within our Toolkit.

3. Results

Nine technical experts participated. Five themes and 19 subthemes emerged (Table 1). Data were collected until saturation. Subthemes were mapped to Toolkit resources.

Table 1. Themes and subthemes for the technical components and processes related to implementation.

Theme	Sub-Theme	Toolkit Resources
Challenges	Specific site challenges	All readiness checklist
	Mapping CONCERN application to FHIR standards	FHIR Implementation Guide App Orchard Documentation for FHIR CONCERN Implementation Guide
	No template to follow	Project Management Readiness Checklist Baseline-Workflow Readiness Checklist
	External build integrated into EHR	FHIR Implementation Guide App Orchard Documentation for FHIR CONCERN Implementation Document
Facilitators	Integration into user's workflow	IT Approaches to Enable Spread
	Standard that will mature over time	FHIR Implementation Guide
Project management	Choosing an interoperable application	FHIR Implementation Guide
	Building an interdisciplinary team	All readiness checklists
	Checking in with goal alignment in biweekly meetings	Project Management Readiness Checklist Evaluation Readiness Checklist
	Implementation checklist	Project Management Readiness Checklist
Stakeholder Engagement	Pre-implementation checklist	Project Management Readiness Checklist
	Testing in multiple environments	Project Management Readiness Checklist
	Early engagement with hospital leadership	Executive Leadership Engagement
	Fostering buy-in from executive leadership	Executive Leadership Engagement
Security Assessment	Early engagement with IT leadership	Presentation to IT Executives
	Early engagement with clinicians	Presentation to Clinical RNs & Unit-Based Providers
	Partnering with Hospital IT to ensure safety and security	CONCERN Implementation Guide
	Initial technical security assessment bundled with IRB submission	CONCERN Implementation Guide
	Minimal application risk assessment because not using a third party	CONCERN Implementation Guide

Note. Fast Healthcare Interoperability Resources (FHIR); IT (Information Technology)

4. Conclusions

This study interviewed technical experts to understand the components and processes related to the CONCERN SmartApp. Some subthemes may be generalizable to implementation of other SmartApps. Results will aid in the development and validation of the CONCERN Implementation Toolkit for spread of CONCERN to other sites. This work was supported by the National Institute of Nursing Research (R01NR016941, T32NR007969), Jonas Scholarship, and American Nursing Foundation: Reimagining Nursing Initiative.

References

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