Evaluating academic detailing as a method for identifying contextual factors that influence the implementation of HIT in the emergency department

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Abstract

Context

With the rapid implementation of health information technologies (HIT), health systems are being required to manage increasingly dynamic systems while ensuring the delivery of high quality patient care (Yen et al., 2017). The complexity of the clinical context is only further exacerbated by the fall-out of the COVID-19 pandemic and ongoing clinician burnout crisis (National Academies of Sciences & Medicine, 2019; Tamata & Mohammadnezhad, 2023). In implementing HIT in such complex environments, barriers invariably emerge (Cook et al., 2000); thus, even well-designed HIT often have slow uptake at first (Patterson, Pulia, et al., 2019). Researchers have called for re-defining successful implementation from HIT adoption and acceptance to HIT adaptation, recognizing that successful implementation involves modifying the context to better support HIT implementation (Yen et al., 2017). Yet, methods for assessing and informing HIT adaptation have yet to be developed.

One method that holds the potential to efficiently assess the contexts in which HIT are being implemented is academic detailing. Adapted from pharmaceutical industry sales methods by researchers to improve physicians’ prescribing practices, academic detailing is defined as a “personal visit by a trained person to health professionals in their own settings” (O’Brien et al., 2007, p. 3; Yeh et al., 2016). While the method has primarily been used to promote evidence-based practice by providing focused clinician education, initial work has demonstrated the method’s ability to identify barriers to following best-practice (Barton et al., 2023; Saffore et al., 2020). However, the potential for academic detailing to assess complex and dynamic contexts may only grow if structured to do so.

Describing complex clinical environments is a key contribution of the field of Human Factors Engineering (HFE) to healthcare quality and patient safety (Carayon et al., 2014; Hignett et al., 2013). By considering clinicians to be workers, HFE methods can be applied to assess the context of clinicians’ work, i.e., work system. The Systems Engineering Initiative for Patient Safety (SEIPS) model, for example, situates a person (clinician) in the center of a work system—constituted by the tools and technology they use to do certain tasks, within a certain organizational and environmental context—that interacts to produce health care processes and outcomes (Carayon et al., 2013; Carayon et al., 2006). Identifying barriers to (obstacles to achieving) or facilitators of (support in achieving) desired outcomes, e.g., patient safety, can direct efforts to redesign the work system. The identification of work system barriers and facilitators has contributed to the development of hospital- and home-based health interventions and technologies (Salwei et al., 2021; Salwei et al., 2022; Wooldridge et al., 2020). The use of work systems models to assess HIT implementation is less explored.
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HIT to prevent future falls. Every year approximately 1 in 4 people over 65 years old experiences a fall—the leading traumatic cause of morbidity and mortality for older adults (Burns & Kakara, 2018). While emergency departments (EDs) are primarily tasked with providing acute care for patients, advances in algorithm-based risk prediction have made preventative care referrals feasible even in the time-constrained ED environment (Goldstein et al., 2017). Our research team developed one such algorithm to predict future falls in addition to a clinical decision support (CDS) tool to utilize the algorithm (Close et al., 1999; Patterson, Engstrom, et al., 2019). The CDS supports clinicians’ referral of patients who are at the greatest risk of a fall to the health system’s underutilized falls prevention clinic.

Objective

The objective of this study was to evaluate academic detailing as a method for conducting a work system analysis to assess and inform HIT adaptation.

Methods

Participants and Procedure. We conducted academic detailing interviews (n=16) with resident emergency medicine physicians and advanced practice providers who had previously encountered our CDS tool in practice. The interviews were semi-structured and followed an interview guide that included questions such as, “How and when did you see the tool initially? What was your reaction?” and “How did you make the decision to refer the patient or not?” Interviews lasted roughly 10 minutes and took place over the phone and in-person.

Data analysis. Interviews were analyzed using an inductive, team-based content analysis (Hsieh & Shannon, 2005). Two researchers (AM, ML) independently reviewed and coded four interviews, line-by-line. The researchers then met to compare and refine codes until there was agreement and all transcripts were coded. The research team categorized the resulting codes into the HFE-based Systems Engineering Initiative for Patient Safety (SEIPS) 2.0 framework (Holden et al., 2013). An HFE-expert (HB) then reviewed these categorizations and compiled a list of barriers and facilitators for each work system component.

Main results

Our analysis resulted in the following factors that impacted clinicians’ use of the CDS: (1) aspects of the CDS tool’s design, e.g., its features, usability, appropriateness, and how it fit in the clinician’s workflow, (2) the clinician’s perceptions of the patient and their associated fall-risk, (3) patient’s chief complaint, i.e., reason for being in the ED, (4) the busy nature of the ED environment, and (5) clinician’s understanding (or misunderstanding) of the CDS and referral process. Table 1 categorizes these factors into the SEIPS 2.0 components and lists exemplary barriers and facilitators.
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Table 1. Mapping of inductively derived factors implementing clinicians’ CDS use to SEIPS 2.0 components, including exemplary work system barriers (-) and facilitators (+).

<table>
<thead>
<tr>
<th>SEIPS 2.0 component</th>
<th>Factors impacting clinicians’ CDS use</th>
<th>Example work system barrier/facilitator</th>
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</table>
| Person (Clinician)  | (2) the clinician’s perceptions of the patient and their associated fall-risk  
(5) clinician’s understanding (or misunderstanding) of the CDS and referral process, i.e., where the referral goes | [+ ] Clinician is familiar with the concept of the CDS from organizational stakeholder’s communication  
[- ] Misunderstanding of where the referral is sent |
| Person (Patient)    | (3) patient’s chief complaint, i.e., reason for being in the ED | [- ] Patient is being seen for a chief complaint other than a fall |
| Tools & Technology  | (1) aspects of the CDS tool’s design, i.e., CDS appropriateness, features, and usability | [+ ] CDS requires minimal input from clinician  
[- ] Alert that signals clinician they missed the CDS (and therefore cannot yet discharge the patient) does not provide clear instruction on how to find and complete it |
| Task                | (1) aspects of the CDS tool’s design, i.e., CDS workflow integration | [+ ] CDS prompts clinician for input at a convenient place in the workflow, i.e., just prior to patient discharge  
[- ] Clinician workflow deviates from the recommended order of operations |
| Organization        | (5) clinician’s understanding (or misunderstanding) of the CDS and referral process | [+ ] Hearing about successfully referred patients  
[- ] Clinician lacks the necessary information needed to counsel patients on what to expect from the referral |
| Environment         | (4) the busy nature of the ED environment | [- ] A busy ED |

Discussion/perspectives

Our findings suggest that academic detailing is an efficient method for assessing the context, i.e., work system, into which our CDS tool was implemented. We identified five factors which impacted clinicians’ CDS use which mapped to each component of the work system, including both the clinician and patient. We also identified work system barriers and facilitators for each work system component, though they were most frequently associated with the person (clinician), tools and technology, and organization components. Fewer work system barriers and facilitators were identified for the environment and person (patient) components which could indicate that academic detailing may be less suited for identifying those barriers and facilitators, or alternatively that, in determining whether the clinician uses the CDS, those components are less influential. Regardless, to ensure academic detailing provides a comprehensive work system analysis, a more systematic approach to incorporating a work systems lens should be taken. In Table 2, we provide exemplary prompts and probes for conducting SEIPS-based academic detailing.
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By conducting brief 10-minute interviews with several clinicians, we were able to identify a variety of work system barriers and facilitators that could then be addressed or leveraged at different levels to improve the implementation of HIT—including directly addressing a clinician’s misconception during the academic detailing interview itself. The novelty of this method is its efficiency in simultaneously promoting a tool, ensuring the proper understanding of it, as well as identifying barriers to implementation that can be addressed though iterative redesign. Further, given the barriers and facilitators identified with this method were noted in situ, it may be the case that they identify more nuanced insight into how to design HIT to effectively integrate into clinical workflows (Salwei et al., 2021).

With HIT being developed and implemented at rapid speeds, feasible methods for assessing and informing HIT adaptation are greatly needed. To ensure the viability of any HIT, health systems will need to develop new methods for managing and monitoring the fit of their HIT systems to the evolving clinical context (Carayon & Salwei, 2021). SEIPS-based academic detailing may be a resource-efficient way to assess the contexts in which HIT is implemented and inform ongoing HIT adaptation.

Table 2. Exemplary SEIPS-based academic detailing prompts and probes.

<table>
<thead>
<tr>
<th>Exemplary SEIPS-based academic detailing prompts</th>
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<tr>
<td><strong>• Can you tell us a little about one of the times you interacted with the CDS?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Person</strong></td>
<td>What was your reaction to seeing the alert? Did you recognize it? Did it seem to accurately identify a patient at high risk of falling?</td>
</tr>
<tr>
<td><strong>Tools &amp; Technology</strong></td>
<td>How was the CDS to interact with? What made it easy to use? Were there any things about the tool you found frustrating?</td>
</tr>
<tr>
<td><strong>Task</strong></td>
<td>How did the CDS fit into your workflow?</td>
</tr>
<tr>
<td><strong>Organization</strong></td>
<td>Was it clear what would happen when you accepted the CDS, e.g., where the referral would go? Was it clear who should counsel the patient?</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td>Where were you when you saw the alert?</td>
</tr>
</tbody>
</table>

**• How did you make the decision about whether to refer the patient to the fall prevention clinic or not? What factors influenced that decision? (Probe to identify how influences were different the other times they encountered the CDS)**

| **Person** | Characteristics of the patient? |
| **Tools & Technology** | Aspects of the CDS? Of the electronic health record? Other tools or technologies? |
| **Task** | Aspects of the work required to refer the patient? |
| **Organization** | Aspects of the referral process? |
| **Environment** | State of the ED? |

**Keywords**
Healthcare, Health IT, SEIPS, Implementation

**References**
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