



ELSEVIER

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major Article

Health care worker perceptions toward computerized clinical decision support tools for *Clostridium difficile* infection reduction: A qualitative study at 2 hospitals

Natalia Blanco PhD, MPH ^{a,*}, Lyndsay M. O'Hara PhD, MPH ^a, Gwen L. Robinson MPH ^a, Jeanine Brown MSN ^a, Emily Heil PharmD ^{a,b}, Clayton H. Brown PhD, MS ^a, Brian D. Stump PharmD ^c, Bryant W. Sigler MS ^c, Anusha Belani MD ^c, Heidi L. Miller RN ^d, Amber N. Chiplinski PharmD ^d, Rebecca Perlmutter MPH ^e, Lucy Wilson MD, MS ^e, Daniel J. Morgan MD, MS ^{a,f}, Surbhi Leekha MBBS, MPH ^a

^a Department of Epidemiology and Public Health, University of Maryland School of Medicine, Baltimore, MD

^b Department of Pharmacy Practice and Science, University of Maryland School of Pharmacy, Baltimore, MD

^c Frederick Memorial Hospital, Frederick, MD

^d Meritus Health, Hagerstown, MD

^e Emerging Infections Program, Maryland Department of Health, Baltimore, MD

^f VA Maryland Healthcare System, Baltimore, MD

Key Words:

Clostridium difficile infection
computerized clinical decision support
antibiotics
proton-pump inhibitors

Background: *Clostridium difficile* infection (CDI) is associated with significant morbidity and mortality. Computerized clinical decision support (CCDS) tools can aid process improvement in infection prevention and antibiotic stewardship, but implementation and health care workers (HCWs) uptake of these tools is often variable. The objective of this study was to describe HCWs' perceptions of barriers and facilitators related to uptake of CCDS tools as part of a CDI reduction bundle.

Methods: We conducted a qualitative study among HCWs at 2 acute care hospitals in Maryland. Semi-structured interviews and structured surveys were completed by HCWs to evaluate their perception to CCDS tools at 2 different stages: predevelopment and preimplementation. Emergent themes and patterns in the data were identified and condensed.

Results: Gaps in CDI-related knowledge and in communication between HCWs were identified throughout the evaluation. HCWs agreed on the potential of the tools to improve CDI diagnosis, prevention, and control. An important barrier for uptake was the perceived loss of autonomy and clinical judgment, whereas standardization and error reduction were perceived advantages.

Conclusions: These observations shaped the development and implementation of the CDI reduction bundle. Qualitative findings can provide valuable contextual information during the development stages of CCDS tools in infection prevention and antibiotic stewardship.

Published by Elsevier Inc. on behalf of Association for Professionals in Infection Control and Epidemiology, Inc.

* Address correspondence to Natalia Blanco, PhD, MPH, University of Maryland School of Medicine, 10 S Pine St, Ste 360F, Baltimore, MD 21201.

Email address: nblanco@som.umaryland.edu (N. Blanco).

Funding/support: Supported by the Centers for Disease Control and Prevention through a Broad Agency Announcement (contract no. 200-2016-91943).

Conflicts of interest: N.B. reports grants from Centers for Disease Control and Prevention, during the conduct of the study; S.L. reports grants from Centers for Disease Control and Prevention, during the conduct of the study; D.J.M. reports grants

from CDC, NIH, AHRQ, VA HSRD, IDSA, other from ASM, Lown and SHEA for expenses to organize or present at national meetings, other from Springer Inc, outside the submitted work; C.B. reports grants from Centers for Disease Control, during the conduct of the study; G.L.R. reports grants from Centers for Disease Control, during the conduct of the study; J.B. reports grants from Centers for Disease Control, during the conduct of the study; L.M.O reports grants from Centers for Disease Control and Prevention, during the conduct of the study; E.H. reports grants from ALK-ABELLO, outside the submitted work; there are no other conflicts to disclose.

BACKGROUND

Despite prevention efforts, *Clostridium difficile* infection (CDI) rates have remained high across the United States, suggesting that new interventions are needed.¹ Electronic health record–based computerized clinical decision support (CCDS), a technology that uses patient-specific data to provide relevant pieces of knowledge at the point of care, has been used to optimize infection control and antibiotic stewardship activities.²⁻⁶ However, the use of CCDS specifically for CDI prevention and control has been more limited.⁶⁻⁹ Although studies report improved user performance when CCDS tools are implemented,^{3,10} health care workers' (HCW) uptake is not guaranteed.^{11,12}

This study is part of an initiative implementing and assessing the impact of a CCDS-based bundle for reducing hospital CDI rates. This study aimed to describe HCWs' perceptions of barriers and facilitators related to uptake of computerized tools for CDI reduction.

MATERIALS AND METHODS

We conducted a qualitative study among HCWs at 2 acute care hospitals in Maryland to explore the perceived barriers and facilitators related to the uptake of a CDI reduction bundle.

Data collection

The CCDS tools used as part of the CDI reduction bundle were evaluated at 2 different time points: (1) predevelopment of the electronic tools and (2) preimplementation of the electronic tools (Fig 1).

For the pre-development evaluation, we conducted in-person semi-structured interviews with a convenience sample of HCWs including physicians, nurses, pharmacists, radiology technicians, and environmental services (EVS) workers in December 2016. The interviews were composed of 2 different sections: (1) a structured section to assess CDI-related knowledge, and (2) a semi-structured section with open-ended questions to assess their perceptions of, and agreement with, the tools included in each of the CDI bundle components. For each interview, the HCWs' occupation determined the components to be addressed (Table 1). An example of an asked open-ended question is the following:

The *C difficile* reduction bundle is planning to generate an automatic order for contact precautions that is coupled to *C difficile* testing. In other words, when you order a *C difficile* test in the system, automatically a contact precautions order will be generated for this patient.

- Would you agree with this measure? Why or why not?
- Do you think this tool will facilitate the health care provider's ordering of contact precautions?
- Would you prefer if the system allow you to opt out of the automatic contact precautions ordering? Why or why not?

To reduce potential interviewer bias, research team members (epidemiologist, nurse practitioner) with no association to either hospital acted as interviewers. The interviewees were informed the interview was anonymous and voluntary.

For the pre-implementation evaluation, a self-administered structured survey was completed by a convenience sample of 13 HCWs (physician or physician assistant role only) in September 2017 to evaluate the level of agreement toward the electronic tools ready for implementation. The survey included screenshots for each of the new electronic tools, including alerts, hard stops, and order sets. This study was approved by the Institutional Review Board at the University of Maryland, Baltimore.

Data processing and analysis

All interviews were audio-recorded and transcribed verbatim. Both interviews and surveys were anonymous and de-identified. For the CDI knowledge section, we calculated percent agreement with each CDI-related statement, stratified by occupation. For the pre-implementation stage survey, medians of agreement levels were estimated.

Nvivo 11 (QSR International, Burlington, MA) was used to analyze the open-ended questions and to guide the thematic analysis. Three research team members (N.B., G.L.R., and L.M.O.) performed conventional content analysis on 4 randomly selected interview transcripts to create an initial coding scheme that was later refined. Two of these 3 reviewers independently coded each transcript to ensure consistency of coding. Emergent themes and patterns in the data were identified. Through reviewer consensus, themes were condensed into overarching categories and subthemes which were supported with the strongest direct quotations (subsequently reported in results section).

RESULTS

Pre-development stage

CDI-related knowledge among HCWs

Of the 34 HCWs (17 from each hospital) who participated in the structured interviews, 11 were nurses, 9 were physicians, 3 were pharmacists, 4 were radiology technicians, and 7 were EVS workers.

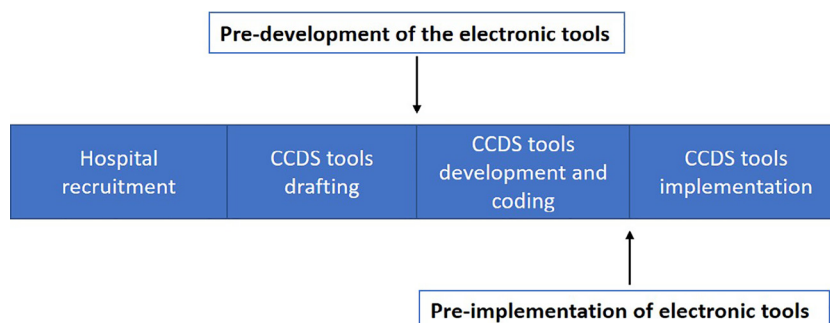


Fig 1. Graphic representation of study timeline. CCDS, computerized clinical decision support.

Download English Version:

<https://daneshyari.com/en/article/11019272>

Download Persian Version:

<https://daneshyari.com/article/11019272>

[Daneshyari.com](https://daneshyari.com)